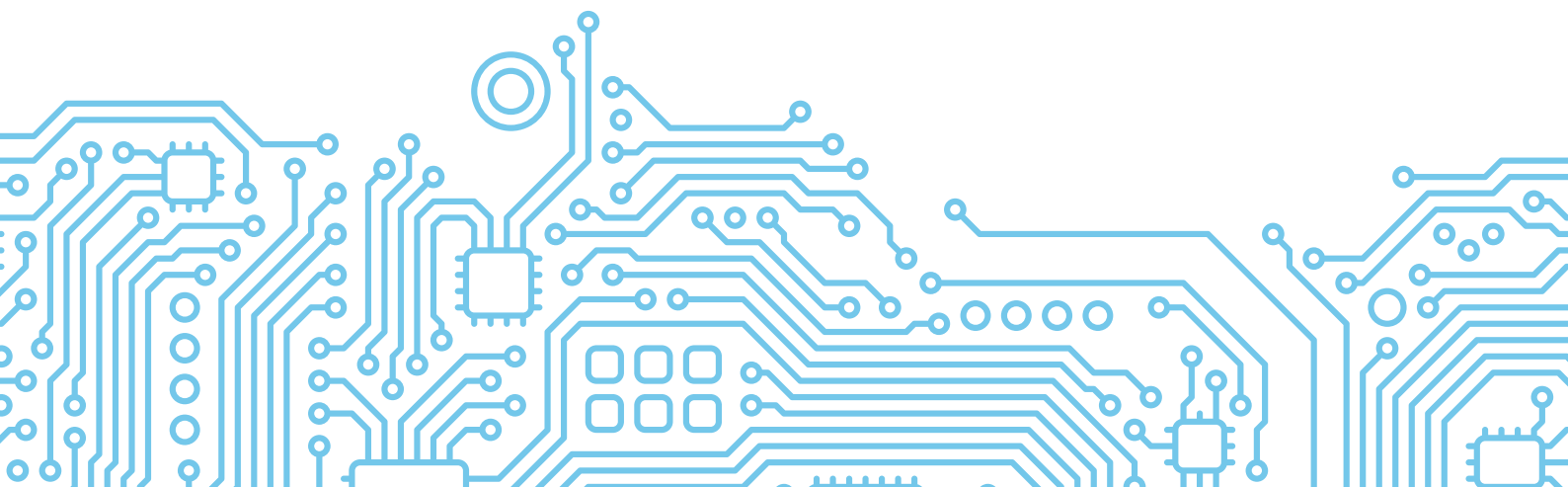
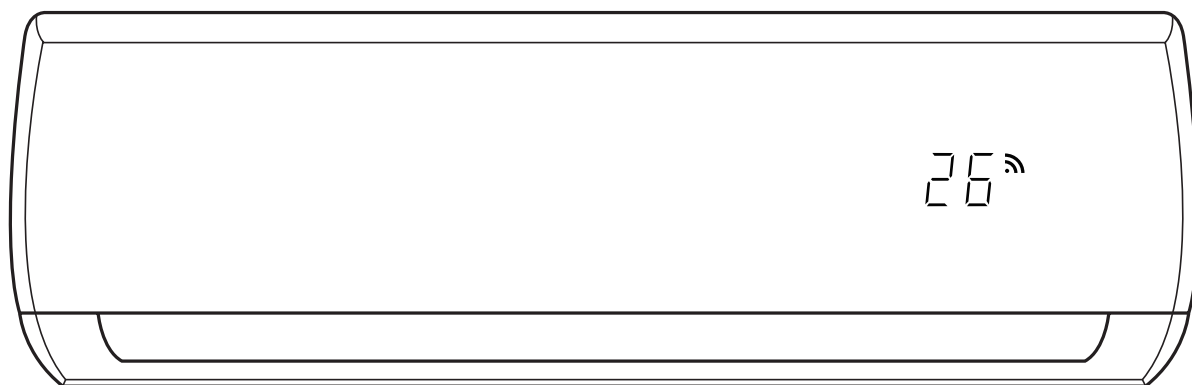




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NEXO INVERTER SOROZAT / R32 KOR32

SZERVIZ kézikönyv



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- iii) Nyomás a szerviz porton



Caution: Risk of fire
(Required for R32/R290
units only)

**Figyelem : tűzveszély !
Csak R32 és R290-es
egység esetében.**

Biztonsági intézkedések

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1. Óvintézkedések

A személyi sérülések, vagyoni vagy anyagi károk elkerülése érdekében tartsa be az ebben a kézikönyvben ismertetett óvintézkedéseket és utasításokat. Az egység javítása előtt olvassa el ezt a szervizelési útmutatót és annak vonatkozó szakaszát.

Az ebben a szakaszban felsorolt óvintézkedések be nem tartása személyi sérüléseket, a készülék vagy vagyon károsodását vagy szélsőséges esetekben halálát okozhatja.



A **FIGYELEM** egy potenciálisan veszélyes helyzetet jelöl, amely elkerülése nélkül súlyos személyi sérüléseket vagy halált okozhat.



VIGYÁZAT egy potenciálisan veszélyes helyzetet jelöl, amely elkerülése esetén enyhe vagy közepes mértékű személyi sérülést vagy egységet okozhat.

1.1 Baleset vagy vészhelyzet esetén



FIGYELEM

- Ha feltételezhető gázszivárgás, azonnal kapcsolja ki a gázt és szellőztesse ki a helységet, ha gyanú merül fel gázszivárgás előtt, mielőtt a készüléket bekapcsolná.
- Ha furcsa hangokat vagy füstöt észlel a készülékből, kapcsolja ki a megszakítót, és húzza ki a tápkábelt.
- Ha az egység folyadékkal érintkezik szállítás során, vegye fel a kapcsolatot egy hivatalos szervizközponttal.
- Ha az akkumulátorokból származó folyadék érintkezésbe kerül a bőrrel vagy a ruházattal, azonnal öblítse le vagy mossa le tiszta vízzel.
- Ne helyezze a kezét vagy más tárgyat a levegő be- vagy kimeneti nyílásába, amíg a készülék be van dugva.
- Ne működtesse a készüléket nedves kézzel.
- Ne használjon távirányítót, amely korábban akkumulátor károsodásának vagy szivárgásának volt kitéve.



VIGYÁZAT

- Tisztítsa meg és szellőztesse az egységet rendszeres időközönként, amikor tűzhely közelében vagy hasonló eszközök közelében üzemelteti.
- Ne használja a készüléket szélsőséges időjárási körülmények között. Ha lehetséges, távolítsa el a terméket az ablakon, mielőtt ilyen események bekövetkeznének.

1.2 Előtelepítés és telepítés



WARNING

- Ezt a készüléket csak egy szabványos áramkörtön használja.
- A telepítési terület károsodása miatt az egység leeshet, ami személyi sérüléseket, vagyonkárosodásokat vagy termékhibákat okozhat.
- A készülék szétszerelést, javítását, eltávolítását csak szakképzett szakember végezheti.
- A készülék elektromos szerelését csak szakképzett villanyszerelő végezheti. További információért vegye fel a kapcsolatot a kereskedővel, az eladóval vagy a hivatalos szervizközponttal.



CAUTION

- Kicsomagolás közben vigyázzon az egység körül lévő éles élekre, valamint a kondenzátoron és az elpárologtatóban lévő lamellák széleire.

1.3 Üzemeltetés és karbantartás



FIGYELEM

- Ne használjon hibás vagy alulértékelt megszakítókat.
- Ellenőrizze, hogy az egység megfelelően van-e földelve, és hogy van-e telepítve egy külön áramkör és megszakító.
- Ne módosítsa vagy hosszabbítsa meg a tápkábelt. Győződjön meg arról, hogy a tápkábel biztonságos és működés közben nem sérült.
- Működés közben ne húzza ki a hálózati csatlakozódugót.
- Ne tárolja és ne használjon gyúlékony anyagokat a készülék közelében.
- Működés közben ne nyissa ki a készülék bemeneti rácsát.
- Ne érintse meg az elektrosztatikus szűrőt, ha az egység fel van szerelve.
- Ne blokkolja a levegő áramlását az egységbe.
- Ne használjon erős tisztítószeret, oldószereket vagy hasonló eszközöket a készülék tisztításához. A tisztításhoz használjon puha ruhát.
- A légszűrő eltávolításakor ne érintse meg a készülék fém alkatrészeit, mivel ezek nagyon élesek.
- Ne lépjen rá, és ne tegyen semmit az egységre vagy a kültéri egységekre.
- Ne igyon a készülékből kifolyó vizet
- Kerülje a közvetlen bőrrel való érintkezést az egységből kifolyó vízzel.
- A készülék tisztításakor vagy karbantartásakor használjon szilárd széket vagy létrát a gyártó előírásainak megfelelően.



VIGYÁZAT

- Ne telepítse és ne üzemeltesse hosszabb ideig az egységet magas páratartalmú területeken vagy olyan környezetben, amely közvetlenül a tengeri szélnek vagy a sópermetnek van kitéve.
- Ne telepítse hibás vagy sérült szerelési állványra, vagy nem biztonságos helyre.
- Győződjön meg arról, hogy az egység vízszintes helyzetben van felszerelve
- Ne telepítse az egységet olyan helyre, ahol a kültéri egység által okozott zaj vagy levegőkiáramlás negatív hatással van a környezetre vagy a közeli lakásokra.
- Ne tegye ki a bőrét közvetlenül az egység által kibocsátott levegőnek hosszabb ideig.
- **Ellenőrizze, hogy az egység vízben vagy más folyadékban működik-e.**
- Ellenőrizze, hogy a kifolyócső megfelelően van-e felszerelve, hogy biztosítsa a megfelelő vízleeresztést.
- A készülék felemelésekor vagy szállításakor ajánlott, hogy két vagy több ember legyen a feladathoz.
- Ha az egységet hosszabb ideig nem használja, húzza ki az áramellátást vagy kapcsolja ki a megszakítót.

2. Információs szolgáltatás (gyúlékony anyagok esetén)

2.1 A terület ellenőrzése

A gyúlékony hűtőközegeket tartalmazó rendszerekkel történő munka megkezdése előtt biztonsági ellenőrzésekre van szükség annak biztosítása érdekében, hogy a gyulladás kockázata minimalizálódjon.

A hűtőrendszer javításakor a következő óvintézkedéseket be kell tartani, mielőtt a rendszeren elvégzik a munkát.

2.2 Munka eljárás

- A munkát ellenőrzött eljárás szerint kell elvégezni annak érdekében, hogy minimálisra csökkentsék a gyúlékony gáz vagy gőz jelenlétét a munka során.

2.3 Munka folyamat

A karbantartó és más, helyi területen dolgozó személyzetet be kell tanítani a végrehajtandó munka jellegére.

Kerülni kell a zárt terekben végzett munkát.

A munkaterület körüli területet el kell választani. A gyúlékony anyagok ellenőrzésével gondoskodjon arról, hogy a térségben a körülmények biztonságossá váljanak.

2.4 Hűtőközeg jelenlétének ellenőrzése

- A területet a munka előtt és alatt megfelelő hűtőközeg-detektorral kell ellenőrizni, hogy megbizonyosodjon arról, hogy a technikus tisztában van-e a potenciálisan tűzveszélyes légkörrel.
- Győződjön meg arról, hogy a használt szivárgásérzékelő berendezés tűzveszélyes hűtőközeggel történő használatra alkalmas, azaz nincs szikra, megfelelően lezárt vagy gyújtószikramentes.

2.5 Tűzoltó készülék jelenléte

Ha a hűtőberendezésen vagy annak kapcsolódó alkatrészein bármilyen hőátadással járó munkát kell végezni, megfelelő tűzoltó készüléket kell biztosítani.

A töltési hely közelében legyen száraz por vagy CO₂ tűzoltó készülék.

2.6 Nincsenek gyújtóforrások

- A hűtőrendszerrel kapcsolatos munka ill. a hűtőközeget vagy azt tartalmazó csővezetéke szerelése során nem használhat gyújtóforrást oly módon, hogy tűz vagy robbanás kockázatához vezethet.
- Az összes lehetséges gyújtóforrást, beleértve a cigarettázást is, kellő távolságra kell tartani a telepítés, javítás, eltávolítás és ártalmatlanítás helyétől, amely során tűzveszélyes hűtőközeg szabadulhat fel a környező helyre.

- A munka elvégzése előtt meg kell vizsgálni a berendezés körüli területet, hogy megbizonyosodjon arról, hogy nincs-e éghetőség veszély vagy gyulladási veszély.
- NE DOHÁNYOZZ jeleket kell megjeleníteni.

2.7 Szellőztetett terület

- A rendszerbe való belépés vagy bármilyen forró munka elvégzése előtt ellenőrizze, hogy a terület szabadon van-e vagy megfelelő szellőzésű. A munka elvégzésének időtartama alatt folytatni kell a szellőztetést. A szellőzésnek biztonságosan el kell diszpergálnia a kibocsátott hűtőközeget, és lehetőleg külsőleg kell a légkörbe juttatnia.

2.8 A hűtőberendezés ellenőrzése

- Az elektromos alkatrészek cseréjekor azoknak meg kell felelniük a rendeltetésnek és a megfelelő előírásoknak. Minden esetben be kell tartani a gyártó karbantartási és szervizelési útmutatásait. Kétség esetén forduljon segítségért a gyártó műszaki osztályához. A gyúlékony hűtőközegeket használó létesítményeknél a következő ellenőrzéseket kell elvégezni:
 - a töltés mérete megegyezik a helyiség méretével, amelybe a hűtőközeget tartalmazó alkatrészek be vannak szerelve;
 - a szellőztető gépek és a kimenetek megfelelően működnek és nincsenek akadályozva;
 - közvetett hűtőkör használata esetén a másodlagos áramkört ellenőrizni kell a hűtőközeg jelenlétére vonatkozóan; A berendezés jelölése továbbra is látható és olvasható.
 - az olvashatatlan jelöléseket és jeleket javítani kell;
 - a hűtőcső vagy alkatrészei olyan helyzetben vannak be szerelve, ahol valószínűleg nem lesznek kitéve olyan anyagoknak, amelyek korrodálhatják a hűtőközeget tartalmazó alkotóelemeket, kivéve, ha az alkotóelemeket olyan anyagokból állítják elő, amelyek eredendően ellenállnak a korrodálódásnak, vagy amelyek megfelelően védettek az ilyen korrózió ellen.

2.9 Elektromos készülékek ellenőrzése

- Az elektromos alkatrészek javításának és karbantartásának tartalmaznia kell a kezdeti biztonsági ellenőrzéseket és az alkatrészek ellenőrzési eljárásait. Ha olyan hiba keletkezik, amely veszélyeztetheti a biztonságot, akkor nem szabad csatlakoztatni az áramkörhöz addig amíg kielégítően ellenőrizték. Ha a hibát nem lehet azonnal kijavítani, de a működést folytatni kell, megfelelő ideiglenes megoldást kell alkalmazni. Erről értesíteni kell a berendezés tulajdonosát, így minden felet értesíteni kell. A kezdeti biztonsági ellenőrzéseknek tartalmazniuk kell:

- a kondenzátorok kiürülnek: ezt biztonságosan kell elvégezni a szikraképződés elkerülése érdekében;
- a rendszer feltöltése, helyreállítása vagy megtisztítása közben nincsenek kitéve élő elektromos alkatrészek és vezetékek;
- fennáll-e a föld kötésének folytonossága.

2.10 Zárt alkatrészek javítása

- A lezárt alkatrészek javításánál az összes elektromos tápegységet le kell választani a megmunkált készülékektől, mielőtt leszerelik a burkolatot. Ha feltétlenül szükséges a berendezéshez elektromos ellátás a szervizelés során, akkor a szivárgás észlelését a legkritikusabb ponton kell elhelyezni, hogy figyelmeztesse a potenciálisan veszélyes helyzetet.
- Különös figyelmet kell fordítani a következőkre annak biztosítása érdekében, hogy az elektromos alkatrészek megmunkálásával a ház ne változzon úgy, hogy az befolyásolja a védelem szintjét. Ez magában foglalja a kábelek sérülését, a túl sok csatlakozást, a sorkapcsokat, amelyek nem az eredeti specifikáció szerint vannak elkészítve, a tömítések sérüléseit, a tömszelencék helytelen felszerelését stb.
- Ügyeljen arra, hogy a készüléket biztonságosan rögzítse.
- Ügyeljen arra, hogy a tömítések vagy tömítőanyagok nem romlanak oly módon, hogy azok már nem szolgálják a tűzveszélyes légkör behatolásának megakadályozását. A cserealkatrészeknek meg kell felelniük a gyártó előírásainak.

MEGJEGYZÉS: A szilikon tömítőanyag használata korlátozhatja bizonyos típusú szivárgásérzékelő berendezések hatékonyságát. A gyújtószikramentes alkatrészeket nem kell elkülöníteni, mielőtt azokon dolgoznának.

2.11 Szikramentes alkatrészek javítása

- Ne tegyen semmilyen állandó induktív vagy kapacitív terhelést az áramkörre anélkül, hogy megbizonyosodott arról, hogy az nem haladja meg a használt berendezések megengedett feszültségét és áramát. Gyújtószikramentes alkatrészek az egyetlen típus, amelyen dolgozhatók, miközben gyúlékony légkörben élnek. A vizsgálóberendezésnek a megfelelő névleges besorolásúnak kell lennie.
- Csak az alkatrészeket cserélje ki a gyártó által megadott alkatrészekre. Más részek miatt a hűtőközeg meggyulladhat a légkörben szivárgás következtében.

2.12 Kábelezés

- Ellenőrizze, hogy a kábelezés nem esik-e kopásnak, korrózióknak, túlzott nyomásnak, rezgésnek, éles széleknek vagy más káros környezeti hatásoknak.

Az ellenőrzéseknek figyelembe kell venniük az öregedés vagy a folyamatos rezgés hatásait is, pl. Kompresszorok vagy ventilátorok.

2.13 Tűzveszélyes hűtőközegek kimutatása

- A hűtőközeg-szivárgások keresésekor vagy felismerésekor semmilyen körülmények között nem szabad potenciális gyújtóforrást használni. Halid fáklyát (vagy bármilyen nyílt lángot használó érzékelőt) nem szabad használni.

2.14 Szivárgásérzékelési módszerek

- A következő szivárgáskeresési módszereket tűzveszélyes hűtőközegeket tartalmazó rendszerek esetében elfogadhatónak tekintik. A tűzveszélyes hűtőközegek detektálásához elektronikus szivárgásérzékelőt kell használni, de ha az érzékenység nem megfelelő, újrakalibrálást igényelhet.
- (A detektáló berendezést hűtőközegmentes helyen kell kalibrálni.) Gondoskodjon arról, hogy az érzékelő ne jelentsen potenciális gyulladási forrást, és alkalmas legyen a használt hűtőközeg számára. A szivárgásérzékelő berendezést a hűtőközeg LFL százalékában kell beállítani, és kalibrálni kell az alkalmazott hűtőközeggel, és meg kell erősíteni a megfelelő gázszintet (legfeljebb 25%). A szivárgásjelző folyadékok a legtöbb hűtőközeghez felhasználhatók, de kerülni kell a klórtartalmú mosószerek használatát, mivel a klór reagálhat a hűtőközeggel és korrodálhatja a rézcsővezetékét.
- Szivárgás gyanúja esetén minden nyílt lángot el kell távolítani vagy el kell oltani.
- Ha olyan hűtőközeg-szivárgást észlel, amely forrasztást igényel, az összes hűtőközeget el kell távolítani a rendszerből, vagy el kell különíteni (elzáró szelepekkel) a rendszer egy részében a szivárgástól. Az oxigénmentes nitrogént (OFN) ezután a rendszeren keresztül ki kell tisztítani a forrasztási folyamat előtt és alatt.

2.15 Removal and evacuation

- Ha a hűtőközeg körébe javítások vagy bármilyen más célból behatol, hagyományos eljárásokat kell alkalmazni. Fontos azonban, hogy a legjobb gyakorlatot kövessük, mivel a gyúlékonyságot figyelembe kell venni.

A következő eljárást kell betartani:

- távolítsa el a hűtőközeget;
- tisztítsa meg az áramkört inert gázzal;
- kiürít;
- ismét öblítse le inert gázzal;
- nyissa meg az áramkört vágással vagy keményforrasztással.

- A hűtőközeg-töltetet vissza kell vezetni a megfelelő visszanyerő palackba. A rendszert le kell öblíteni OFN-vel, hogy az egység biztonságos legyen. Lehet, hogy ezt a folyamatot többször meg kell ismételni. Sűrített levegő vagy oxigén nem használható erre a feladatra. Az öblítést úgy kell elérni, hogy a rendszerben lévő vákuumot megszakítják az OFN-szel, és az üzemi nyomás eléréséig folytatják a feltöltést, majd a légkörbe vezetik, és végül levákuumozzák. Ezt a folyamatot addig kell ismételni, amíg a rendszerben nincs hűtőközeg. A végső OFN-töltet felhasználásakor a rendszert légköri nyomásig kell szellőztetni, hogy lehetővé váljon a munka. Ez a művelet elengedhetetlen a csőmunkálatok keményforrasztási műveleteinek végrehajtásához.
- Győződjön meg arról, hogy a vákuumszivattyú kimenete nincs gyújtóforrás közelében, és rendelkezésre áll-e szellőzés.

2.16 Töltési eljárások

- A hagyományos töltési eljárások mellett a következő követelményeket kell betartani:
- Ügyeljen arra, hogy a töltőberendezések használata közben ne forduljon elő a hűtőközegek szennyeződése. A tömlőknek vagy vezetéknek a lehető legrövidebbnek kell lenniük, hogy minimalizálják a bennük lévő hűtőközeg mennyiségét.
- A tartályokat függőlegesen kell tartani.
- A rendszer hűtőközeggel történő feltöltése előtt ellenőrizze, hogy a hűtőrendszer földelt-e.
- Ha a töltés befejeződött (ha még nem), jelölje meg a rendszert.
- Rendkívül ügyelni kell arra, hogy ne töltse túl a hűtőrendszert.
- A rendszer újratöltése előtt nyomást kell próbálni az OFN-rel. A rendszert a töltés befejezése után, de üzembe helyezés előtt szivárgáspróbának kell megvizsgálni. A helyszínről való távozás előtt utólagos szivárgási vizsgálatot kell végezni.

2.17 Leszerelés

Az eljárás végrehajtása előtt elengedhetetlen, hogy a szakember teljesen ismerje a berendezést és annak minden részletét. Javasoljuk, hogy minden hűtőközeget biztonságosan nyerjenek vissza. A feladat elvégzése előtt olaj- és hűtőközeg-mintát kell venni. Ha a visszanyert hűtőközeg újrafelhasználása előtt elemzésre van szükség. Alapvető fontosságú, hogy az elektromos áram rendelkezésre álljon a feladat megkezdése előtt.

- Ismerje meg a berendezést és annak működését.
- Izolálja a rendszert elektromosan.

- Az eljárás megkezdése előtt győződjön meg arról, hogy:
- szükség esetén mechanikus szállítóeszközök állnak-e rendelkezésre a hűtőközeg-palackok kezeléséhez;
- minden egyéni védőfelszerelés rendelkezésre áll és helyesen használják;
- a helyreállítási folyamatot mindig illetékes személy felügyeli;
- a helyreállító berendezések és a palackok megfelelnek a rendelkező szabványoknak.
- Ha lehetséges, szivattyúzza le a hűtőközeget.
- Ha a vákuumozás nem lehetséges, akkor készítsen elosztót, hogy a hűtőközeg eltávolítható legyen a rendszer különböző részeiről.
- A visszanyerés előtt ellenőrizze, hogy a henger a mérlegen van-e.
- Indítsa el a helyreállító gépet, és a gyártó utasításainak megfelelően használja.
- Ne töltse túl a hengereket. (Legfeljebb 80 térfogat% folyadék töltet).
- Ne lépje túl ideiglenesen sem a henger maximális üzemi nyomását.
- A hengerek megfelelő feltöltése és a folyamat befejezése után győződjön meg arról, hogy a hengereket és a berendezéseket azonnal eltávolítják a helyszínről, és a berendezés összes leválasztó szelepét bezárják.
- A visszanyert hűtőközeget csak akkor lehet betölteni egy másik hűtőrendszerbe, ha azt megtisztították és ellenőrizték.

2.18 Címkézés

- A berendezésen fel kell tüntetni, hogy üzembe helyezték és kiürítették
- hűtőközeg. A címkét dátummal és aláírással kell ellátni. Győződjön meg arról, hogy a berendezésen vannak címkék, amelyek szerint a berendezés gyúlékony hűtőközeget tartalmaz.

2.19 Visszanyerés

- Ha hűtőközeget távolít el egy rendszerből, akár karbantartás, akár leszerelés céljából, ajánlott a bevált gyakorlat, hogy az összes hűtőközeget biztonságosan távolítsa el.
- Ha hűtőközeget tölt be hengerbe, győződjön meg arról, hogy csak megfelelő hűtőközeg-visszanyerő hengereket használ. Győződjön meg arról, hogy rendelkezésre áll-e a hengerek megfelelő száma a teljes rendszer feltöltéséhez. Minden használandó henger meg van jelölve
- a visszanyert hűtőközeg számára, és az adott hűtőközetre fel van címkézve (azaz speciális palackok a hűtőközeg visszanyerésére). A hengereknek megfelelő nyomáscsökkentő szeleppel és a hozzájuk tartozó elzárószelepekkel kell rendelkezniük.

-
- Az ürítő hengereket kiürítik, és ha lehetséges, lehűtik, mielőtt a visszanyerés megtörténne.
 - A visszanyerő berendezésnek működőképességűnek kell lennie, a rendelkezésre álló berendezésre vonatkozó utasításokkal együtt, és alkalmasnak kell lennie a gyúlékony hűtőközegek visszanyerésére. Ezenkívül rendelkezésre kell állnia egy kalibrált mérlegkészletnek, amely jó állapotban van.
 - A tömlőknek szivárgásmentes jó állapotban levő leválasztó szelepekkel kell rendelkezni. A visszanyerő gép használata előtt ellenőrizze, hogy az megfelelően működik, megfelelően karbantartva van-e, és minden kapcsolódó elektromos alkatrész le van-e zárva, hogy megakadályozza a hűtőközeg felszabadulása esetén a meggyulladás. Ha kétségei vannak, forduljon a gyártóhoz.

- A visszanyert hűtőközeget a megfelelő gyűjtőpalackban kell visszajuttatni a hűtőközeg szállítójához, és foganatosítani kell a vonatkozó hulladékátadási megjegyzést. Ne keverjen hűtőközeget visszanyerő egységekben, főleg ne hengerekben.
- Ha el akarja távolítani a kompresszorokat vagy a kompresszorolajokat, győződjön meg arról, hogy azokat elfogadható szintre ürítették, hogy megbizonyosodjon arról, hogy a gyúlékony hűtőközeg nem marad a kenőanyagban.
- A kiürítési folyamatot a kompresszor szállítókhöz történő visszaküldése előtt kell végrehajtani. Csak a kompresszor testének elektromos fűtését szabad használni
- hogy felgyorsítsa ezt a folyamatot. Ha az olajat egy rendszerből ürítik, azt biztonságosan kell végrehajtani.

Specifikációk

Tartalom

| | | |
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1. Model Reference

Refer to the following table to determine the specific indoor and outdoor unit model.

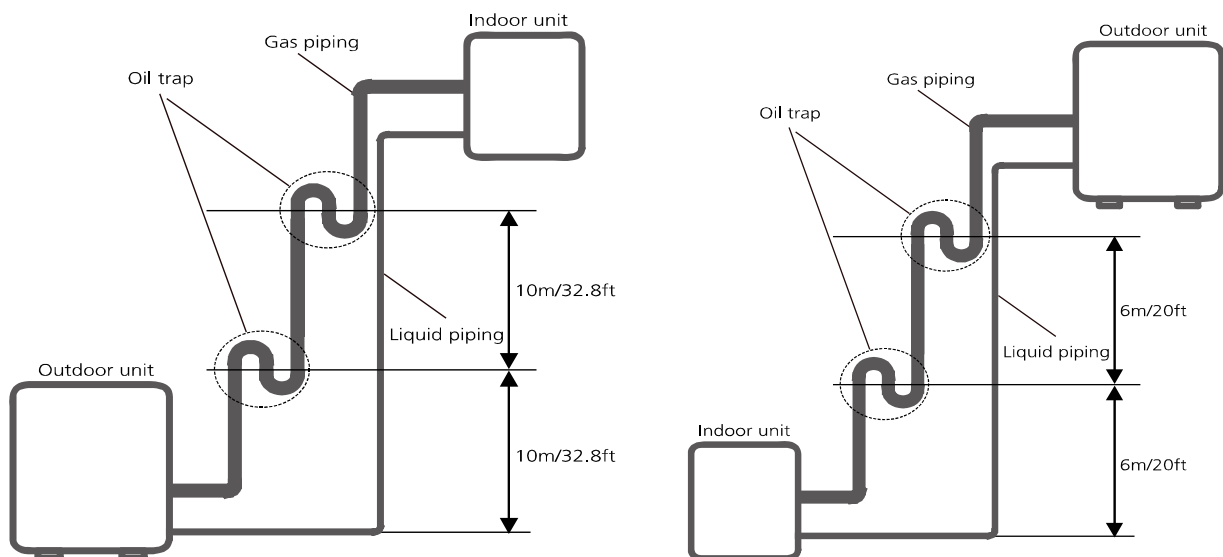
| Indoor Unit Model | Outdoor Unit Model | = KOREL | Power Supply |
|-----------------------|----------------------|----------------------------------|----------------------------|
| MSAFU-09HRDN8-QRD0GW | MOBA31-09HFN8-QRD0GW | KOR32-09HFN8-I KOR32-09HFN8-O | 220-240V~, 50Hz, 1Phase |
| MSAFBU-09HRDN8-QRD0GW | MOAB30-09HFN8-QRD0GW | | |
| MSAFBU-12HRDN8-QRD0GW | MOBA31-12HFN8-QRD0GW | KOR32-12HFN8-I KOR32-12HFN8-O | |
| MSAFBU-12HRDN8-QRD0GW | MOAB30-12HFN8-QRD0GW | | |
| MSAFU-18HRFN8-QRD0GW | MOB32-18HFN8-QRD0GW | KOR32-18HFN8-I KOR32-18HFN8-O | |
| MSAFU-18HRFNX-QRD0GW | MOB32-18HFN8-QRD0GW | | |
| MSAFDU-24HRFN8-QRD0GW | MOCA31-24HFN8-QRD0GW | KOR32-24HFN8-I KOR32-24HFN8-O | |
| MSAFDU-24HRFNX-QRD0GW | MOCA32-24HFN8-QRD0GW | | |

2. Csőhossz és ejtési magasság

A csatlakozócső hosszát és magasságát az alábbi táblázat mutatja. Ha a cső hossza meghaladja a cső maximális hosszát, további hűtőközeget kell tölteni a névleges hűtési / fűtési teljesítmény biztosítása érdekében.

| Capacity(Btu) | Standard Length | Max Pipe Length | Max Elevation | Additional Refrigerant |
|---------------|-----------------|-----------------|---------------|------------------------|
| 9k&12k | 5m (16.4ft) | 25m (82.0ft) | 10m (32.8ft) | 12g/m (0.13oz/ft) |
| 18k | | 30m (98.4ft) | 20m (65.6ft) | |
| 24k | | 50m (164ft) | 25m (82ft) | 24g/m (0.26oz/ft) |

Ha az olaj visszafolyik a kültéri egység kompresszorába, az folyadék összenyomódását vagy az olaj visszatérésének romlását okozhatja. Az emelkedő gázvezeték olajcsapdái megakadályozhatják ezt.



1. A beltéri egység magasabbra van telepítve, mint a kültéri egység
2. A kültéri egységet a beltéri egységnél magasabbra telepítik

Ha a beltéri egységet a kültéri egységnél magasabbra szerelik, akkor az olajcsapdát 10 méterenként (32,8 láb) kell függőleges távolságban beállítani.

Ha a kültéri egységet a beltéri egységnél magasabbra szerelik, akkor a kompresszor kenésének fenntartása érdekében a hűtőközeg szívásával együtt a megfelelő olajnak vissza kell térnie a kompresszorba. Ha a szívóáram sebessége 7,62 m / s (1500 fpm (láb / perc)) alá csökken, az olaj nem tér vissza a kompresszorba. Olajcsapdát kell felszerelni 6 méterenként (20 láb) függőleges távolságban.

3. Elektromos bekötési rajzok

Beltéri és kültéri egység kapcsolási rajza.

| Beltéri egység | | Kültéri egység | |
|-----------------------|---------------------|----------------------|---------------------|
| IDU Model | IDU Kábelezési rajz | ODU Model | ODU Kábelezési rajz |
| MSAFU-09HRDN8-QRD0GW | 16022000020169 | MOBA31-09HFN8-QRD0GW | 16022000019533 |
| MSAFBU-09HRDN8-QRD0GW | | MOAB30-09HFN8-QRD0GW | |
| MSAFBU-12HRDN8-QRD0GW | | MOBA31-12HFN8-QRD0GW | |
| MSAFBU-12HRDN8-QRD0GW | | MOAB30-12HFN8-QRD0GW | |
| MSAFBU-18HFN8-QRD0GW | | MOB32-18HFN8-QRD0GW | |
| MSAFBU-18HFN8-QRD0GW | | MOB32-18HFN8-QRD0GW | |
| MSAFDU-24HFN8-QRD0GW | | MOCA31-24HFN8-QRD0GW | 16022000019069 |
| MSAFDU-24HFN8-QRD0GW | | MOCA32-24HFN8-QRD0GW | |

A kültéri egység nyomtatott áramköri rajza

| Outdoor Unit | |
|----------------------|------------------------|
| ODU Model | ODU Nyomtatott áramkör |
| MOBA31-09HFN8-QRD0GW | 17122000002718 |
| MOAB30-09HFN8-QRD0GW | |
| MOBA31-12HFN8-QRD0GW | |
| MOAB30-12HFN8-QRD0GW | |
| MOB32-18HFN8-QRD0GW | |
| MOB32-18HFN8-QRD0GW | 17122000023675 |
| MOCA31-24HFN8-QRD0GW | 17122000036588 |
| MOCA32-24HFN8-QRD0GW | |

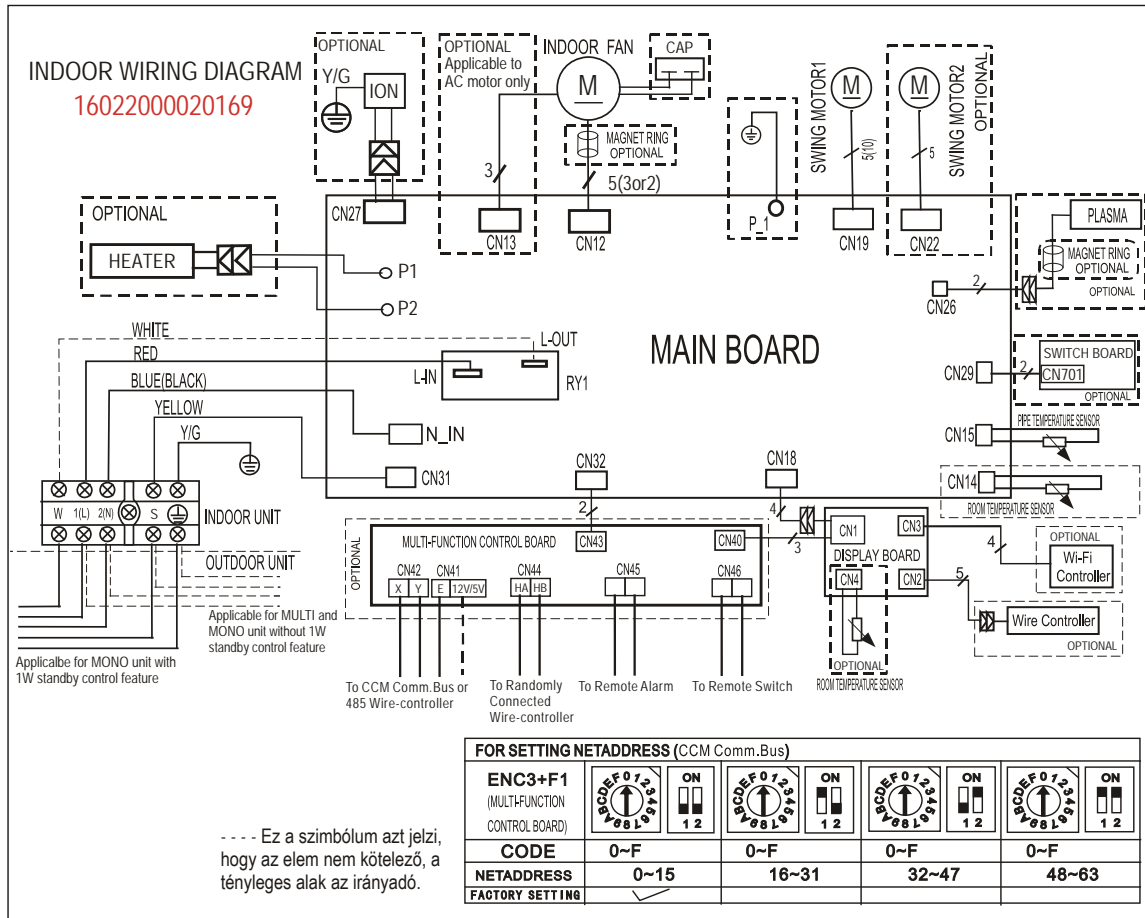
Beltéri egységek rövidítései

| Abbreviation | Paraphrase |
|--------------|--|
| Y/G | Sárga-zöld vezető |
| ION | Pozitív és negatív iongenerátor |
| CAP | Kondenzátor |
| PLASMA | Elektronikus porgyűjtő |
| L | LIVE |
| N | SEMLEGES/nulla |
| Heater | A beltéri egység elektromos fűtőszalagja |
| T1 | Ibeltéri szobahőmérséklet |
| T2 | A beltéri hőcserélő tekercs hőmérséklete |

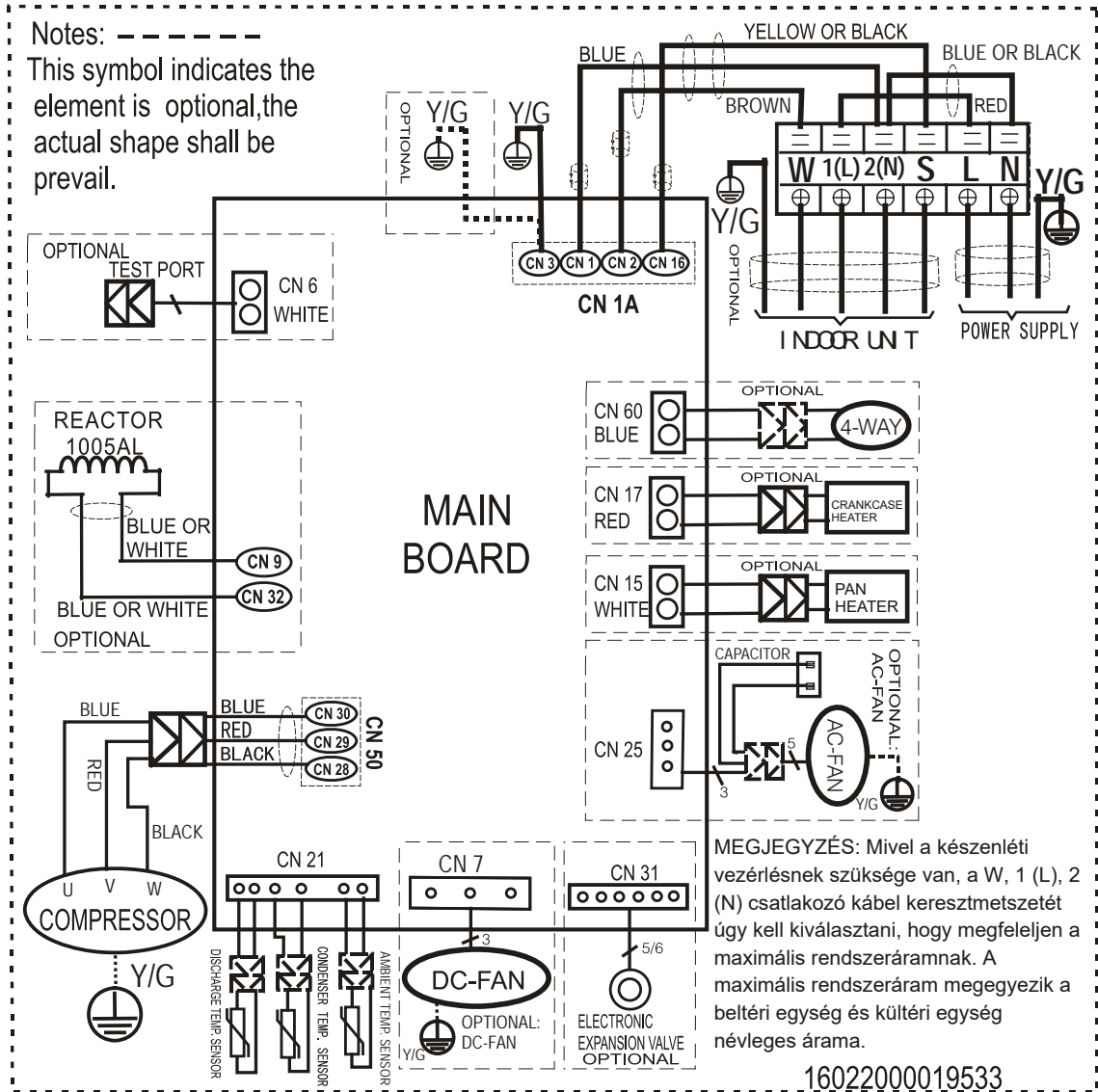
Outdoor unit abbreviations

| Rövidítés | magyarázó |
|-----------|----------------------------------|
| 4-WAY | Gas Valve Assembly/4-WAY VALVE |
| AC-FAN | Alternating Current FAN |
| DC-FAN | Direct Current FAN |
| CT1 | AC Current Detector |
| COMP | Compressor |
| T3 | Coil Temperature of Condenser |
| T4 | Outdoor Ambient Temperature |
| TH | Compressor Suction Temperature |
| TP | Compressor Discharge Temperature |
| EEV | Electronic Expansion Valve |
| L-PRO | Low Pressure Switch |
| H-PRO | High Pressure Switch |

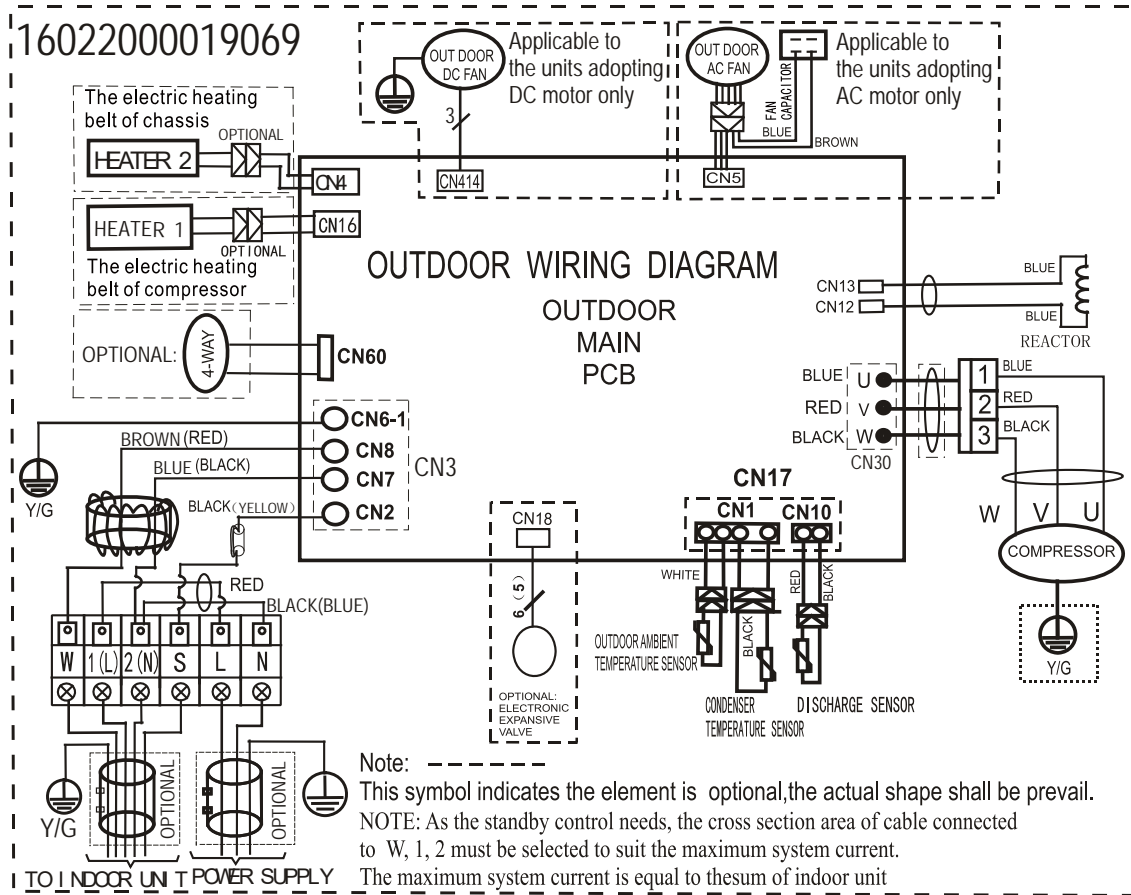
Indoor unit wiring diagram: 16022000020169



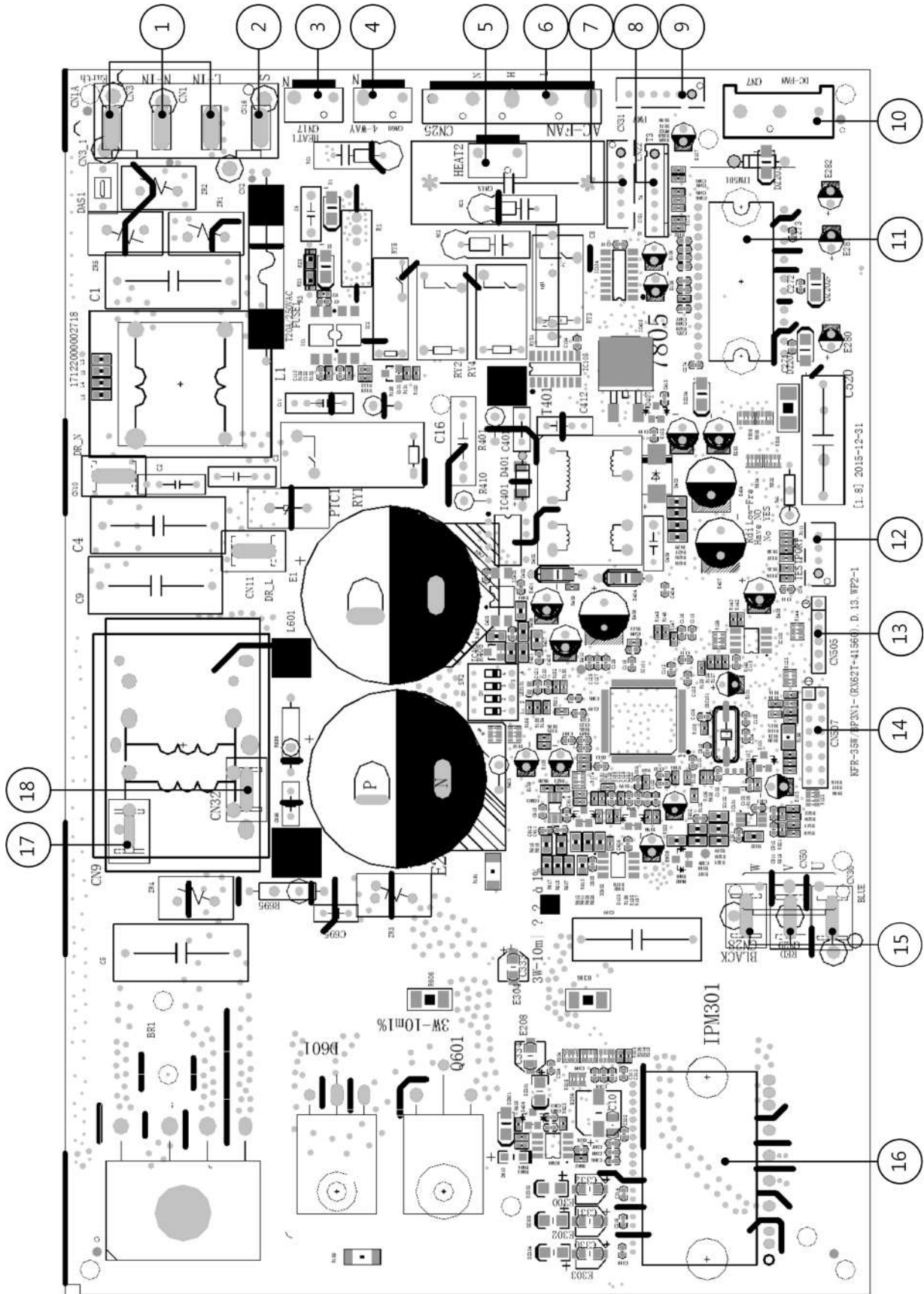
Outdoor unit wiring diagram: 16022000019533



Outdoor unit wiring diagram: 16022000019069



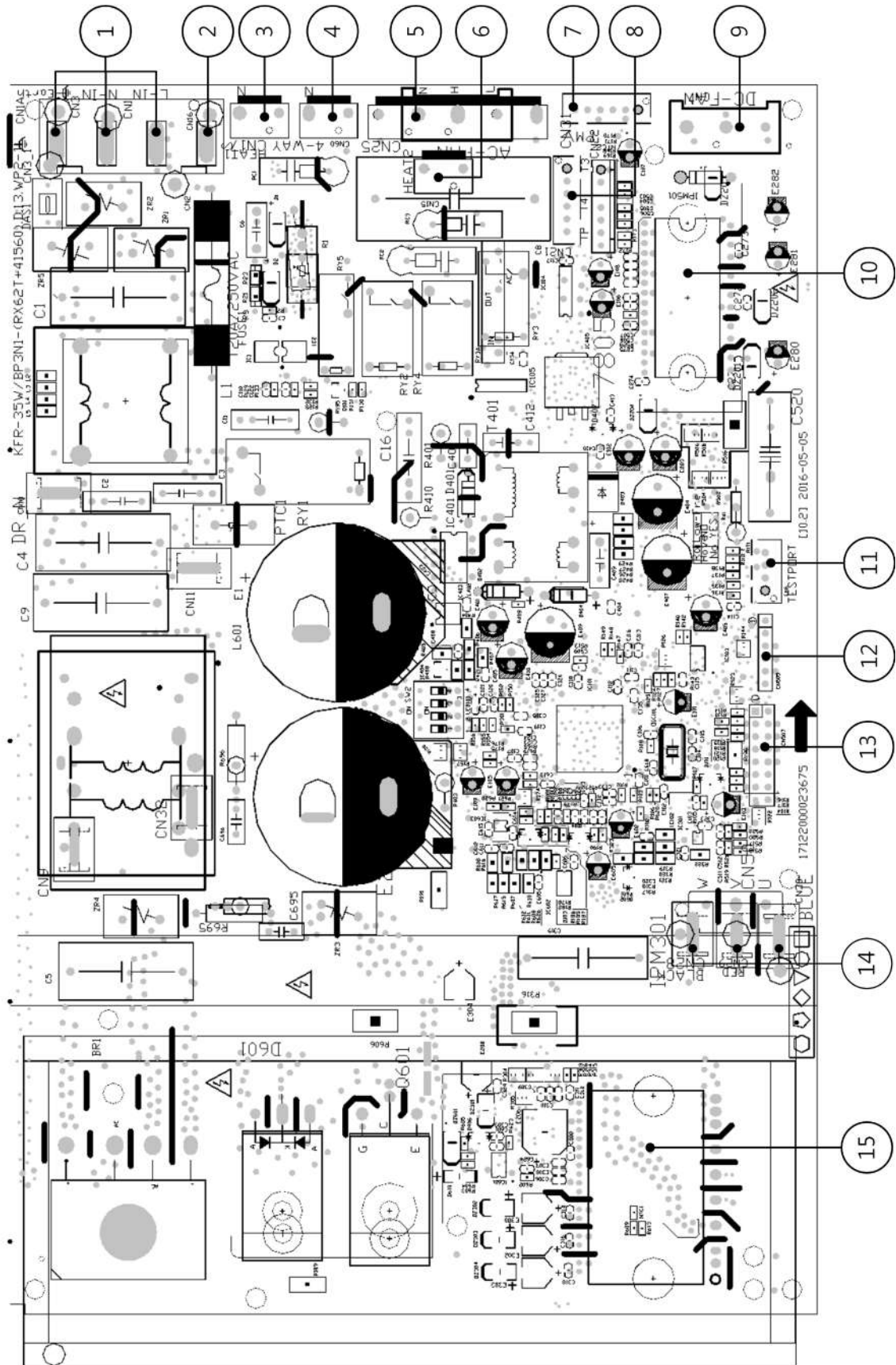
Outdoor unit printed circuit board diagram: 1712200002718



| No. | Name | CN# | Meaning |
|-----|--------------|---------|---|
| 1 | Power Supply | CN3 | Föld: csatlakozzon a Földhöz |
| | | CN1 | N_in: connect to N-line (208-230V AC input) |
| | | CN2 | L_in: connect to L-line (208-230V AC input) |
| 2 | S | CN16 | S: connect to indoor unit communication |
| 3 | HEAT1 | CN17 | connect to compressor heater, 208-230V AC when is ON |
| 4 | 4-WAY | CN60 | connect to 4 way valve, 208-230V AC when is ON. |
| 5 | HEAT2 | CN15 | connect to chassis heater, 208-230V AC when is ON |
| 6 | AC-FAN | CN25 | connect to AC fan |
| 7 | TP T4 T3 | CN22 | connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP |
| 8 | TP T4 T3 | CN21 | connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP |
| 9 | PMV | CN31 | connect to Electric Expansion Valve |
| 10 | DC-FAN | CN7 | connect to DC fan |
| 11 | FAN_IPM | IPM 501 | IPM for DC fan |
| 12 | TESTPORT | CN6 | used for testing |
| 13 | EE_PORT | CN505 | EEPROM programmer port |
| 14 | MCUPORT | CN507 | connect to PC communication |
| 15 | W | CN28 | connect to compressor |
| | V | CN29 | 0V AC (standby) |
| | U | CN30 | 10-200V AC (running) |
| 16 | COMP_IPM | IPM 301 | IPM for compressor |
| 17 | CN9 | CN9 | connect to reactor |
| 18 | CN32 | CN32 | connect to reactor |

Note: This section is for reference only. Please take practicality as standard.

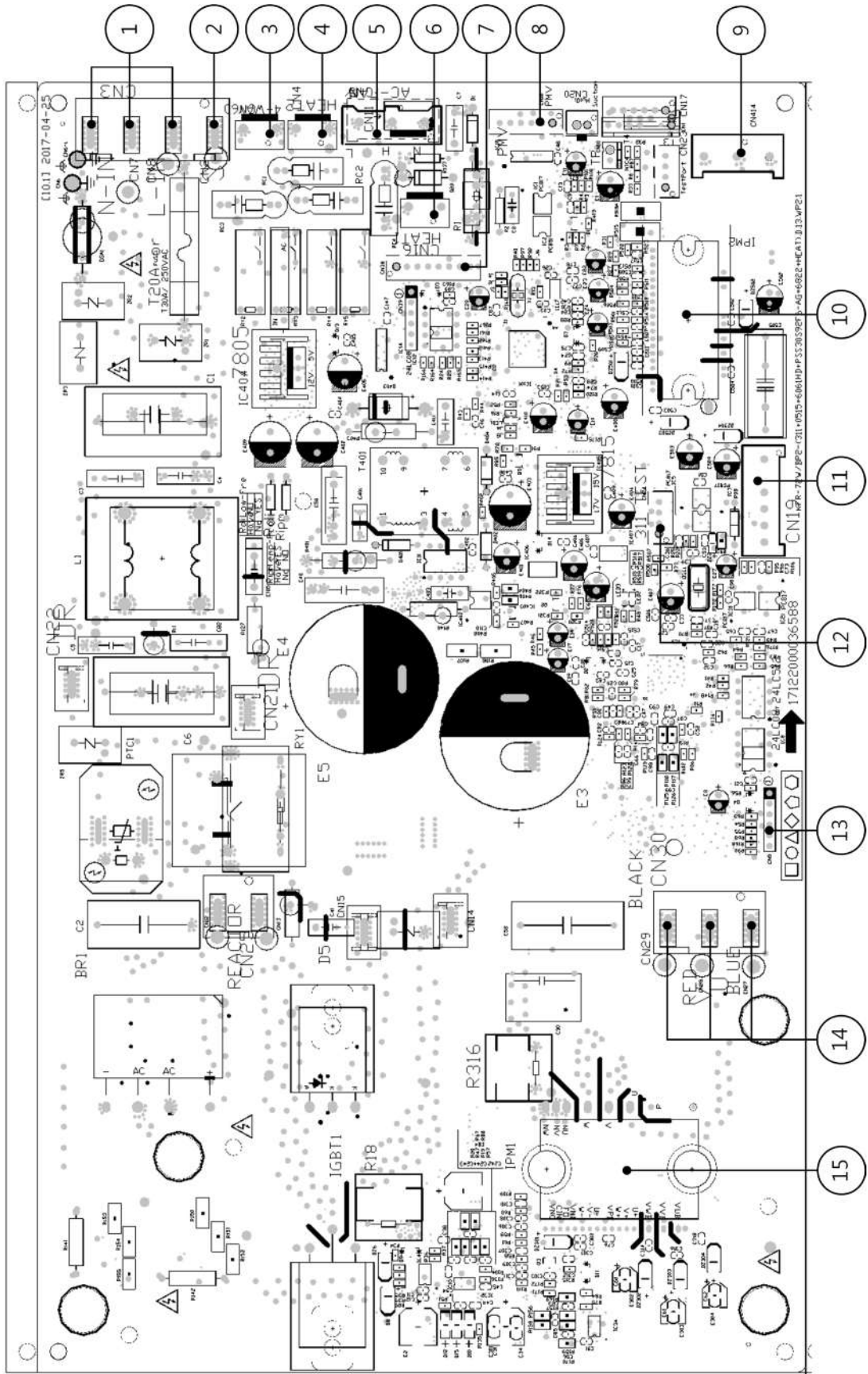
Outdoor unit printed circuit board diagram: 17122000023675



| No. | Name | CN# | Meaning |
|-----|--------------|-----------|---|
| 1 | Power Supply | CN3 | Earth: connect to Ground |
| | | CN1 | N_in: connect to N-line (208-230V AC input) |
| | | CN2 | L_in: connect to L-line (208-230V AC input) |
| 2 | S | CN16 | S: connect to indoor unit communication |
| 3 | HEAT1 | CN17 | connect to compressor heater, 208-230V AC when is ON |
| 4 | 4-WAY | CN60 | connect to 4 way valve, 208-230V AC when is ON. |
| 5 | AC-FAN | CN25 | connect to AC fan |
| 6 | HEAT2 | CN15 | connect to chassis heater, 208-230V AC when is ON |
| 7 | PMV | CN31 | connect to Electric Expansion Valve |
| 8 | TP T4 T3 | CN21/CN22 | connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP |
| 9 | DC-FAN | CN7 | connect to DC fan |
| 10 | FAN_IPM | IPM 501 | IPM for DC fan |
| 11 | TESTPORT | CN6 | used for testing |
| 12 | EE_PORT | CN505 | EEPROM programer port |
| 13 | MCUPORT | CN507 | connect to PC communication |
| 14 | W | CN28 | connect to compressor |
| | V | CN29 | 0V AC (standby) |
| | U | CN30 | 10-200V AC (running) |
| 15 | COMP_IPM | IPM 301 | IPM for compressor |

Note: This section is for reference only. Please take practicality as standard.

Outdoor unit printed circuit board diagram: 17122000036588



| No. | Name | CN# | Meaning |
|-----|--------------|---------|--|
| 1 | Power Supply | CN3 | Earth: connect to Ground |
| | | CN7 | N_in: connect to N-line (208-230V AC input) |
| | | CN8 | L_in: connect to L-line (208-230V AC input) |
| 2 | S | CN3 | S: connect to indoor unit communication |
| 3 | 4-WAY | CN60 | connect to 4 way valve, 208-230V AC when is ON. |
| 4 | HEAT1 | CN17 | connect to compressor heater, 208-230V AC when is ON |
| 5 | AC-FAN | CN11 | connect to AC fan |
| 6 | HEAT2 | CN16 | connect to chassis heater, 208-230V AC when is ON |
| 7 | CN38 | CN38 | connect to PC communication |
| 8 | PMV | CN18 | connect to Electric Expansion Valve |
| 9 | DC-FAN | CN414 | connect to DC fan |
| 10 | FAN_IPM | IPM 501 | IPM for DC fan |
| 11 | CN19 | CN19 | internal drive motor |
| 12 | TESTPORT | CN23 | used for testing |
| 13 | CN9 | CN9 | connect to PC communication |
| 14 | U | CN28 | connect to compressor |
| | V | CN29 | 0V AC (standby) |
| | W | CN30 | 10-200V AC (running) |
| 15 | COMP_IPM | IPM 301 | IPM for compressor |

Note: This section is for reference only. Please take practicality as standard.

Product Features


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1. Display Function

Unit display functions



| Function | Display |
|---|--|
| Temperature | Set temperature value |
| Temperature (fan and Drying mode) | Room temperature |
| Activation of Timer ON, Fresh, Swing, Turbo, or Silent | 01 (3s) |
| Cancellation of Timer OFF, Fresh, Swing, Turbo, or Silent | 0F (3s) |
| Defrost | dF |
| Warming in heating mode | cF |
| Self-clean (available on select units only) | SC |
| Heating in room temperature under 8°C | FP |
| WiFi control (available on select units only) |  |
| ECO function (available on select units only) | E → C → 0 → set temperature → E gradually illuminates to 88 in one second intervals |

Note: Please select the display function according to your purchase product.

2. Safety Features

Compressor three-minute delay at restart

Compressor functions are delayed for up to one minute upon the first startup of the unit, and are delayed for up to three minutes upon subsequent unit restarts.

Zero crossing detection error protection(Except for DC fan units)

If AC can not detect zero crossing signal for 4 minutes or the zero crossing signal time interval is not correct, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

Automatic shutoff based on discharge temperature

If the compressor discharge temperature exceeds a certain level for a period of time, the compressor ceases operation.

Automatic shutoff based on fan speed

If the indoor fan speed registers below 300RPM for an extended period of time, the unit ceases operation and the corresponding error code is displayed on the indoor unit.

Inverter module protection

The inverter module has an automatic shutoff mechanism based on the unit's current, voltage, and temperature. If automatic shutoff is initiated, the corresponding error code is displayed on the indoor unit and the unit ceases operation.

Indoor fan delayed operation

- When the unit starts, the louver is automatically activated and the indoor fan will operate after a period of 7 seconds.
- If the unit is in heating mode, the indoor fan is regulated by the anti-cold wind function.

Sensor redundancy and automatic shutoff

- If one temperature sensor malfunctions, the air conditioner continues operation and displays the corresponding error code, allowing for emergency use.
- When more than one temperature sensor is malfunctioning, the air conditioner ceases operation.

Refrigerant leakage detection

This function is active only when cooling mode is selected. It will detect if the compressor is being damaged by refrigerant leakage or by compressor overload. This is measured using the coil temperature of evaporator T2 when the compressor is in operation.

3. Basic Functions

3.1 Table

| Functions | | Cooling Mode&Heating mode | | Heating Mode | | Auto Mode |
|-----------|---------------------------|---|-----------|-------------------------------|----------------------|---------------------------------|
| | | Outdoor Fan Control | | Defrosting Mode | | |
| Cases | | Case 1: Compressor Frequency and T4 | Case 2:T4 | Case 1:T3 and T4,15 min | Case 2: T3,10 min | A=2°C(3.6°F), B=-2°C(-3.6°F) |
| Models | MSAFU-09HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-09HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFBU-12HRDN8- ORD0GW | ✓ | | ✓ | | ✓ |
| | MSAFDU-24HRFN8- ORD0GW | | ✓ | | ✓ | ✓ |
| | MSAFDU-24HRFNX- ORD0GW | ✓ | | ✓ | | ✓ |

Note: The detailed description of case 1 or case 2 is shown in the following function sections(from 3.4 to 3.6).

3.2 Abbreviation

Unit element abbreviations

| Abbreviation | Element |
|--------------|----------------------------------|
| T1 | Indoor room temperature |
| T2 | Coil temperature of evaporator |
| T3 | Coil temperature of condenser |
| T4 | Outdoor ambient temperature |
| TS | Set temperature |
| Td | Control target temperature |
| TP | Compressor discharge temperature |

In this manual, such as TCE1, TCE2...etc., they are well-setting parameter of EEPROM.

3.3 Fan Mode

When fan mode is activated:

- The outdoor fan and compressor are stopped.
- Temperature control is disabled and no temperature setting is displayed.
- The indoor fan speed can be set to high, medium, low, or auto.
- The louver operations are identical to those in cooling mode.
- Auto fan: In fan-only mode, AC operates the same as auto fan in cooling mode with the temperature set at 24°C(75.2°F).

3.4 Cooling Mode

3.4.1 Compressor Control

Cooling temperature compensation($\Delta T5$) is a well-setting parameter of EEPROM. It's value ranges from -2°C to 2°C. The default value is 0.

- When $T1-Ts < \Delta T5-2\text{ }^{\circ}\text{C}$ (3.6°F), the compressor ceases operation.
- When $T1-Ts > \Delta T5+3\text{ }^{\circ}\text{C}$ (5.4°F), the compressor continues operation.
- When the AC is operating in mute mode, the compressor operates at a low frequency.
- When the current exceeds the preset value, the current protection function activates and the compressor ceases operation.

3.4.2 Indoor Fan Control

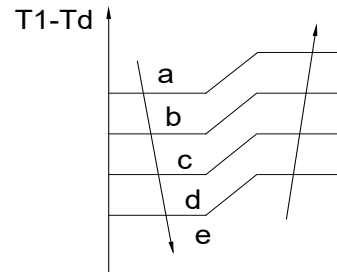
- In cooling mode, the indoor fan operates continuously. The fan speed can be set to high, medium, low, or

auto.

- If the compressor ceases operation when the configured temperature is reached, the indoor fan motor operates at the minimum or configured speed.
- The indoor fan is controlled as below:

| Setting fan speed | T1-Td °C(°F) | Actual fan speed |
|-------------------|--------------|------------------|
| H | A | H+ (H+=H+G) |
| | B | H (=H) |
| | C | H- (H-=H-G) |
| M | D | M+ (M+=M+Z) |
| | E | M (M=M) |
| | F | M- (M-=M-Z) |
| L | G | L+ (L+=L+D) |
| | H | L (L=L) |
| | I | L- (L-=L-D) |

- The auto fan acts as below rules:



3.4.3 Outdoor Fan Control

Case 1:

- The outdoor unit will be run at different fan speed according to T4 and compressor frequency.
- For different outdoor units, the fan speeds are different.

Case 2:

- The outdoor unit will be run at different fan speed according to T4.
- For different outdoor units, the fan speeds are different.

3.4.4 Condenser Temperature Protection

When condenser temperature is more than setting value, the compressor ceases operation..

3.4.5 Evaporator Temperature Protection

When evaporator temperature drops below a configured value, the compressor and outdoor fan cease operation.

3.5 Heating Mode(Heat pump units)

3.5.1 Compressor Control

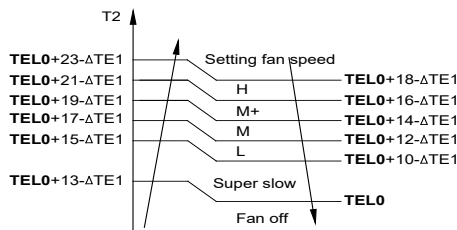
Heating temperature compensation($\Delta T3$) is a well-setting

parameter of EEPROM. It's value ranges from -6°C to 6°C.

- When $T1-Ts > -\Delta T3$, the compressor ceases operation.
- When $T1-Ts < -\Delta T3 - 1.5^\circ\text{C} (2.7^\circ\text{F})$, the compressor continues operation.
- When the AC is operating in mute mode, the compressor operates at a low frequency.
- When the current exceeds the preset value, the current protection function activates and the compressor ceases operation.

3.5.2 Indoor Fan Control:

- When the compressor is on, the indoor fan speed can be set to high, medium, low, or auto. And the anti-cold wind function has the priority.
- Anti-cold air function
 - The indoor fan is controlled by the indoor temperature $T1$ and indoor unit coil temperature $T2$.

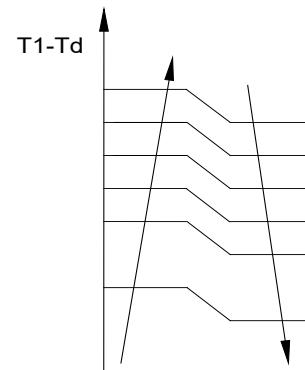


| | |
|--|---|
| $T1 \geq 19^\circ\text{C} (66.2^\circ\text{F})$ | $\Delta TE1 = 0$ |
| $15^\circ\text{C} (59^\circ\text{F}) \leq T1 \leq 18^\circ\text{C} (64.4^\circ\text{F})$ | $\Delta TE1 = 19^\circ\text{C} - T1$ ($34.2^\circ\text{F} - T1$) |
| $T1 < 15^\circ\text{C} (59^\circ\text{F})$ | $\Delta TE1 = 4^\circ\text{C} (7.2^\circ\text{F})$ |

- When the indoor temperature $T1$ reaches the setting temperature, the compressor continues operation, the indoor fan motor runs at the minimum speed or setting speed. (The anti-cold air function is valid).
- The indoor fan is controlled as below:

| Setting fan speed | $T1-Td$ (°F) | Actual fan speed |
|-------------------|--------------|------------------|
| H | | H (H=H+G) |
| | | H (=H) |
| | | H+(H+=H+G) |
| M | | M-(M=M-Z) |
| | | M(M=M) |
| | | M+(M+=M+Z) |
| L | | L-(L=L-D) |
| | | L(L=L) |
| | | L+(L+=L+D) |

- Auto fan action in heating mode:



3.5.3 Outdoor Fan Control:

Case 1:

- The outdoor unit will be run at different fan speed according to $T4$ and compressor frequency.
- For different outdoor units, the fan speeds are different.

Case 2:

- The outdoor unit will be run at different fan speed according to $T4$.
- For different outdoor units, the fan speeds are different.

3.5.4 Defrosting mode

Case 1:

- The unit enters defrosting mode according to the temperature value of $T3$ and $T4$ as well as the compressor running time.
- In defrosting mode, the compressor continues to run, the indoor and outdoor motor will cease operation, the defrost light of the indoor unit will turn on, and the "df" symbol is displayed.
- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
 - $T3$ rises above $TCDE1$.
 - $T3$ maintained above $TCDE2$ for 80 seconds.
 - Unit runs for 15 minutes consecutively in defrosting mode.

Case 2:

- The unit enters defrosting mode according to the temperature value of $T3$ as well as the compressor running time.
- In defrosting mode, the compressor continues to run, the indoor and outdoor motor will cease operation, the defrost light of the indoor unit will turn on, and the "df" symbol is displayed.

- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
 - T3 rises above TCDE1.
 - T3 maintained above TCDE2 for 80 seconds.
 - Unit runs for 10 minutes consecutively in defrosting mode.

3.5.5 Evaporator Temperature Protection

When the evaporator temperature exceeds a preset protection value, the compressor ceases operation.

3.6 Auto-mode

- This mode can be selected with the remote controller and the setting temperature can be changed between 17°C~30°C(62°F~86°F).
- In auto mode, the machine selects cooling, heating, or fan-only mode on the basis of ΔT ($\Delta T = T1 - TS$).

| ΔT | Running mode |
|-----------------------|--------------|
| $\Delta T > A$ | Cooling |
| $B < \Delta T \leq A$ | Fan-only |
| $\Delta T < B$ | Heating* |

Heating*: In auto mode, cooling only models run the fan

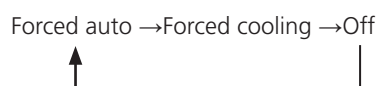
- Indoor fan will run at auto fan speed.
- The louver operates same as in relevant mode.
- If the machine switches mode between heating and cooling, the compressor will keep stopping for certain time and then choose mode according to ΔT .

3.7 Drying mode

- Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.
- All protections are active and the same as that in cooling mode.

3.8 Forced operation function

Press the AUTO/COOL button, the AC will run as below sequence:



- Forced cooling mode:

The compressor and outdoor fan continue to run and the indoor fan runs at breeze speed. After running for 30 minutes, the AC will switch to auto mode with a preset temperature of 24°C(76°F).

- Forced auto mode:

Forced auto mode operates the same as normal auto mode with a preset temperature of 24°C(76°F).

- The unit exits forced operation when it receives the following signals:
 - Switch on
 - Switch off
 - Timer on
 - Timer off
 - Changes in:
 - mode
 - fan speed
 - sleep mode
 - Follow me

- Forced defrosting mode:

- Press AUTO/COOL button continuously for 5s under forced cooling mode to enter this mode.
- Indoor fan will stop, defrosting lamp will light on.
- Quit this mode and turn off the unit when:
 - quit normal defrosting
 - turn off by RC
 - press AUTO/COOL button continuously for 5s again

3.9 Sleep function

- The sleep function is available in cooling, heating, or auto mode.
- The operational process for sleep mode is as follows:
 - When cooling, the temperature rises 1°C(2°F) (to not higher than 30°C(86°F)) every hour. After 2 hours, the temperature stops rising and the indoor fan is fixed at low speed.
 - When heating, the temperature decreases 1°C(2°F) (to not lower than 17°C(62.6°F)) every hour. After 2 hours, the temperature stops decreasing and the indoor fan is fixed at low speed. Anti-cold wind function takes priority.
- The operating time for sleep mode is 8 hours, after which, the unit exits this mode and does not switch off.

3.10 Auto-Restart function

- The indoor unit has an auto-restart module that allows the unit to restart automatically. The module automatically stores the current settings (not including the swing setting) and, in the case of a sudden power

failure, will restore those setting automatically within 3 minutes after power returns.

- If the unit was in forced cooling mode, it will run in this mode for 30 minutes and turn to auto mode with temperature set to 24°C(76°F).
- If there is a power failure while the unit is running, the compressor starts 3 minutes after the unit restarts. If the unit was already off before the power failure, the compressor starts 1 minute after the unit restarts.

3.11 Refrigerant Leakage Detection

With this new technology, the display area will show "EC" when the outdoor unit detects refrigerant leakage.

3.12 Ionizer/Plasma (for some models)

Press "Fresh" for at least 2 seconds on the remote control to enable the IONIZER function. While this function is active, the Ionizer/Plasma Dust Collector(depending on models) is energized and will help to remove pollen and impurities from the air.

4. Optional Functions

4.1 8°C Heating

In heating mode, the temperature can be set to as low as 8°C, preventing the indoor area from freezing if unoccupied during severe cold weather.

4.2 Self clean

- If you press “Self Clean” when the unit is in cooling or drying mode:
 - For cooling models, the indoor unit will run in low fan mode for a certain time, then ceases operation.
 - For heat pump models, the indoor unit will run in fan-only mode, then low heat, and finally in fan-only mode.
- Self Clean keeps the indoor unit dry and prevents mold growth.
- When match with multi outdoor unit, this function is disabled.

4.3 Follow me

- If you press “Follow Me” on the remote, the indoor unit will beep. This indicates the follow me function is active.
- Once active, the remote control will send a signal every 3 minutes, with no beeps. The unit automatically sets the temperature according to the measurements from the remote control.
- The unit will only change modes if the information from the remote control makes it necessary, not from the unit’s temperature setting.
- If the unit does not receive a signal for 7 minutes or you press “Follow Me,” the function turns off. The unit regulates temperature based on its own sensor and settings.

4.4 Silence

- Press “Silence” on the remote control to enable the SILENCE function. While this function is active, the compressor frequency is maintained at a lower level than F2. The indoor unit will run at faint breeze, which reduces noise to the lowest possible level.
- When match with multi outdoor unit, this function is disabled.

Maintenance

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| 1. | First Time Installation Check | 2 |
| 2 | Refrigerant Recharge | 4 |
| 3 | Re-Installation | 5 |
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1. First Time Installation Check

Air and moisture trapped in the refrigerant system affects the performance of the air conditioner by:

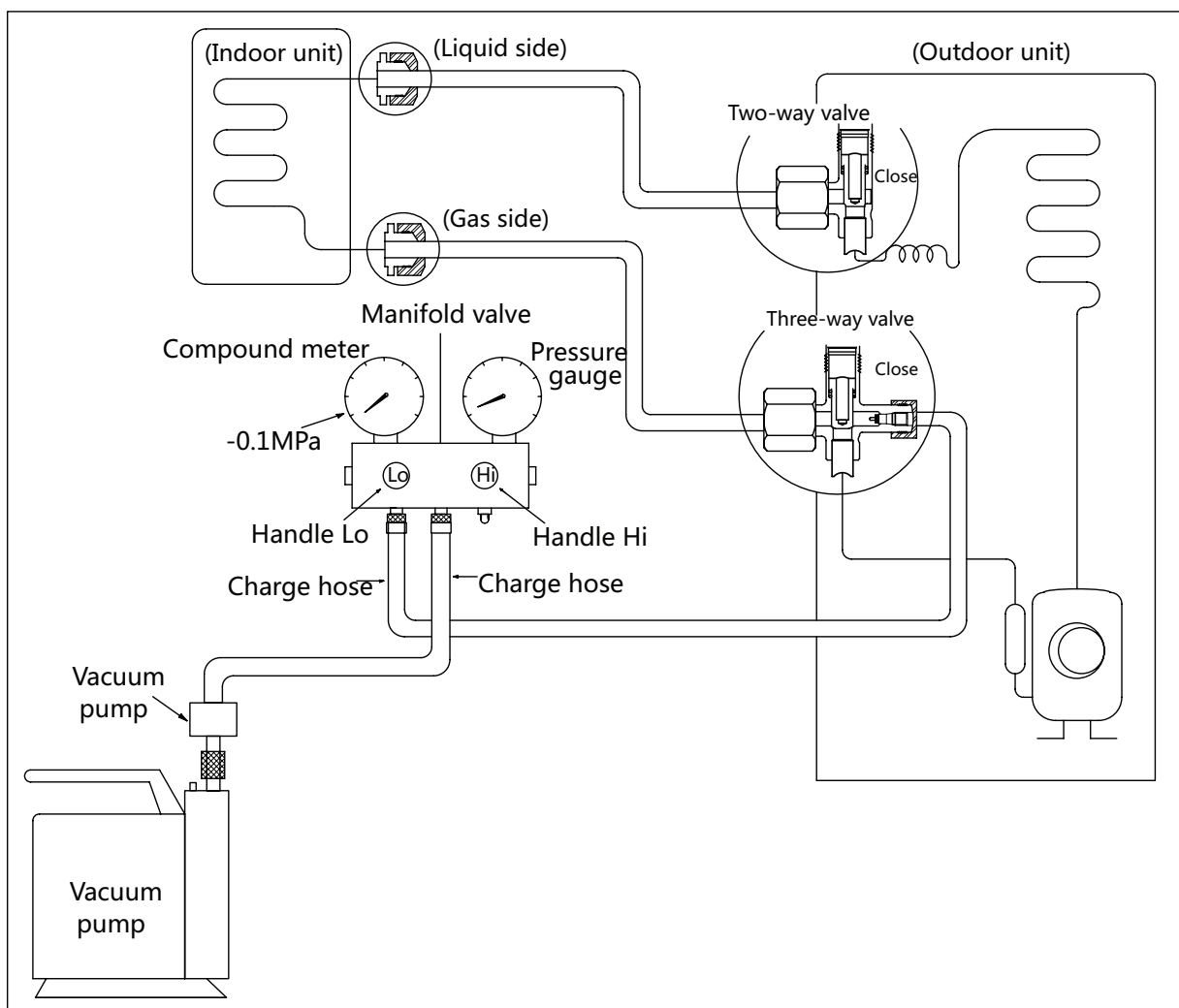
- Increasing pressure in the system.
- Increasing the operating current.
- Decreasing the cooling or heating efficiency.
- Congesting the capillary tubing due to ice build-up in the refrigerant circuit.
- Corroding the refrigerant system.

To prevent air and moisture from affecting the air conditioner's performance, the indoor unit, as well as the pipes between the indoor and outdoor unit, must be leak tested and evacuated.

Leak test (soap water method)

Use a soft brush to apply soapy water or a neutral liquid detergent onto the indoor unit connections and outdoor unit connections. If there is gas leakage, bubbles will form on the connection.

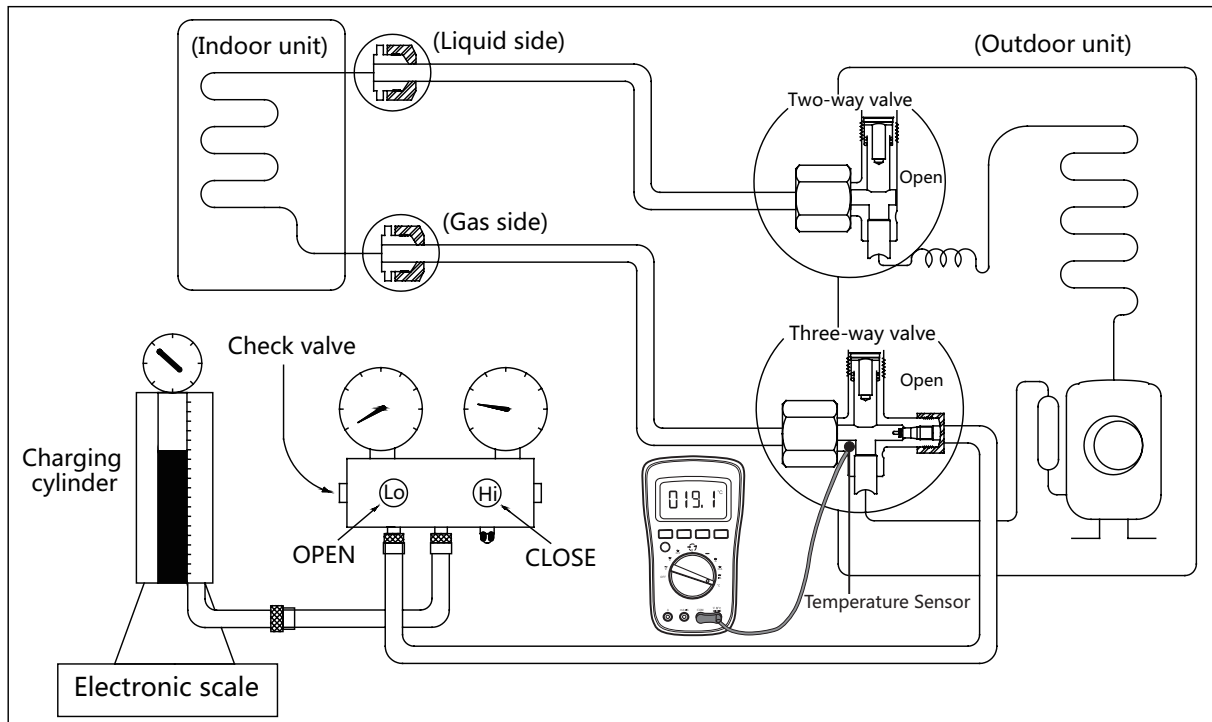
Air purging with vacuum pump



Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
 - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
 - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
 - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
 - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
 - b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.
 - If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
8. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.

2. Refrigerant Recharge



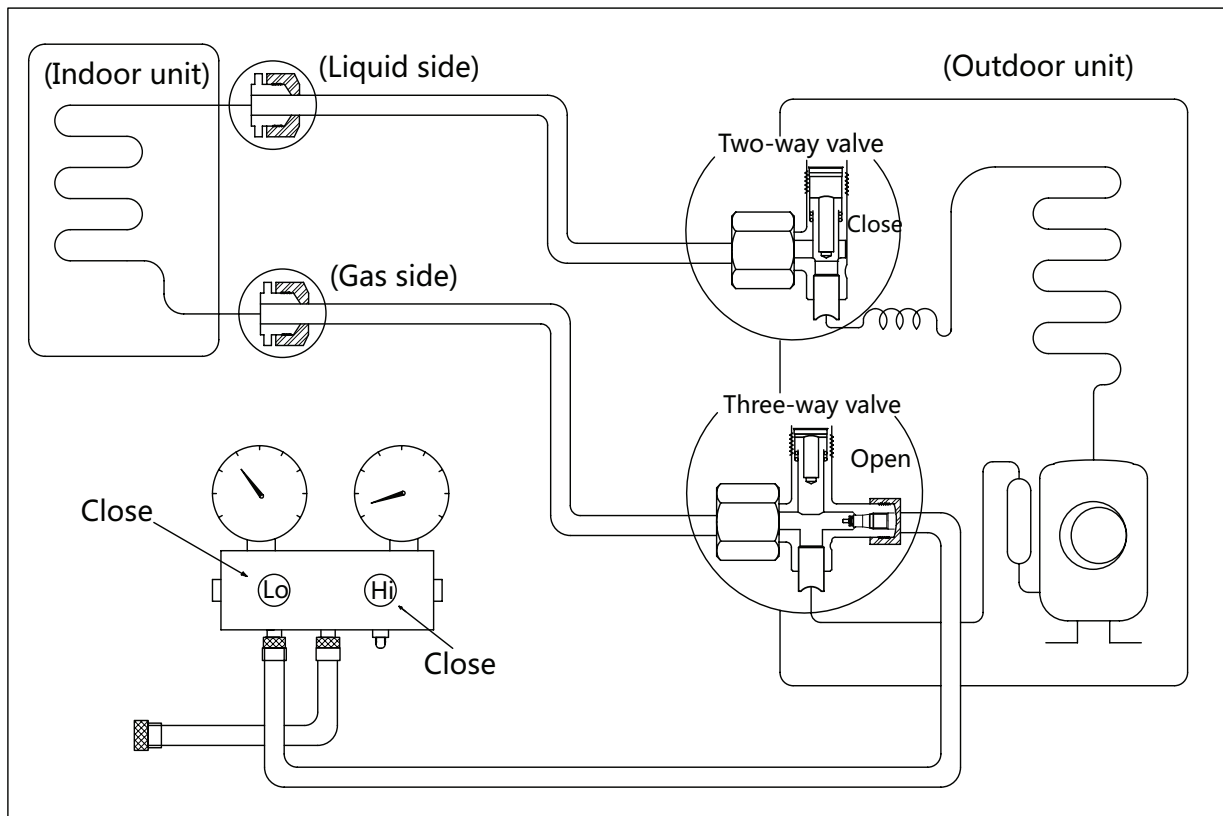
Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A/R32, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm, the value of pressure refers to chapter Appendix), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

3. Re-Installation

3.1 Indoor Unit

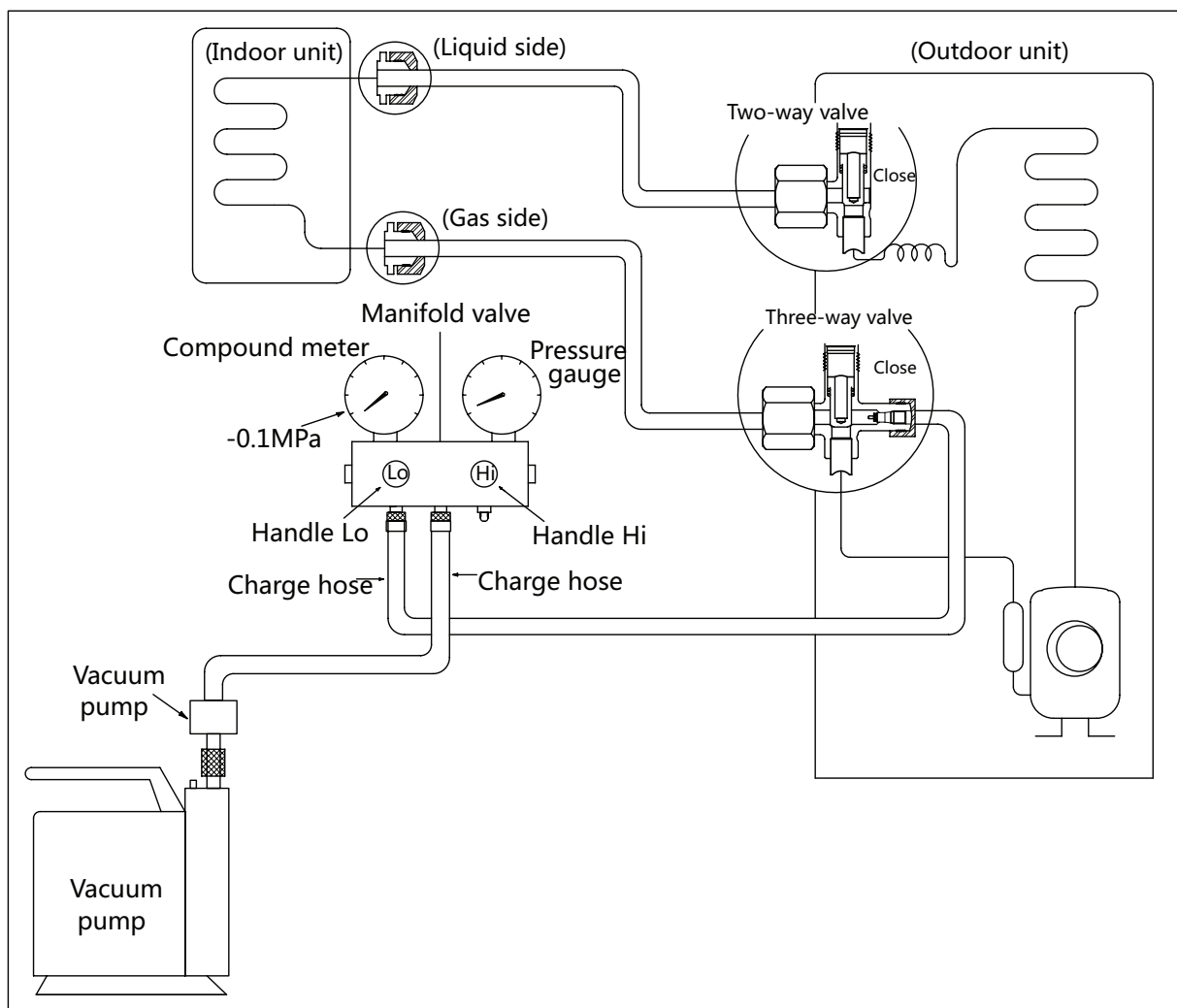
Collecting the refrigerant into the outdoor unit



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the charge hose with the push pin of Handle Lo to the 3-way valve's gas service port.
3. Open the Handle Lo manifold valve to purge air from the charge hose for 5 seconds and then close it quickly.
4. Close the 2-way valve.
5. Operate the air conditioner in cooling mode. Cease operations when the gauge reaches 0.1 MPa (14.5 Psi).
6. Close the 3-way valve so that the gauge rests between 0.3 MPa (43.5 Psi) and 0.5 MPa (72.5 Psi).
7. Disconnect the charge set and mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.
9. Check for gas leakage.

Air purging with vacuum pump

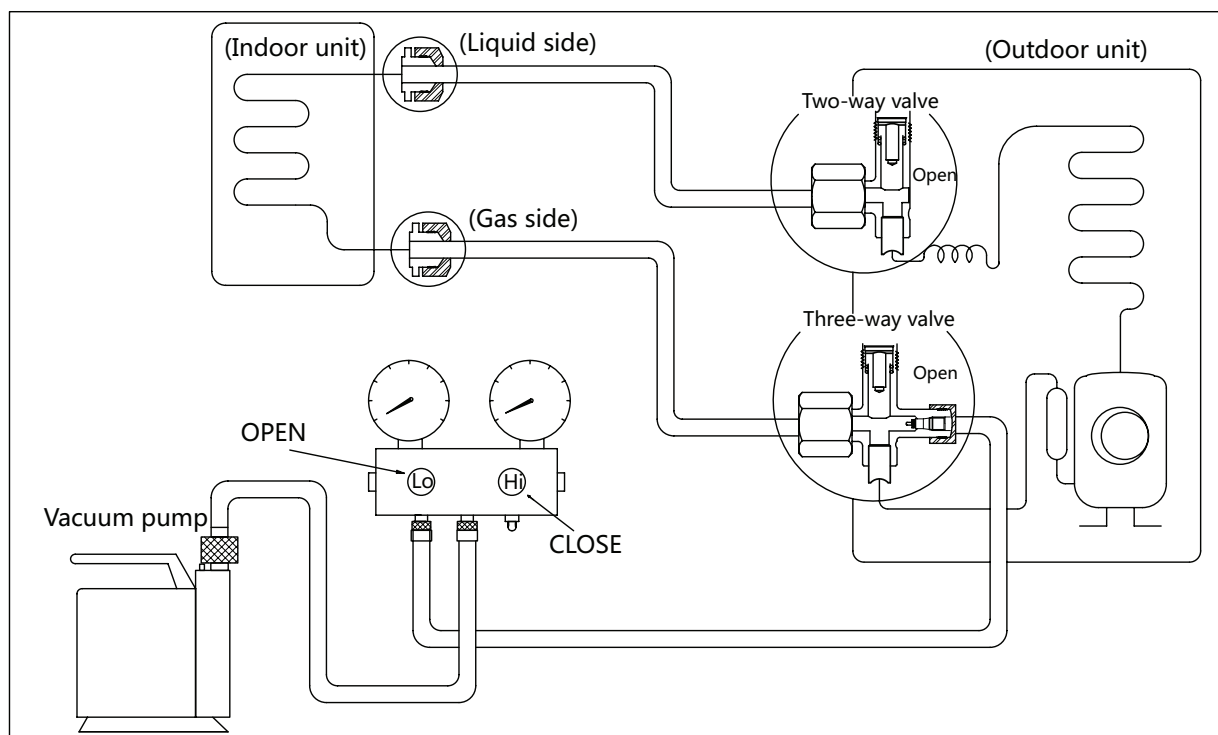


Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
 - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
 - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
 - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
 - b. If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
 - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
 - b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

3.2 Outdoor Unit

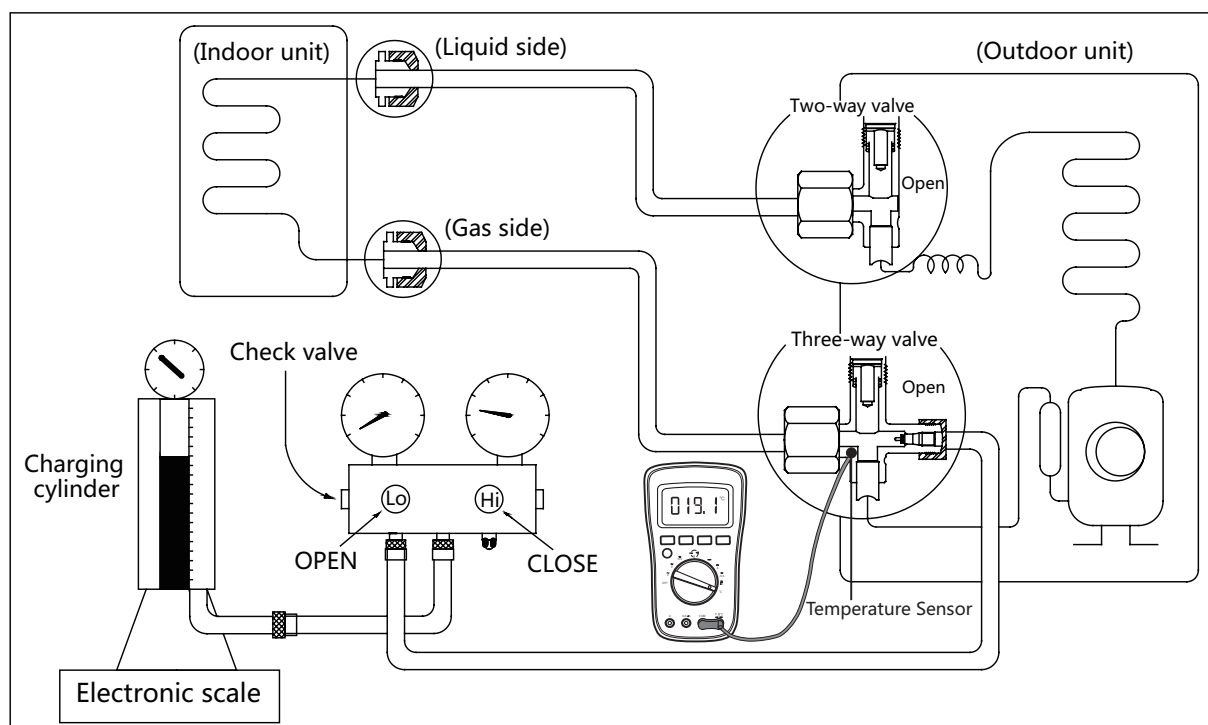
Evacuation for the whole system



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the vacuum pump to the 3-way valve's service port.
3. Evacuate the system for approximately one hour. Confirm that the compound meter indicates -0.1 MPa (14.5Psi).
4. Close the valve (Low side) on the charge set and turn off the vacuum pump.
5. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
6. Disconnect the charge hose from the vacuum pump.
7. Mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.

Refrigerant charging



Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A/R32, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm, the value of pressure refers to chapter Appendix), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

Note: 1. Mechanical connectors used indoors shall comply with local regulations.

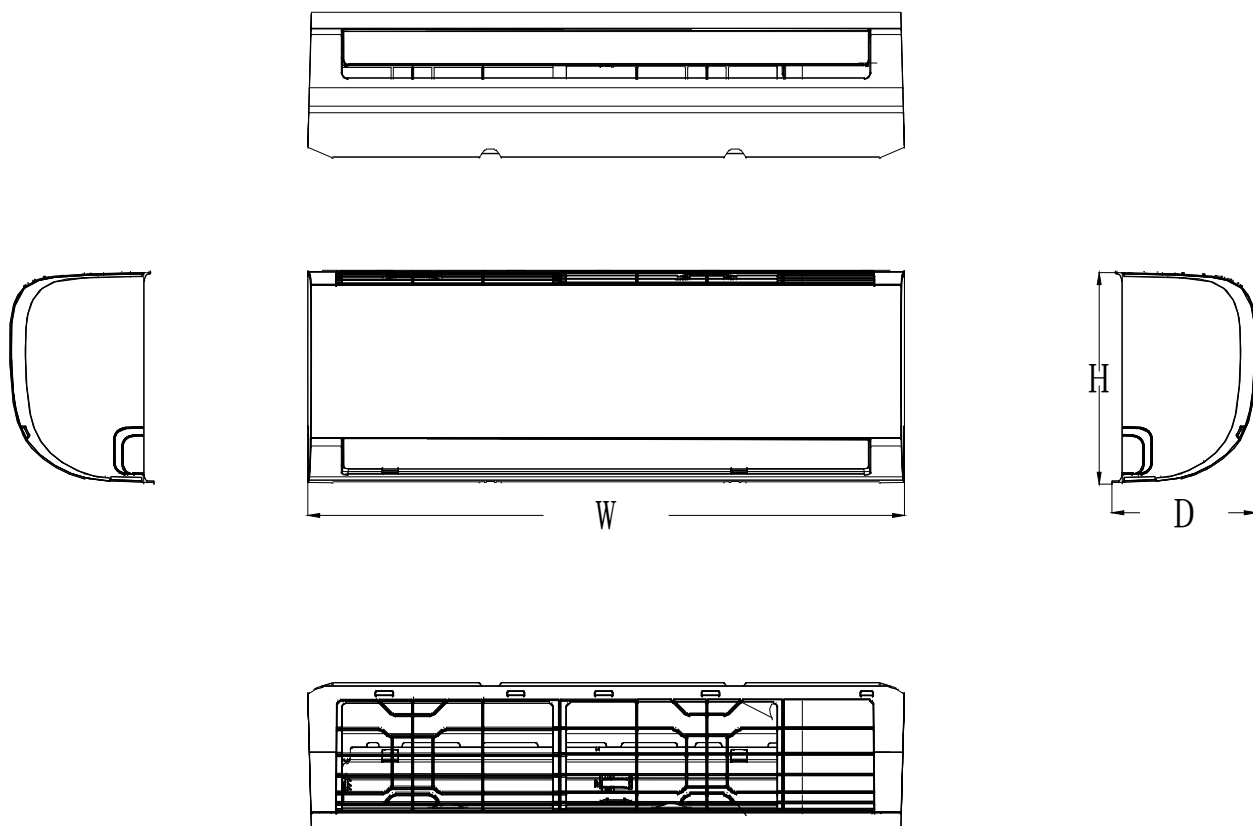
2. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.

Indoor Unit Disassembly

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| | | |
|-----------|--------------------------------------|----------|
| 1. | Dimension | 2 |
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| 2.5 | Step motor | 16 |
| 2.6 | Drain Hose | 17 |

1. Dimension

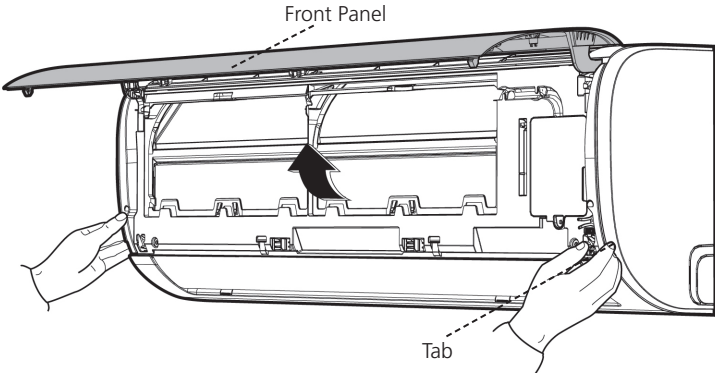
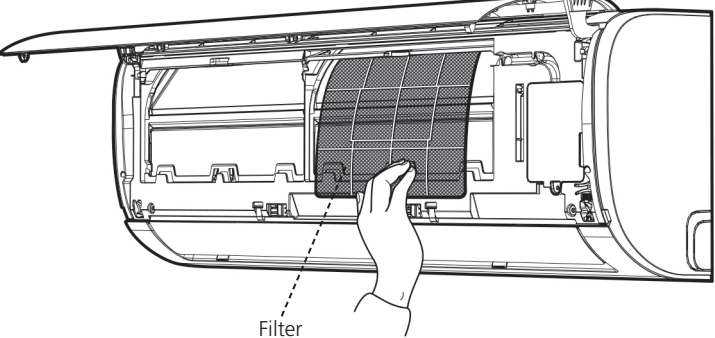


| Model | W(mm) | D(mm) | H(mm) |
|-------|-------|-------|-------|
| 5K~9K | 715 | 194 | 285 |
| 12K | 805 | 194 | 285 |
| 18K | 957 | 213 | 302 |
| 24K | 1040 | 220 | 327 |

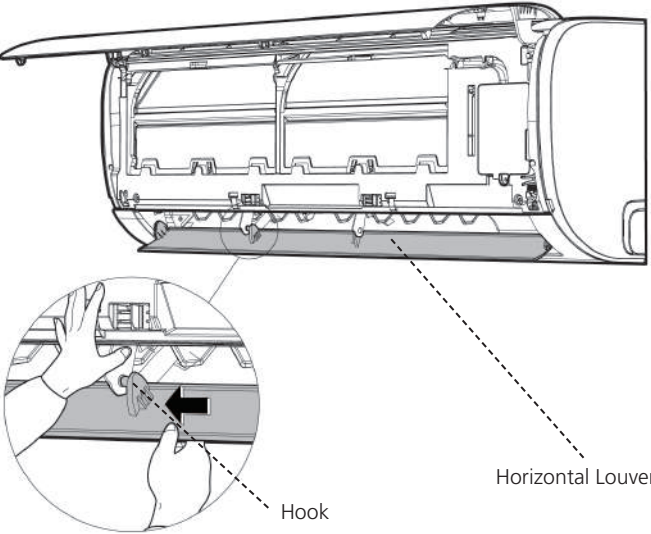
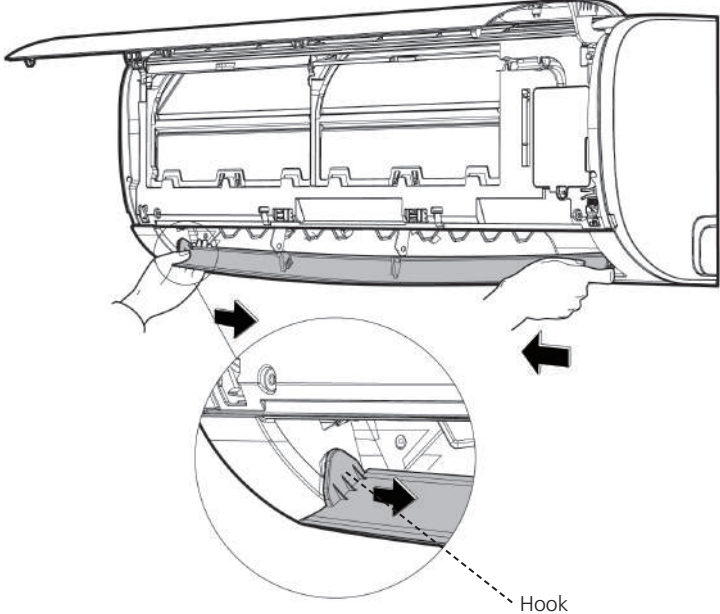
2. Disassembly

2.1 Indoor unit

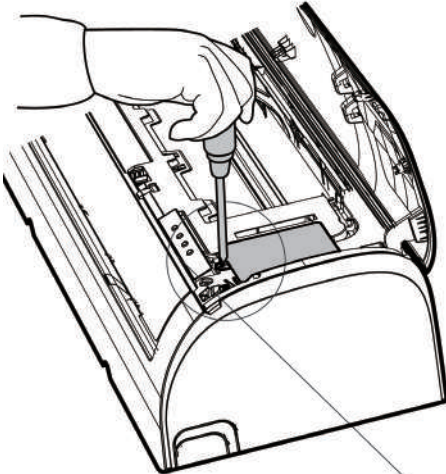
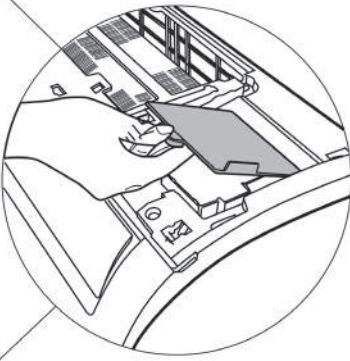
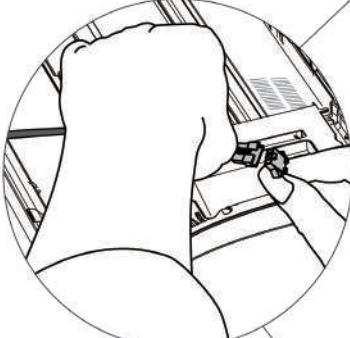
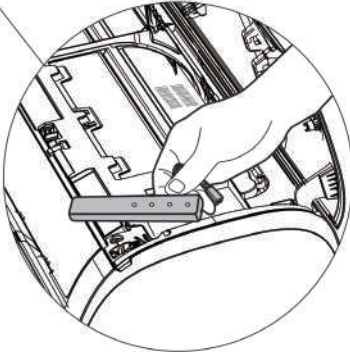
1. Front Panel

| Procedure | Illustration |
|--|--|
| <p>1) Hold the front panel by the tabs on the both sides and lift it (see CJ_AF_001).</p> |  <p style="text-align: center;">CJ_AF_001</p> |
| <p>2) Push up the bottom of an air filter, and then pull it out downwards (see CJ_AF_002).</p> |  <p style="text-align: center;">CJ_AF_002</p> |

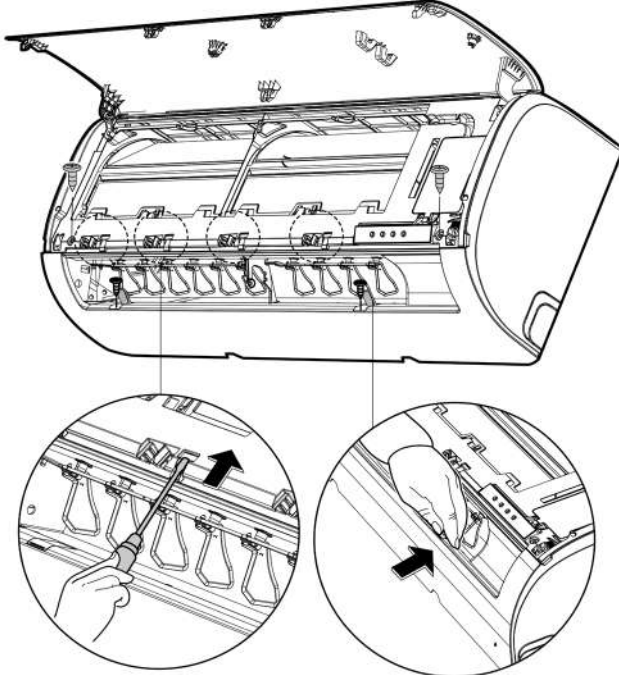
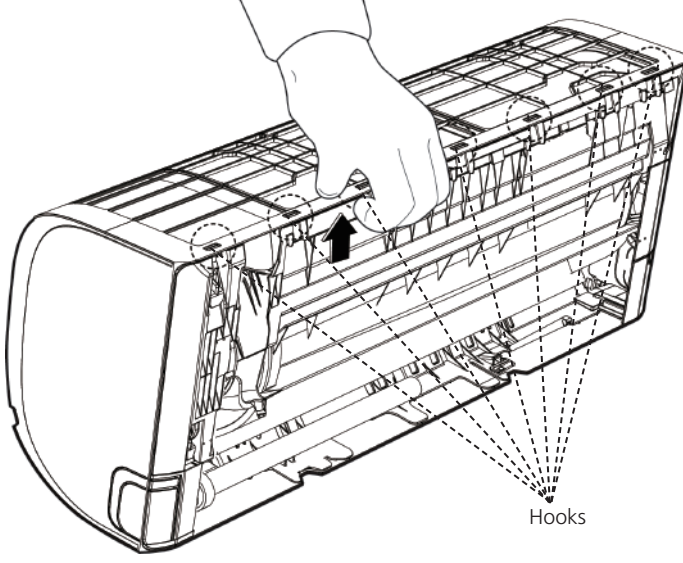
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|---|
| <p>3) Open the horizontal louver and push the hook towards left to open it (see CJ_AF_003).</p> |  <p>Horizontal Louver</p> <p>Hook</p> <p>CJ_AF_003</p> |
| <p>4) Bend the horizontal louver lightly by both hands to loosen the hooks, then remove the horizontal louver (see CJ_AF_004).</p> |  <p>Hook</p> <p>CJ_AF_004</p> |

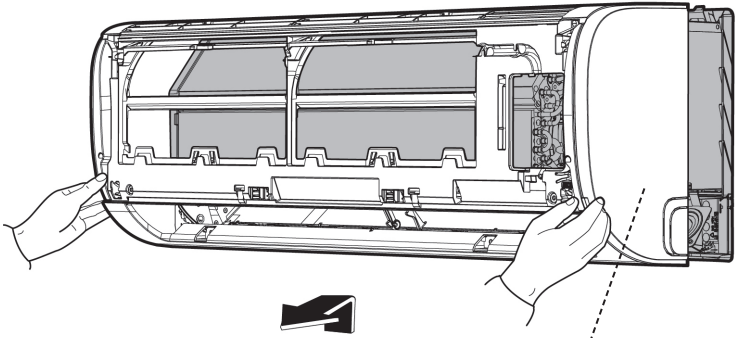
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|---|
| <p>5) Remove 1 screw and then remove the electrical cover(see CJ_AF_005-1 and CJ_AF_005-2).</p> |  <p>CJ_AF_005-1</p>  <p>CJ_AF_005-2</p> |
| <p>6) Disconnect the connector for display board(see CJ_AF_005-3) .</p> |  <p>CJ_AF_005-3</p> |
| <p>7) Remove the display board(see CJ_AF_005-4).</p> |  <p>CJ_AF_005-4</p> <p>CJ_AF_005</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|---|
| <p>8) Open the screw caps(2) and the remove the screws(see CJ_AF_006).</p> <p>9) Release the 4 hooks.</p> |  <p style="text-align: center;">CJ_AF_006</p> |
| <p>10)Release the seven hooks in the back (see CJ_AF_007).</p> |  <p style="text-align: center;">CJ_AF_007</p> |

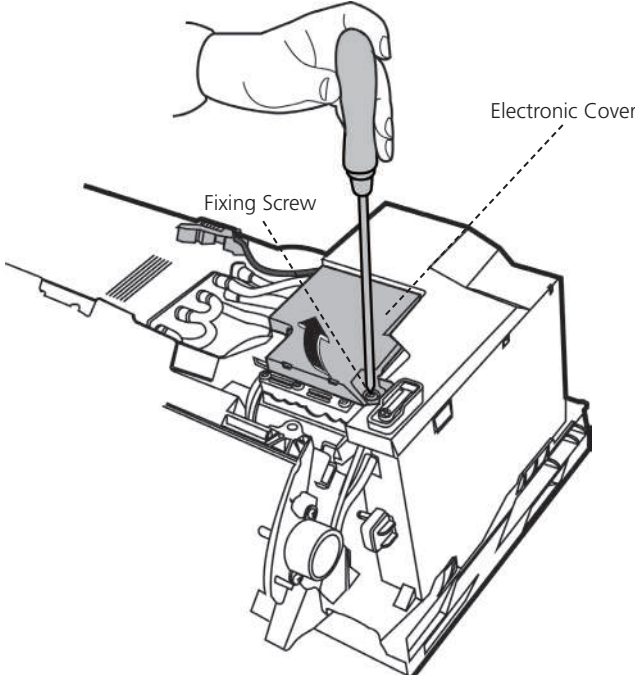
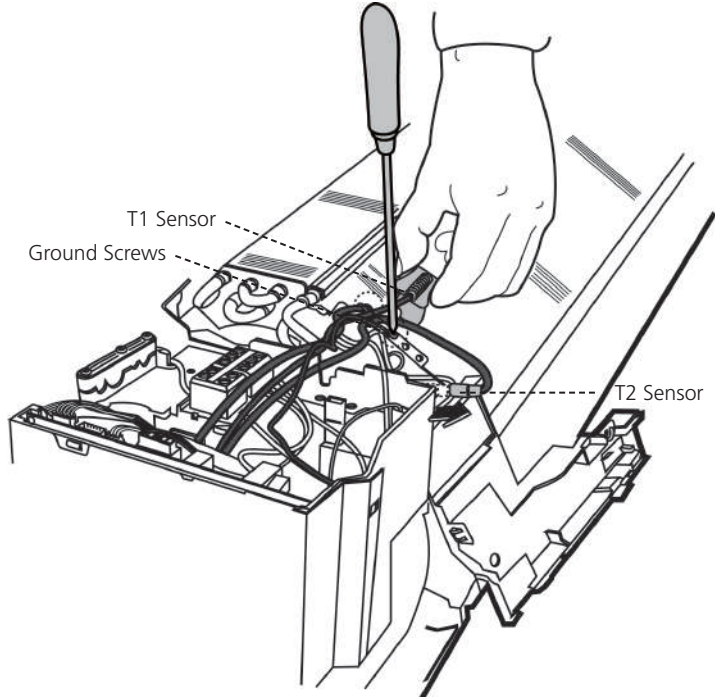
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|---|
| <p>11) Pull out the panel frame while pushing the hook through a clearance between the panel frame and the heat exchanger (see CJ_AF_008).</p> |  <p data-bbox="946 734 1086 763">CJ_AF_008</p> <p data-bbox="1169 734 1284 763">Panel Frame</p> |

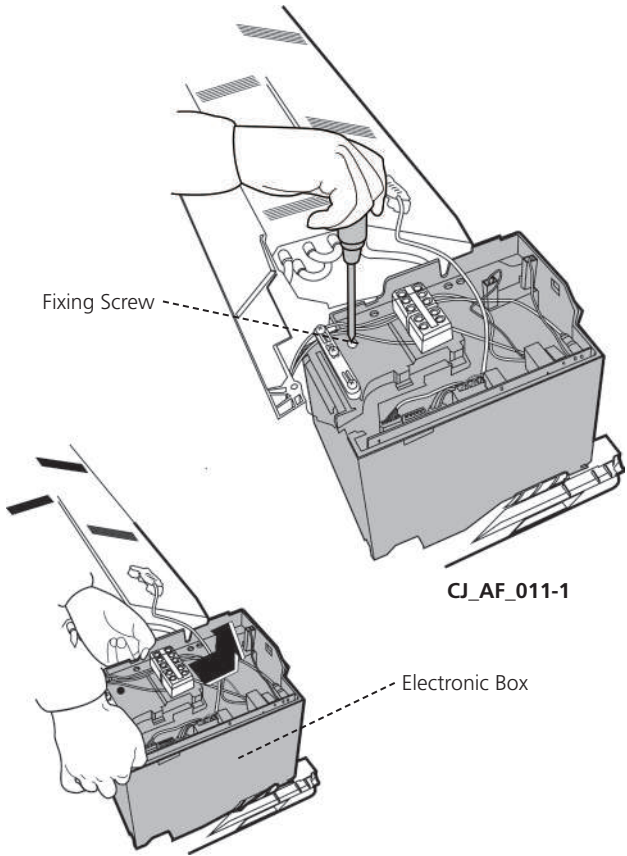
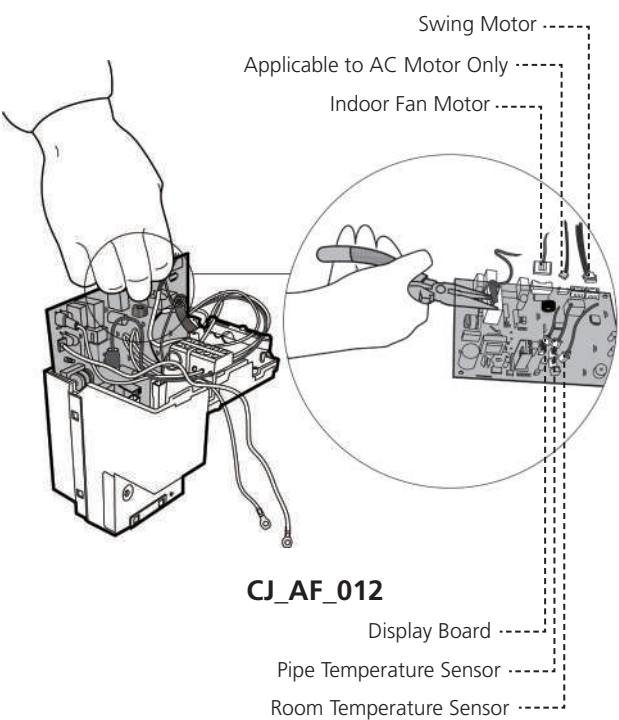
Note: This section is for reference only. Actual unit appearance may vary.

2. Electrical parts

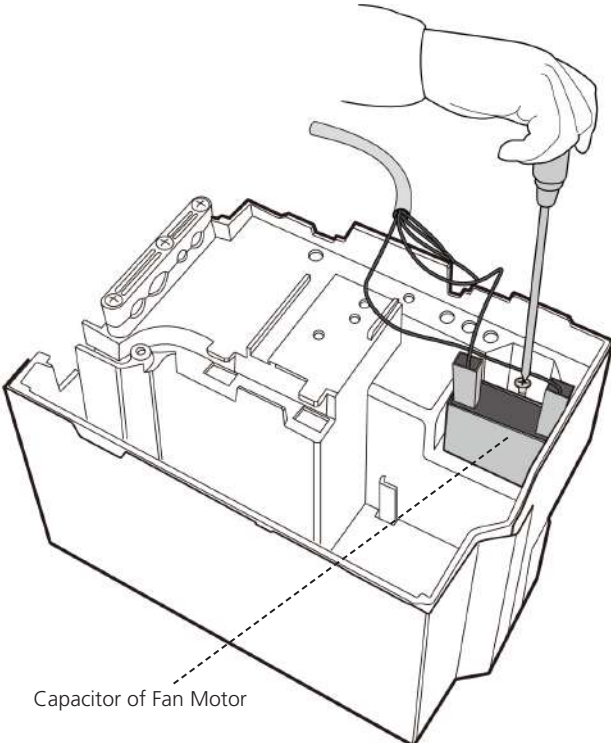
Note: Remove the front panel (refer to 1. Front panel) before disassembling electrical parts.

| Procedure | Illustration |
|---|--|
| <p>1) Remove the fixing screw and then remove the cover of electronic box and the terminal cover (see CJ_AF_009).</p> |  <p style="text-align: center;">CJ_AF_009</p> |
| <p>2) Pull out the room temperature sensor (T1) and the coil temperature sensor (T2) (see CJ_AF_010).</p> <p>3) Remove the two screws used for the ground connection (see CJ_AF_010).</p> |  <p style="text-align: center;">CJ_AF_010</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|--|
| <p>4) Remove the fixing screw (see CJ_AF_011-1).</p> <p>5) Pull out the Electrical control box along the direction indicated in right image. to remove it (CJ_AF_011-2).</p> |  <p>Fixing Screw</p> <p>CJ_AF_011-1</p> <p>Electronic Box</p> <p>CJ_AF_011-2</p> |
| <p>6) Disconnect the wires. Then remove the electronic main board (CJ_AF_012).</p> |  <p>Swing Motor</p> <p>Applicable to AC Motor Only</p> <p>Indoor Fan Motor</p> <p>CJ_AF_012</p> <p>Display Board</p> <p>Pipe Temperature Sensor</p> <p>Room Temperature Sensor</p> |

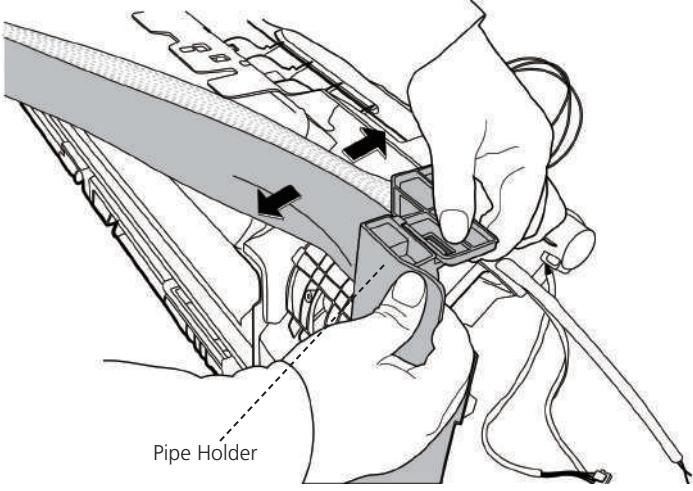
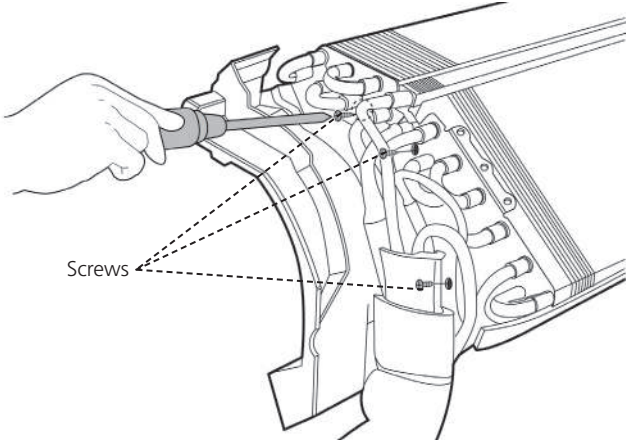
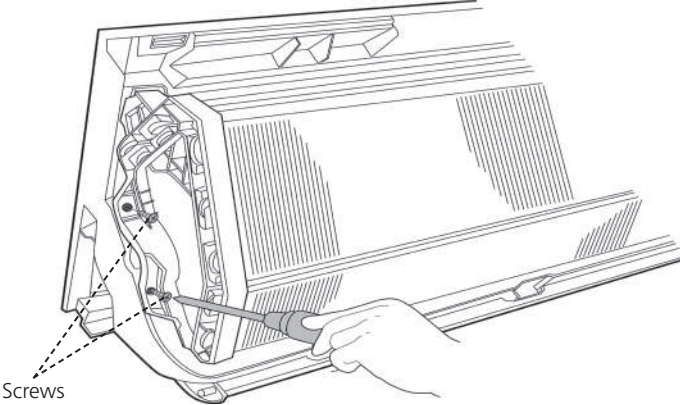
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|---|
| <p>7) Remove the fixing screw, then remove the capacitor of fan motor (see CJ_AF_013).</p> |  <p>Capacitor of Fan Motor</p> <p>CJ_AF_013</p> |

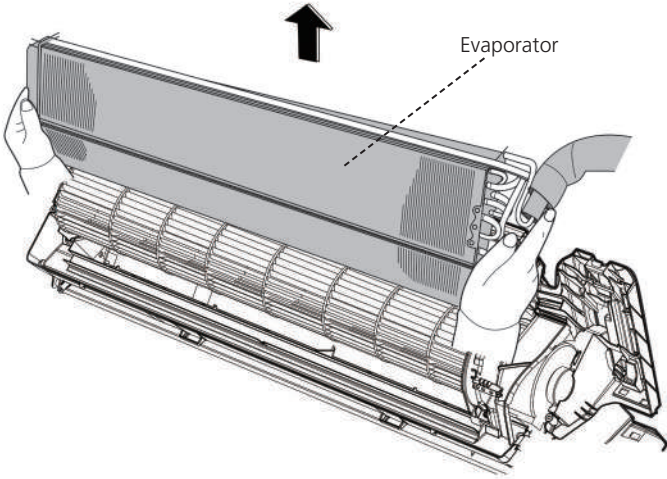
Note: This section is for reference only. Actual unit appearance may vary.

3. Evaporator

Note: Remove the front panel and electrical parts (refer to 1. Front panel and 2. Electrical parts) before disassembling evaporator.

| Procedure | Illustration |
|---|--|
| 1) Disassemble the pipe holder located at the rear of the unit (see CJ_AF_014). |  <p style="text-align: center;">CJ_AF_014</p> |
| 2) Remove the screws on the evaporator located at the fixed plate (see CJ_AF_015). |  <p style="text-align: center;">CJ_AF_015</p> |
| 3) Remove the two screws on the evaporator located at the base of the bearing side (see CJ_AF_016). |  <p style="text-align: center;">CJ_AF_016</p> |

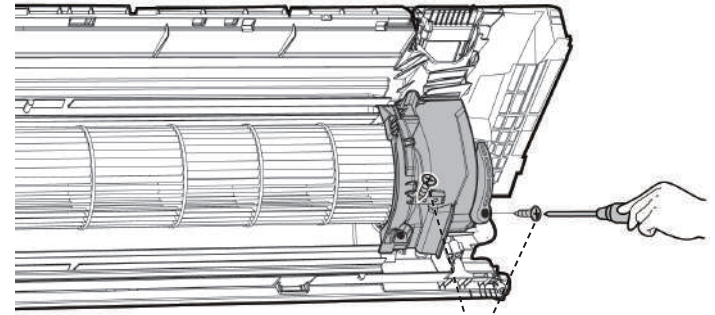
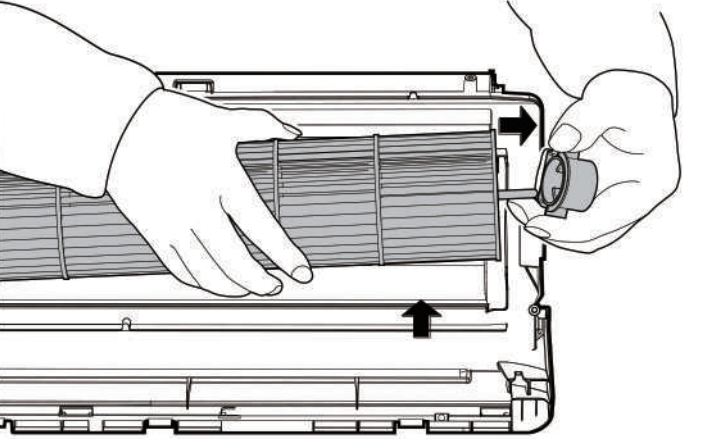
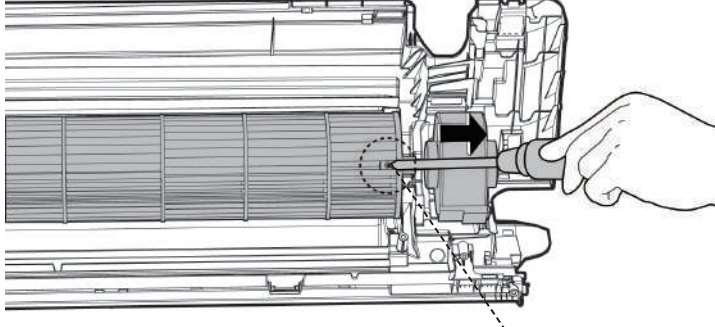
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|---|
| 4) Pull out the evaporator (see CJ_AF_017). |  <p>The illustration shows a person's hands pulling a rectangular evaporator coil out of a larger indoor unit. The evaporator is shaded in grey. A dashed line points to it with the label 'Evaporator'. A black arrow above the evaporator points upwards, indicating the direction of removal. The indoor unit has a series of horizontal fins. The label 'CJ_AF_017' is located at the bottom center of the illustration area.</p> |

Note: This section is for reference only. Actual unit appearance may vary.

4. Fan motor and fan

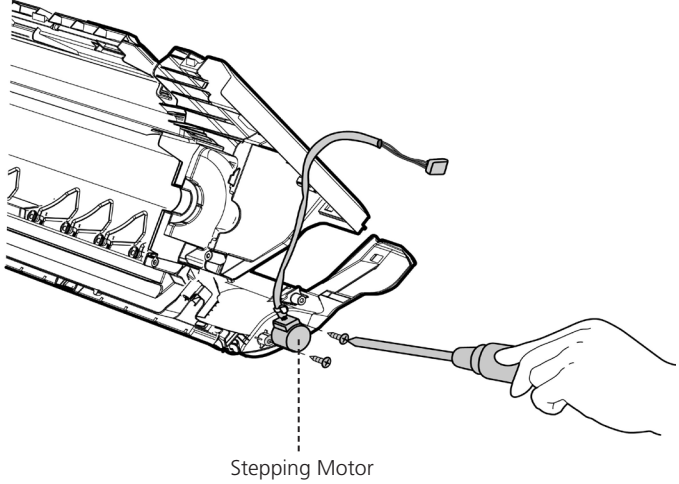
Note: Remove the front panel, electrical parts and evaporator (refer to 1. Front panel, 2. Electrical parts, and 3. Evaporator). before disassembling fan motor and fan.

| Procedure | Illustration |
|--|---|
| 1) Remove the two screws and remove the fixing board of the fan motor (see CJ_AF_018). |  <p data-bbox="965 840 1189 907">Screws CJ_AF_018</p> |
| 2) Remove the Bearing sleeve(see CJ_AF_019). |  <p data-bbox="965 1456 1117 1500">CJ_AF_019</p> |
| 3) Remove the fixing screw (see CJ_AF_020). 4) Pull out the fan motor and fan assembly from the side. |  <p data-bbox="965 1915 1324 1960">Fixing Screw CJ_AF_020</p> |

Note: This section is for reference only. Actual unit appearance may vary.

5. Step motor

Note: Remove the front panel and electrical parts (refer to 1. Front panel, 2. Electrical parts) before disassembling step motor.

| Procedure | Illustration |
|---|---|
| 1) Remove the two screws, then remove the stepping motor (see CJ_AF_021). |  <p data-bbox="932 909 1078 936">Stepping Motor</p> <p data-bbox="970 1005 1107 1032">CJ_AF_021</p> |

Note: This section is for reference only. Actual unit appearance may vary.

Outdoor Unit Disassembly

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| | | |
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| 3.4 | Fan Motor | 36 |
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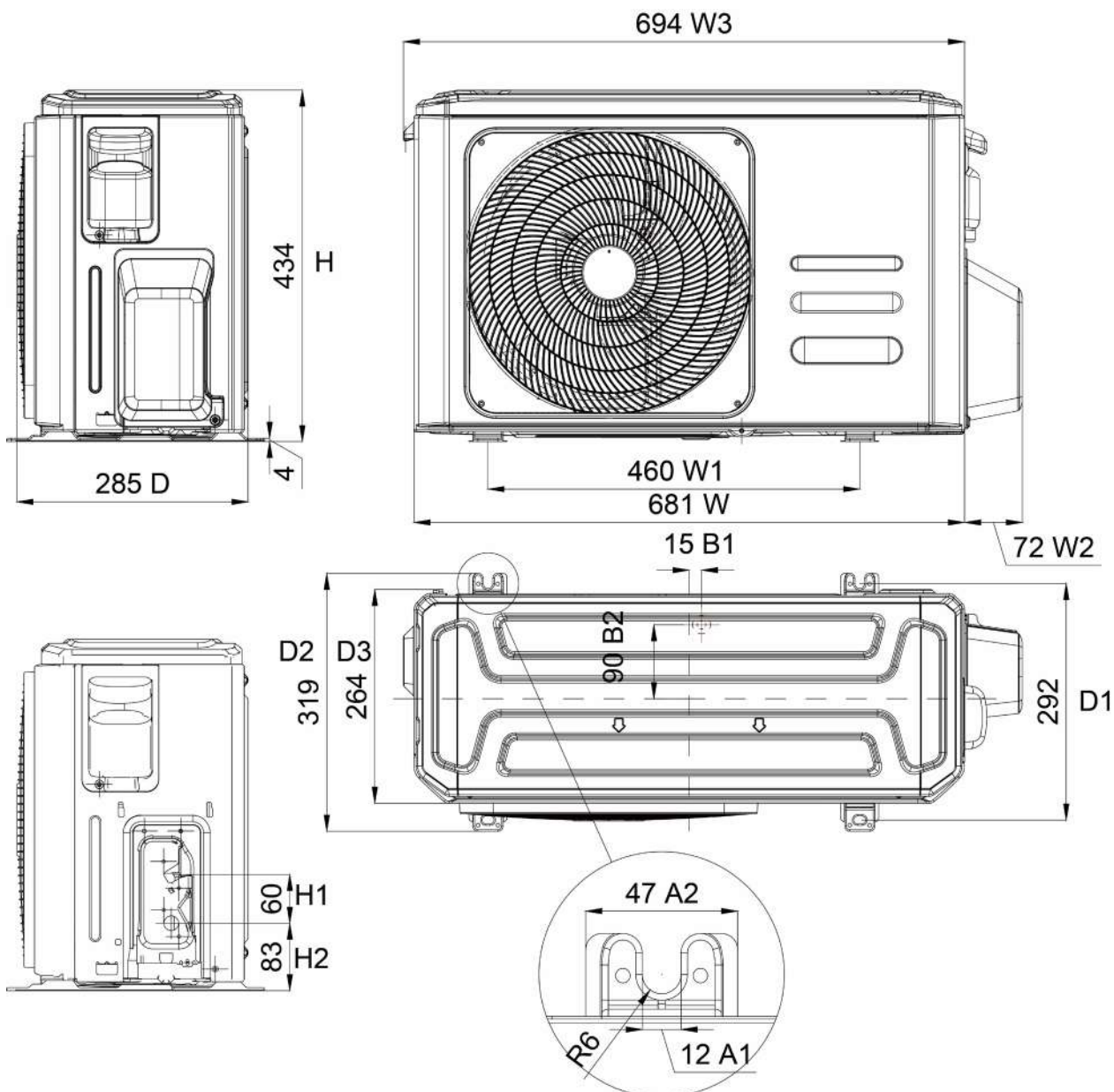
1. Outdoor Unit Disassembly

1.1 Outdoor Unit Table

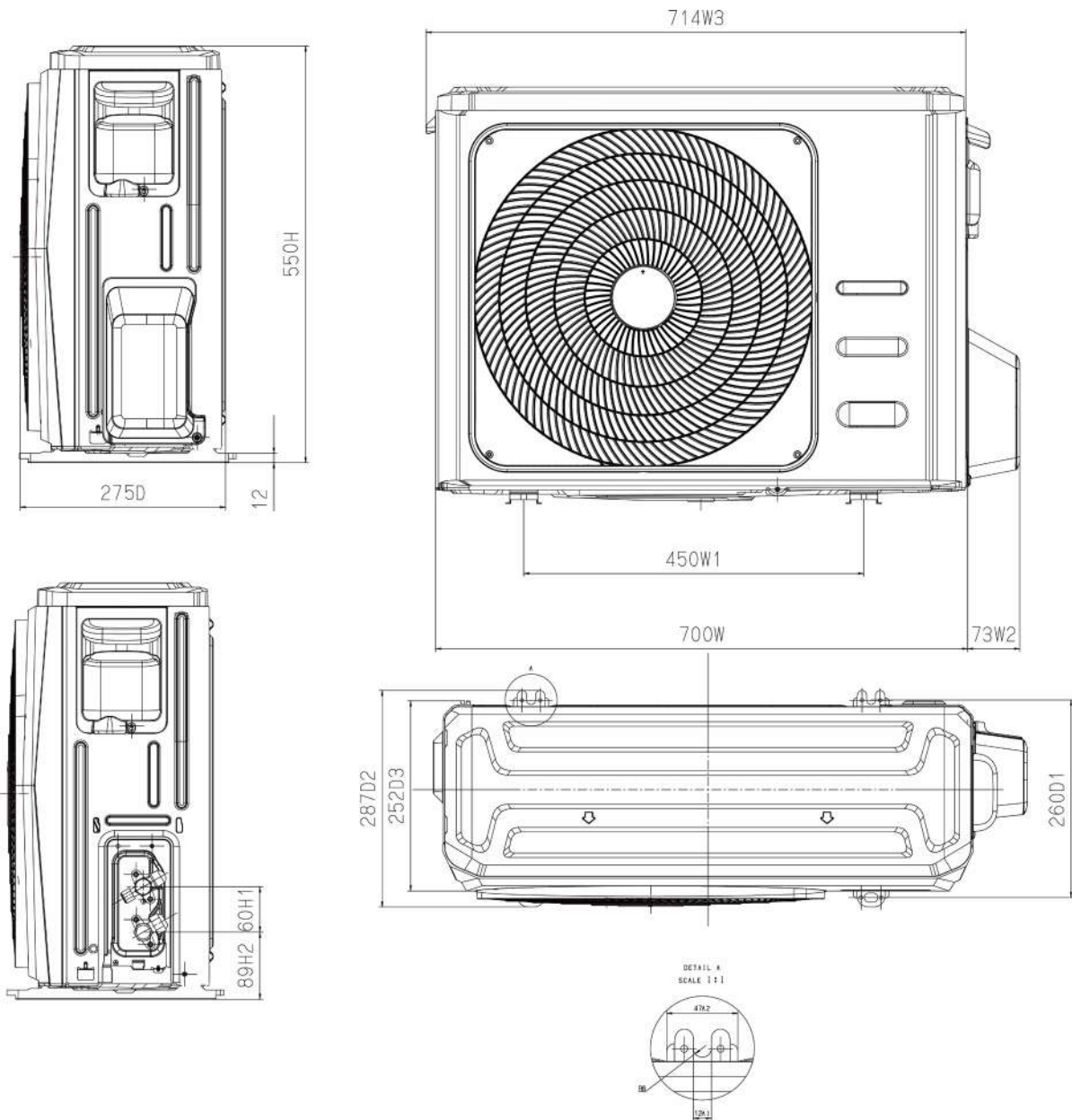
| Outdoor Unit Model | Panel Plate | PCB Board |
|---|-------------|-------------|
| MOBA31-09HFN8-QRD0GW | BA30 | PCB Board 4 |
| MOAB30-09HFN8-QRD0GW | AB30 | PCB Board 4 |
| MOBA31-12HFN8-QRD0GW | BA30 | PCB Board 4 |
| MOAB30-12HFN8-QRD0GW | AB30 | PCB Board 4 |
| MOB32-18HFN8-QRD0GW(with MSAFUCU-18HRFN8-QRD0GW) | B30 | PCB Board 4 |
| MOB32-18HFN8-QRD0GW(with MSAFUCU-18HRFNX-QRD0GW) | B30 | PCB Board 4 |
| MOCA31-24HFN8-QRD0GW | CA30 | PCB Board 5 |
| MOCA32-24HFN8-QRD0GW | CA30 | PCB Board 5 |

2. Dimension

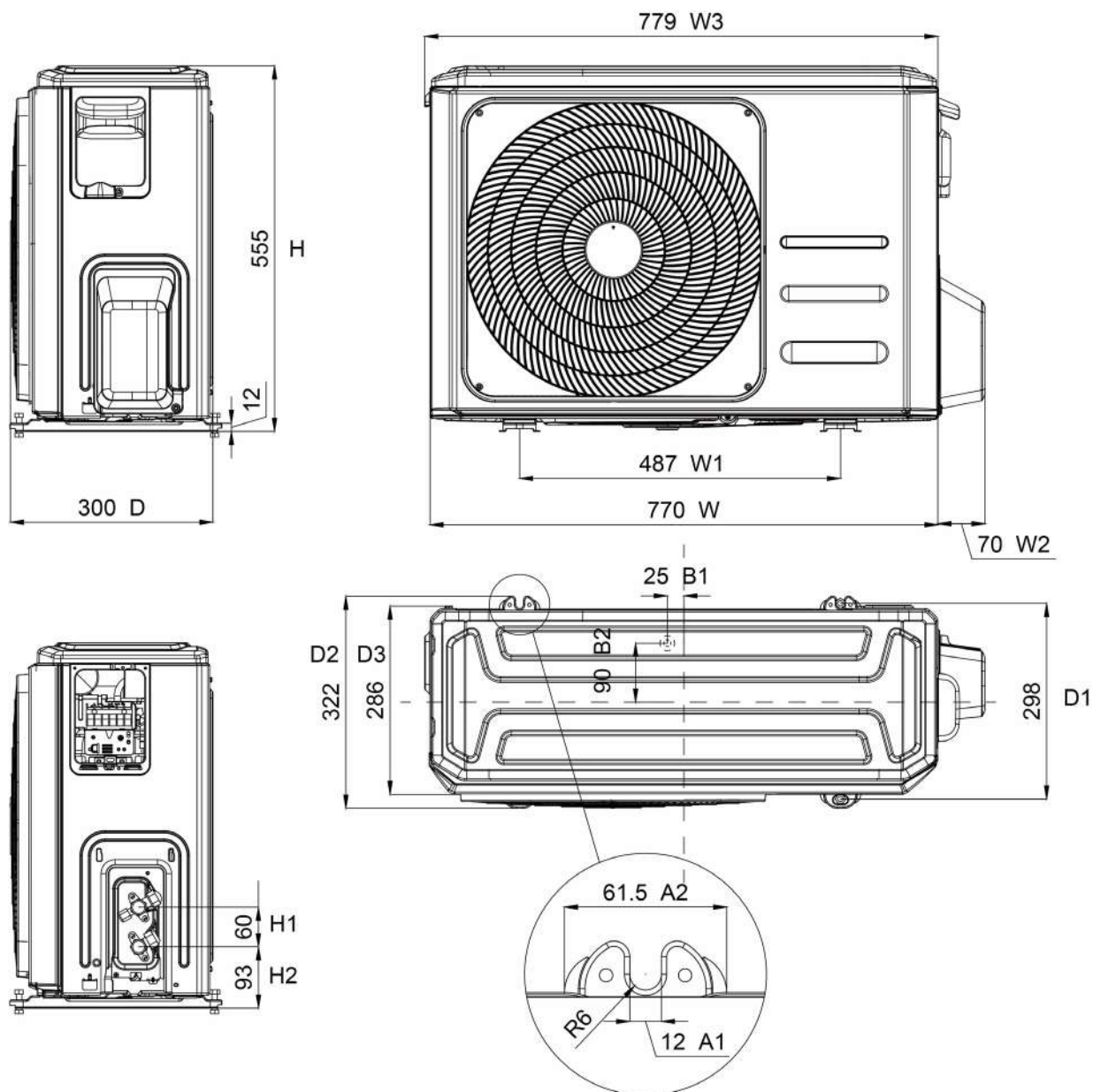
1. Panel Plate AA30



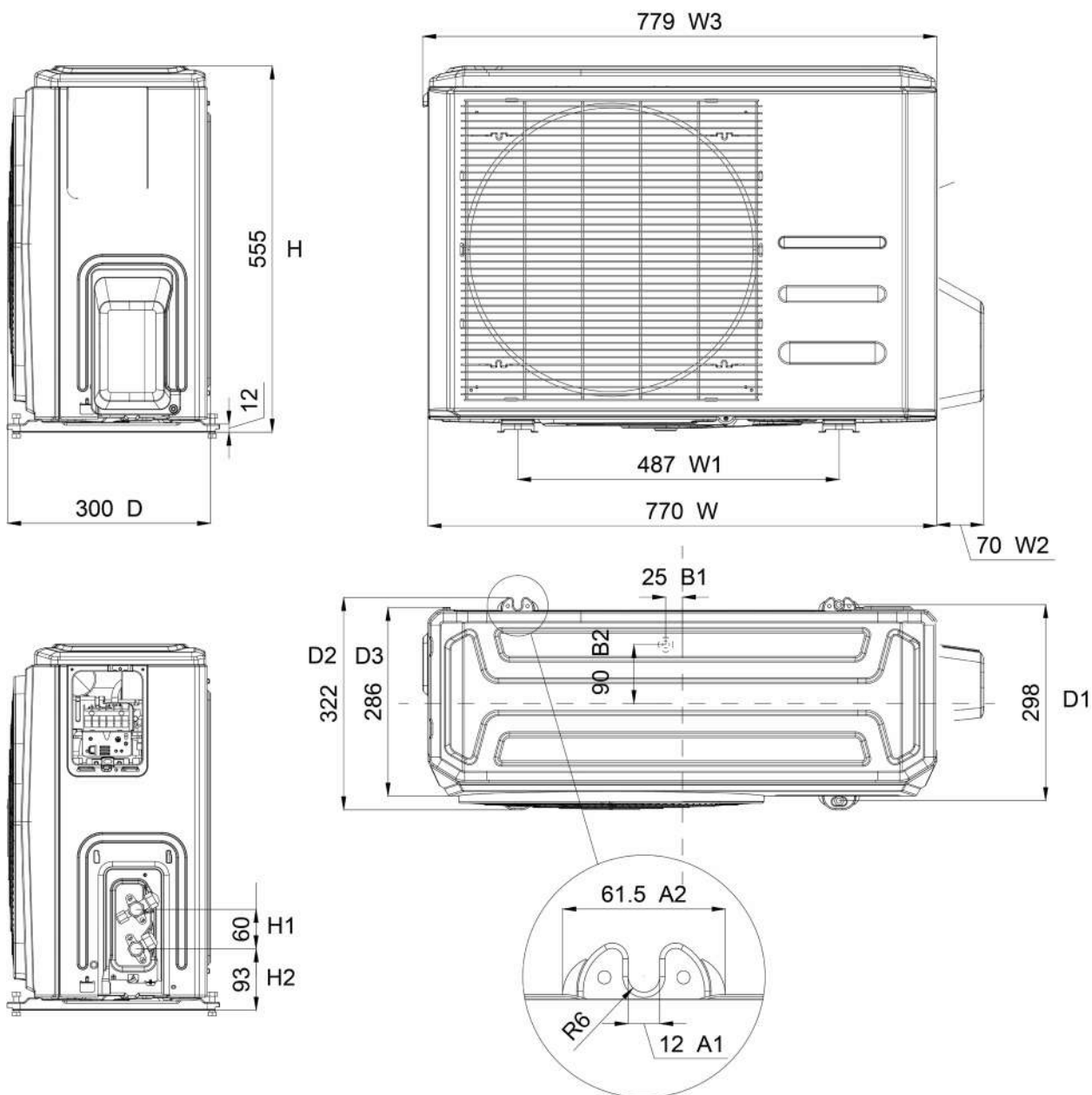
2. Panel Plate AB30



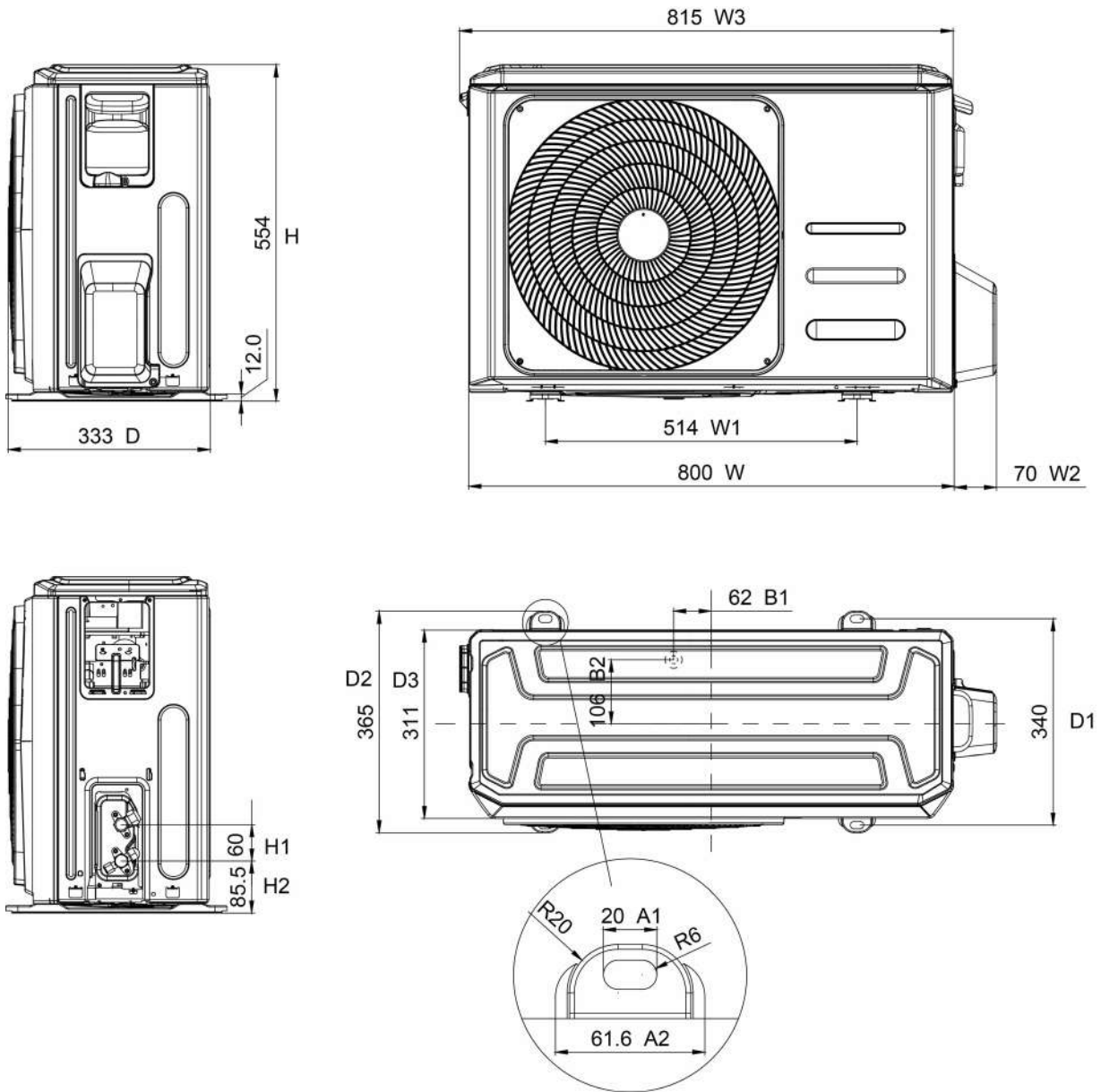
3. Panel Plate BA30



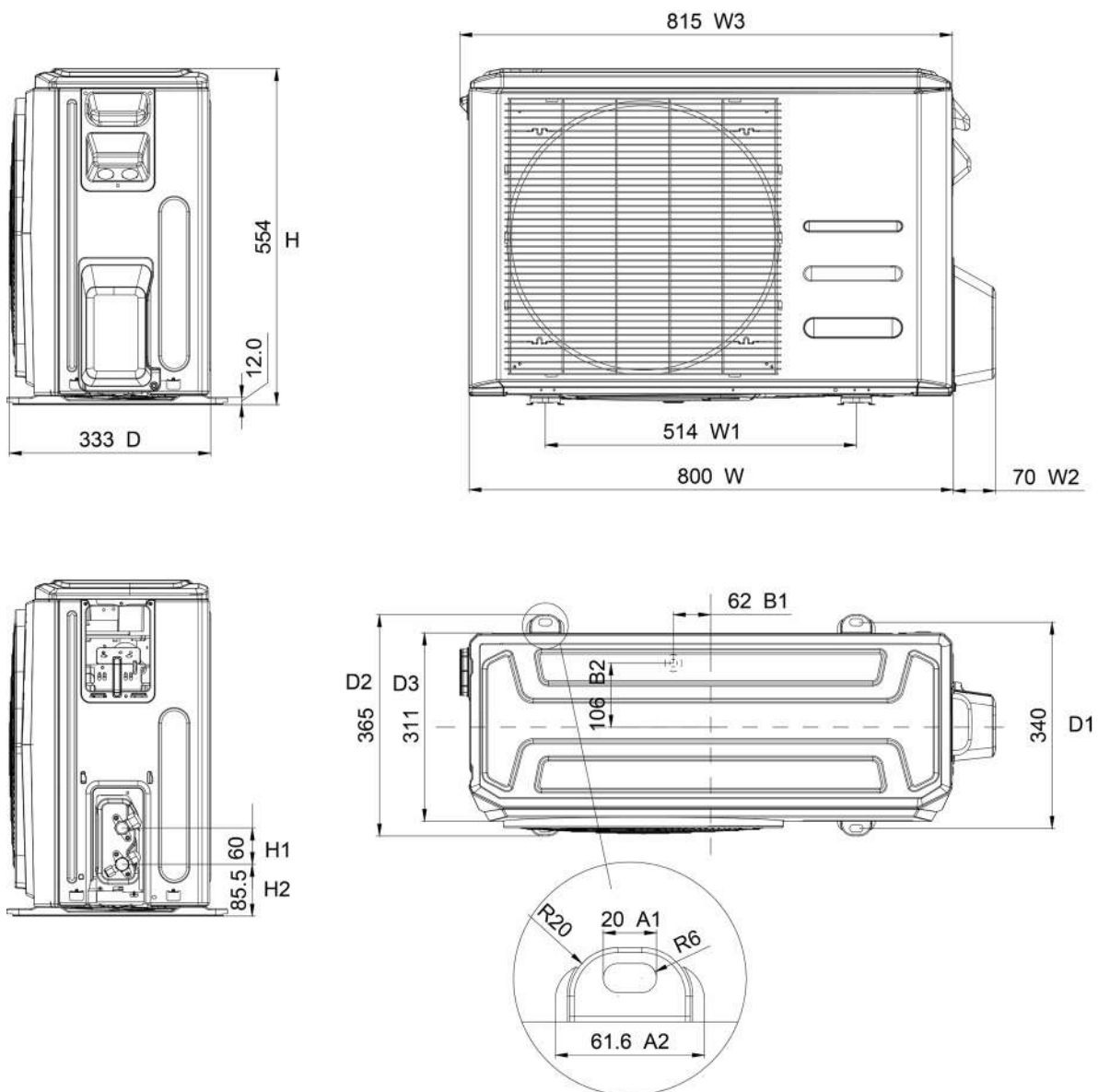
For US models:



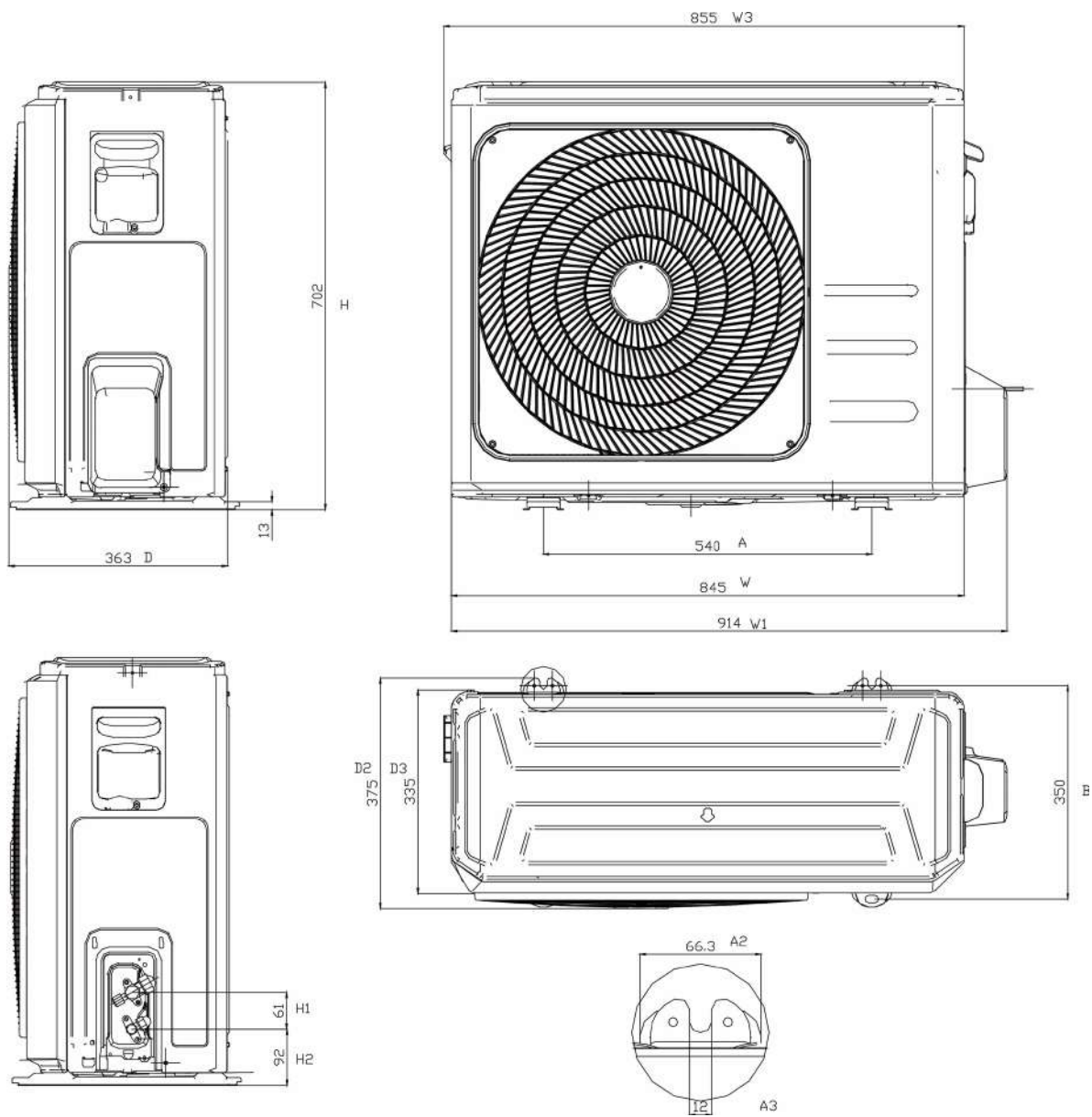
4. Panel Plate B30



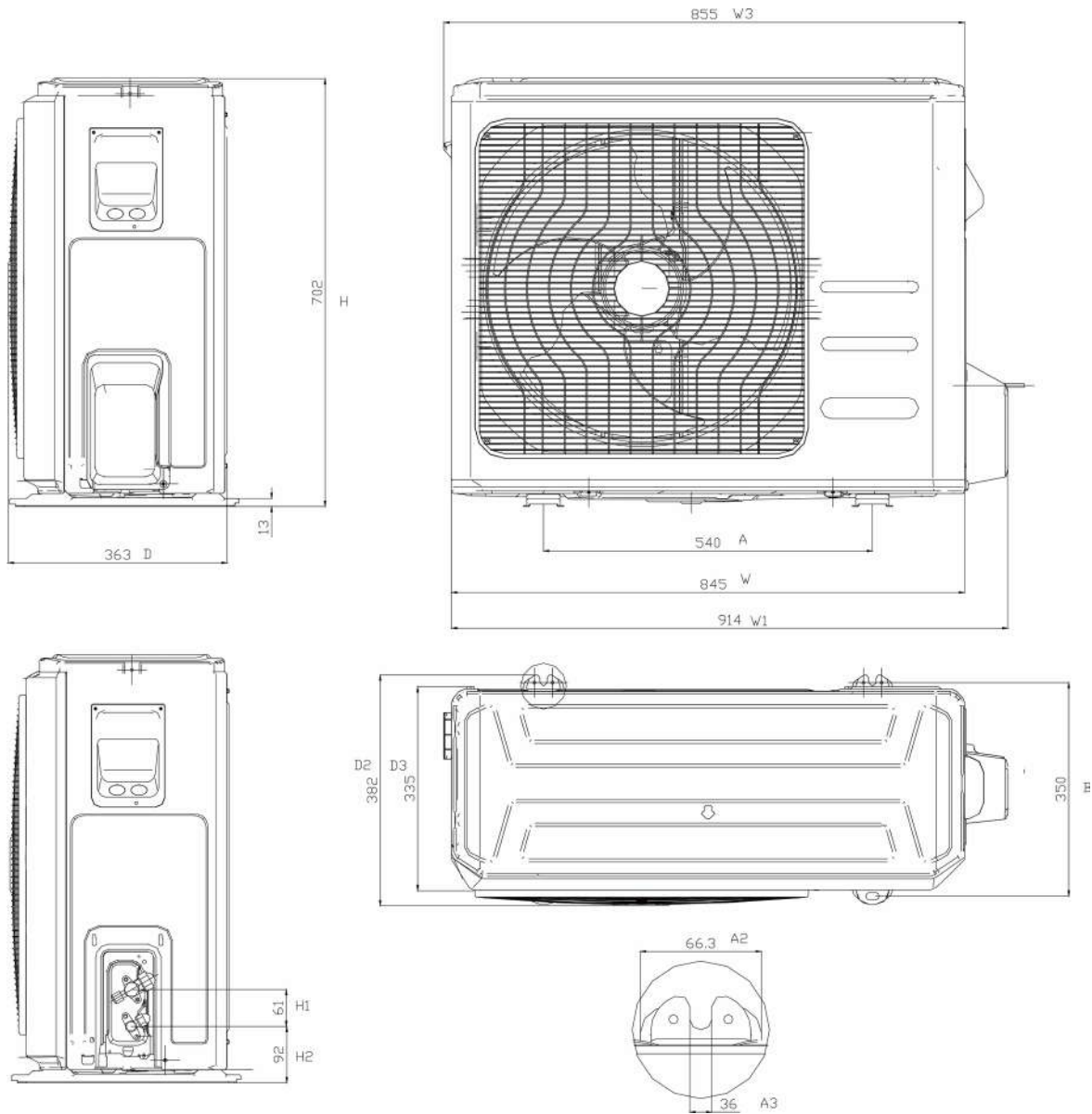
For US models:



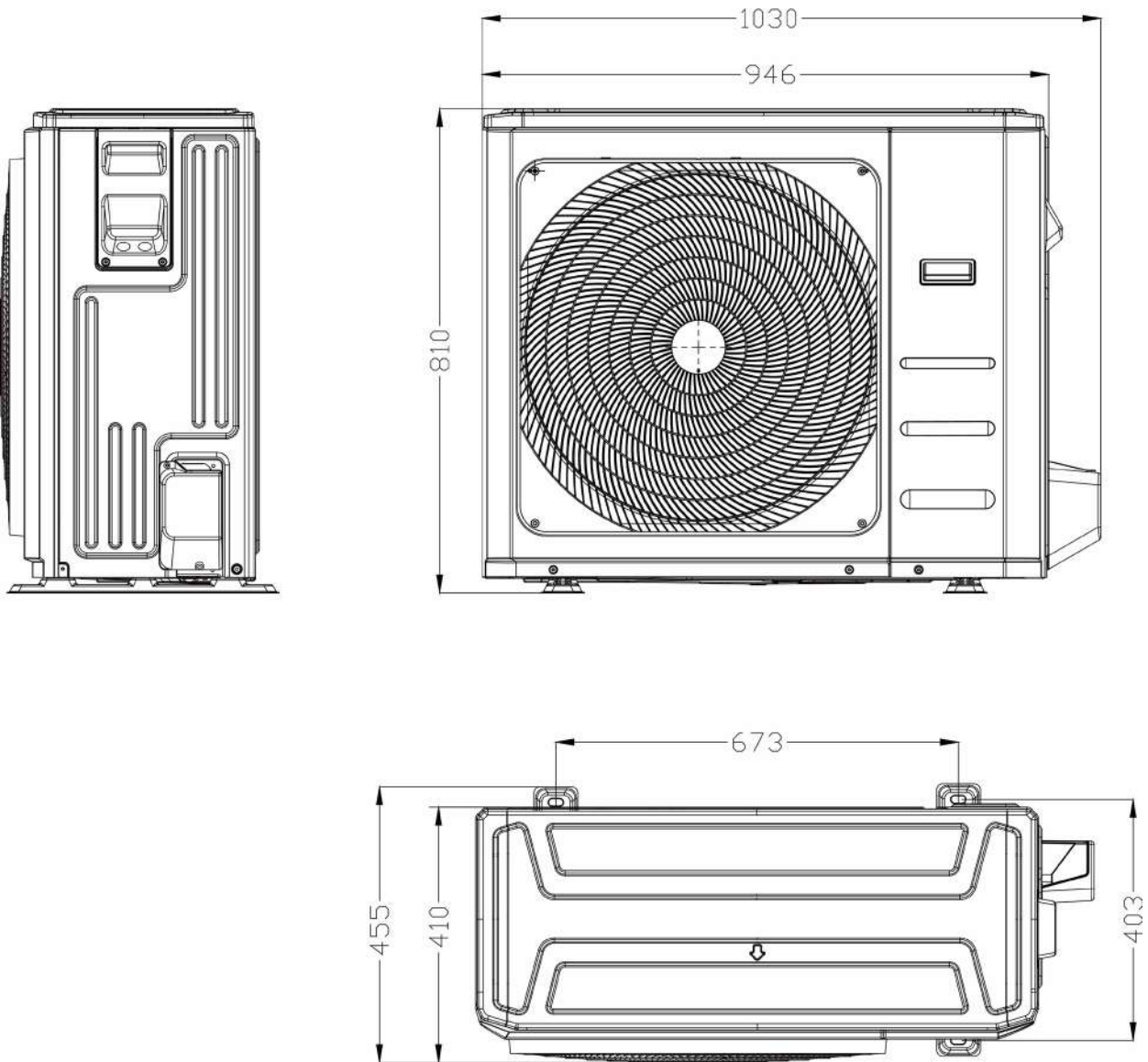
5. Panel Plate CA30



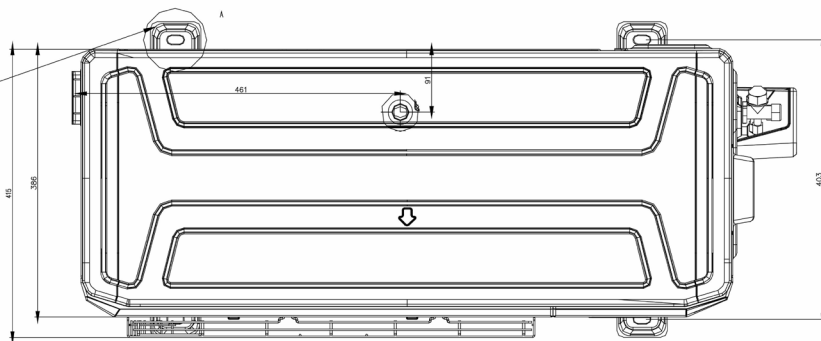
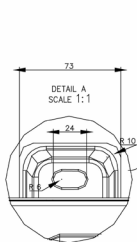
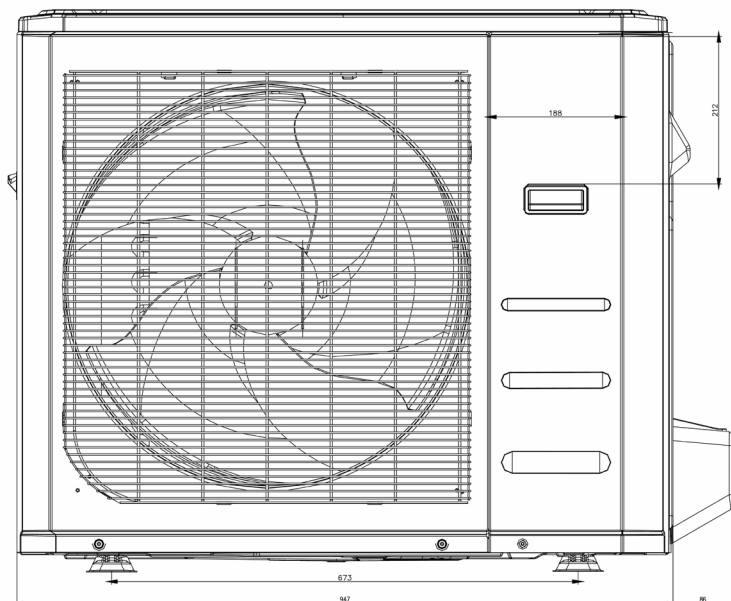
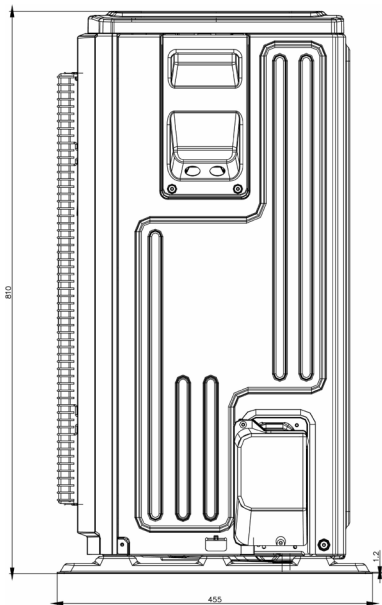
For US models:



6. Panel Plate D30



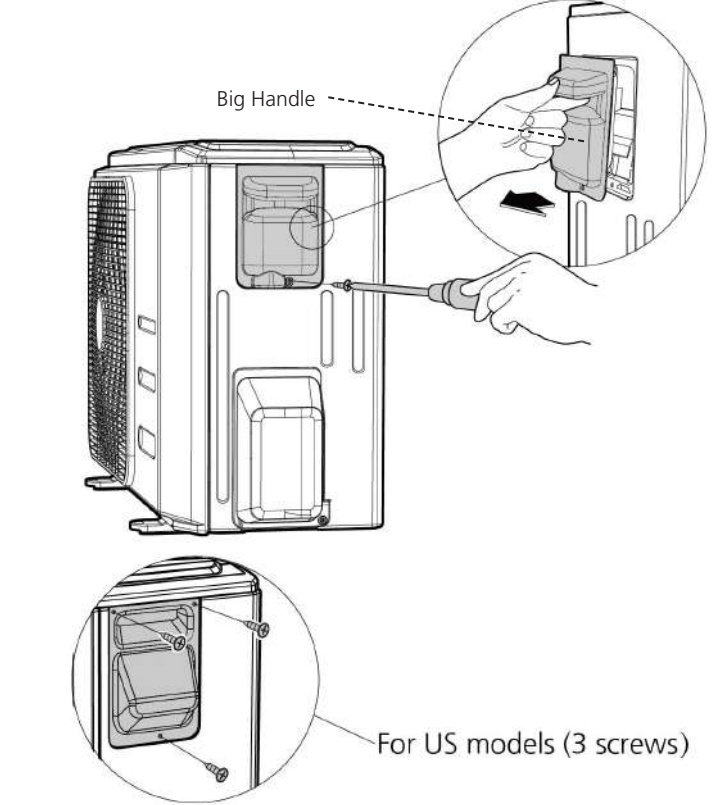
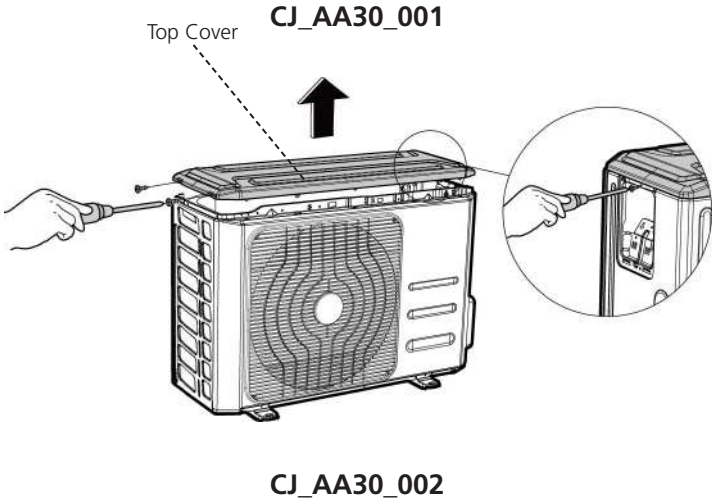
For US models:



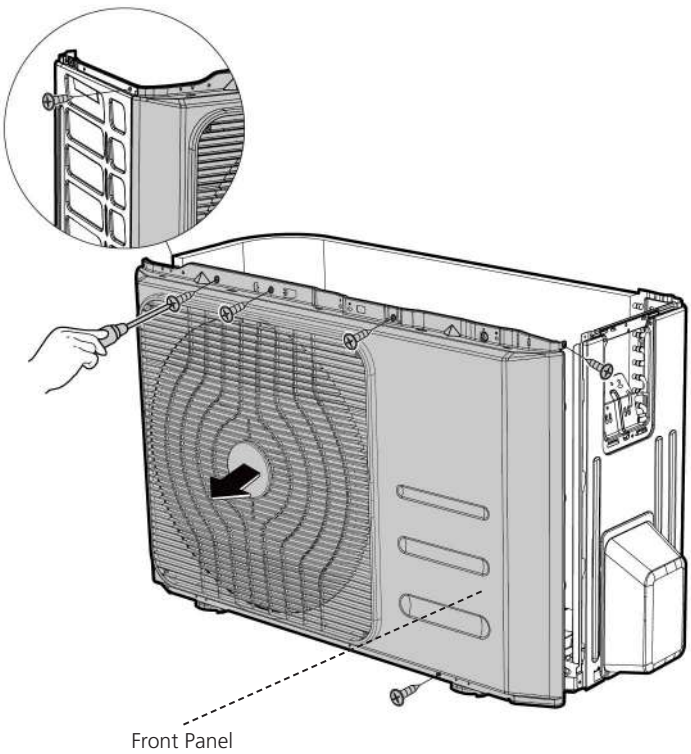
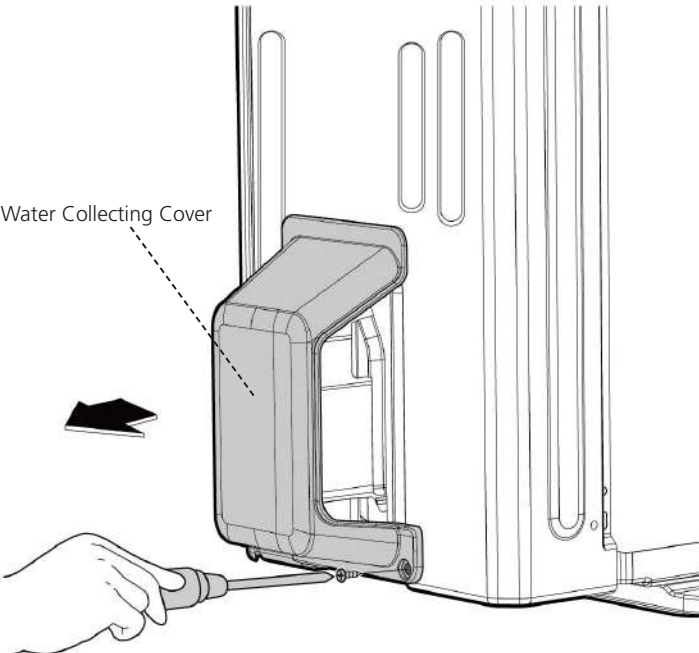
3. Outdoor Unit Disassembly

3.1 Panel Plate

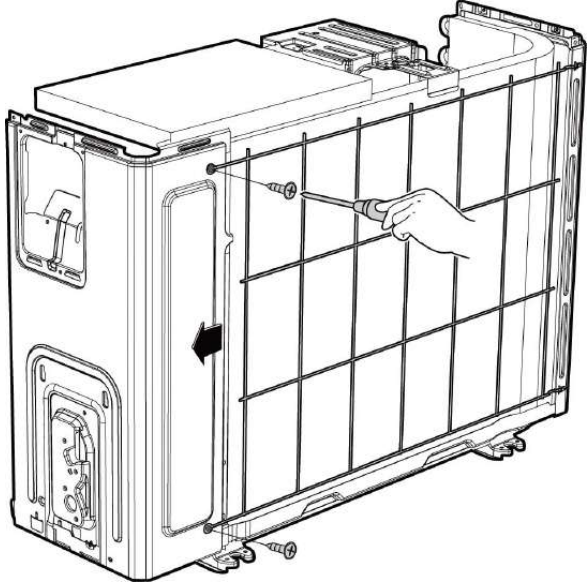
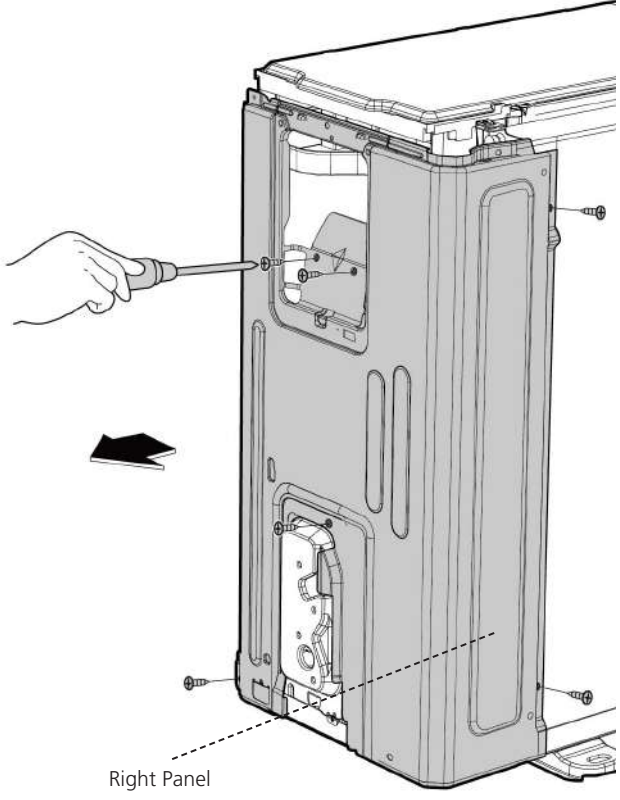
1. AA30 / AB30

| Procedure | Illustration |
|--|---|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (1 screws) (see CJ_AA30_001).</p> |  <p>Big Handle</p> <p>For US models (3 screws)</p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_AA30_002).</p> |  <p>Top Cover</p> <p>CJ_AA30_001</p> <p>CJ_AA30_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

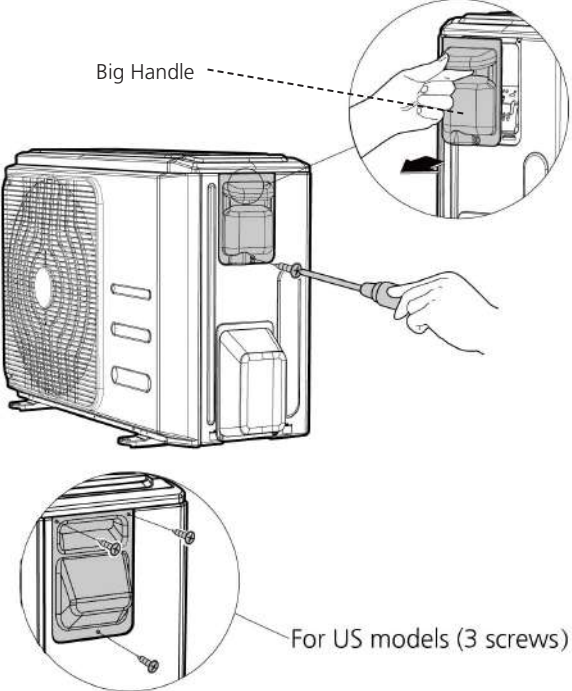
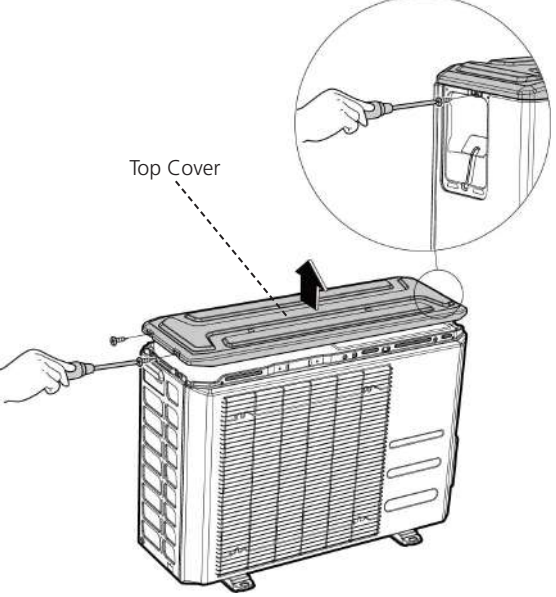
| Procedure | Illustration |
|--|---|
| <p>4) Remove the screws of the front panel and then remove the front panel (6 screws) (see CJ_AA30_003).</p> |  <p style="text-align: center;">CJ_AA30_003</p> |
| <p>5) Remove the screws of water collecting cover (1 screw) (see CJ_AA30_004).</p> |  <p style="text-align: center;">CJ_AA30_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

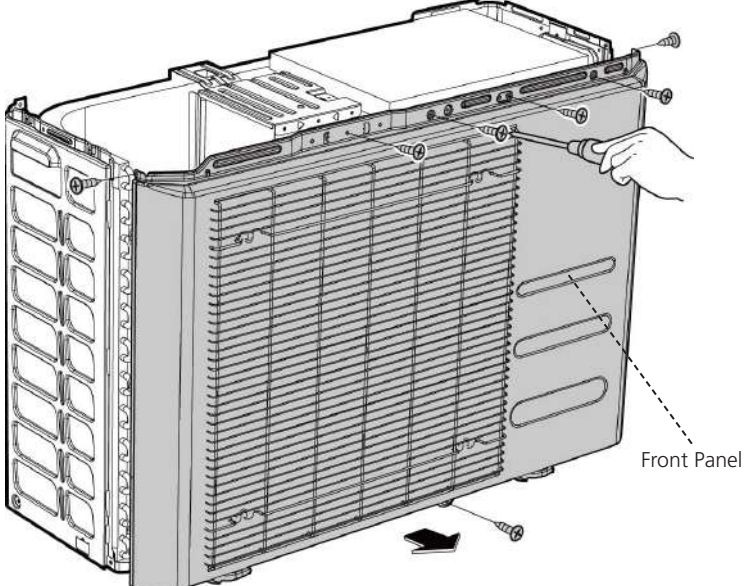
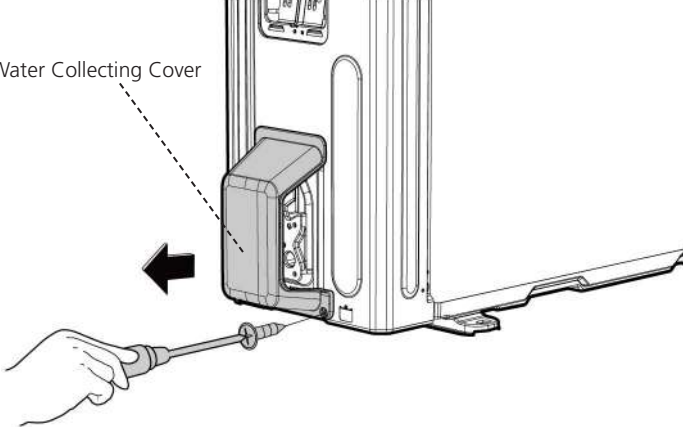
| Procedure | Illustration |
|--|--|
| <p>6) Remove the screws of the rear net and then remove the rear net (2 screws) (see CJ_AA30_005). (for some models)</p> |  <p style="text-align: center;">CJ_AA30_005</p> |
| <p>7) Remove the screws of the right panel and then remove the right panel (6 screws) (see CJ_AA30_006).</p> |  <p style="text-align: center;">CJ_AA30_006</p> |

Note: This section is for reference only. Actual unit appearance may vary.

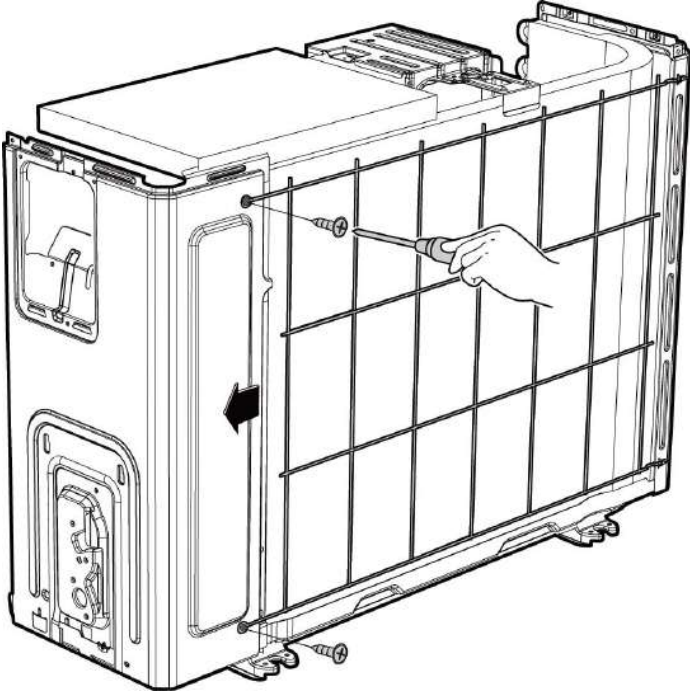
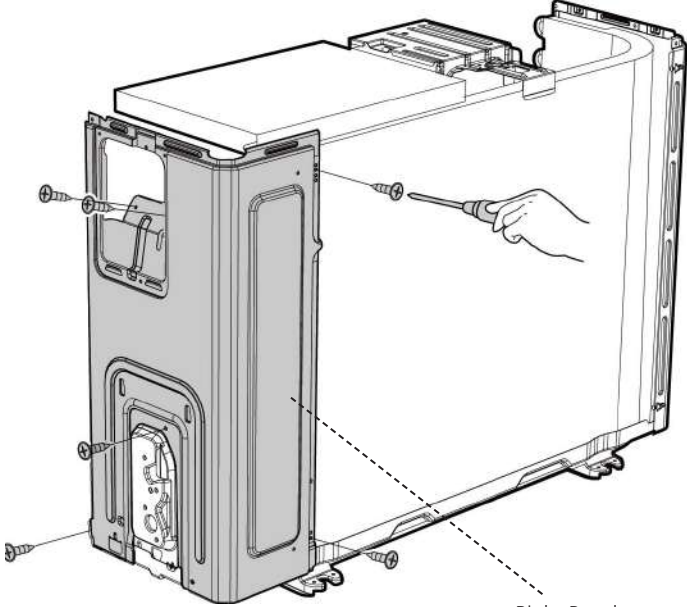
2. BA30

| Procedure | Illustration |
|--|---|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (1 screws) (see CJ_BA30_001).</p> |  <p data-bbox="933 1153 1109 1187">CJ_BA30_001</p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_BA30_002).</p> |  <p data-bbox="933 1848 1109 1881">CJ_BA30_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

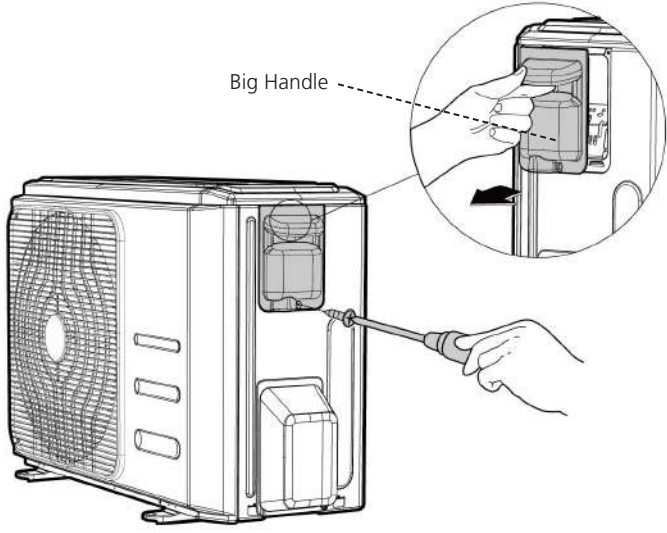
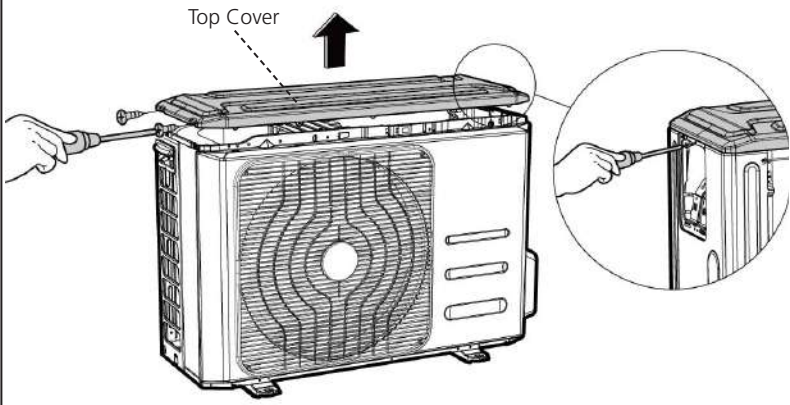
| Procedure | Illustration |
|--|--|
| <p>4) Remove the screws of the front panel and then remove the front panel (7 screws) (see CJ_BA30_003).</p> |  <p style="text-align: center;">CJ_BA30_003</p> |
| <p>5) Remove the screws of water collecting cover (1 screw) (see CJ_BA30_004).</p> |  <p style="text-align: center;">CJ_BA30_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

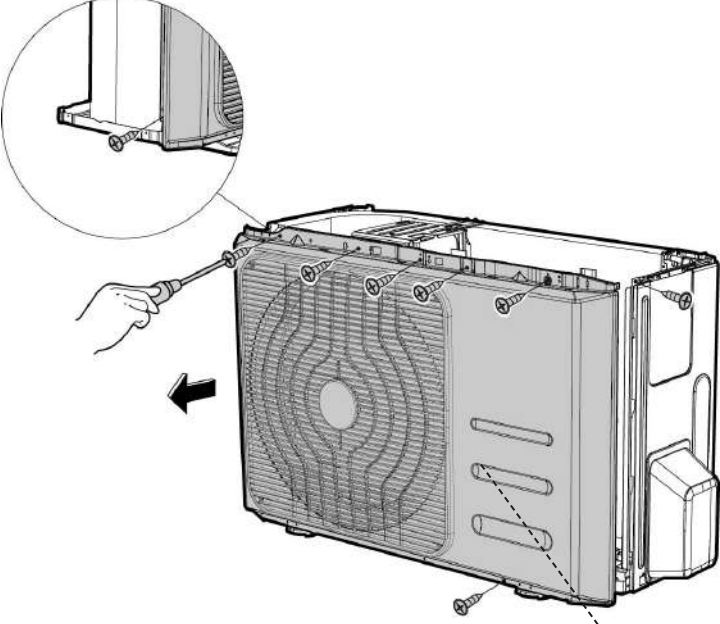
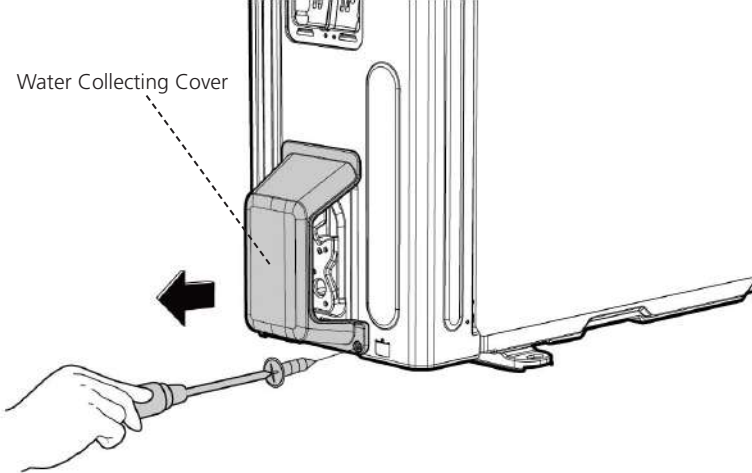
| Procedure | Illustration |
|--|--|
| <p>6) Remove the screws of the rear net and then remove the rear net (2 screws) (see CJ_BA30_005). (for some models)</p> |  <p style="text-align: center;">CJ_BA30_005</p> |
| <p>7) Remove the screws of the right panel and then remove the right panel (6 screws) (see CJ_BA30_006).</p> |  <p style="text-align: right;">Right Panel</p> <p style="text-align: center;">CJ_BA30_006</p> |

Note: This section is for reference only. Actual unit appearance may vary.

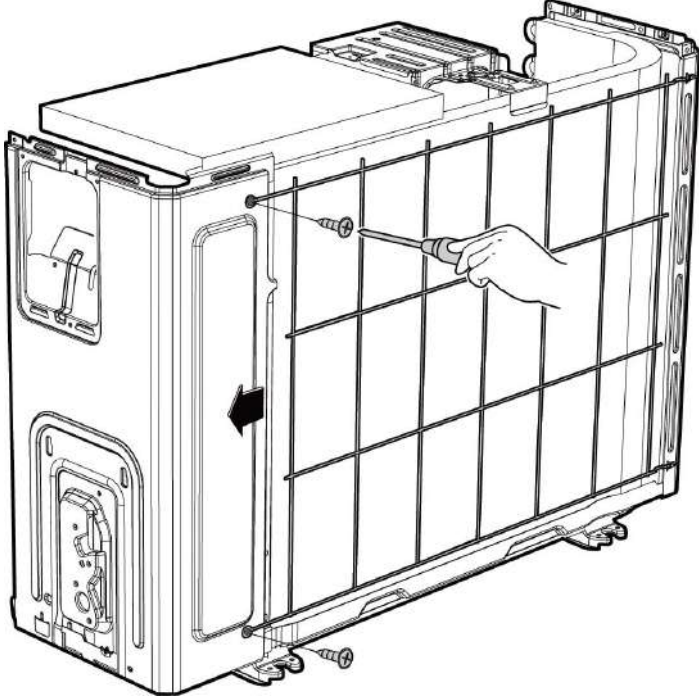
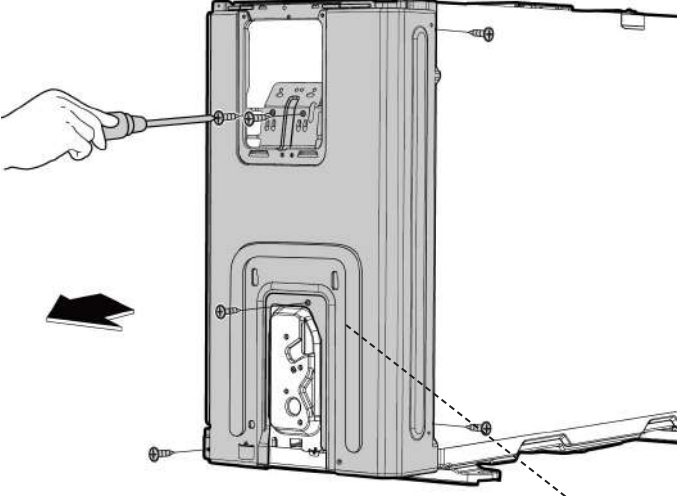
3. B30

| Procedure | Illustration |
|---|--|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (1 screws) (see CJ_B30_001).</p> |  <p>Big Handle</p> <p>For US models (3 screws)</p> <p>CJ_B30_001</p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_B30_002).</p> |  <p>Top Cover</p> <p>CJ_B30_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

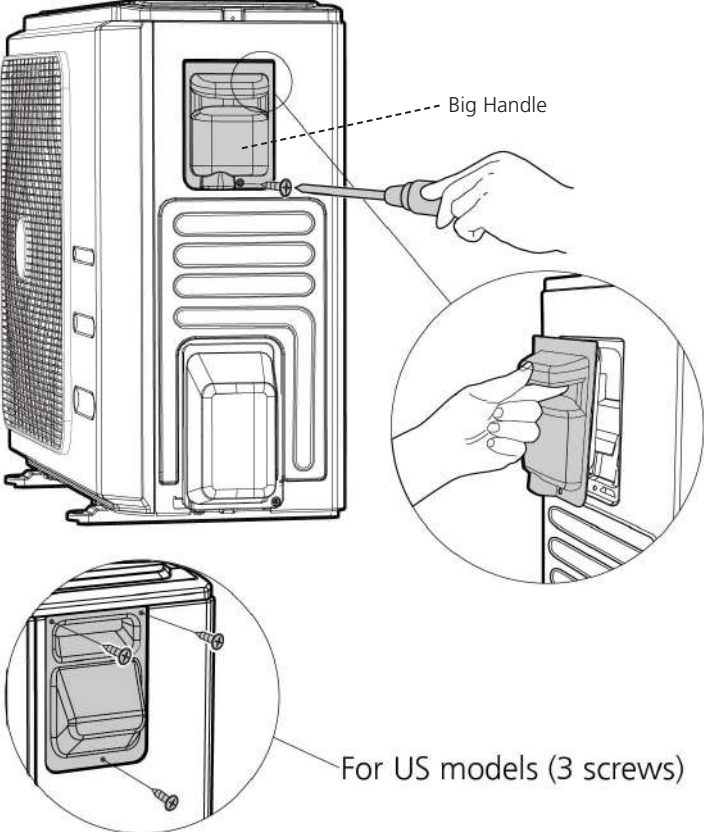
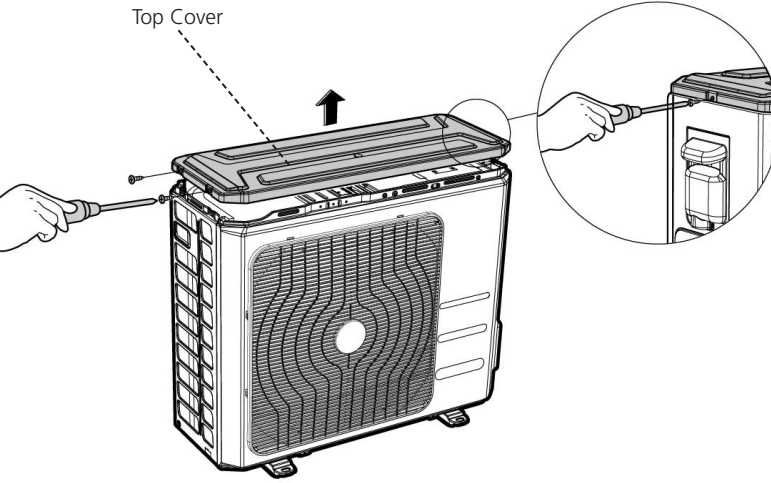
| Procedure | Illustration |
|--|---|
| <p>4) Remove the screws of the front panel and then remove the front panel (8 screws) (see CJ_B30_003).</p> |  <p style="text-align: center;">CJ_B30_003</p> |
| <p>5) Remove the screws of water collecting cover and then remove the water collecting cover (1 screw) (see CJ_B30_004).</p> |  <p style="text-align: center;">CJ_B30_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

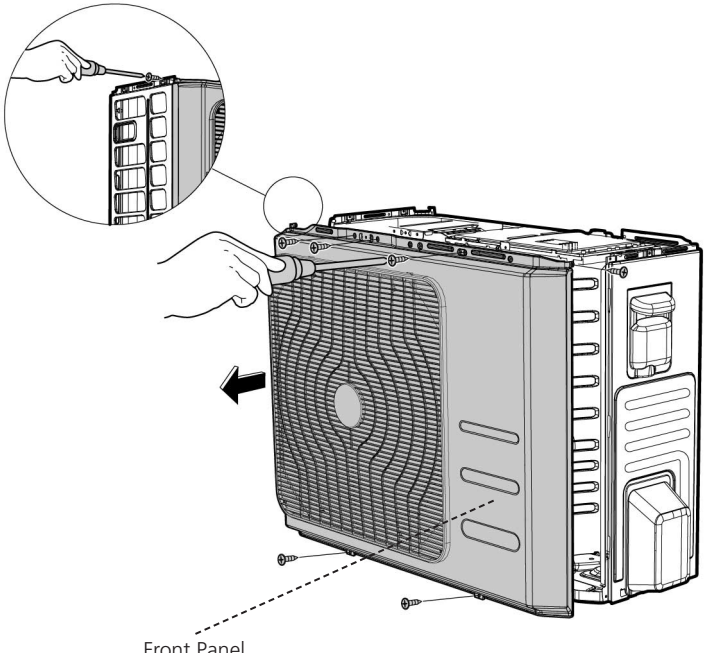
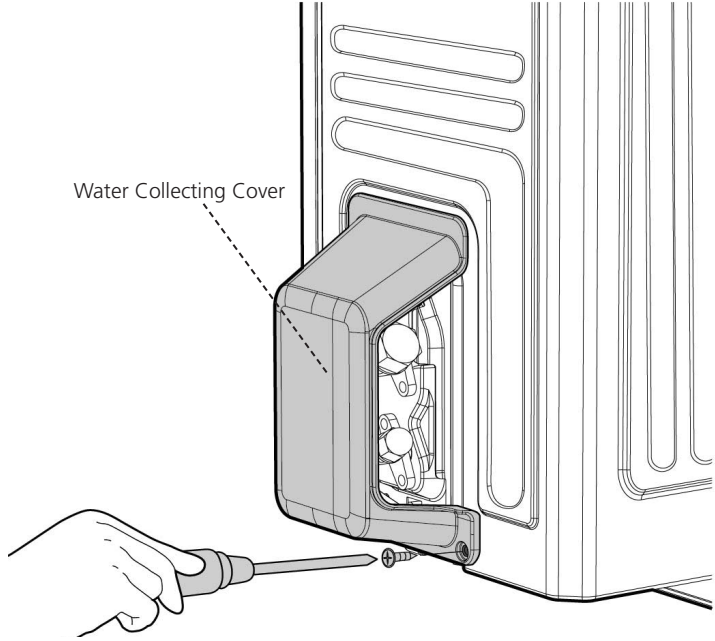
| Procedure | Illustration |
|---|---|
| <p>6) Remove the screws of the rear net and then remove the rear net (2 screws) (see CJ_B30_005). (for some models)</p> |  <p style="text-align: center;">CJ_B30_005</p> |
| <p>7) Remove the screws of the right panel and then remove the right panel (5 screws) (see CJ_B30_006).</p> |  <p style="text-align: center;">CJ_B30_006</p> <p style="text-align: right;">Right Panel</p> |

Note: This section is for reference only. Actual unit appearance may vary.

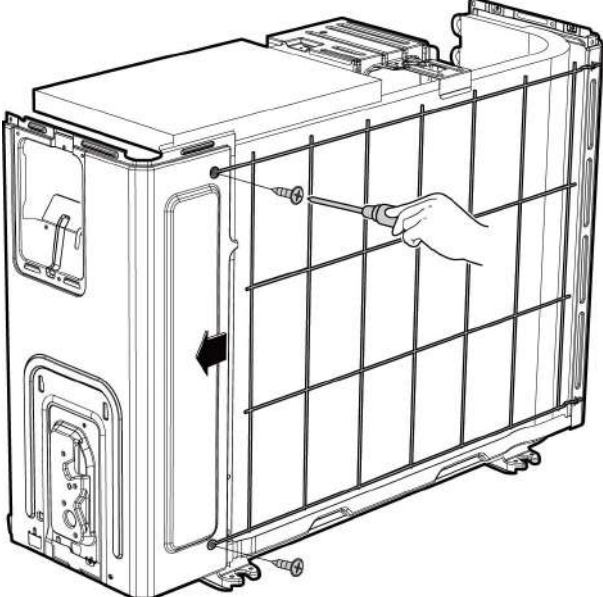
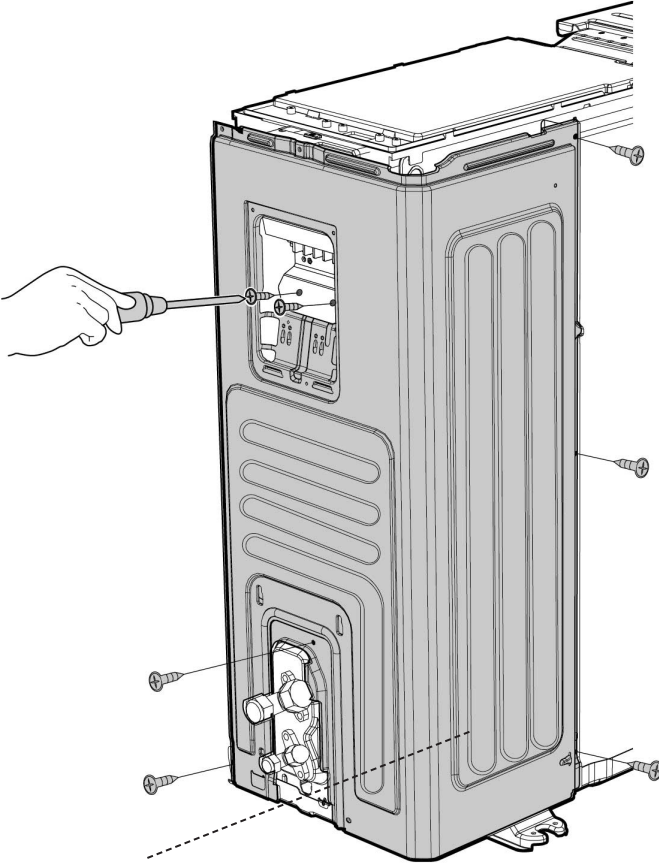
4. CA30

| Procedure | Illustration |
|--|--|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (1 screws) (see CJ_CA30_001).</p> |  <p>Big Handle</p> <p>For US models (3 screws)</p> <p>CJ_CA30_001</p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_CA30_002).</p> |  <p>Top Cover</p> <p>CJ_CA30_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

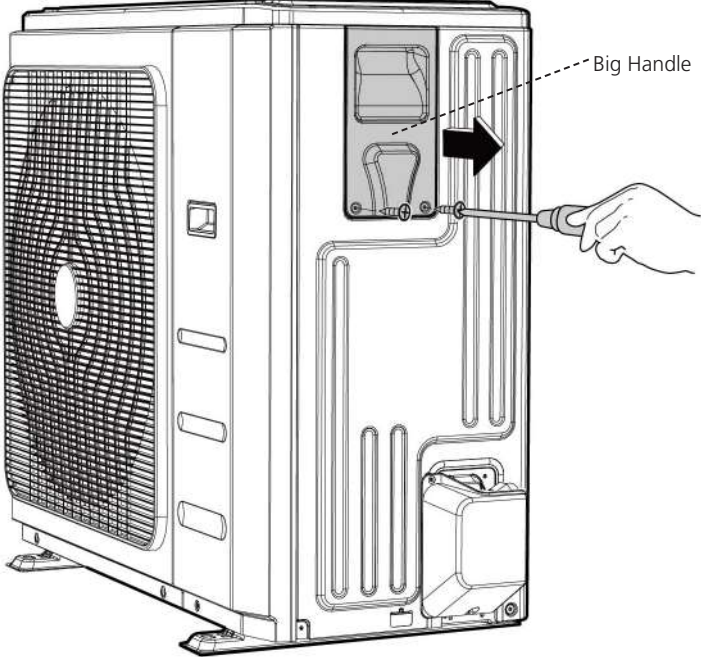
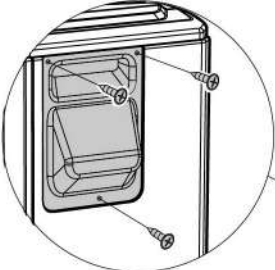
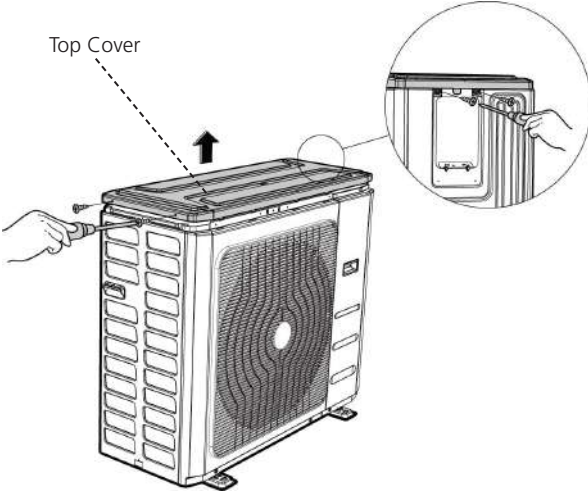
| Procedure | Illustration |
|---|--|
| <p>4) Remove the screws of the front panel and then remove the front panel (7 screws) (see CJ_CA30_003).</p> |  <p style="text-align: center;">CJ_CA30_003</p> |
| <p>5) Remove the screws of water collecting cover and then remove the water collecting cover (1 screw) (see CJ_CA30_004).</p> |  <p style="text-align: center;">CJ_CA30_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

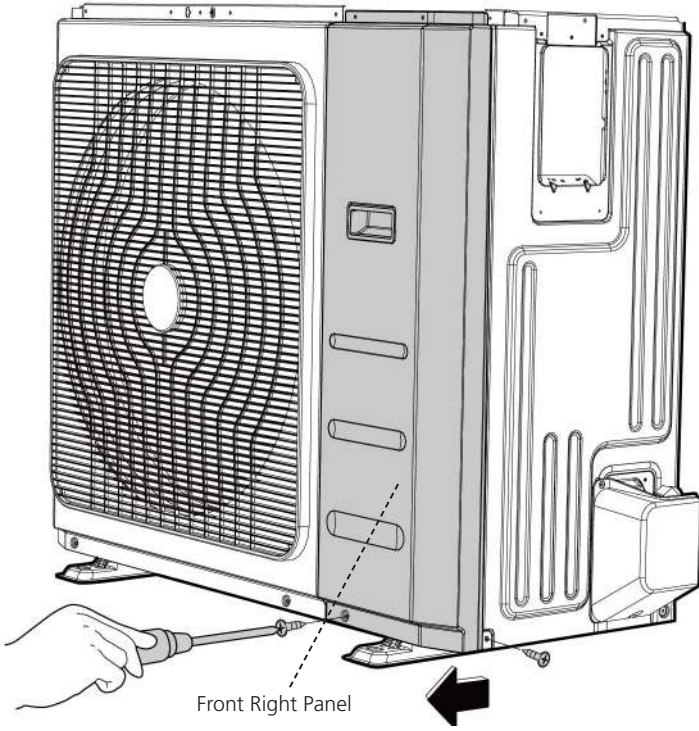
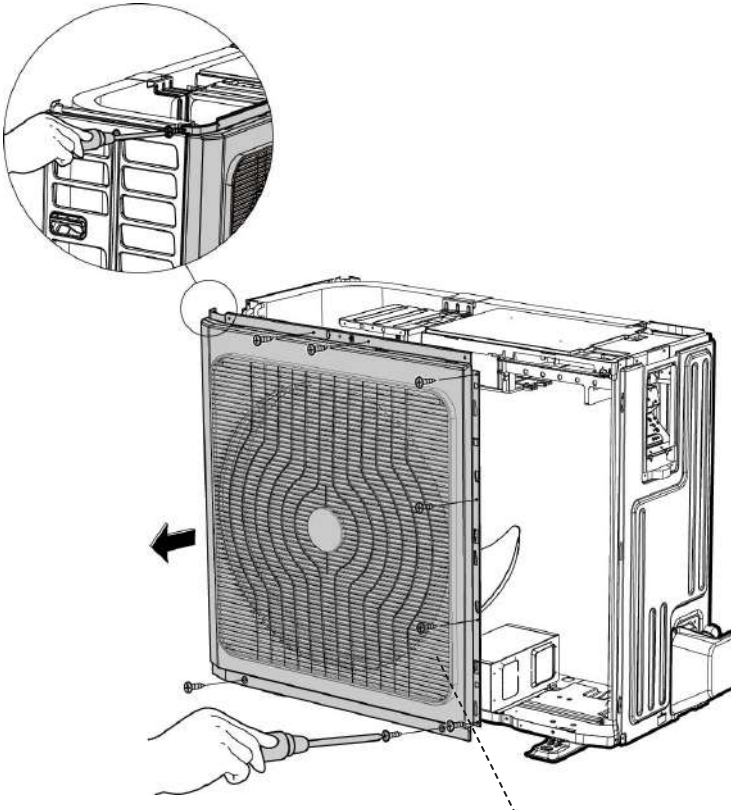
| Procedure | Illustration |
|--|---|
| <p>6) Remove the screws of the rear net and then remove the rear net (2 screws) (see CJ_CA30_005). (for some models)</p> |  <p style="text-align: center;">CJ_CA30_005</p> |
| <p>7) Remove the screws of the right panel and then remove the right panel (7 screws) (see CJ_CA30_006).</p> |  <p style="text-align: center;">CJ_CA30_006</p> |

Note: This section is for reference only. Actual unit appearance may vary.

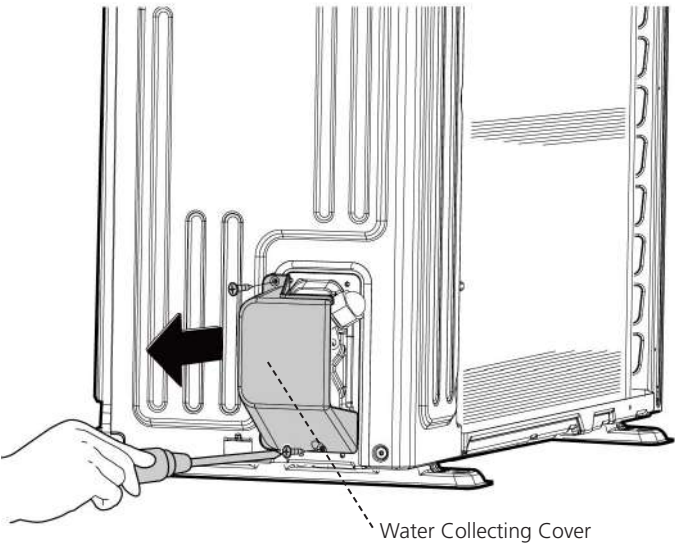
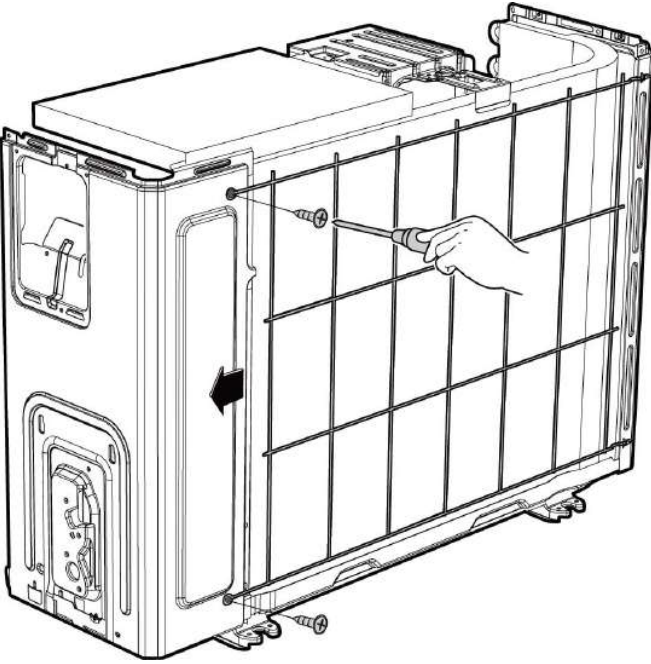
5. D30

| Procedure | Illustration |
|---|--|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (2 screws) (see CJ_D30_001).</p> |  <p>Big Handle</p>  <p>For US models (3 screws)</p> <p>CJ_D30_001</p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (4 screws). Two of the screws is located underneath the big handle (see CJ_D30_002).</p> |  <p>Top Cover</p> <p>CJ_D30_002</p> |

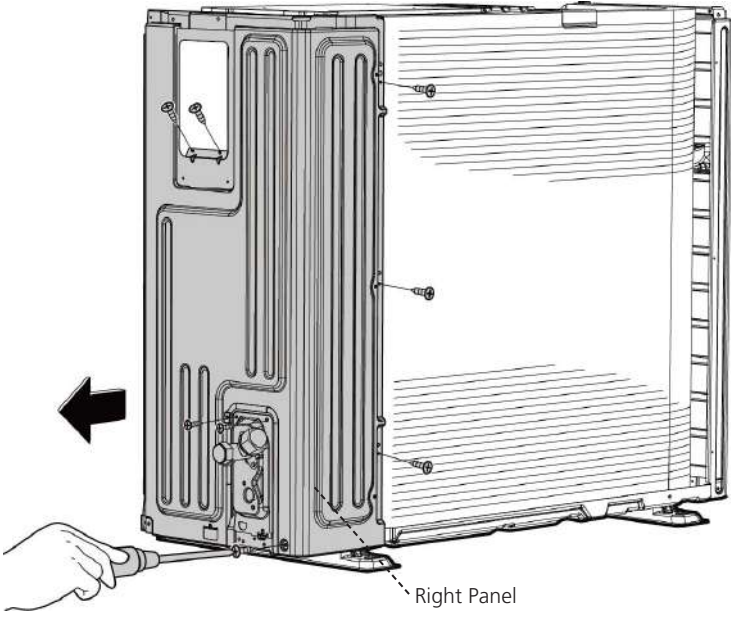
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|---|
| <p>4) Remove the screws of the front right panel and then remove the front right panel (2 screws) (see CJ_D30_003).</p> |  <p style="text-align: center;">Front Right Panel</p> <p style="text-align: center;">CJ_D30_003</p> |
| <p>5) Remove the screws of the front panel and then remove the front panel (9 screws) (see CJ_D30_004).</p> |  <p style="text-align: center;">Front Panel</p> <p style="text-align: center;">CJ_D30_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|--|
| <p>6) Remove the screws of water collecting cover and then remove the water collecting cover (2 screw) (see CJ_D30_005).</p> |  <p style="text-align: right;">Water Collecting Cover</p> <p style="text-align: center;">CJ_D30_005</p> |
| <p>7) Remove the screws of the rear net and then remove the rear net (2 screws) (see CJ_D30_006). (for some models)</p> |  <p style="text-align: center;">CJ_D30_006</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|--|
| <p>8) Remove the screws of the right panel and then remove the right panel (8 screws) (see CJ_D30_007).</p> |  <p data-bbox="938 1093 1093 1131">CJ_D30_007</p> |

Note: This section is for reference only. Actual unit appearance may vary.

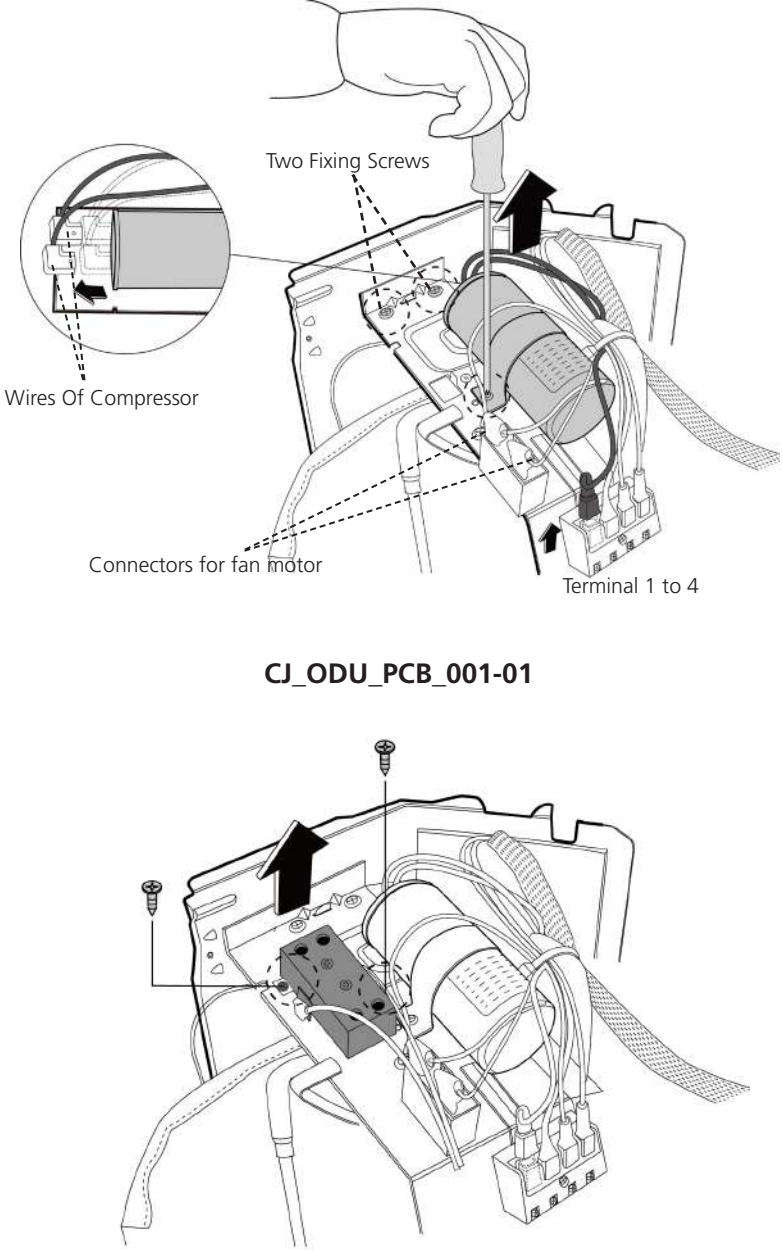
3.2 Electrical parts

⚠ WARNING: Antistatic gloves must be worn when you disassemble the electronic box.

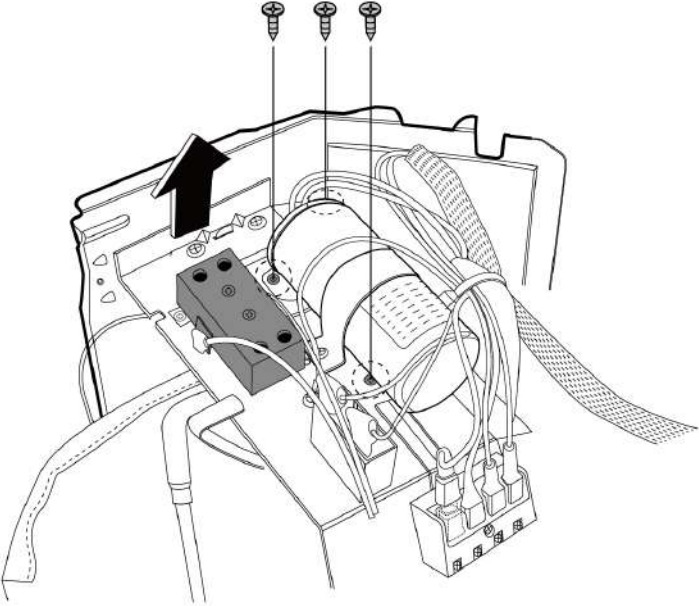
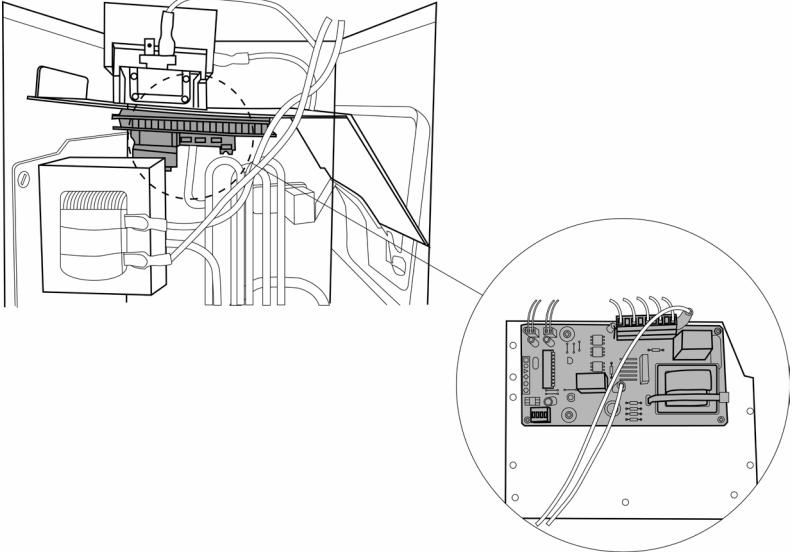
Note: Remove the air outlet grille(refer to 3.1 Panel Plate) before disassembling electrical parts.

i) PCB for ON-OFF Models

1. PCB board 1

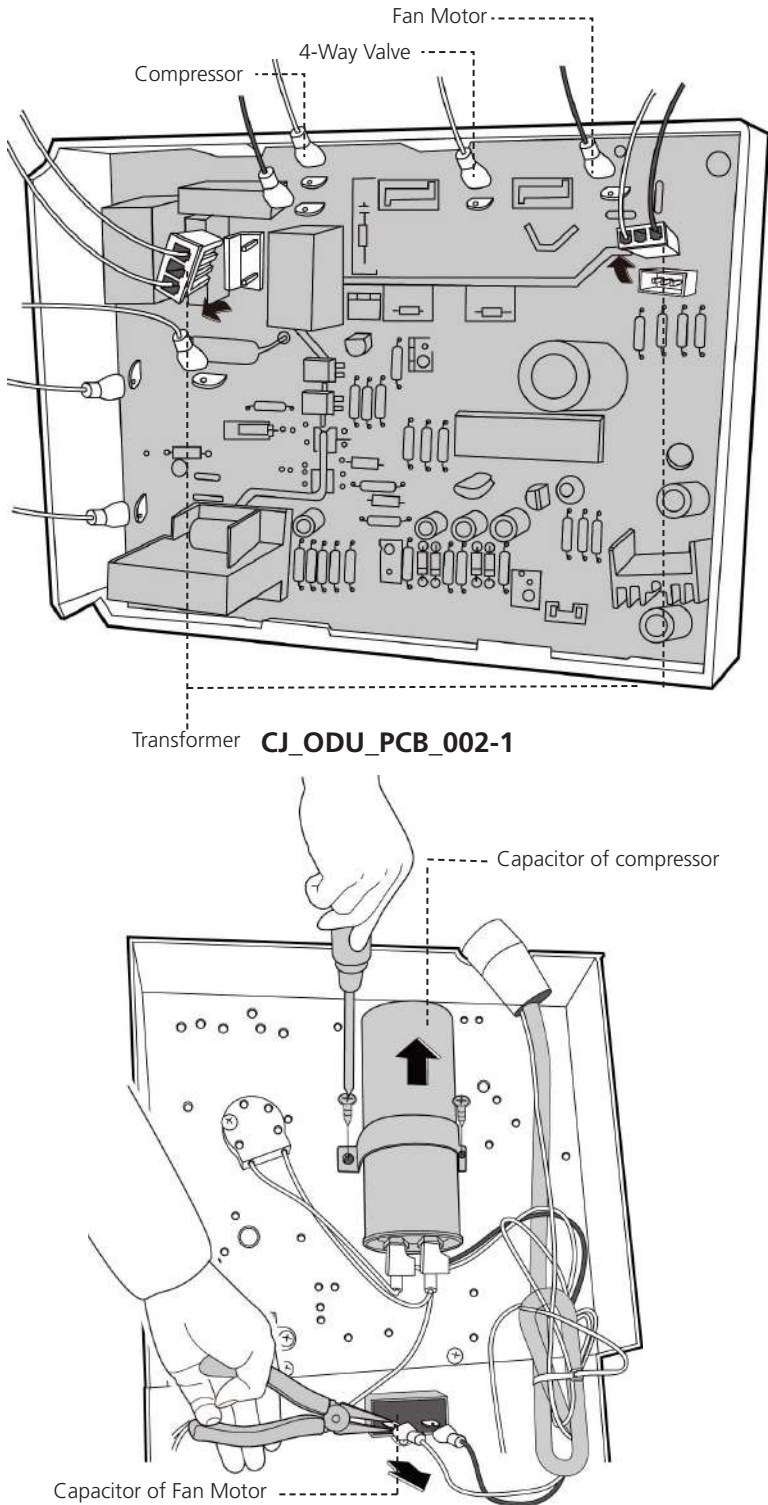
| Procedure | Illustration |
|---|---|
| <ol style="list-style-type: none">1) Remove the two screws fixed the electronic control board (see CJ_ODU_PCB_001).2) Disconnect the connectors for fan motor. (Blue wire, yellow wire, red wire, brown wire and black wire. The blue wire and red wire are on the capacitor. The black wire connects with terminal 4.) (see CJ_ODU_PCB_001)3) Disconnect the wires connected to the compressor. (Black wire connects with terminal 1, blue wire and red wire connect with the compressor capacitor) (see CJ_ODU_PCB_001)4) Disconnect the wires connected to 4-way valve.(Blue wires on terminal 2&3) (see CJ_ODU_PCB_001)5) Remove the fixing screw of the compressor capacitor, then pull it out (see CJ_ODU_PCB_001)6) Remove the electrical parts (see CJ_ODU_PCB_001)7) For models with AC conductor, remove 2 screws of it showed in the figure. |  <p style="text-align: center;">CJ_ODU_PCB_001-01</p> <p style="text-align: center;">CJ_ODU_PCB_001-02</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|--|
| <p>8) For models with subzero refrigeration control board, remove 3 screws of it showed in the figure.</p> |  <p style="text-align: center;">CJ_ODU_PCB_001-03</p> |
| <p>9) The subzero refrigeration control board is in the back of the metal sheet.</p> |  <p style="text-align: center;">CJ_ODU_PCB_001-04</p> |

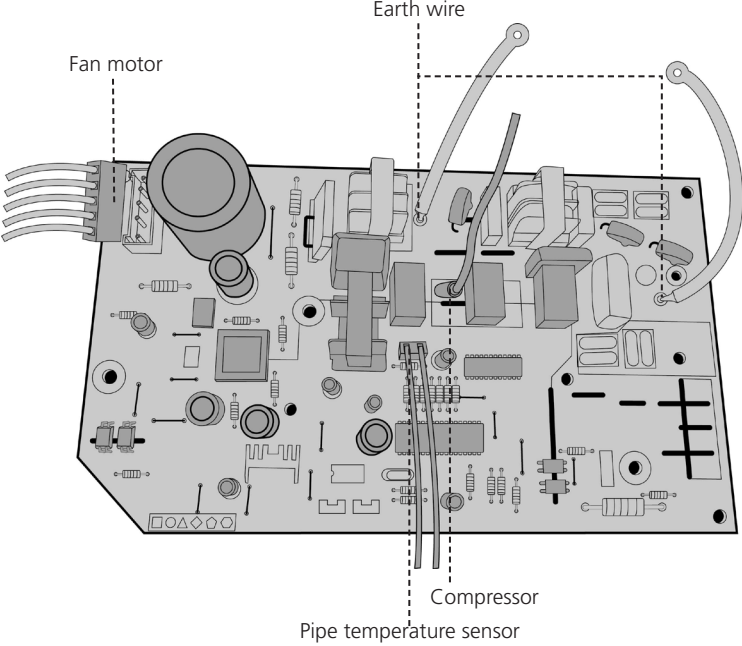
Note: This section is for reference only. Actual unit appearance may vary.

2. PCB board 2

| Procedure | Illustration |
|---|---|
| <ol style="list-style-type: none"> 1) Disconnect the wires connected to the compressor. (Red wire connects with PCB board, others connects with terminals) (see CJ_ODU_PCB_002-1) 2) Disconnect the connectors for fan motor. (Blue wire, red wire, brown wire and black wire. The blue wire and brown wire are on the capacitor. The black wire connects with a terminal. And the red wire is on the board.) (see CJ_ODU_PCB_002-1) 3) Disconnect the wires connected to 4-way valve. (see CJ_ODU_PCB_002-1) 4) Disconnect the wires connected to the transformer. (see CJ_ODU_PCB_002-1) 5) Disconnect the other wires connected to terminals. (see CJ_ODU_PCB_002-1) 6) Remove the PCB board. (see CJ_ODU_PCB_002-1) 7) Remove the screws of the capacitors. (see CJ_ODU_PCB_002-2) |  <p style="text-align: center;">CJ_ODU_PCB_002-1</p> <p style="text-align: center;">CJ_ODU_PCB_002-2</p> |

Note: This section is for reference only. Actual unit appearance may vary.

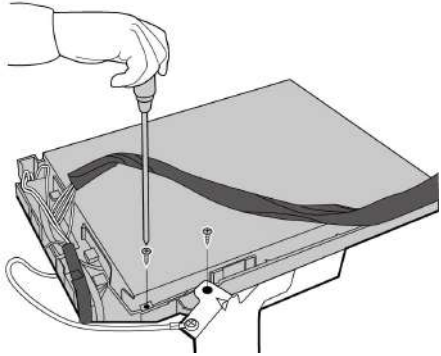
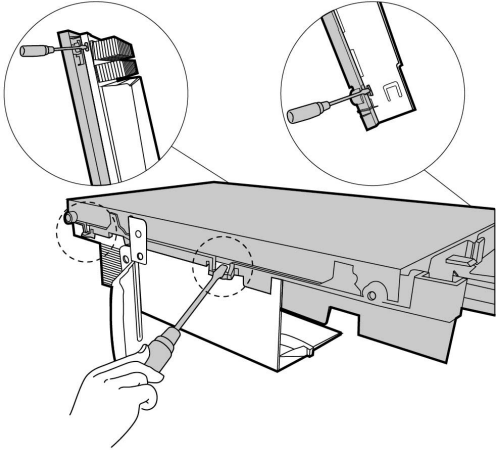
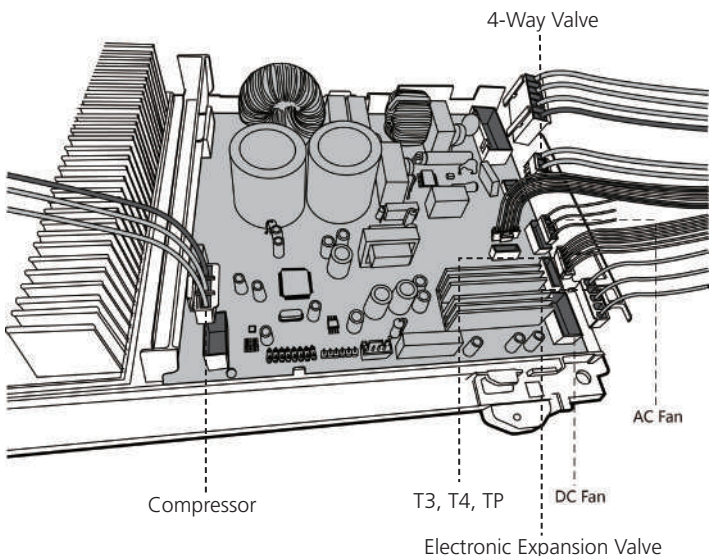
3. PCB board 3

| Procedure | Illustration |
|--|---|
| <ol style="list-style-type: none">1) Disconnect the connectors for fan motor (see CJ_ODU_PCB_003).2) Disconnect the wires connected to the compressor (see CJ_ODU_PCB_003).3) Disconnect the wires connected to Pipe temperature sensor (see CJ_ODU_PCB_003).4) Disconnect the earth wire (see CJ_ODU_PCB_003).5) Remove the PCB board (see CJ_ODU_PCB_003). |  <p>The illustration shows a top-down view of the CJ_ODU_PCB_003 PCB board. It is populated with various electronic components including integrated circuits, capacitors, and connectors. Four specific components are highlighted with dashed lines and labels: 'Fan motor' at the top left, 'Earth wire' at the top center, 'Compressor' at the bottom center, and 'Pipe temperature sensor' at the bottom center. The board has a complex layout of traces and components.</p> <p style="text-align: center;">CJ_ODU_PCB_003</p> |

Note: This section is for reference only. Actual unit appearance may vary.

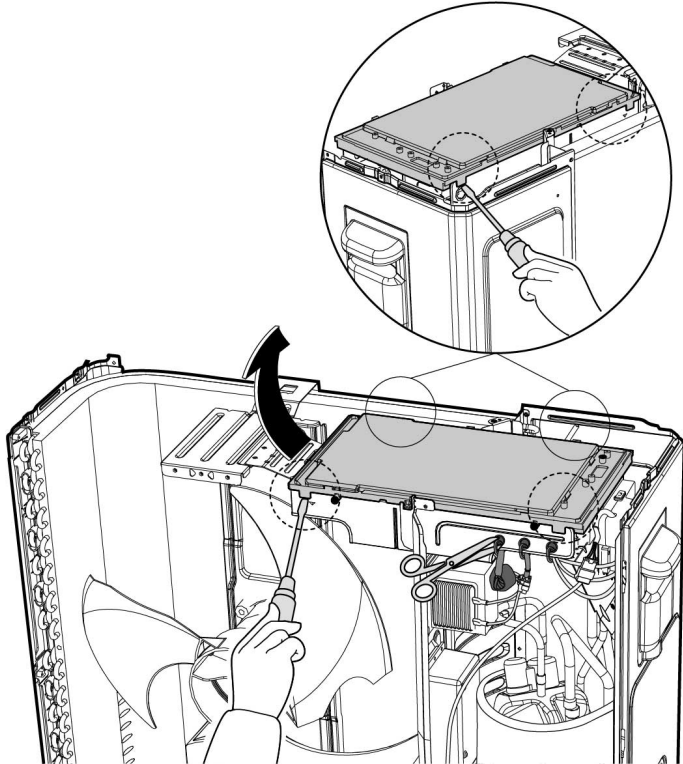
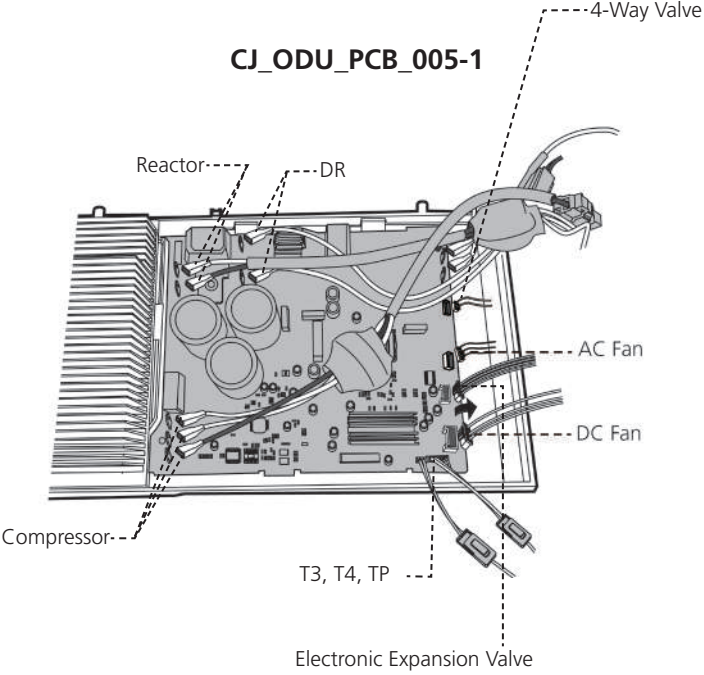
ii) PCB for Inverter Models

3. PCB board 4

| Procedure | Illustration |
|---|---|
| <p>1) Remove the screws of the top cover. (2 screws) (see CJ_ODU_PCB_004-1).</p> |  <p style="text-align: center;">CJ_ODU_PCB_004-1</p> |
| <p>2) Unfix the hooks and then open the electronic control box cover (4 hooks) (see CJ_ODU_PCB_004-2).</p> |  <p style="text-align: center;">CJ_ODU_PCB_004-2</p> |
| <p>3) Disconnect the connector for fan motor from the electronic control board (see CJ_ODU_PCB_004-3).</p> <p>4) Remove the connector for the compressor (see CJ_ODU_PCB_004-3).</p> <p>5) Pull out the two blue wires connected with the four way valve (CJ_ODU_PCB_004-3).</p> <p>6) Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (CJ_ODU_PCB_004-3).</p> <p>7) Disconnect the electronic expansion valve wire (CJ_ODU_PCB_004-3).</p> <p>8) Then remove the electronic control board.</p> |  <p style="text-align: center;">CJ_ODU_PCB_004-3</p> |

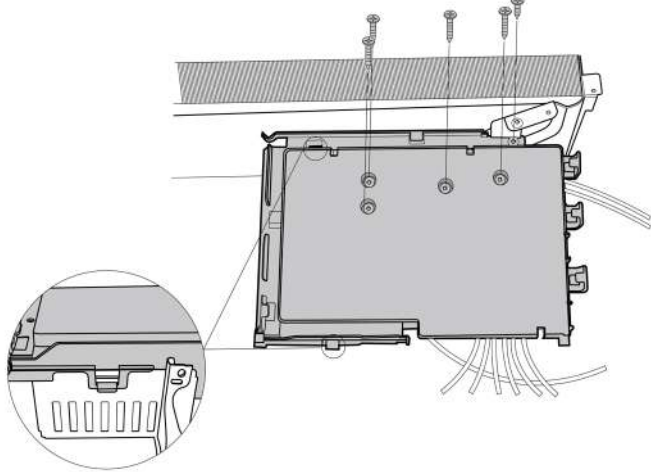
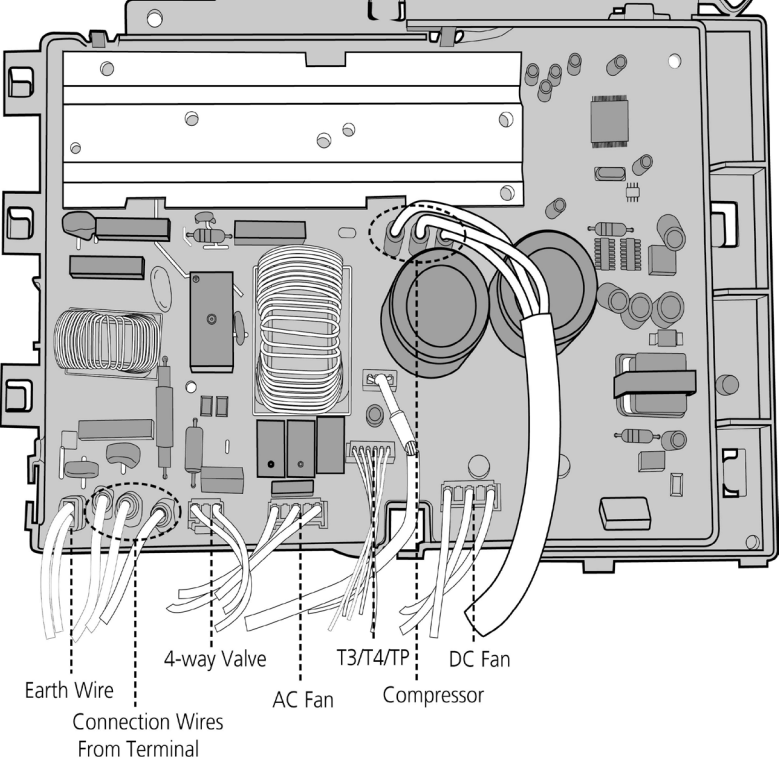
Note: This section is for reference only. Actual unit appearance may vary.

4. PCB board 5

| Procedure | Illustration |
|---|--|
| <p>1) Unfix the hooks and then open the electronic control box cover (4 hooks) (see CJ_ODU_PCB_005-1).</p> |  |
| <p>2) Disconnect the connector for fan motor from the electronic control board (see CJ_ODU_PCB_005-2).</p> <p>3) Remove the connector for the compressor (see CJ_ODU_PCB_005-2).</p> <p>4) Pull out the two blue wires connected with the four way valve (see CJ_ODU_PCB_005-2).</p> <p>5) Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_005-2).</p> <p>6) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_005-2).</p> <p>7) Then remove the electronic control board.</p> |  <p style="text-align: center;">CJ_ODU_PCB_005-1</p> <p style="text-align: center;">CJ_ODU_PCB_005-2</p> |

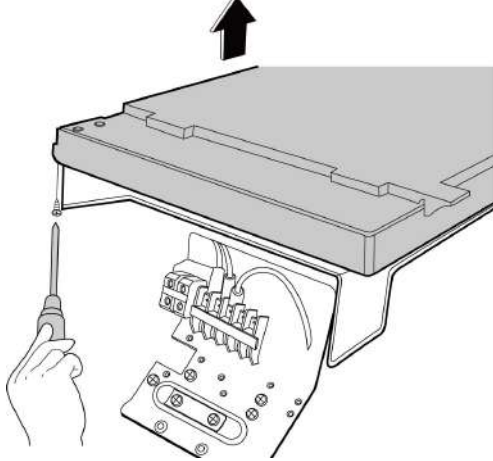
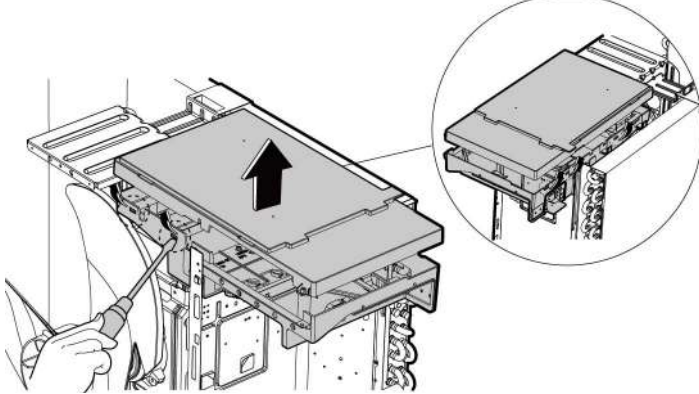
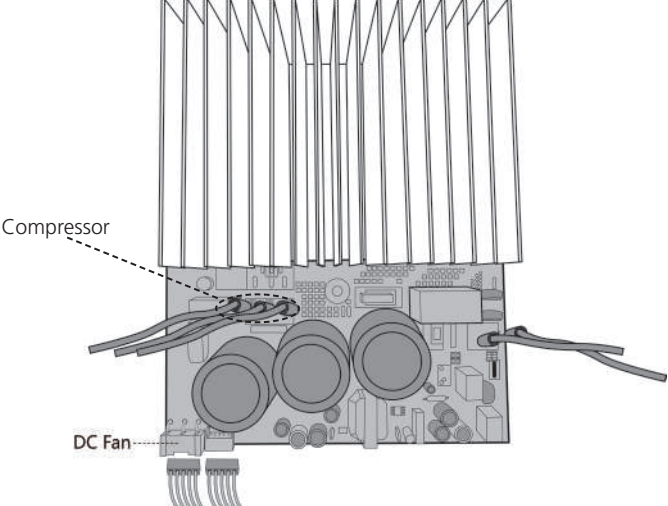
Note: This section is for reference only. Actual unit appearance may vary.

5. PCB board 6

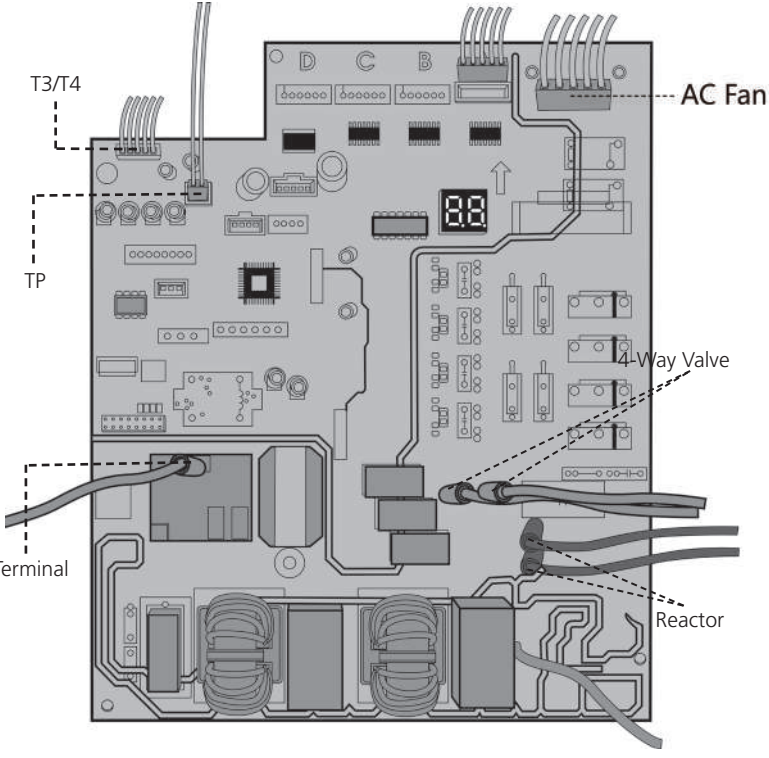
| Procedure | Illustration |
|--|---|
| <p>1) Remove the screws and unfix the hooks, then open the electronic control box cover (5 screws and 2 hooks)(see CJ_ODU_PCB_006-1).</p> |  <p style="text-align: center;">CJ_ODU_PCB_006-1</p> |
| <p>2) Disconnect the connector for fan motor from the electronic control board (see CJ_ODU_PCB_006-2).</p> <p>3) Remove the connector for the compressor (see CJ_ODU_PCB_006-2).</p> <p>4) Pull out the two blue wires connected with the four way valve (see CJ_ODU_PCB_006-2).</p> <p>5) Pull out connectors of the condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_006-2).</p> <p>6) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_006-2).</p> <p>7) Remove the connector for the DR and reactor (see Fig CJ_ODU_PCB_006-2).</p> <p>8) Then remove the electronic control board.</p> |  <p style="text-align: center;">CJ_ODU_PCB_006-2</p> |

Note: This section is for reference only. Actual unit appearance may vary.

6. PCB board 7

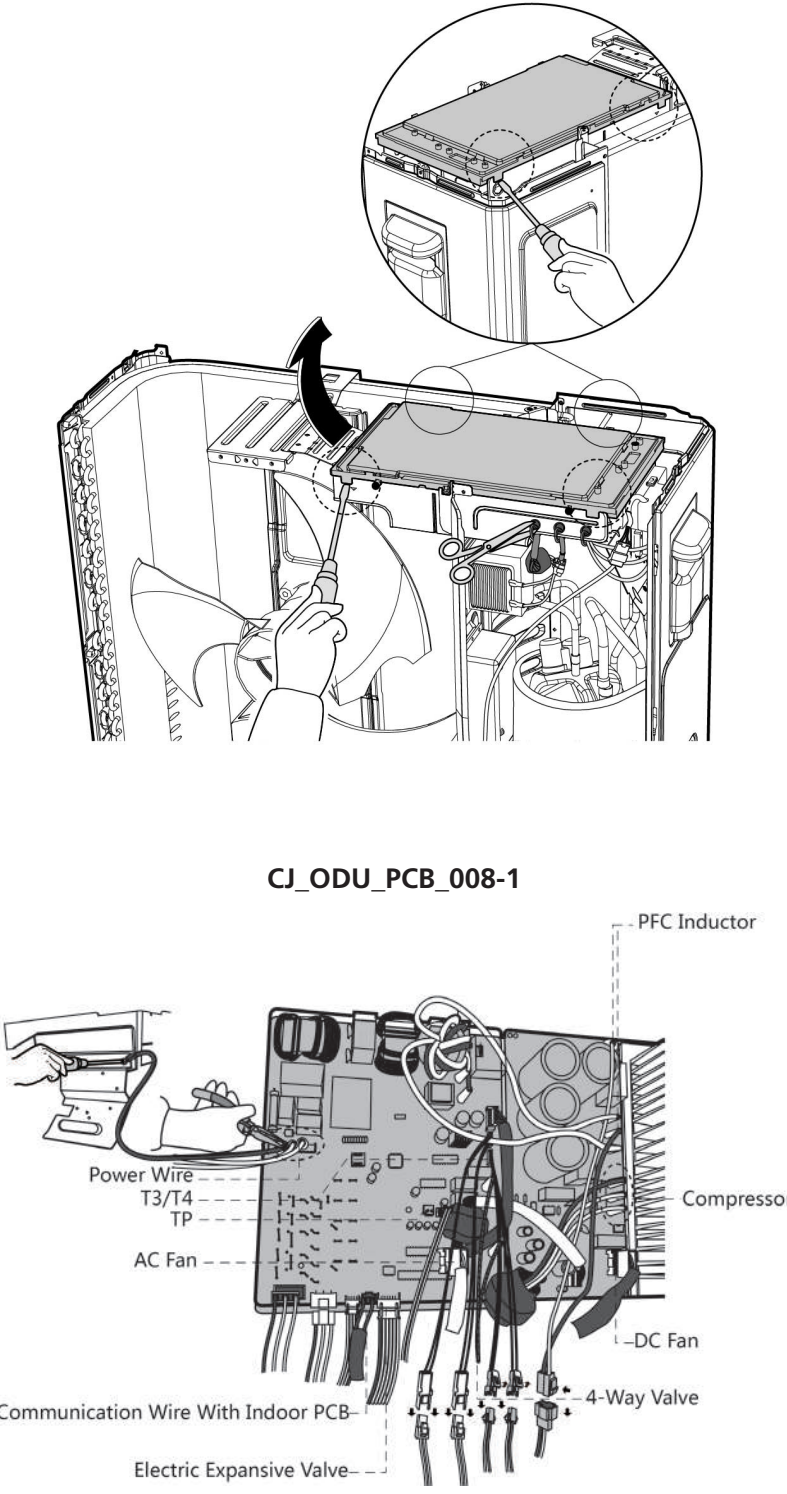
| Procedure | Illustration |
|---|--|
| <p>1) Remove the screws of the top cover. (1 screws) (see CJ_ODU_PCB_007-1).</p> |  <p>CJ_ODU_PCB_007-1</p> |
| <p>2) Unfix the hooks and then open the electronic control box cover (5 hooks) (see CJ_ODU_PCB_007-2).</p> |  <p>CJ_ODU_PCB_007-2</p> |
| <p>3) Disconnect the connector for fan motor from the IPM board (see CJ_ODU_PCB_007-3).</p> <p>4) Remove the connector for the compressor (see CJ_ODU_PCB_007-3).</p> |  <p>CJ_ODU_PCB_007-3</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|--|--|
| <p>5) Pull out the wire connected with the terminal. (see CJ_ODU_PCB_007-4).</p> <p>6) Pull out connectors of the condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_007-4).</p> <p>7) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_007-4).</p> <p>8) Remove the connector for 4-way valve. (see Fig CJ_ODU_PCB_007-4).</p> <p>9) Remove the connector for the reactor (see Fig CJ_ODU_PCB_007-4).</p> <p>10)Then remove the electronic control box (see Fig CJ_ODU_PCB_007-4).</p> |  <p style="text-align: center;">CJ_ODU_PCB_007-4</p> |

Note: This section is for reference only. Actual unit appearance may vary.

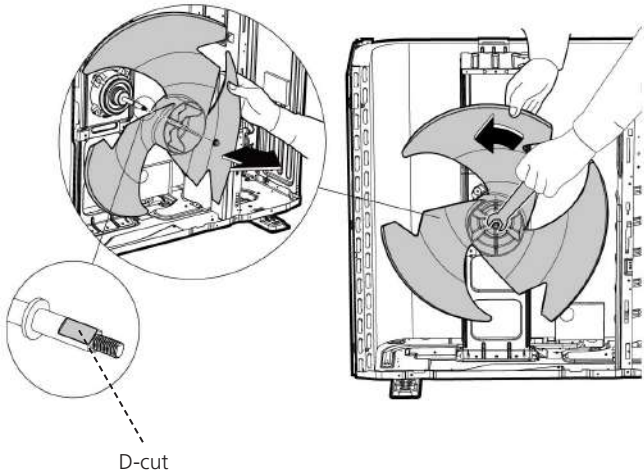
7. PCB board 8

| Procedure | Illustration |
|--|--|
| <ol style="list-style-type: none"> 1) Unfix the hooks and then open the electronic control box cover (4 hooks) (see CJ_ODU_PCB_008-1). 2) Disconnect the connector for outdoor DC fan from the electronic control board (see CJ_ODU_PCB_008-2). 3) Remove the connector for the compressor (see CJ_ODU_PCB_008-2). 4) Pull out the two blue wires connected with the four way valve (see CJ_ODU_PCB_008-2). 5) Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_008-2). 6) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_008-2). 7) Disconnect the communication wire indoor PCB (see Fig CJ_ODU_PCB_008-2). 8) Disconnect the PFC inductor (see Fig CJ_ODU_PCB_008-2). 9) Then remove the electronic control box (see CJ_ODU_PCB_008-2). |  <p style="text-align: center;">CJ_ODU_PCB_008-1</p> <p style="text-align: center;">CJ_ODU_PCB_008-2</p> <p>Labels in the illustration include: PFC Inductor, Compressor, DC Fan, 4-Way Valve, Electric Expansive Valve, Communication Wire With Indoor PCB, AC Fan, TP, T3/T4, and Power Wire.</p> |

Note: This section is for reference only. Actual unit appearance may vary.

3.3 Fan Assembly

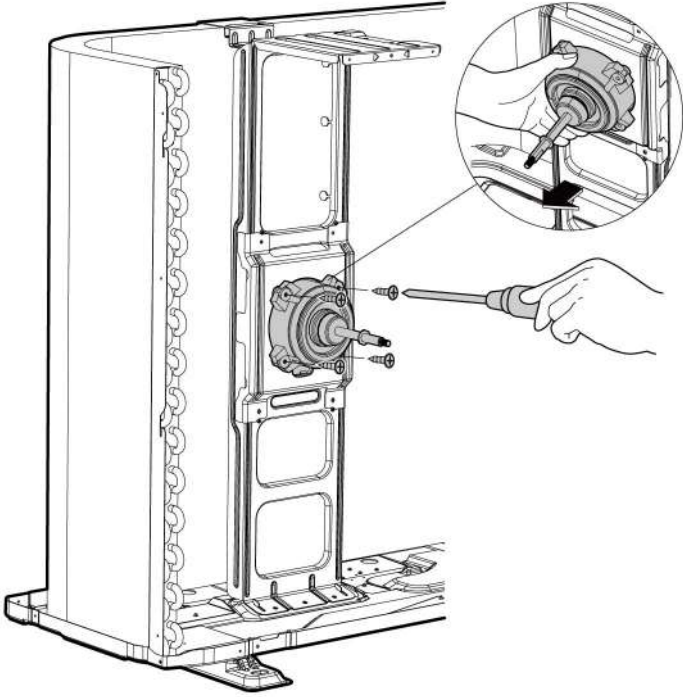
Note: Remove the panel plate (refer to 3.1 Panel Plate) before disassembling fan.

| Procedure | Illustration |
|--|--|
| <p>1) Remove the nut securing the fan with a spanner (see CJ_ODU_FAN_001).</p> <p>2) Remove the fan.</p> |  <p>CJ_ODU_FAN_001</p> |

Note: This section is for reference only. Actual unit appearance may vary.

3.4 Fan Motor

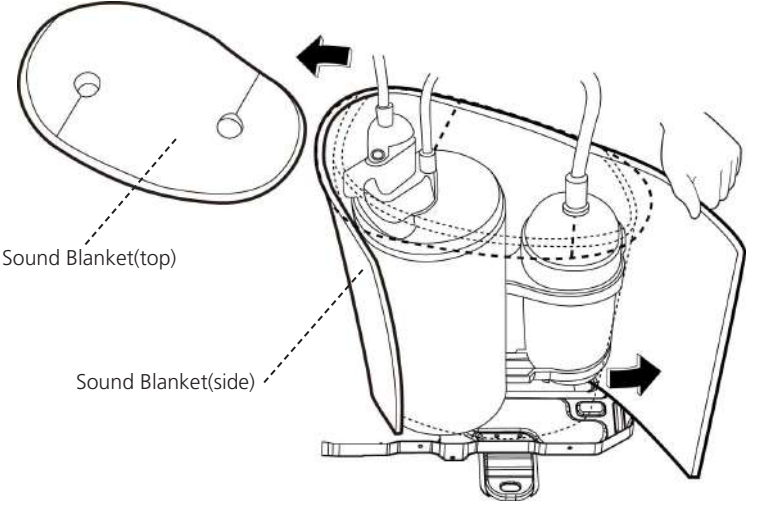
Note: Remove the panel plate and the connection of fan motor on PCB (refer to 3.1 Panel Plate and 3.2 Electrical parts) before disassembling fan motor.

| Procedure | Illustration |
|--|--|
| <p>3) Remove the fixing screws of the fan motor (4 screws) (see CJ_ODU_MOTOR_001).</p> <p>4) Remove the fan motor.</p> |  <p data-bbox="893 1232 1181 1265">CJ_ODU_MOTOR_001</p> |

Note: This section is for reference only. Actual unit appearance may vary.

3.5 Sound blanket

Note: Remove the panel plate (refer to 3.1 Panel plate) before disassembling sound blanket.

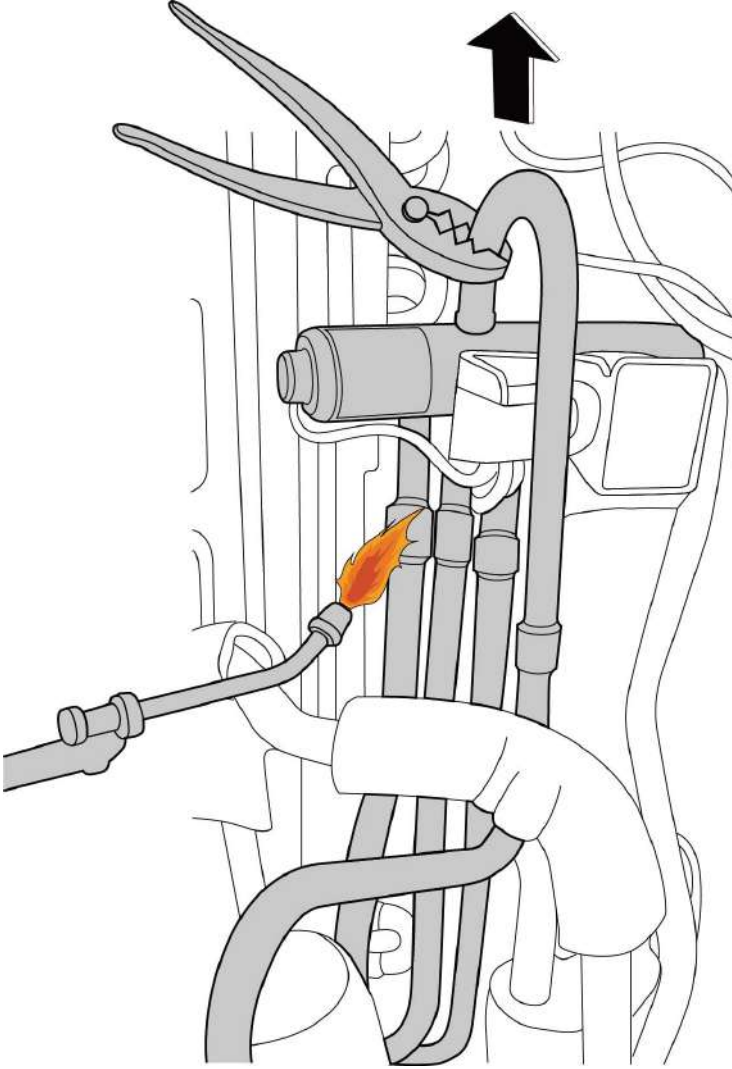
| Procedure | Illustration |
|---|--|
| <p>1) Remove the sound blanket (side and top) (see CJ_ODU_BLANKET_001).</p> |  <p>CJ_ODU_BLANKET_001</p> |

Note: This section is for reference only. Actual unit appearance may vary.

3.6 Four-way valve (for heat pump models)

⚠ WARNING: Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (For R32 & R290, you should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Note: Remove the panel plate, connection of four-way valve on PCB (refer to 3.1 Panel plate and 3.2 Electrical parts) before disassembling sound blanket.

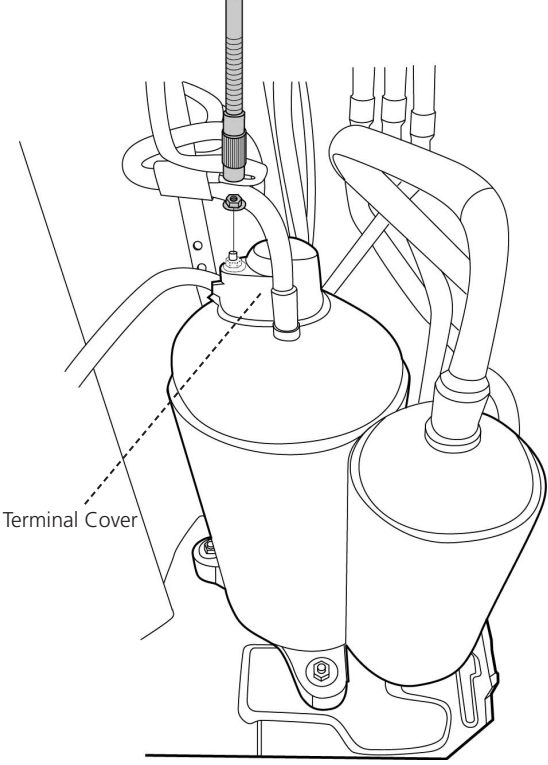
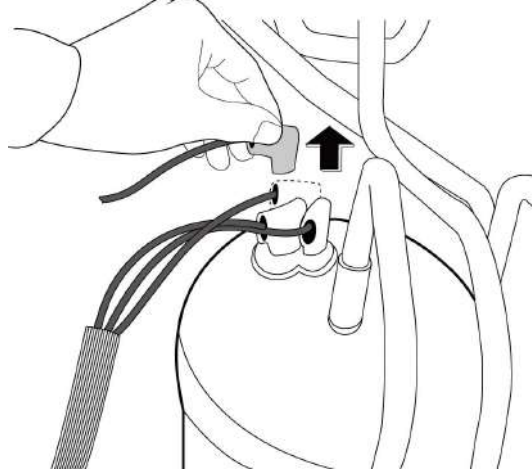
| Procedure | Illustration |
|--|--|
| <ol style="list-style-type: none">1) Heat up the brazed parts and then detach the the four-way valve and the pipe (see CJ_ODU_VALVE_001).2) Remove the four-way valve assembly with pliers. |  <p data-bbox="911 1693 1171 1727">CJ_ODU_VALVE_001</p> |

Note: This section is for reference only. Actual unit appearance may vary.

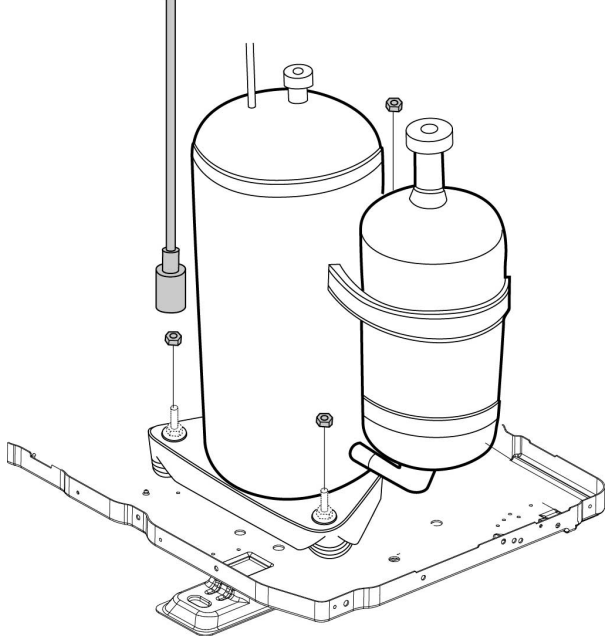
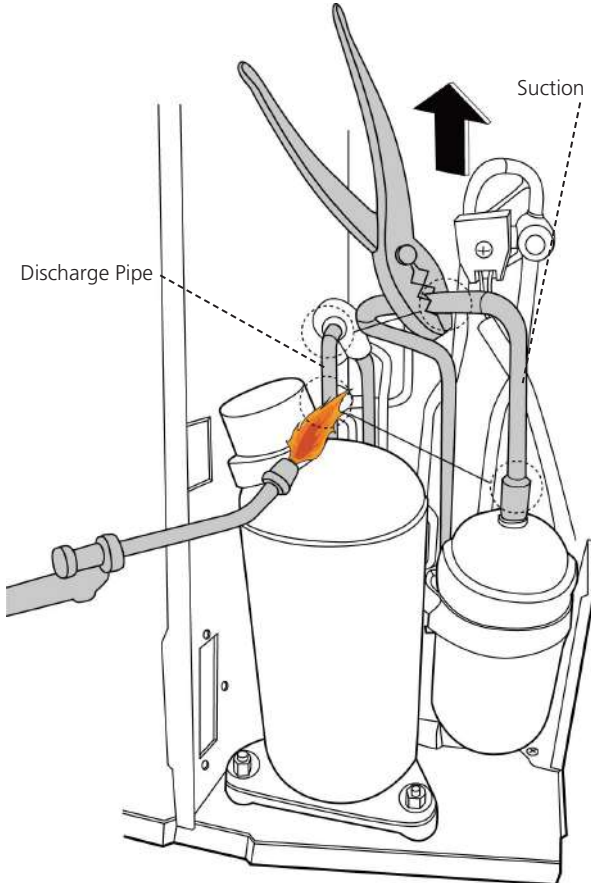
3.7 Compressor

⚠ WARNING: Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (For R32 & R290, you should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Note: Remove the panel plate, connection of compressor on PCB (refer to 3.1 Panel plate and 3.2 Electrical parts) before disassembling sound blanket.

| Procedure | Illustration |
|---|--|
| 1) Remove the flange nut of terminal cover and remove the terminal cover (see CJ_ODU_COMP_001). |  <p style="text-align: center;">CJ_ODU_COMP_001</p> |
| 2) Disconnect the connectors (see CJ_ODU_COMP_002). |  <p style="text-align: center;">CJ_ODU_COMP_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

| Procedure | Illustration |
|---|--|
| <p>3) Remove the hex nuts and washers securing the compressor, located on the bottom plate (see CJ_ODU_COMP_003).</p> |  <p style="text-align: center;">CJ_ODU_COMP_003</p> |
| <p>4) Heat up the brazed parts and then remove the the discharge pipe and the suction pipe (see CJ_ODU_COMP_004).</p> <p>5) Lift the compressor from the base pan assembly with pliers.</p> |  <p style="text-align: center;">CJ_ODU_COMP_004</p> |

Note: This section is for reference only. Actual unit appearance may vary.

Troubleshooting

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1. Safety Caution

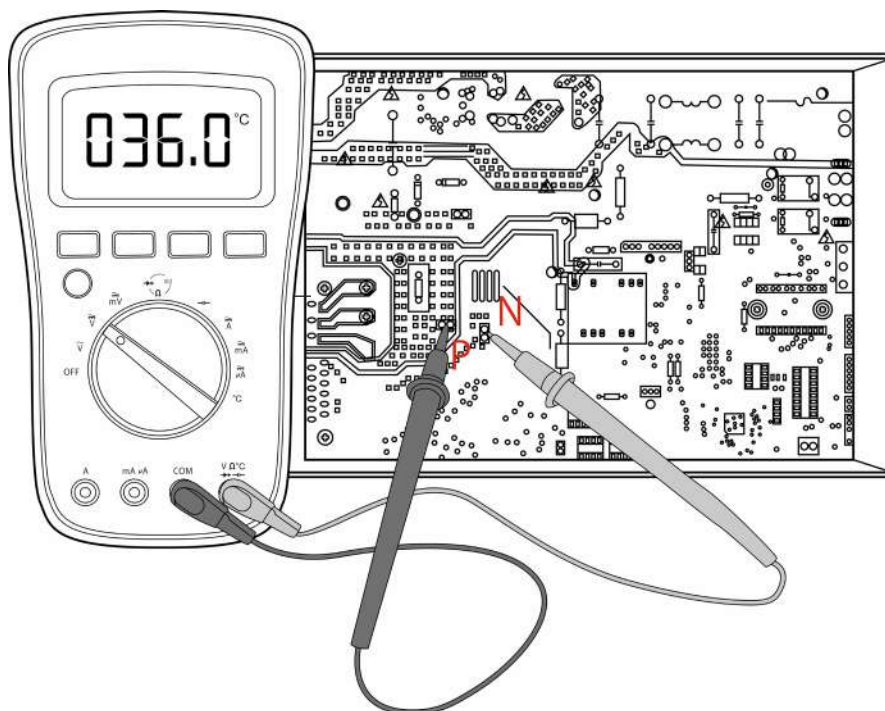
⚠ WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking indoor/outdoor PCB, please equip oneself with antistatic gloves or wrist strap to avoid damage to the board.

⚠ WARNING

Electricity remains in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

Test the voltage between P and N on back of the main PCB with multimeter. If the voltage is 36V, the capacitors are fully discharged.



Note: This picture is for reference only. Actual appearance may vary.

2. General Troubleshooting

2.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the operation lamp will flash in a corresponding series, the timer lamp may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

| Operation Lamp | Timer Lamp | Display | Error Information | Solution |
|----------------|------------|---------|--|----------|
| 1 time | OFF | E0 | A beltéri egység EEPROM paraméter hibája | TS18 |
| 2 times | OFF | E1 | Beltéri / kültéri egység kommunikációs hibája | TS19 |
| 3 times | OFF | E2 | Nulla kereszteződés(Zero-crossing signal) észlelési hiba (egyres modellek esetén) | TS21 |
| 4 times | OFF | E3 | A beltéri ventilátor sebessége a normál tartományon kívül működik | TS22 |
| 5 times | OFF | E4 | A T1 beltéri szobahőmérséklet-érzékelő nyitott áramkörben van vagy rövidzárlatú | TS25 |
| 6 times | OFF | E5 | A T2 párologtató tekercs hőmérséklet-érzékelője nyitott áramkörben van vagy rövidzárlatú | TS25 |
| 9 times | OFF | E7 | Beltéri NYÁK / Kijelző kártya kommunikációs hibája | TS26 |
| 7 times | OFF | EC | Hűtőközeg-szivárgás észlelve | TS27 |
| 1 times | ON | F0 | Aktuális túlterhelés-védelem | TS28 |
| 2 times | ON | F1 | A T4 kültéri helyiség hőmérséklet érzékelő nyitott áramkörben van vagy rövidzárlatú | TS25 |
| 3 times | ON | F2 | A T3 kondenzátor tekercs hőmérséklet-érzékelője nyitott áramkörben van vagy rövidzárlatú | TS25 |
| 4 times | ON | F3 | A TP kompresszor kisülési hőmérséklet-érzékelője nyitott áramkörben van vagy zárlatos | TS25 |
| 5 times | ON | F4 | A kültéri egység EEPROM paraméter hibája | TS18 |
| 6 times | ON | F5 | A kültéri ventilátor sebessége a normál tartományon kívül működik (egyres modellek esetén) | TS22 |
| 1 times | FLASH | P0 | IPM meghibásodás vagy IGBT túl erős áramvédelem | TS29 |
| 2 times | FLASH | P1 | Túlfeszültség vagy túlfeszültség-védelem | TS30 |
| 3 times | FLASH | P2 | Az IPM modul magas hőmérsékleti védelme | TS31 |
| 5 times | FLASH | P4 | Inverter kompresszor hajtási hibája | TS32 |

Egyéb hibák esetén:

A kijelzőpanel megjelenítheti a meghibásodott kódot vagy a szervizkönyvben nem meghatározott kódot. Győződjön meg arról, hogy ez a kód nem hőmérséklet-leolvasás.

Hibaelhárítás:

Tesztelje az egységet a távirányítóval. Ha az egység nem reagál a távvezérlőre, a beltéri NYÁKot cserélni kell. Ha az egység reagál, a kijelzőtáblát cserélni kell. Ellenőrizze a távvezérlő infra működését a telefonja kamerájával.

2.2 Hiba kijelző (18K és 18K feletti kültéri egység esetén)

A kültéri alaplapon 2 LED (piros és zöld színű) található. Bekapcsolás után a LED különböző módon reagál ha eltérő problémák merülnek fel.

| No. | Problem | LED(GREEN) | LED(RED) | Solution |
|-----|--|------------|----------|----------|
| 1 | Standby normally Készenléti állapotban | ON | OFF | - |
| 2 | Normális működés | OFF | ON | - |
| 3 | Kompresszor vezérelő chip EEPROM paraméterhiba | ON | FLASH | TS18 |
| 4 | IPM meghibásodás vagy IGBT túl erős áramvédelem | FLASH | OFF | TS29 |
| 5 | Túlfeszültség vagy túl alacsony feszültségvédelem | ON | ON | TS30 |
| 6 | Inverter kompresszor hajtási hibája | OFF | FLASH | TS32 |
| 7 | Inverter kompresszor hajtási hibája | FLASH | LIGHT | TS32 |
| 8 | Kommunikációs hiba a kültéri fő chip és a kompresszor által vezérelt chip között | FLASH | FLASH | TS18 |

3. Panaszbejelentési űrlap

Panaszbejelentési űrlap

Kérés száma:

Datum:

Telepítés dátuma:

Szolgáltatás dátuma:

| A vevő adatai | | | |
|--|----------------------------------|--|--|
| Név | | Telefon. | |
| Lakcím | | | |
| Email | | | |
| | | | |
| Termék információ | | | |
| Beltéri egység modellje | | Kültéri egység modell | |
| A beltéri egység sorozatszáma | | | |
| A kültéri egység sorozatszáma | | | |
| Munka üzemmód | <input type="checkbox"/> hűtés | <input type="checkbox"/> Fűtés | <input type="checkbox"/> csak ventilátor <input type="checkbox"/> Szárítás |
| Hőmérséklet beállítása | _____°C / °F | Ventilátor sebesség | <input type="checkbox"/> Turbo <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/> Auto |
| A levegő bemeneti hőmérséklete | _____°C / °F | A levegő kilépő hőmérséklete | _____°C / °F |
| | | | |
| Telepítési / kondíciós információk | | | |
| Beltéri hőmérséklet | _____°C / °F | Beltéri páratartalom | _____ %RH |
| Kültéri hőmérséklet | _____°C / °F | Kültéri páratartalom | _____ %RH |
| Csatlakozó cső hossza | | Cső átmérője | Gázvezeték: Folyadék cső: |
| Vezeték hossza | | Vezeték átmérő | |
| System Running Pressure | _____MPa or _____Bar or _____PSI | | |
| Room size (L*W*H) | | | |
| Fénykép az beltéri egység beszereléséről (1. fotó) | | Fénykép a kültéri egység telepítéséről (2. fotó) | |
| | | | |
| Hiba leírása | | | |
| Beltéri egység hibakódja | | Kültéri PCB kódja | |
| Az egység nem indul el | | | |
| A távirányító nem működik | | | |
| A beltéri kijelző nem mutat semmit | | | |
| Egyáltalán nincs hűtés vagy fűtés | | | |
| Kevesebb hűtés vagy fűtés | | | |
| Az egység elindul, de hamarosan leáll | | | |
| Nagy zaj | | | |
| Nagy vibráció | | | |
| | | | |

| Parameter Checking information by Remote controller | | | |
|---|---|---------------------|-------------------------|
| Kód megjelenítése | Kód jelentés megjelenítése | Megjelenített érték | Kijelző érték jelentése |
| T1 | Szobahőmérséklet | | |
| T2 | Beltéri tekercs hőmérséklete | | |
| T3 | Kültéri tekercs hőmérséklete | | |
| T4 | Környezeti hőmérséklet | | |
| Tb | A beltéri tekercs kimeneti hőmérséklete | | |
| TP | Kiürítési hőmérséklet | | |
| TH | Szívási hőmérséklet | | |
| FT | Célzott frekvencia | | |
| Fr | Tényleges frekvencia | | |
| IF | Beltéri ventilátor sebessége | | |
| OF | Kültéri ventilátor sebessége | | |
| LA | EXV nyitó lépések | | |
| CT | A kompresszor folyamatos működési ideje | | |
| ST | A kompresszor leállításának okai. | | |
| A0, A1, 0, 1, 2, 3, 4, 5, 6, L, A, U, T | Fenntartott | | |

| A gyártó jóváhagyása | |
|--|--|
| <input type="checkbox"/> Jóváhagyott | |
| <input type="checkbox"/> Több bizonyítékra van szükség | |
| <input type="checkbox"/> Elutasítva | |

4. Adat igény

5. A vizsgált adatok megadásához töltse ki az alábbi eljárást tíz másodpercen belül:
 - Nyomja meg háromszor a LED (vagy a NE zavarj) gombot.
 - Nyomja meg háromszor a SWING (vagy AIR DIRECTION) gombot.
6. Fejezze be az 1-es és 2-es folyamatot 10 másodpercen belül, két másodpercig sípolást fog hallani, ami azt jelenti, hogy az egység paraméter-ellenőrzési módba kerül.
7. Használja a LED (vagy NO DISTURB) és a SWING (vagy AIR DIRECTION) gombokat a megjelenített információk közötti váltáshoz.
8. A LED (vagy NO DISTURB) megnyomásával megjelenik a sorozat következő kódja. A SWING (vagy AIR DIRECTION) megnyomásával az előző jelenik meg.
9. Az alábbi táblázat az információs kódokat mutatja. A képernyőn ez a kód jelenik meg két másodpercig, majd az információ 25 másodpercig.

| Displayed code | Explanation | Displayed value | Meaning | Additional Notes |
|----------------|------------------------------------|---|---|---|
| T1 | Szobahőmérséklet | -1F,-1E,-1d,-1c,-1b,-1A -19—99 A0,A1,...A9 b0,b1,...b9 c0,c1,...c9 d0,d1,...d9 E0,E1,...E9 F0,F1,...F9 | -25,-24,-23,-22,-21,-20 -19—99 100,101,...109 110,111,...119 120,121,...129 130,131,...139 140,141,...149 150,151,...159 | <ol style="list-style-type: none"> 1. Az összes megjelenített hőmérséklet a tényleges értékeket használja. 2. All temperatures are displayed in °C regardless of remote used. 3. T1, T2, T3, T4, and T2B display ranges from -25 to 70 °C. TP display ranges from -20 to 130 °C. 4. The frequency display ranges from 0 to 159HZ. 5. If the actual values exceed or fall short of the defined range, the values closest to the maximum and minimum values will be displayed. |
| T2 | Beltéri tekercs hőfok | | | |
| T3 | Kültéri coil hőfok | | | |
| T4 | Környezeti hőmérséklet | | | |
| TB | Outlet temperature of indoor coil | | | |
| TP | Discharge temperature | | | |
| TH | Suction temperature | | | |
| FT | Targeted frequency | | | |
| FR | Actual frequency | | | |
| IF | Indoor fan speed | 0 1,2,3,4 | OFF Low speed, Medium speed, High speed, Turbo. | N/A Used for some large capacity motors. |
| OF | Outdoor fan speed | 14-FF | Actual fan speed is equal to the display value converted to decimal value and multiplied by 10. This is measured in RPM. | Used for some small capacity motors. The display value is 14-FF (hexadecimal). The corresponding fan speed ranges from 200 to 2550RPM. |
| LR | EXV opening angle | 0-FF | Actual EXV opening value is equal to the display value converted to decimal value and then multiplied by 2. | - |
| CT | Compressor continuous running time | 0-FF | 0-255 minutes | If the actual value exceeds or falls short of the defined range, the value closest to the maximum and minimum will be displayed. |
| ST | Causes of compressor stop | 0-99 | For a detailed explanation, contact technical support. | - |

| Displayed code | Explanation | Displayed value | Meaning | Additional Notes |
|----------------|-------------|------------------------------|---------|------------------|
| R0 | Reserved | 0-FF 2-28 5-20 5-25 | - | - |
| R1 | | | | |
| b0 | | | | |
| b1 | | | | |
| b2 | | | | |
| b3 | | | | |
| b4 | | | | |
| b5 | | | | |
| b6 | | | | |
| dL | | | | |
| Rc | | | | |
| Uo | | | | |
| Td | | | | |
| dR | | | | |
| dS | | | | |
| dT | | | | |

5. Error Diagnosis and Troubleshooting Without Error Code

WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

5.1 Remote maintenance

SUGGESTION: When troubles occur, please check the following points with customers before field maintenance.

| No. | Problem | Solution |
|-----|--|-------------|
| 1 | Unit will not start | TS13 - TS14 |
| 2 | The power switch is on but fans will not start | TS13 - TS14 |
| 3 | The temperature on the display board cannot be set | TS13 - TS14 |
| 4 | Unit is on but the wind is not cold(hot) | TS13 - TS14 |
| 5 | Unit runs, but shortly stops | TS13 - TS14 |
| 6 | The unit starts up and stops frequently | TS13 - TS14 |
| 7 | Unit runs continuously but insufficient cooling(heating) | TS13 - TS14 |
| 8 | Cool can not change to heat | TS13 - TS14 |
| 9 | Unit is noisy | TS13 - TS14 |

5.2 Field maintenance

| | Problem | Solution |
|----|---|-------------|
| 1 | Unit will not start | TS15 - TS16 |
| 2 | Compressor will not start but fans run | TS15 - TS16 |
| 3 | Compressor and condenser (outdoor) fan will not start | TS15 - TS16 |
| 4 | Evaporator (indoor) fan will not start | TS15 - TS16 |
| 5 | Condenser (Outdoor) fan will not start | TS15 - TS16 |
| 6 | Unit runs, but shortly stops | TS15 - TS16 |
| 7 | Compressor short-cycles due to overload | TS15 - TS16 |
| 8 | High discharge pressure | TS15 - TS16 |
| 9 | Low discharge pressure | TS15 - TS16 |
| 10 | High suction pressure | TS15 - TS16 |
| 11 | Low suction pressure | TS15 - TS16 |
| 12 | Unit runs continuously but insufficient cooling | TS15 - TS16 |
| 13 | Too cool | TS15 - TS16 |
| 14 | Compressor is noisy | TS15 - TS16 |
| 15 | Horizontal louver can not revolve | TS15 - TS16 |

| 1.Remote Maintenance | Electrical Circuit | | | | Refrigerant Circuit | | | | | | | | | | | | | | |
|--|--|---|---|---|---------------------|---|---|---|---|---|---|---|--|---|--|--|---|--|--|
| Possible causes of trouble | Power failure | | | | | | | | | | | | | | | | | | |
| | The main power tripped | | | | | | | | | | | | | | | | | | |
| | Loose connections | | | | | | | | | | | | | | | | | | |
| | Faulty transformer | | | | | | | | | | | | | | | | | | |
| | The voltage is too high or too low | | | | | | | | | | | | | | | | | | |
| | The remote control is powered off | | | | | | | | | | | | | | | | | | |
| | Broken remote control | | | | | | | | | | | | | | | | | | |
| | Dirty air filter | | | | | | | | | | | | | | | | | | |
| | Dirty condenser fins | | | | | | | | | | | | | | | | | | |
| | The setting temperature is higher/lower than the room's(cooling/heating) | | | | | | | | | | | | | | | | | | |
| | The ambient temperature is too high/low when the mode is cooling/heating | | | | | | | | | | | | | | | | | | |
| | Fan mode | | | | | | | | | | | | | | | | | | |
| | SILENCE function is activated(optional function) | | | | | | | | | | | | | | | | | | |
| Frosting and defrosting frequently | | | | | | | | | | | | | | | | | | | |
| Unit will not start | ☆ | ☆ | ☆ | ☆ | | | | | | | | | | | | | | | |
| The power switch is on but fans will not start | | | ☆ | ☆ | ☆ | | | | | | | | | | | | | | |
| The temperature on the display board cannot be set | | | | | | ☆ | ☆ | | | | | | | | | | | | |
| Unit is on but the wind is not cold(hot) | | | | | | | | | | ☆ | ☆ | ☆ | | | | | | | |
| Unit runs, but shortly stops | | | | | ☆ | | | | | ☆ | ☆ | | | | | | | | |
| The unit starts up and stops frequently | | | | | ☆ | | | | | | ☆ | | | | | | ☆ | | |
| Unit runs continuously but insufficient cooling/heating) | | | | | | | | ☆ | ☆ | ☆ | ☆ | | | ☆ | | | | | |
| Cool can not change to heat | | | | | | | | | | | | | | | | | | | |
| Unit is noisy | | | | | | | | | | | | | | | | | | | |
| Test method / remedy | Test voltage | | | | | | | | | | | | | | | | | | |
| | Close the power switch | | | | | | | | | | | | | | | | | | |
| | Inspect connections - tighten | | | | | | | | | | | | | | | | | | |
| | Change the transformer | | | | | | | | | | | | | | | | | | |
| | Test voltage | | | | | | | | | | | | | | | | | | |
| | Replace the battery of the remote control | | | | | | | | | | | | | | | | | | |
| | Replace the remote control | | | | | | | | | | | | | | | | | | |
| | Clean or replace | | | | | | | | | | | | | | | | | | |
| | Clean | | | | | | | | | | | | | | | | | | |
| | Adjust the setting temperature | | | | | | | | | | | | | | | | | | |
| | Turn the AC later | | | | | | | | | | | | | | | | | | |
| | Adjust to cool mode | | | | | | | | | | | | | | | | | | |
| | Turn off SILENCE function. | | | | | | | | | | | | | | | | | | |
| Turn the AC later | | | | | | | | | | | | | | | | | | | |

| 1.Remote Maintenance | Others | | | | | |
|--|----------------------|--|---------------------------------|---|--|---------------------------------|
| Possible causes of trouble | Heavy load condition | Loosen hold down bolts and / or screws | Bad airproof | The air inlet or outlet of either unit is blocked | Interference from cell phone towers and remote boosters | Shipping plates remain attached |
| Unit will not start | | | | | | |
| The power switch is on but fans will not start | | | | | ☆ | |
| The temperature on the display board cannot be set | | | | | | |
| Unit is on but the wind is not cold(hot) | | | | | | |
| Unit runs, but shortly stops | | | | | | |
| The unit starts up and stops frequently | | | | ☆ | | |
| Unit runs continuously but insufficient cooling(heating) | ☆ | | ☆ | ☆ | | |
| Cool can not change to heat | | | | | | |
| Unit is noisy | | ☆ | | | | ☆ |
| Test method / remedy | Check heat load | Tighten bolts or screws | Close all the windows and doors | Remove the obstacles | Reconnect the power or press ON/OFF button on remote control to restart operation | Remove them |

| 2.Field Maintenance | Electrical Circuit | | | | | | | | | | | | | | |
|---|--------------------|--------------------------|-------------------------------|---------------------------|----------------------------------|---|---|-----------------------------------|-----------------------------|--|------------------------------------|--------------|----------------------------|----------------------------------|----------------------------------|
| Possible causes of trouble | | | | | | | | | | | | | | | |
| | Power failure | Blown fuse or varistor | Loose connections | Shorted or broken wires | Safety device opens | Faulty thermostat / room temperature sensor | Wrong setting place of temperature sensor | Faulty transformer | Shorted or open capacitor | Faulty magnetic contactor for compressor | Faulty magnetic contactor for fan | Low voltage | Faulty stepping motor | Shorted or grounded compressor | Shorted or grounded fan motor |
| Unit will not start | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ | | | | | | | |
| Compressor will not start but fans run | | | | ☆ | | ☆ | | | ☆ | ☆ | | | | ☆ | |
| Compressor and condenser (outdoor) fan will not start | | | | ☆ | | ☆ | | | | ☆ | | | | | |
| Evaporator (indoor) fan will not start | | | | ☆ | | | | | ☆ | | ☆ | | | | ☆ |
| Condenser (Outdoor) fan will not start | | | | ☆ | | ☆ | | | ☆ | | ☆ | | | | ☆ |
| Unit runs, but shortly stops | | | | | | | | | | ☆ | | ☆ | | | |
| Compressor short-cycles due to overload | | | | | | | | | | ☆ | | ☆ | | | |
| High discharge pressure | | | | | | | | | | | | | | | |
| Low discharge pressure | | | | | | | | | | | | | | | |
| High suction pressure | | | | | | | | | | | | | | | |
| Low suction pressure | | | | | | | | | | | | | | | |
| Unit runs continuously but insufficient cooling | | | | | | | | | | | | | | | |
| Too cool | | | | | | ☆ | ☆ | | | | | | | | |
| Compressor is noisy | | | | | | | | | | | | | | | |
| Horizontal louver can not revolve | | | ☆ | ☆ | | | | | | | | | ☆ | | |
| Test method / remedy | | | | | | | | | | | | | | | |
| | Test voltage | Inspect fuse type & size | Inspect connections - tighten | Test circuits with tester | Test continuity of safety device | Test continuity of thermostat / sensor & wiring | Place the temperature sensor at the central of the air inlet grille | Check control circuit with tester | Check capacitor with tester | Test continuity of coil & contacts | Test continuity of coil & contacts | Test voltage | Replace the stepping motor | Check resistance with multimeter | Check resistance with multimeter |

| 2.Field Maintenance | Refrigerant Circuit | | | | | | | | | | | | | | Others | | | | | | | | |
|---|------------------------|-------------------------|-------------------------|------------------|-----------------------|--|-----------------------------------|--------------------------------------|--|---------------------------------|---|---|----------------------------------|----------------------------|----------------------------|---|--|----------------------------------|----------------------|--|---------------------------------|---|---|
| Possible causes of trouble | Compressor stuck | Shortage of refrigerant | Restricted liquid line | Dirty air filter | Dirty evaporator coil | Insufficient air through evaporator coil | Overcharge of refrigerant | Dirty or partially blocked condenser | Air or incompressible gas in refrigerant cycle | Short cycling of condensing air | High temperature condensing medium | Insufficient condensing medium | Broken compressor internal parts | Inefficient compressor | Expansion valve obstructed | Expansion valve or capillary tube closed completely | Leaking power element on expansion valve | Poor installation of feeler bulb | Heavy load condition | Loosen hold down bolts and / or screws | Shipping plates remain attached | Poor choices of capacity | Contact of piping with other piping or external plate |
| Unit will not start | | | | | | | | | | | | | | | | | | | | | | | |
| Compressor will not start but fans run | ☆ | | | | | | | | | | | | | | | | | | | | | | |
| Compressor and condenser (outdoor) fan will not start | | | | | | | | | | | | | | | | | | | | | | | |
| Evaporator (indoor) fan will not start | | | | | | | | | | | | | | | | | | | | | | | |
| Condenser (Outdoor) fan will not start | | | | | | | | | | | | | | | | | | | | | | | |
| Unit runs, but shortly stops | | ☆ | ☆ | | | | ☆ | ☆ | | | | | | | | ☆ | ☆ | | | | | | |
| Compressor short-cycles due to overload | | ☆ | | | | | ☆ | ☆ | | | | | | | | | | | | | | | |
| High discharge pressure | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | | | | | | | | | | | | |
| Low discharge pressure | | ☆ | | | | | | | | | | | | ☆ | | | | | | | | | |
| High suction pressure | | | | | | | ☆ | | | | | | | ☆ | | | | ☆ | ☆ | | | | |
| Low suction pressure | | ☆ | ☆ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ | ☆ | | | | | | | |
| Unit runs continuously but insufficient cooling | | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | | | | ☆ | | | | | ☆ | | | ☆ | |
| Too cool | | | | | | | | | | | | | | | | | | | | | | | |
| Compressor is noisy | | | | | | | ☆ | | | | | | ☆ | | | | | | | ☆ | ☆ | | ☆ |
| Horizontal louver can not revolve | | | | | | | | | | | | | | | | | | | | | | | |
| Test method / remedy | Replace the compressor | Leak test | Replace restricted part | Clean or replace | Clean coil | Check fan | Change charged refrigerant volume | Clean condenser or remove obstacle | Purge, evacuate and recharge | Remove obstruction to air flow | Remove obstruction in air or water flow | Remove obstruction in air or water flow | Replace compressor | Test compressor efficiency | Replace valve | Replace valve | Replace valve | Fix feeler bulb | Check heat load | Tighten bolts or screws | Remove them | Choose AC of lager capacity or add the number of AC | Rectify piping so as not to contact each other or with external plate |

6. Quick Maintenance by Error Code

If you do not have the time to test which specific parts are faulty, you can directly change the required parts according to the error code.

You can find the parts to replace by error code in the following table.

| Part requiring replacement | Error Code | | | | | | | | |
|----------------------------|------------|----|----|----|----|----|----|----|----|
| | E0 | E1 | E2 | E3 | E4 | E5 | E7 | EC | F0 |
| Indoor PCB | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x |
| Outdoor PCB | x | ✓ | x | x | x | x | x | x | ✓ |
| Display board | x | x | x | x | x | x | ✓ | x | x |
| Indoor fan motor | x | x | x | ✓ | x | x | x | x | x |
| Outdoor fan motor | x | x | x | x | x | x | x | x | x |
| T1 sensor | x | x | x | x | ✓ | x | x | x | x |
| T2 Sensor | x | x | x | x | x | ✓ | x | ✓ | x |
| T3 Sensor | x | x | x | x | x | x | x | x | x |
| T4 Sensor | x | x | x | x | x | x | x | x | x |
| TP Sensor | x | x | x | x | x | x | x | x | x |
| Reactor | x | ✓ | x | x | x | x | x | x | x |
| Compressor | x | x | x | x | x | x | x | x | ✓ |
| Additional refrigerant | x | x | x | x | x | x | x | ✓ | x |

| Part requiring replacement | F1 | F2 | F3 | F4 | F5 | P0 | P1 | P2 | P4 |
|----------------------------|----|----|----|----|----|----|----|----|----|
| Indoor PCB | x | x | x | x | x | x | x | x | x |
| Outdoor PCB | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Indoor fan motor | x | x | x | x | x | x | x | x | x |
| Outdoor fan motor | x | x | x | x | ✓ | ✓ | x | x | ✓ |
| T3 Sensor | x | ✓ | x | x | x | x | x | x | x |
| T4 Sensor | ✓ | x | x | x | x | x | x | x | x |
| TP Sensor | x | x | ✓ | x | x | x | x | x | x |
| Reactor | x | x | x | x | x | x | ✓ | x | x |
| Compressor | x | x | x | x | x | ✓ | x | x | ✓ |
| IPM module board | x | x | x | x | x | ✓ | ✓ | ✓ | ✓ |
| Additional refrigerant | x | x | x | x | x | x | x | x | x |

Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

7. Troubleshooting by Error Code

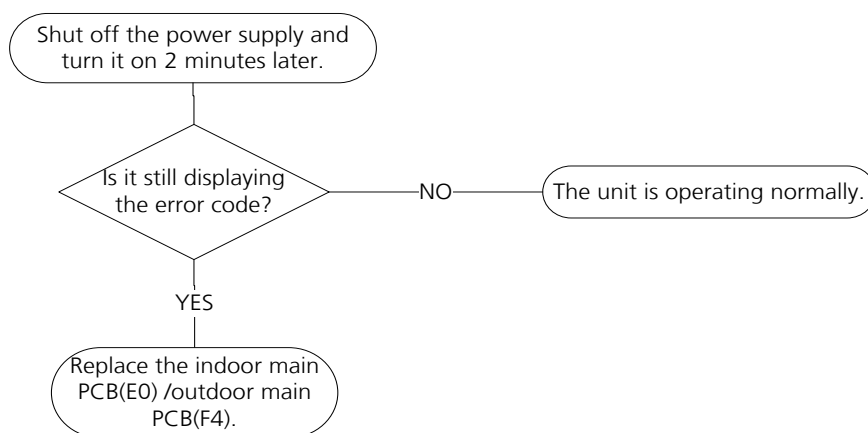
7.1 E0 / F4 (EEPROM parameter error diagnosis and solution)

Description: Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB

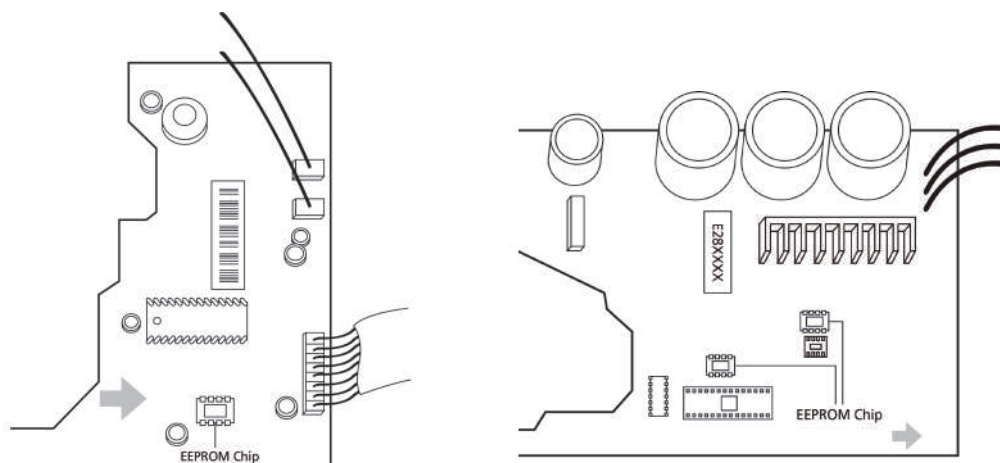
Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following two images:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This pictures are only for reference, actual appearance may vary.

Troubleshooting and repair of compressor driven chip EEPROM parameter error and communication error between outdoor main chip and compressor driven chip are same as F4.

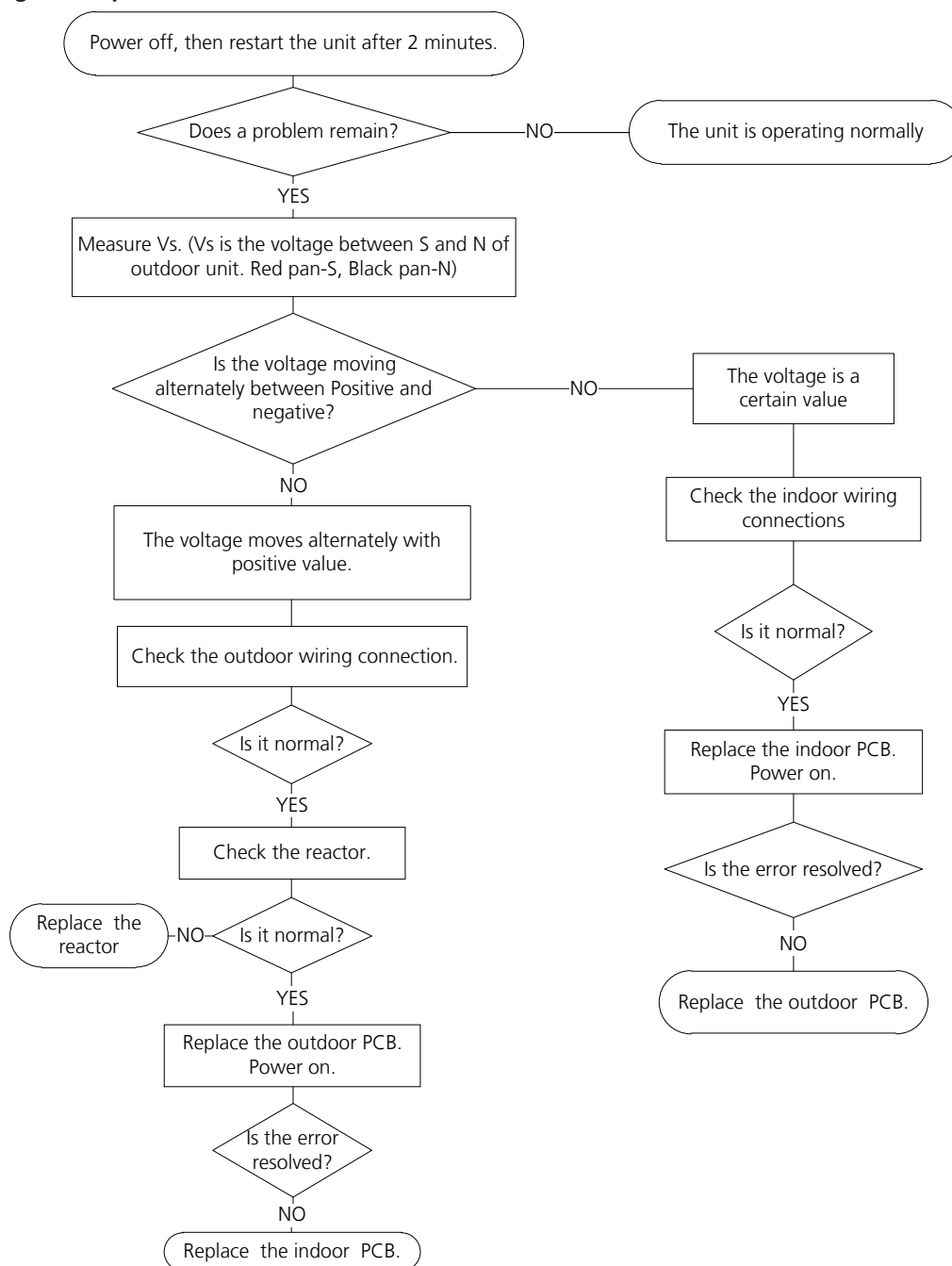
7.2 E1 (Indoor and outdoor unit communication error diagnosis and solution)

Description: Indoor unit can not communicate with outdoor unit

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Reactor

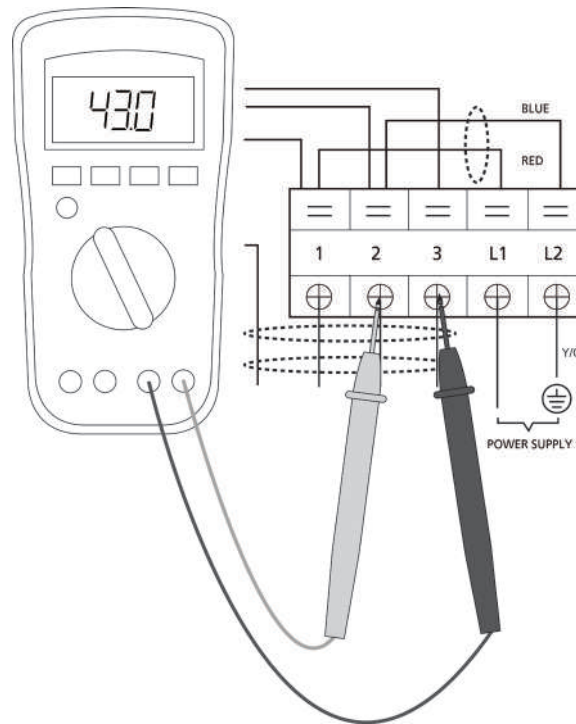
Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

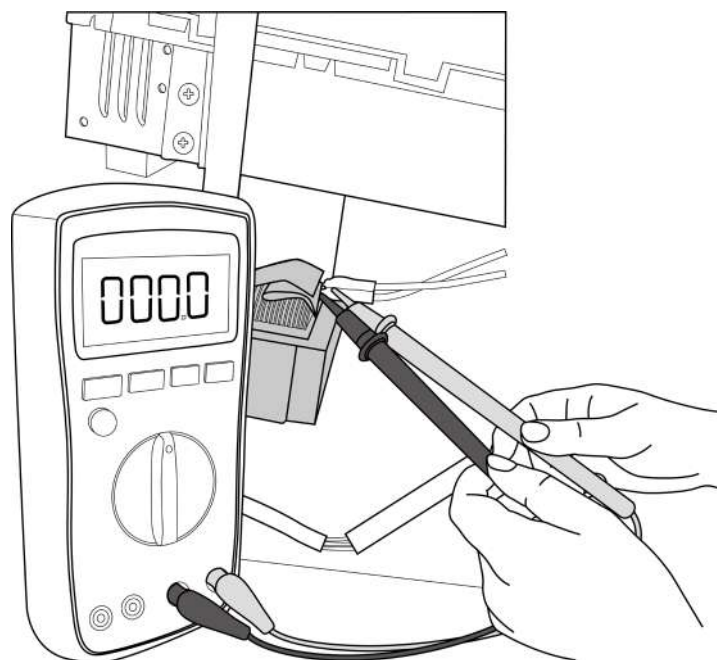
Remarks:

- Use a multimeter to test the DC voltage between 2 port(or S or L2 port) and 3 port(or N or S port) of outdoor unit. The red pin of multimeter connects with 2 port(or S or L2 port) while the black pin is for 3 port(or N or S port).
- When AC is normal running, the voltage will move alternately between -25V to 25V.
- If the outdoor unit has malfunction, the voltage will move alternately with positive value.
- While if the indoor unit has malfunction, the voltage will be a certain value.



**S and N
or
L2 and S
or
2 and 3**

- Use a multimeter to test the resistance of the reactor which does not connect with capacitor.
- The normal value should be around zero ohm. Otherwise, the reactor must have malfunction.



Note: The picture and the value are only for reference, actual condition and specific value may vary.

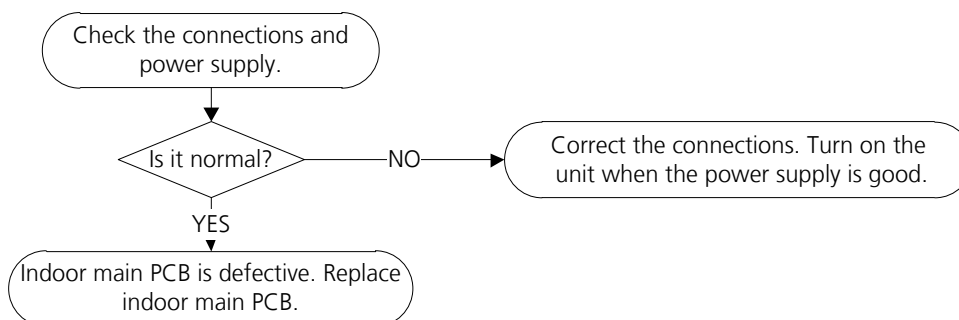
7.3 E2 (Zero crossing detection error diagnosis and solution)

Description: When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.

Recommended parts to prepare:

- Connection wires
- PCB

Troubleshooting and repair:



Note: E2 zero crossing detection error is only valid for the unit with AC fan motor, for other models, this error is invalid.

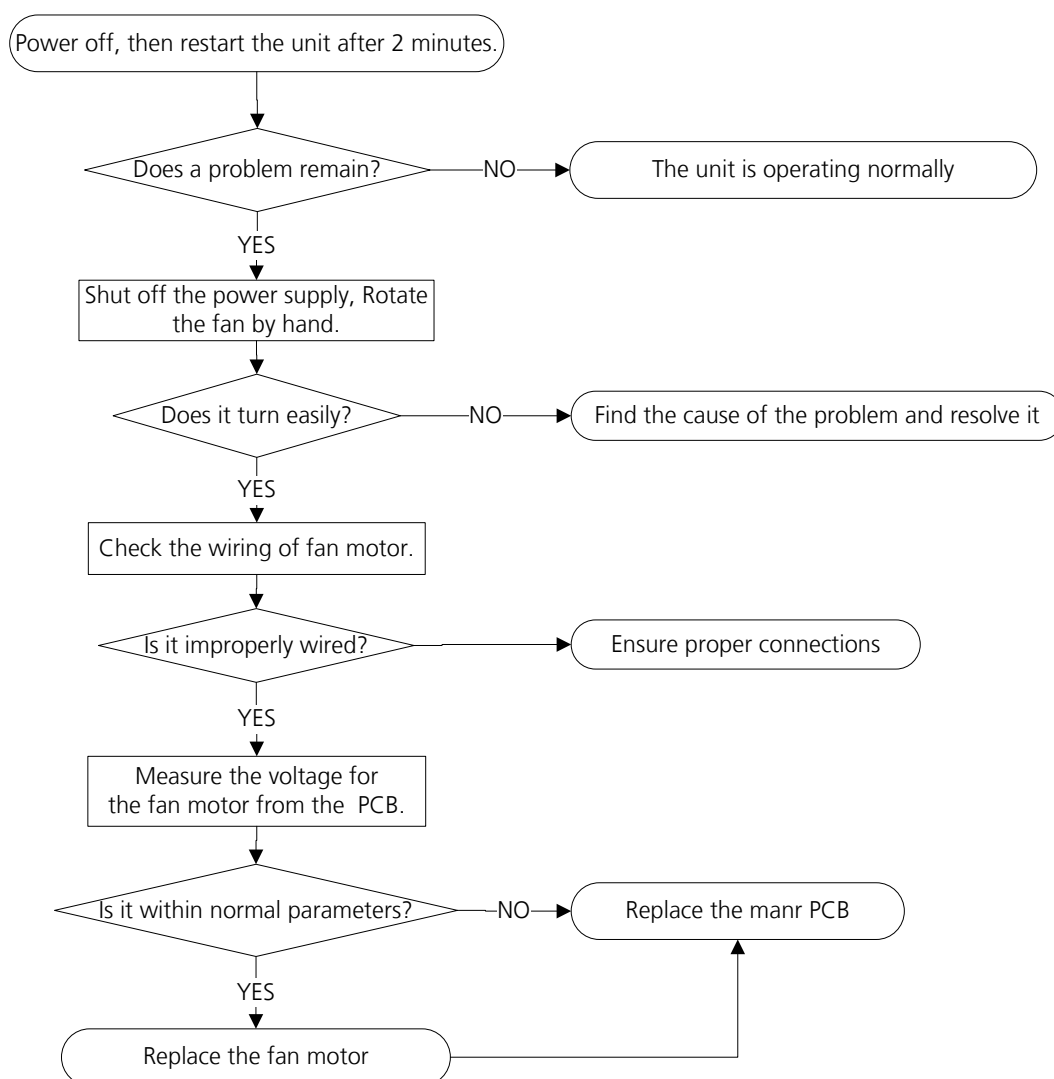
7.4 E3 / F5 (Fan speed is operating outside of normal range diagnosis and solution)

Description: When indoor / outdoor fan speed keeps too low or too high for a certain time, the unit will stop and the LED will display the failure.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Index:**1. Indoor or Outdoor DC Fan Motor(control chip is in fan motor)**

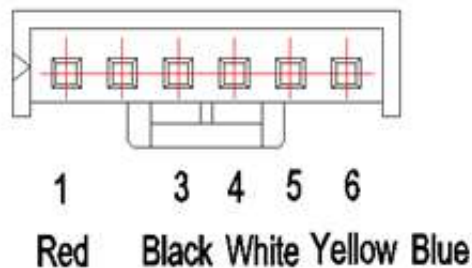
Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.

- DC motor voltage input and output (voltage: 220-240V~):

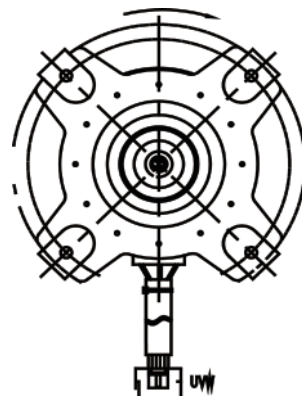
| No. | Color | Signal | Voltage |
|-----|--------|--------|-----------|
| 1 | Red | Vs/Vm | 280V~380V |
| 2 | --- | --- | --- |
| 3 | Black | GND | 0V |
| 4 | White | Vcc | 14-17.5V |
| 5 | Yellow | Vsp | 0~5.6V |
| 6 | Blue | FG | 14-17.5V |

- DC motor voltage input and output (voltage: 115V~):

| No. | Color | Signal | Voltage |
|-----|--------|--------|-----------|
| 1 | Red | Vs/Vm | 140V~190V |
| 2 | --- | --- | --- |
| 3 | Black | GND | 0V |
| 4 | White | Vcc | 14-17.5V |
| 5 | Yellow | Vsp | 0~5.6V |
| 6 | Blue | FG | 14-17.5V |

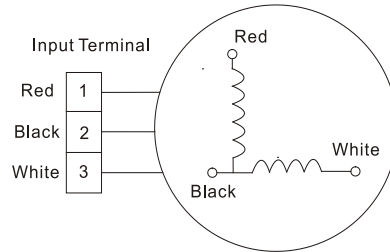
**2. Outdoor DC Fan Motor (control chip is in outdoor PCB)**

Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must has problems and need to be replaced. otherwise the PCB must has problems and need to be replaced.



3. Indoor AC Fan Motor

Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply) or 50V (115V power supply), the PCB must has problems and need to be replaced.



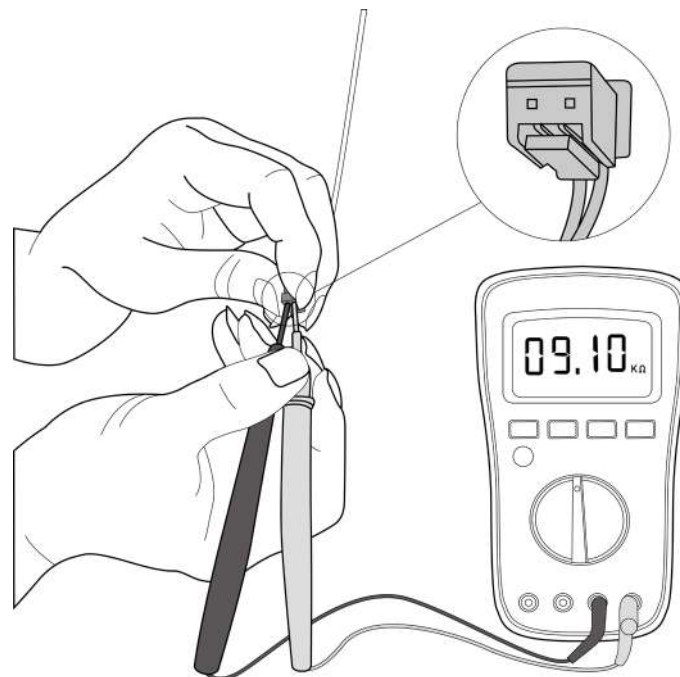
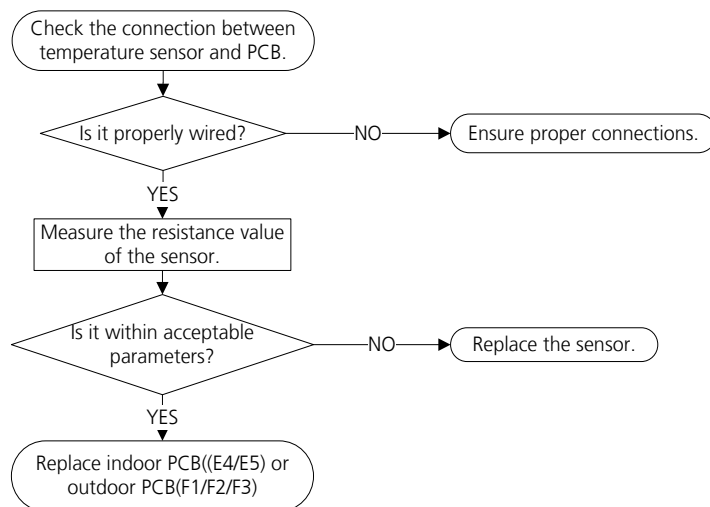
7.5 E4/E5/F1/F2/F3 (Open circuit or short circuit of temperature sensor diagnosis and solution)

Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.

Recommended parts to prepare:

- Connection wires
- Sensors
- PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This picture and the value are only for reference, actual appearance and value may vary

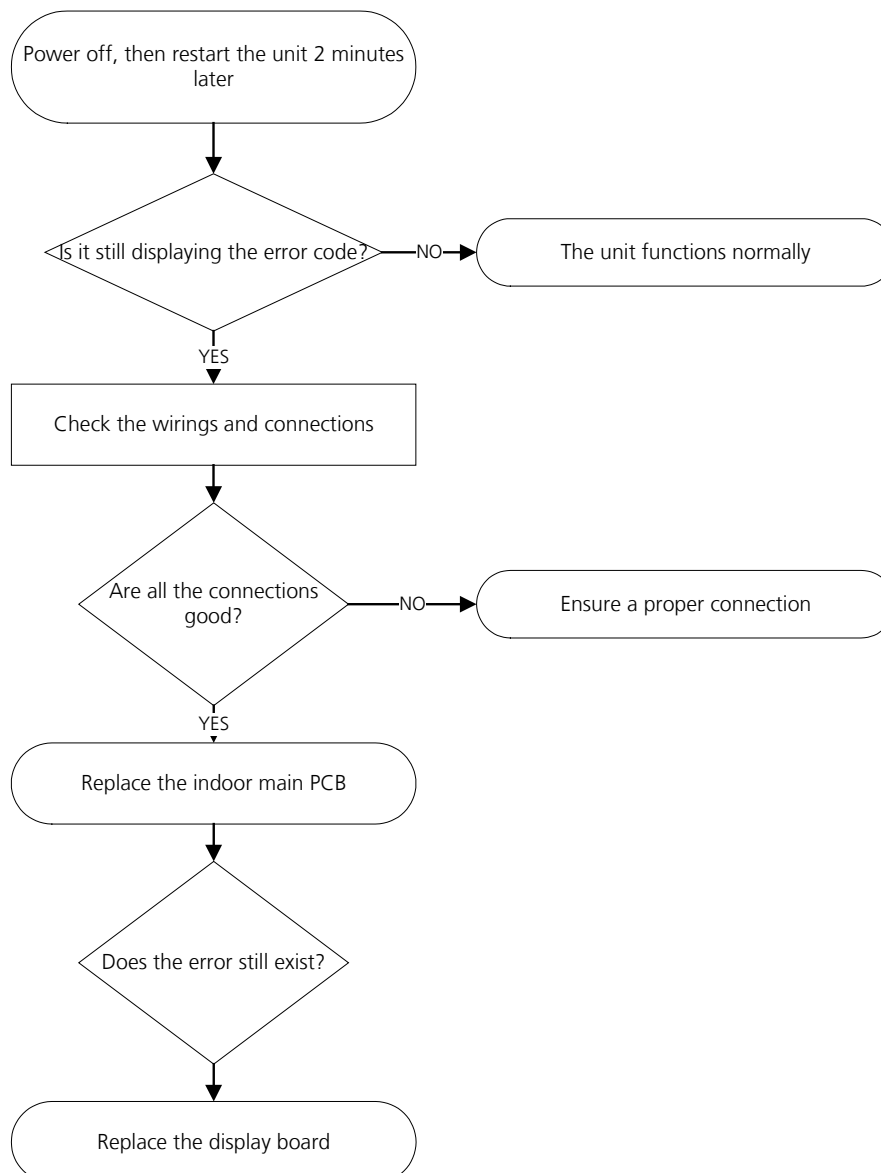
7.6 E7 (Indoor PCB / Display board communication error diagnosis and solution)

Description: Indoor PCB does not receive feedback from the display board.

Recommended parts to prepare:

- Communication wire
- Indoor PCB
- Display board

Troubleshooting and repair:



7.7 EC (Refrigerant Leakage Detection diagnosis and solution)

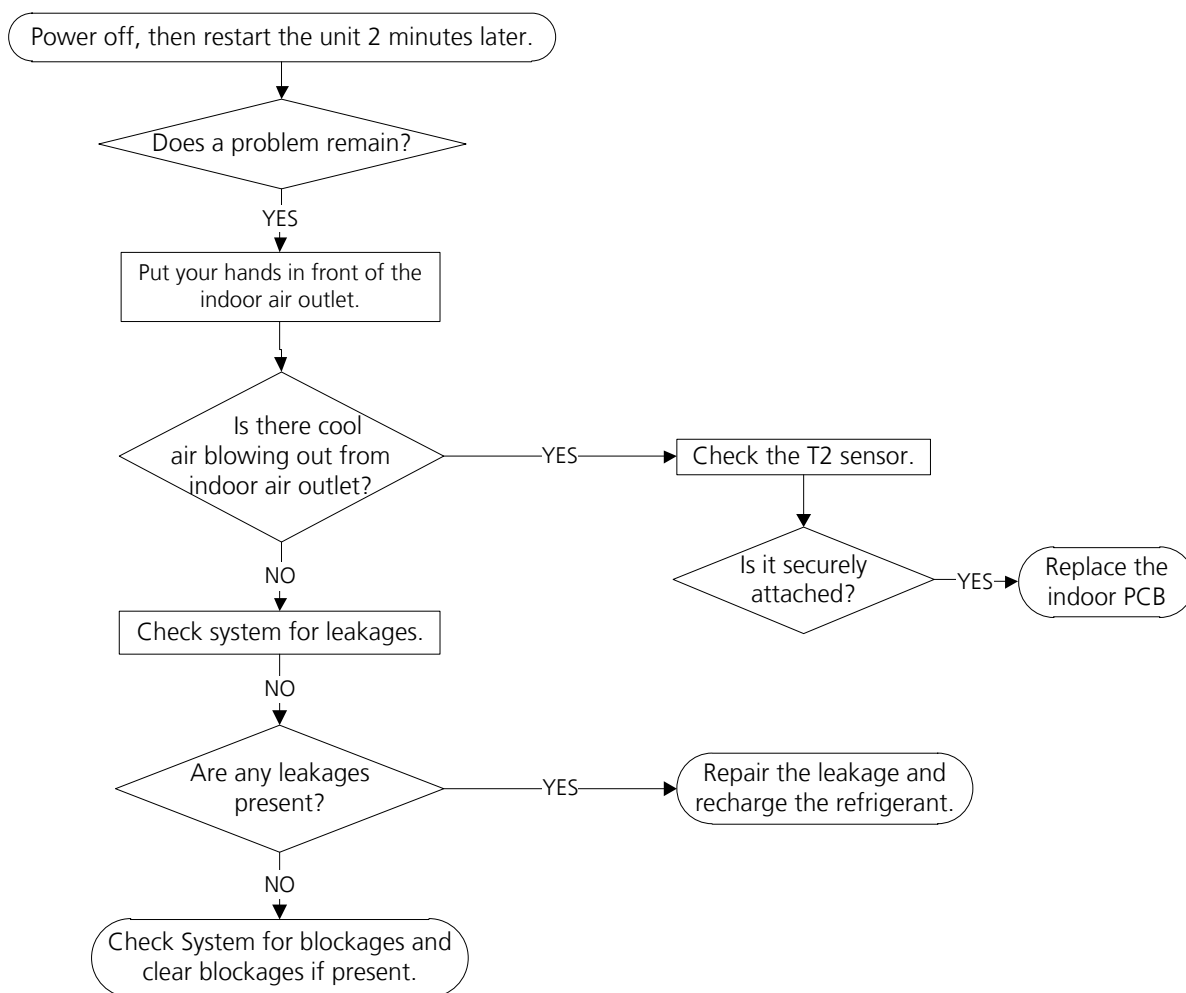
Description: Define the evaporator coil temperature T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if $T2 < T_{cool} - 1^{\circ}\text{C}$ (1.8°F) does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep for 3 minutes, and this situation happens 3 times, the display area will show "EC" and AC will turn off.

Recommended parts to prepare:

- T2 sensor
- Indoor PCB
- Additional refrigerant

Troubleshooting and repair:



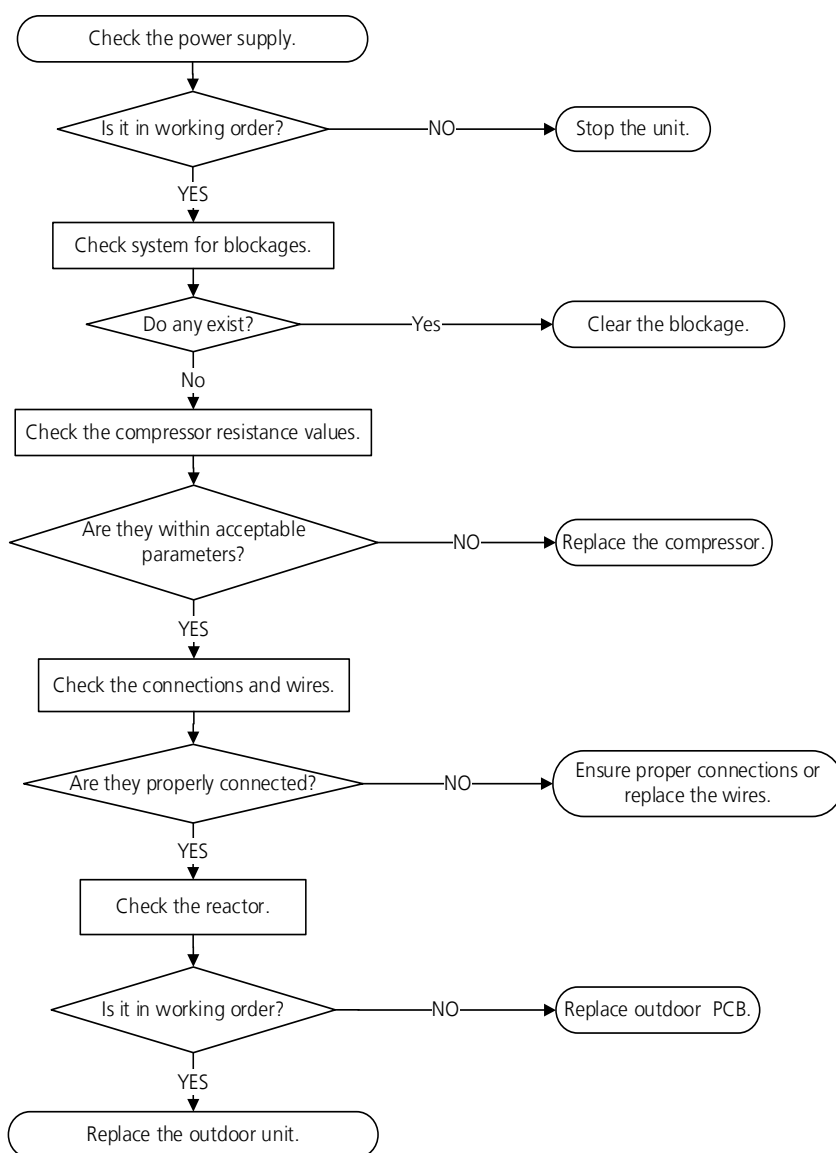
7.8 F0 (Overload current protection diagnosis and solution)

Description: An abnormal current rise is detected by checking the specified current detection circuit.

Recommended parts to prepare:

- Outdoor PCB
- Connection wires
- Compressor

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

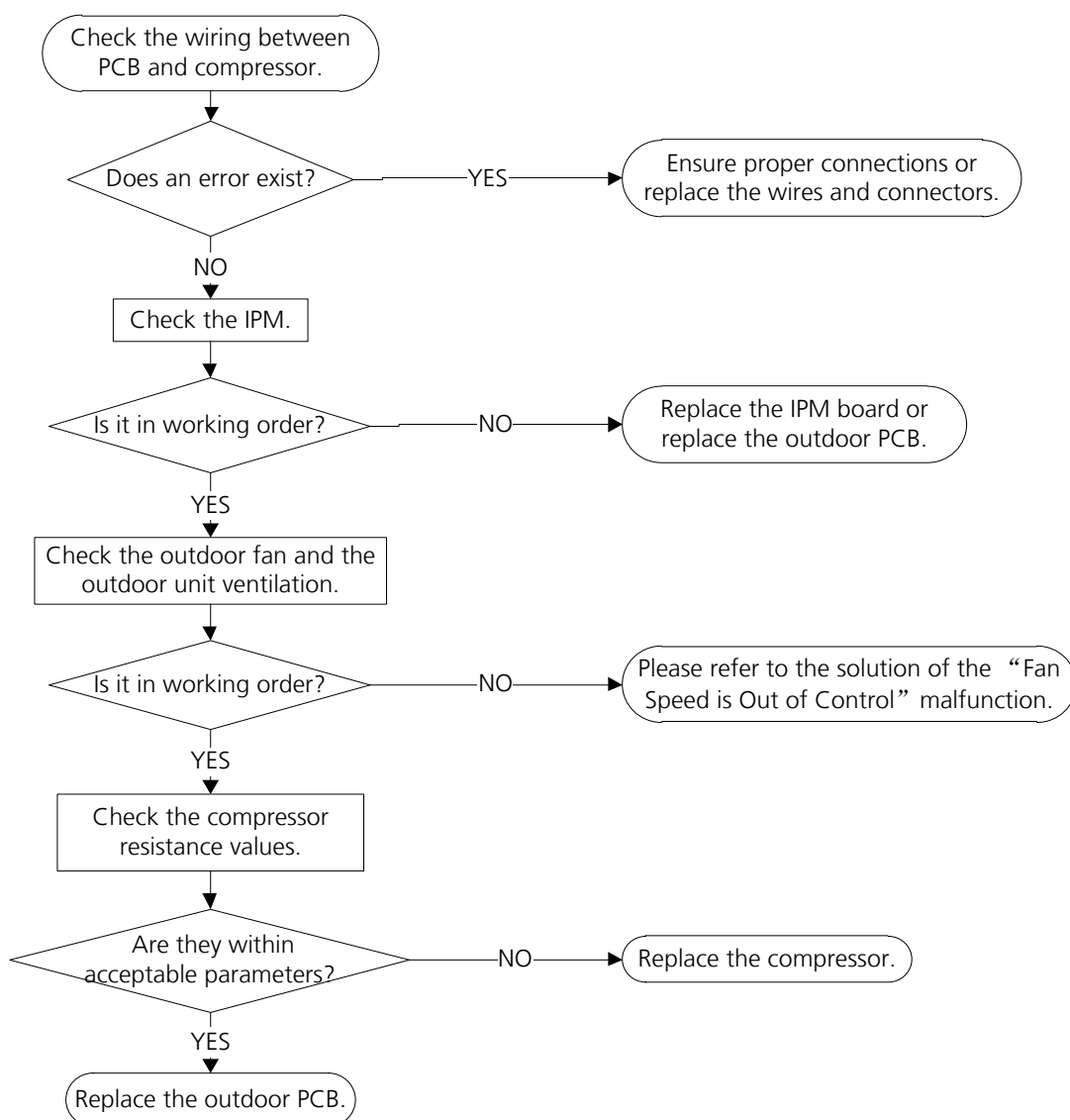
7.9 P0(IPM malfunction or IGBT over-strong current protection diagnosis and solution)

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the display LED shows “P0” and the AC turn off.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

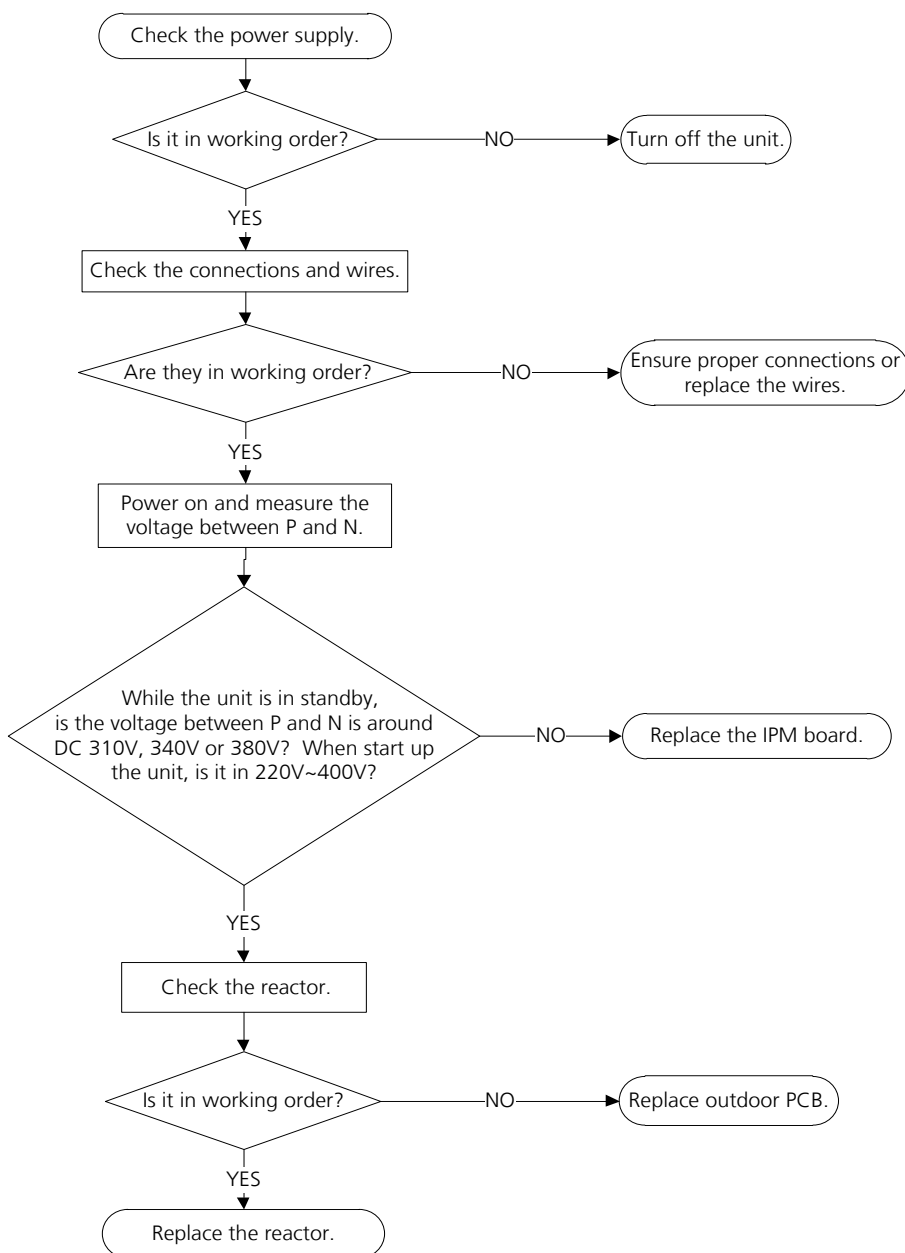
7.10 P1(Over voltage or too low voltage protection diagnosis and solution)

Description: Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.

Recommended parts to prepare:

- Power supply wires
- IPM module board
- PCB
- Reactor

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

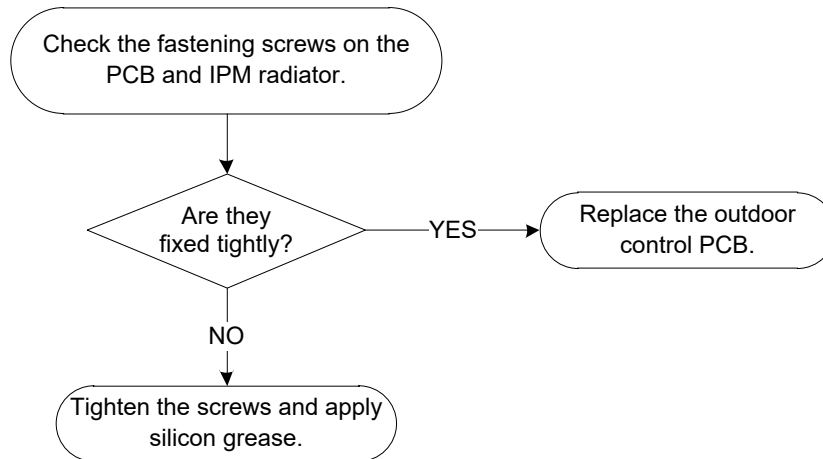
7.11 P2(High temperature protection of IPM module diagnosis and solution)

Description: If the temperature of IPM module is higher than a certain value, the LED will display the failure.

Recommended parts to prepare:

- Outdoor PCB
- IPM module board

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

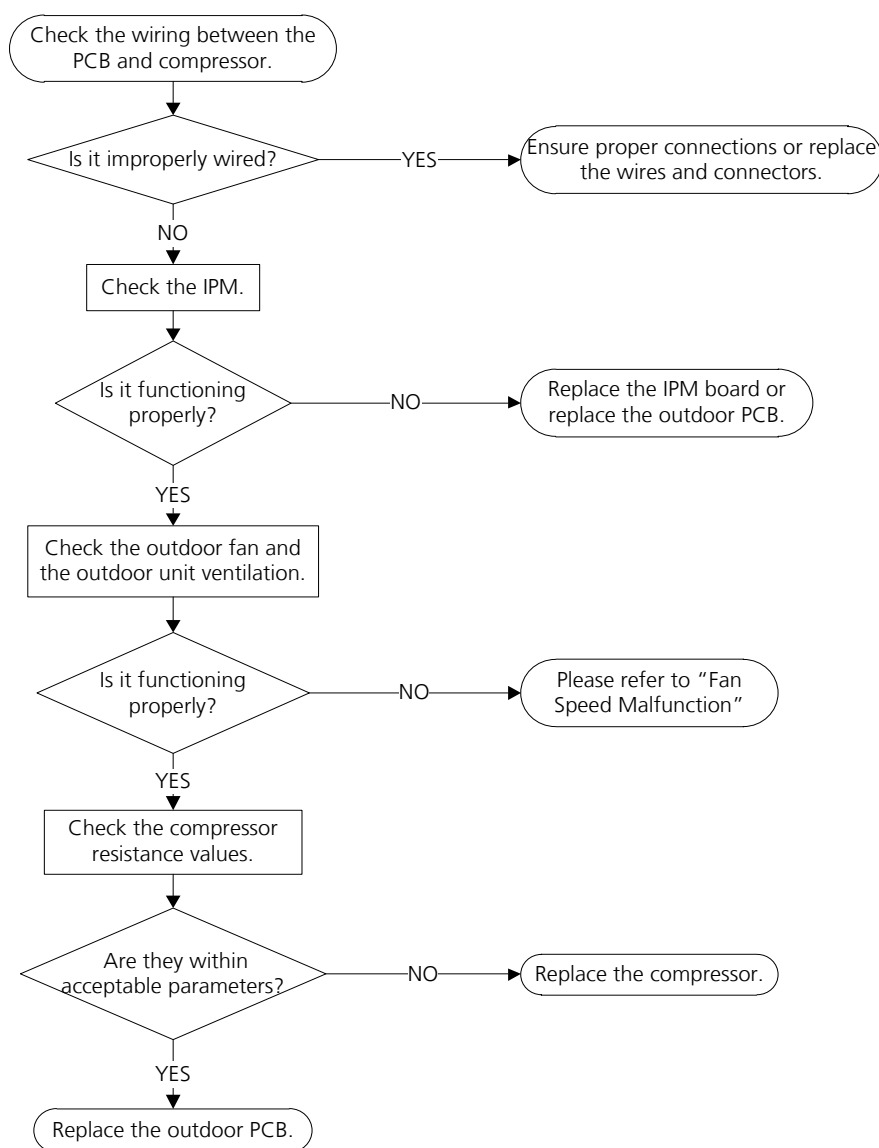
7.12 P4(Inverter compressor drive error diagnosis and solution)

Description: An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

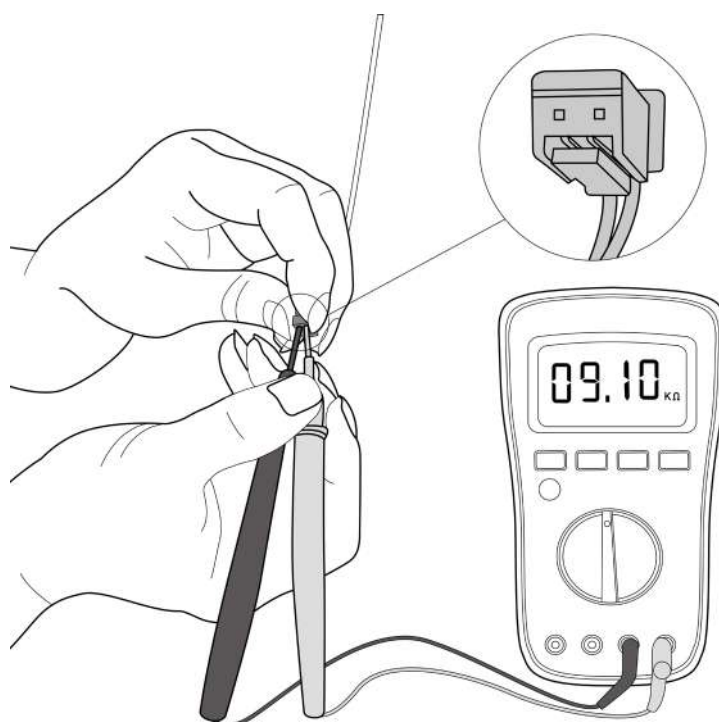
8. Check Procedures

8.1 Temperature Sensor Check

WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. Operate after compressor and coil have returned to normal temperature in case of injury.

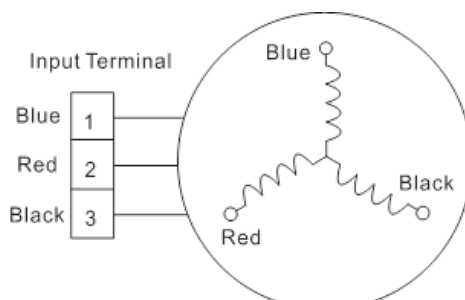
1. Disconnect the temperature sensor from PCB (Refer to Chapter 5&6. Indoor&Outdoor Unit Disassembly).
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table (Refer to Chapter 8. Appendix).



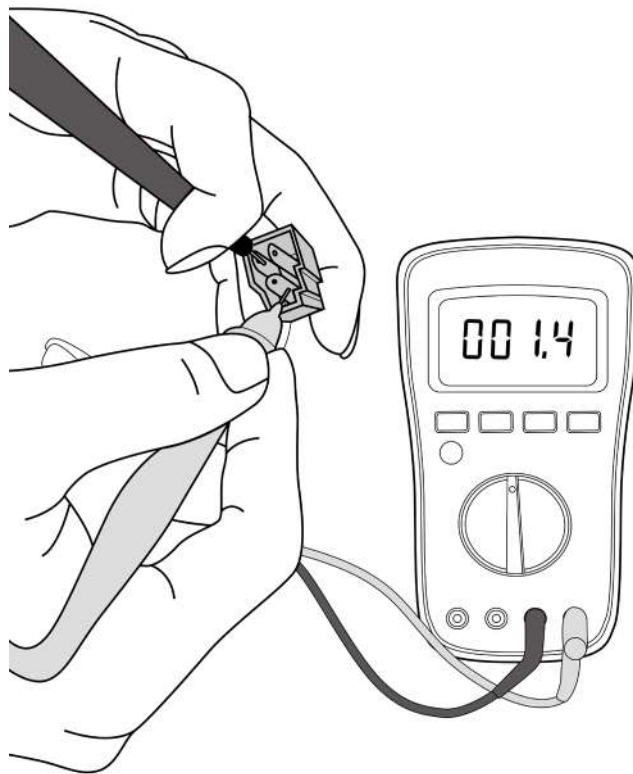
Note: The picture and the value are only for reference, actual condition and specific value may vary.

8.2 Compressor Check

1. Disconnect the compressor power cord from outdoor PCB (Refer to Chapter 6. Outdoor Unit Disassembly).
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



| Resistance Value | KSK89D53UEZ | KSK89D29UEZD | KSM135D23UFZ | KSN140D21UFZ | KTF235D22UMT |
|------------------|-------------|--------------|--------------|--------------|--------------|
| Blue-Red | 2.35Ω | 1.99Ω | 1.72Ω | 1.28Ω | 0.75Ω |
| Blue-Black | | | | | |
| Red-Black | | | | | |



Note: The picture and the value are only for reference, actual condition and specific value may vary.

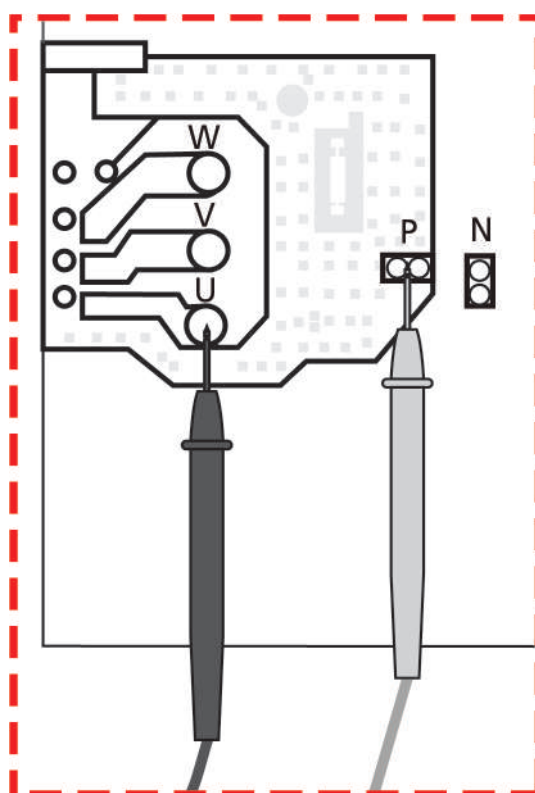
8.3 IPM Continuity Check

⚠ WARNING

Electricity remains in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

1. Turn off outdoor unit and disconnect power supply.
2. Discharge electrolytic capacitors and ensure all energy-storage unit has been discharged.
3. Disassemble outdoor PCB or disassemble IPM board.
4. Measure the resistance value between P and U(V, W, N); U(V, W) and N.

| Digital tester | | Resistance value | Digital tester | | Resistance value |
|----------------|----------|-------------------|----------------|----------|-------------------|
| (+)Red | (-)Black | | (+)Red | (-)Black | |
| P | N | ∞ (Several MΩ) | U | N | ∞ (Several MΩ) |
| | U | | V | | |
| | V | | W | | |
| | W | | - | | |



Note: The picture and the value are only for reference, actual condition and specific value may vary.

Appendix

Tartalom

| | | |
|------|---|---|
| i) | Temperature Sensor Resistance Value Table for T1, T2, T3, and T4 (°C – K) | 2 |
| ii) | Temperature Sensor Resistance Value Table for TP (for some units)(°C --K) | 3 |
| iii) | Pressure On Service Port | 4 |

i) Temperature Sensor Resistance Value Table for T1,T2,T3 and T4 (°C – K)

| °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm |
|-----|----|---------|----|-----|---------|----|-----|---------|-----|-----|---------|
| -20 | -4 | 115.266 | 20 | 68 | 12.6431 | 60 | 140 | 2.35774 | 100 | 212 | 0.62973 |
| -19 | -2 | 108.146 | 21 | 70 | 12.0561 | 61 | 142 | 2.27249 | 101 | 214 | 0.61148 |
| -18 | 0 | 101.517 | 22 | 72 | 11.5 | 62 | 144 | 2.19073 | 102 | 216 | 0.59386 |
| -17 | 1 | 96.3423 | 23 | 73 | 10.9731 | 63 | 145 | 2.11241 | 103 | 217 | 0.57683 |
| -16 | 3 | 89.5865 | 24 | 75 | 10.4736 | 64 | 147 | 2.03732 | 104 | 219 | 0.56038 |
| -15 | 5 | 84.219 | 25 | 77 | 10 | 65 | 149 | 1.96532 | 105 | 221 | 0.54448 |
| -14 | 7 | 79.311 | 26 | 79 | 9.55074 | 66 | 151 | 1.89627 | 106 | 223 | 0.52912 |
| -13 | 9 | 74.536 | 27 | 81 | 9.12445 | 67 | 153 | 1.83003 | 107 | 225 | 0.51426 |
| -12 | 10 | 70.1698 | 28 | 82 | 8.71983 | 68 | 154 | 1.76647 | 108 | 226 | 0.49989 |
| -11 | 12 | 66.0898 | 29 | 84 | 8.33566 | 69 | 156 | 1.70547 | 109 | 228 | 0.486 |
| -10 | 14 | 62.2756 | 30 | 86 | 7.97078 | 70 | 158 | 1.64691 | 110 | 230 | 0.47256 |
| -9 | 16 | 58.7079 | 31 | 88 | 7.62411 | 71 | 160 | 1.59068 | 111 | 232 | 0.45957 |
| -8 | 18 | 56.3694 | 32 | 90 | 7.29464 | 72 | 162 | 1.53668 | 112 | 234 | 0.44699 |
| -7 | 19 | 52.2438 | 33 | 91 | 6.98142 | 73 | 163 | 1.48481 | 113 | 235 | 0.43482 |
| -6 | 21 | 49.3161 | 34 | 93 | 6.68355 | 74 | 165 | 1.43498 | 114 | 237 | 0.42304 |
| -5 | 23 | 46.5725 | 35 | 95 | 6.40021 | 75 | 167 | 1.38703 | 115 | 239 | 0.41164 |
| -4 | 25 | 44 | 36 | 97 | 6.13059 | 76 | 169 | 1.34105 | 116 | 241 | 0.4006 |
| -3 | 27 | 41.5878 | 37 | 99 | 5.87359 | 77 | 171 | 1.29078 | 117 | 243 | 0.38991 |
| -2 | 28 | 39.8239 | 38 | 100 | 5.62961 | 78 | 172 | 1.25423 | 118 | 244 | 0.37956 |
| -1 | 30 | 37.1988 | 39 | 102 | 5.39689 | 79 | 174 | 1.2133 | 119 | 246 | 0.36954 |
| 0 | 32 | 35.2024 | 40 | 104 | 5.17519 | 80 | 176 | 1.17393 | 120 | 248 | 0.35982 |
| 1 | 34 | 33.3269 | 41 | 106 | 4.96392 | 81 | 178 | 1.13604 | 121 | 250 | 0.35042 |
| 2 | 36 | 31.5635 | 42 | 108 | 4.76253 | 82 | 180 | 1.09958 | 122 | 252 | 0.3413 |
| 3 | 37 | 29.9058 | 43 | 109 | 4.5705 | 83 | 181 | 1.06448 | 123 | 253 | 0.33246 |
| 4 | 39 | 28.3459 | 44 | 111 | 4.38736 | 84 | 183 | 1.03069 | 124 | 255 | 0.3239 |
| 5 | 41 | 26.8778 | 45 | 113 | 4.21263 | 85 | 185 | 0.99815 | 125 | 257 | 0.31559 |
| 6 | 43 | 25.4954 | 46 | 115 | 4.04589 | 86 | 187 | 0.96681 | 126 | 259 | 0.30754 |
| 7 | 45 | 24.1932 | 47 | 117 | 3.88673 | 87 | 189 | 0.93662 | 127 | 261 | 0.29974 |
| 8 | 46 | 22.5662 | 48 | 118 | 3.73476 | 88 | 190 | 0.90753 | 128 | 262 | 0.29216 |
| 9 | 48 | 21.8094 | 49 | 120 | 3.58962 | 89 | 192 | 0.8795 | 129 | 264 | 0.28482 |
| 10 | 50 | 20.7184 | 50 | 122 | 3.45097 | 90 | 194 | 0.85248 | 130 | 266 | 0.2777 |
| 11 | 52 | 19.6891 | 51 | 124 | 3.31847 | 91 | 196 | 0.82643 | 131 | 268 | 0.27078 |
| 12 | 54 | 18.7177 | 52 | 126 | 3.19183 | 92 | 198 | 0.80132 | 132 | 270 | 0.26408 |
| 13 | 55 | 17.8005 | 53 | 127 | 3.07075 | 93 | 199 | 0.77709 | 133 | 271 | 0.25757 |
| 14 | 57 | 16.9341 | 54 | 129 | 2.95896 | 94 | 201 | 0.75373 | 134 | 273 | 0.25125 |
| 15 | 59 | 16.1156 | 55 | 131 | 2.84421 | 95 | 203 | 0.73119 | 135 | 275 | 0.24512 |
| 16 | 61 | 15.3418 | 56 | 133 | 2.73823 | 96 | 205 | 0.70944 | 136 | 277 | 0.23916 |
| 17 | 63 | 14.6181 | 57 | 135 | 2.63682 | 97 | 207 | 0.68844 | 137 | 279 | 0.23338 |
| 18 | 64 | 13.918 | 58 | 136 | 2.53973 | 98 | 208 | 0.66818 | 138 | 280 | 0.22776 |
| 19 | 66 | 13.2631 | 59 | 138 | 2.44677 | 99 | 210 | 0.64862 | 139 | 282 | 0.22231 |

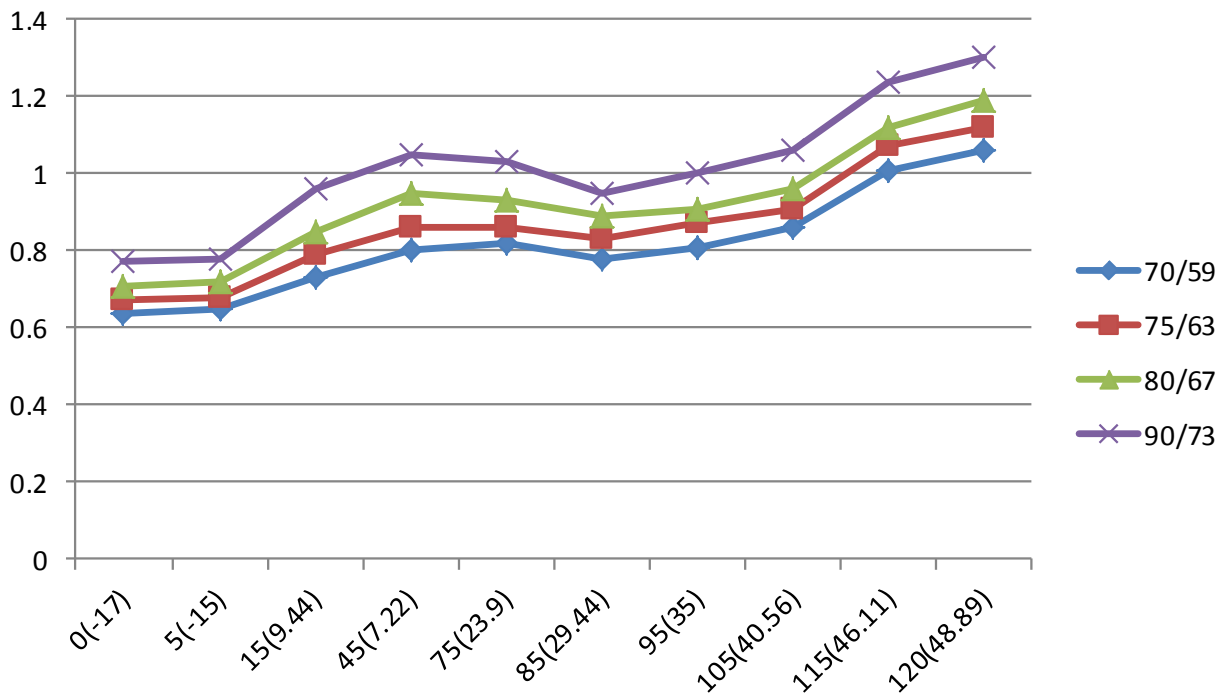
ii) Temperature Sensor Resistance Value Table for TP(for some units) (°C --K)

| °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm |
|-----|----|-------|----|-----|-------|----|-----|-------|-----|-----|-------|
| °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm |
| -20 | -4 | 542.7 | 20 | 68 | 68.66 | 60 | 140 | 13.59 | 100 | 212 | 3.702 |
| -19 | -2 | 511.9 | 21 | 70 | 65.62 | 61 | 142 | 13.11 | 101 | 214 | 3.595 |
| -18 | 0 | 483 | 22 | 72 | 62.73 | 62 | 144 | 12.65 | 102 | 216 | 3.492 |
| -17 | 1 | 455.9 | 23 | 73 | 59.98 | 63 | 145 | 12.21 | 103 | 217 | 3.392 |
| -16 | 3 | 430.5 | 24 | 75 | 57.37 | 64 | 147 | 11.79 | 104 | 219 | 3.296 |
| -15 | 5 | 406.7 | 25 | 77 | 54.89 | 65 | 149 | 11.38 | 105 | 221 | 3.203 |
| -14 | 7 | 384.3 | 26 | 79 | 52.53 | 66 | 151 | 10.99 | 106 | 223 | 3.113 |
| -13 | 9 | 363.3 | 27 | 81 | 50.28 | 67 | 153 | 10.61 | 107 | 225 | 3.025 |
| -12 | 10 | 343.6 | 28 | 82 | 48.14 | 68 | 154 | 10.25 | 108 | 226 | 2.941 |
| -11 | 12 | 325.1 | 29 | 84 | 46.11 | 69 | 156 | 9.902 | 109 | 228 | 2.86 |
| -10 | 14 | 307.7 | 30 | 86 | 44.17 | 70 | 158 | 9.569 | 110 | 230 | 2.781 |
| -9 | 16 | 291.3 | 31 | 88 | 42.33 | 71 | 160 | 9.248 | 111 | 232 | 2.704 |
| -8 | 18 | 275.9 | 32 | 90 | 40.57 | 72 | 162 | 8.94 | 112 | 234 | 2.63 |
| -7 | 19 | 261.4 | 33 | 91 | 38.89 | 73 | 163 | 8.643 | 113 | 235 | 2.559 |
| -6 | 21 | 247.8 | 34 | 93 | 37.3 | 74 | 165 | 8.358 | 114 | 237 | 2.489 |
| -5 | 23 | 234.9 | 35 | 95 | 35.78 | 75 | 167 | 8.084 | 115 | 239 | 2.422 |
| -4 | 25 | 222.8 | 36 | 97 | 34.32 | 76 | 169 | 7.82 | 116 | 241 | 2.357 |
| -3 | 27 | 211.4 | 37 | 99 | 32.94 | 77 | 171 | 7.566 | 117 | 243 | 2.294 |
| -2 | 28 | 200.7 | 38 | 100 | 31.62 | 78 | 172 | 7.321 | 118 | 244 | 2.233 |
| -1 | 30 | 190.5 | 39 | 102 | 30.36 | 79 | 174 | 7.086 | 119 | 246 | 2.174 |
| 0 | 32 | 180.9 | 40 | 104 | 29.15 | 80 | 176 | 6.859 | 120 | 248 | 2.117 |
| 1 | 34 | 171.9 | 41 | 106 | 28 | 81 | 178 | 6.641 | 121 | 250 | 2.061 |
| 2 | 36 | 163.3 | 42 | 108 | 26.9 | 82 | 180 | 6.43 | 122 | 252 | 2.007 |
| 3 | 37 | 155.2 | 43 | 109 | 25.86 | 83 | 181 | 6.228 | 123 | 253 | 1.955 |
| 4 | 39 | 147.6 | 44 | 111 | 24.85 | 84 | 183 | 6.033 | 124 | 255 | 1.905 |
| 5 | 41 | 140.4 | 45 | 113 | 23.89 | 85 | 185 | 5.844 | 125 | 257 | 1.856 |
| 6 | 43 | 133.5 | 46 | 115 | 22.89 | 86 | 187 | 5.663 | 126 | 259 | 1.808 |
| 7 | 45 | 127.1 | 47 | 117 | 22.1 | 87 | 189 | 5.488 | 127 | 261 | 1.762 |
| 8 | 46 | 121 | 48 | 118 | 21.26 | 88 | 190 | 5.32 | 128 | 262 | 1.717 |
| 9 | 48 | 115.2 | 49 | 120 | 20.46 | 89 | 192 | 5.157 | 129 | 264 | 1.674 |
| 10 | 50 | 109.8 | 50 | 122 | 19.69 | 90 | 194 | 5 | 130 | 266 | 1.632 |
| 11 | 52 | 104.6 | 51 | 124 | 18.96 | 91 | 196 | 4.849 | | | |
| 12 | 54 | 99.69 | 52 | 126 | 18.26 | 92 | 198 | 4.703 | | | |
| 13 | 55 | 95.05 | 53 | 127 | 17.58 | 93 | 199 | 4.562 | | | |
| 14 | 57 | 90.66 | 54 | 129 | 16.94 | 94 | 201 | 4.426 | | | |
| 15 | 59 | 86.49 | 55 | 131 | 16.32 | 95 | 203 | 4.294 | | | |
| 16 | 61 | 82.54 | 56 | 133 | 15.73 | 96 | 205 | 4.167 | | | |
| 17 | 63 | 78.79 | 57 | 135 | 15.16 | 97 | 207 | 4.045 | | | |
| 18 | 64 | 75.24 | 58 | 136 | 14.62 | 98 | 208 | 3.927 | | | |
| 19 | 66 | 71.86 | 59 | 138 | 14.09 | 99 | 210 | 3.812 | | | |

iii) Pressure On Service Port

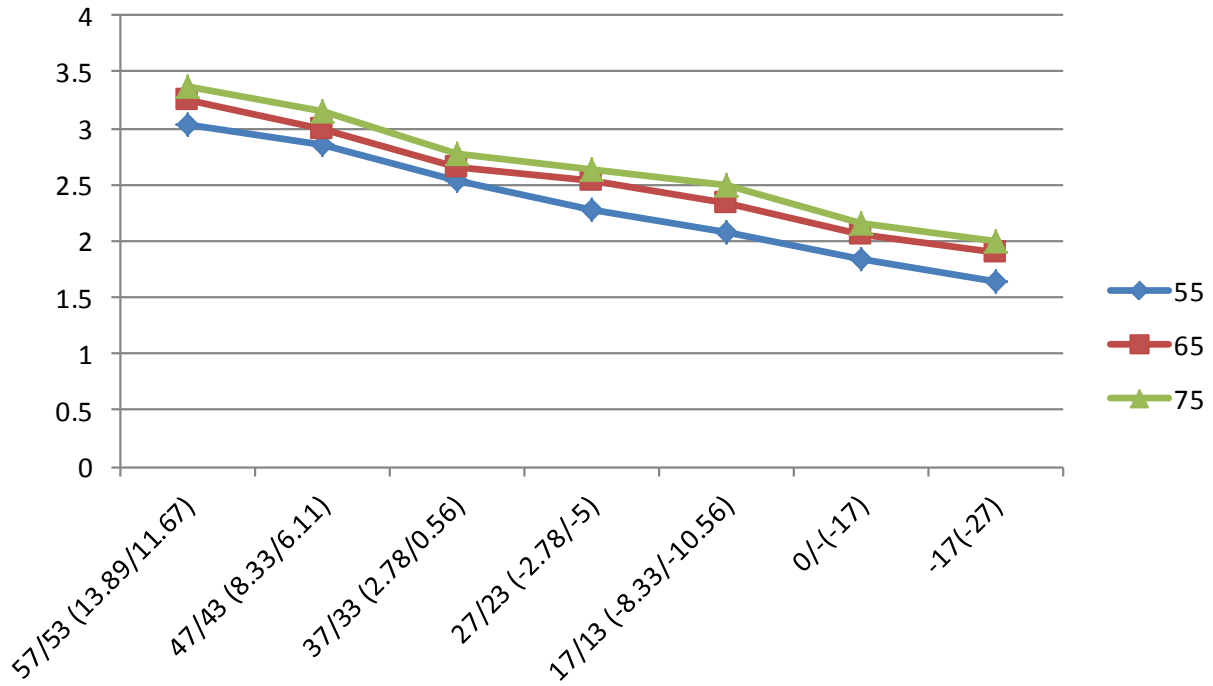
Cooling chart(R410A):

| °F(°C) | ODU(DB) | | 0(-17) | 5(-15) | 15 (9.44) | 45 (7.22) | 75 (23.89) | 85 (29.44) | 95 (35) | 105 (40.56) | 115 (46.11) | 120 (48.89) |
|--------|---------------------|--|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| | IDU(DB/WB) | | | | | | | | | | | |
| BAR | 70/59 (21.11/15) | | 6.4 | 6.5 | 7.3 | 8.0 | 8.2 | 7.8 | 8.1 | 8.6 | 10.1 | 10.6 |
| | 75/63 (23.89/17.22) | | 6.7 | 6.8 | 7.9 | 8.6 | 8.6 | 8.3 | 8.7 | 9.1 | 10.7 | 11.2 |
| | 80/67 (26.67/19.44) | | 7.1 | 7.2 | 8.5 | 9.5 | 9.3 | 8.9 | 9.1 | 9.6 | 11.2 | 11.9 |
| | 90/73 (32.22/22.78) | | 7.7 | 7.8 | 9.6 | 10.5 | 10.3 | 9.5 | 10.0 | 10.6 | 12.4 | 13.0 |
| PSI | 70/59 (21.11/15) | | 93 | 94 | 106 | 116 | 119 | 113 | 117 | 125 | 147 | 154 |
| | 75/63 (23.89/17.22) | | 97 | 99 | 115 | 125 | 124 | 120 | 126 | 132 | 155 | 162 |
| | 80/67 (26.67/19.44) | | 103 | 104 | 123 | 138 | 135 | 129 | 132 | 140 | 162 | 173 |
| | 90/73 (32.22/22.78) | | 112 | 113 | 139 | 152 | 149 | 138 | 145 | 154 | 180 | 189 |
| MPa | 70/59 (21.11/15) | | 0.64 | 0.65 | 0.73 | 0.8 | 0.82 | 0.78 | 0.81 | 0.86 | 1.01 | 1.06 |
| | 75/63 (23.89/17.22) | | 0.67 | 0.68 | 0.79 | 0.86 | 0.86 | 0.83 | 0.87 | 0.91 | 1.07 | 1.12 |
| | 80/67 (26.67/19.44) | | 0.71 | 0.72 | 0.85 | 0.95 | 0.93 | 0.89 | 0.91 | 0.96 | 1.12 | 1.19 |
| | 90/73 (32.22/22.78) | | 0.77 | 0.78 | 0.96 | 1.05 | 1.03 | 0.95 | 1 | 1.06 | 1.24 | 1.3 |



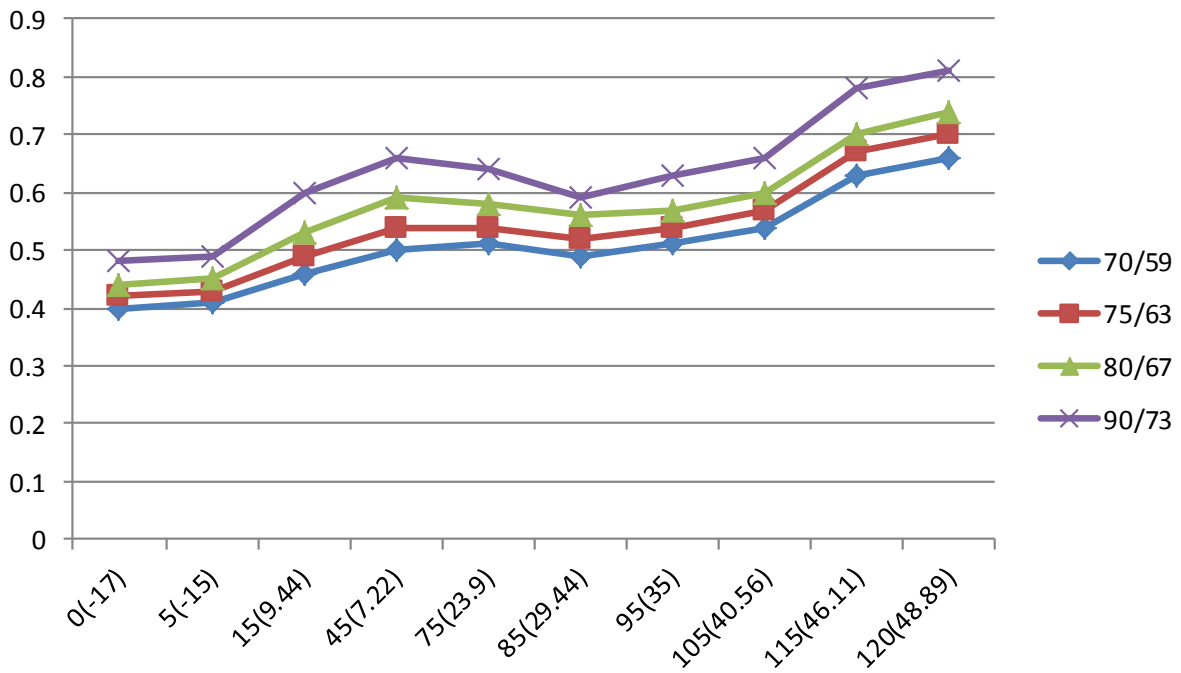
Heating chart(R410A):

| °F(°C) | ODU(DB/WB) | 57/53 (13.89/11.67) | 47/43 (8.33/6.11) | 37/33 (2.78/0.56) | 27/23 (-2.78/-5) | 17/13 (-8.33/ -10.56) | 0/-2 (-17/-19) | -17/-18 (-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|-------------------|----------------------|
| | IDU(DB) | | | | | | | |
| BAR | 55(12.78) | 30.3 | 28.5 | 25.3 | 22.8 | 20.8 | 18.5 | 16.5 |
| | 65(18.33) | 32.5 | 30.0 | 26.6 | 25.4 | 23.3 | 20.5 | 19.0 |
| | 75(23.89) | 33.8 | 31.5 | 27.8 | 26.3 | 24.9 | 21.5 | 20.0 |
| PSI | 55(12.78) | 439 | 413 | 367 | 330 | 302 | 268 | 239 |
| | 65(18.33) | 471 | 435 | 386 | 368 | 339 | 297 | 276 |
| | 75(23.89) | 489 | 457 | 403 | 381 | 362 | 312 | 290 |
| MPa | 55(12.78) | 3.03 | 2.85 | 2.53 | 2.28 | 2.08 | 1.85 | 1.65 |
| | 65(18.33) | 3.25 | 3.00 | 2.66 | 2.54 | 2.33 | 2.05 | 1.90 |
| | 75(23.89) | 3.38 | 3.15 | 2.78 | 2.63 | 2.49 | 2.15 | 2.00 |



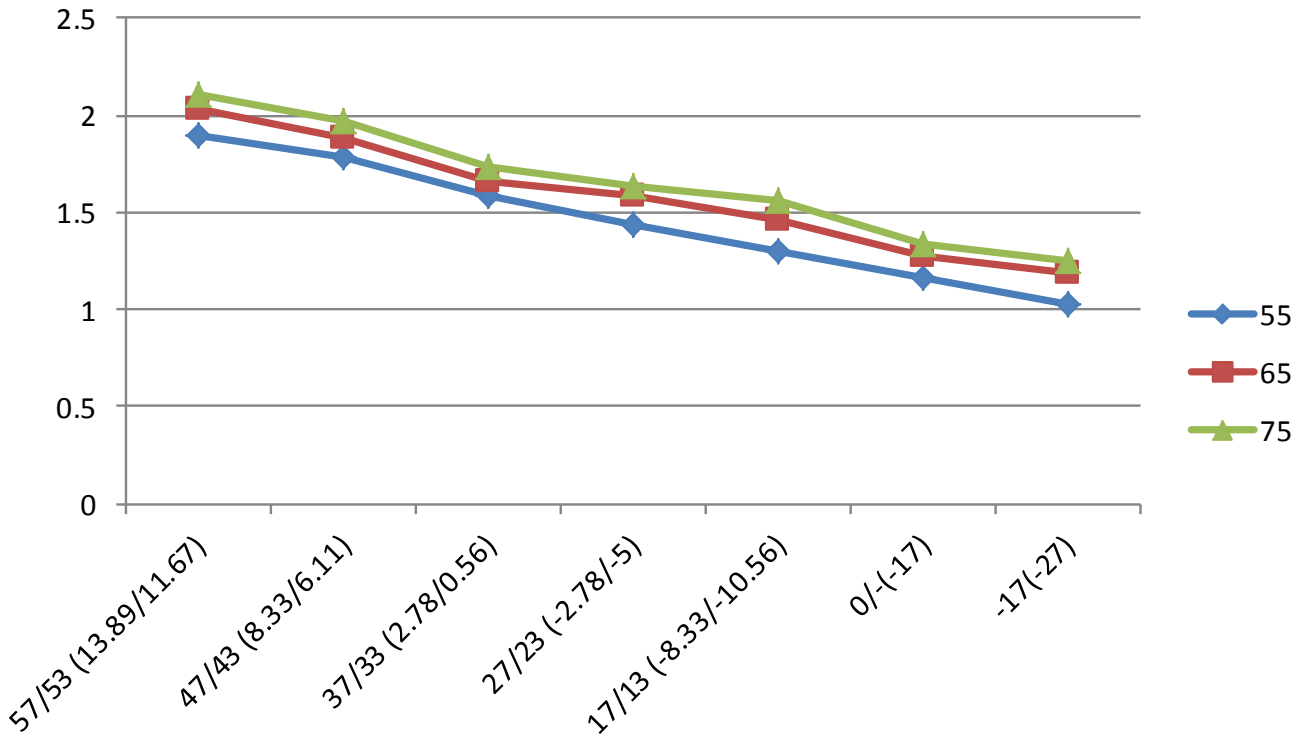
Cooling chart(R22):

| °F(°C) | ODU(DB) | | 0(-17) | 5(-15) | 15 (9.44) | 45 (7.22) | 75 (23.89) | 85 (29.44) | 95 (35) | 105 (40.56) | 115 (46.11) | 120 (48.89) |
|--------|---------------------|--|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| | IDU(DB/WB) | | | | | | | | | | | |
| BAR | 70/59 (21.11/15) | | 4.0 | 4.1 | 4.6 | 5.0 | 5.1 | 4.9 | 5.1 | 5.4 | 6.3 | 6.6 |
| | 75/63 (23.89/17.22) | | 4.2 | 4.3 | 4.9 | 5.4 | 5.4 | 5.2 | 5.4 | 5.7 | 6.7 | 7.0 |
| | 80/67 (26.67/19.44) | | 4.4 | 4.5 | 5.3 | 5.9 | 5.8 | 5.6 | 5.7 | 6.0 | 7.0 | 7.4 |
| | 90/73 (32.22/22.78) | | 4.8 | 4.9 | 6.0 | 6.6 | 6.4 | 5.9 | 6.3 | 6.6 | 7.8 | 8.1 |
| PSI | 70/59 (21.11/15) | | 58 | 59 | 67 | 73 | 74 | 71 | 74 | 78 | 91 | 96 |
| | 75/63 (23.89/17.22) | | 61 | 62 | 71 | 78 | 78 | 75 | 78 | 83 | 97 | 102 |
| | 80/67 (26.67/19.44) | | 64 | 65 | 77 | 86 | 84 | 81 | 83 | 87 | 102 | 107 |
| | 90/73 (32.22/22.78) | | 70 | 71 | 87 | 96 | 93 | 86 | 91 | 96 | 113 | 117 |
| MPa | 70/59 (21.11/15) | | 0.40 | 0.41 | 0.46 | 0.50 | 0.51 | 0.49 | 0.51 | 0.54 | 0.63 | 0.66 |
| | 75/63 (23.89/17.22) | | 0.42 | 0.43 | 0.49 | 0.54 | 0.54 | 0.52 | 0.54 | 0.57 | 0.67 | 0.70 |
| | 80/67 (26.67/19.44) | | 0.44 | 0.45 | 0.53 | 0.59 | 0.58 | 0.56 | 0.57 | 0.60 | 0.70 | 0.74 |
| | 90/73 (32.22/22.78) | | 0.48 | 0.49 | 0.60 | 0.66 | 0.64 | 0.59 | 0.63 | 0.66 | 0.78 | 0.81 |



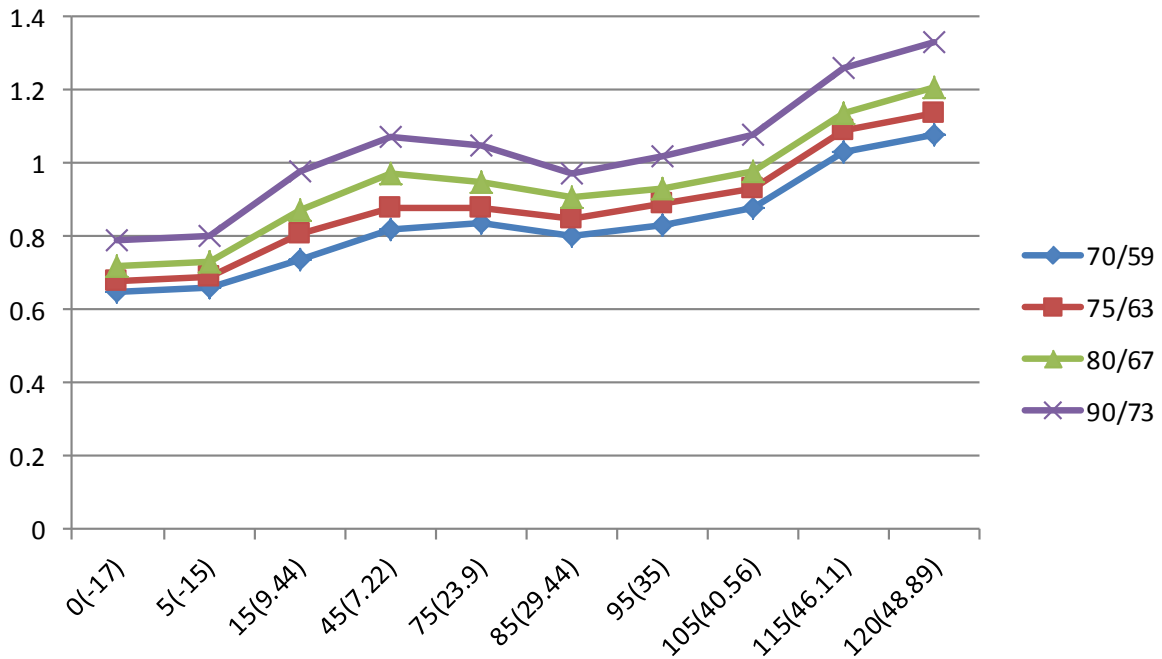
Heating chart(R22):

| °F(°C) | ODU(DB/WB) | 57/53 (13.89/11.67) | 47/43 (8.33/6.11) | 37/33 (2.78/0.56) | 27/23 (-2.78/-5) | 17/13 (-8.33/ -10.56) | 0/-2 (-17/-19) | -17/-18 (-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|-------------------|----------------------|
| | IDU(DB) | | | | | | | |
| BAR | 55(12.78) | 18.9 | 17.8 | 15.8 | 14.3 | 13.0 | 11.6 | 10.3 |
| | 65(18.33) | 20.3 | 18.8 | 16.6 | 15.9 | 14.6 | 12.8 | 11.9 |
| | 75(23.89) | 21.1 | 19.7 | 17.3 | 16.4 | 15.6 | 13.4 | 12.5 |
| PSI | 55(12.78) | 274 | 258 | 229 | 207 | 189 | 168 | 149 |
| | 65(18.33) | 294 | 273 | 241 | 231 | 212 | 186 | 172.6 |
| | 75(23.89) | 306 | 286 | 251 | 238 | 226 | 194 | 181 |
| MPa | 55(12.78) | 1.89 | 1.78 | 1.58 | 1.43 | 1.30 | 1.16 | 1.03 |
| | 65(18.33) | 2.03 | 1.88 | 1.66 | 1.59 | 1.46 | 1.28 | 1.19 |
| | 75(23.89) | 2.11 | 1.97 | 1.73 | 1.64 | 1.56 | 1.34 | 1.25 |



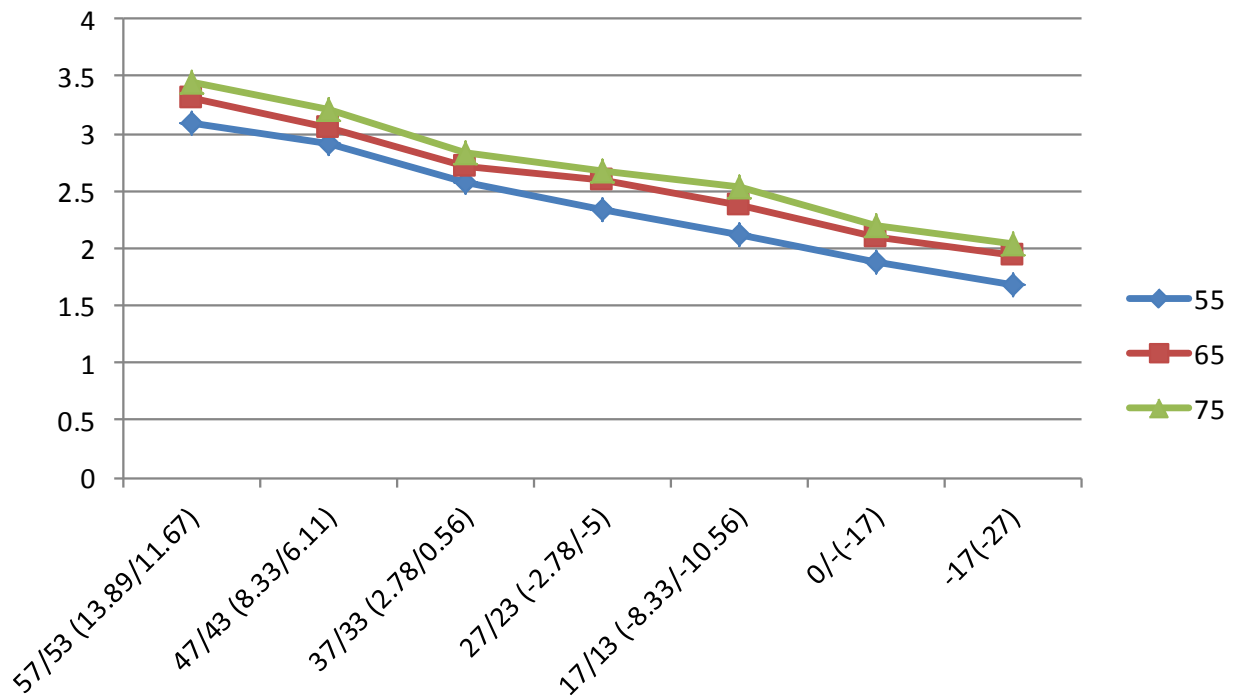
Cooling chart(R32):

| °F(°C) | ODU(DB) | | 0(-17) | 5(-15) | 15 (9.44) | 45 (7.22) | 75 (23.89) | 85 (29.44) | 95 (35) | 105 (40.56) | 115 (46.11) | 120 (48.89) |
|--------|---------------------|--|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| | IDU(DB/WB) | | | | | | | | | | | |
| BAR | 70/59 (21.11/15) | | 6.5 | 6.6 | 7.4 | 8.2 | 8.4 | 8.0 | 8.3 | 8.8 | 10.3 | 10.8 |
| | 75/63 (23.89/17.22) | | 6.8 | 6.9 | 8.1 | 8.8 | 8.8 | 8.5 | 8.9 | 9.3 | 10.9 | 11.4 |
| | 80/67 (26.67/19.44) | | 7.2 | 7.3 | 8.7 | 9.7 | 9.5 | 9.1 | 9.3 | 9.8 | 11.4 | 12.1 |
| | 90/73 (32.22/22.78) | | 7.9 | 8.0 | 9.8 | 10.7 | 10.5 | 9.7 | 10.2 | 10.8 | 12.6 | 13.3 |
| PSI | 70/59 (21.11/15) | | 95 | 96 | 108 | 118 | 121 | 115 | 119 | 128 | 150 | 157 |
| | 75/63 (23.89/17.22) | | 99 | 101 | 117 | 128 | 126 | 122 | 129 | 135 | 158 | 165 |
| | 80/67 (26.67/19.44) | | 105 | 106 | 125 | 141 | 138 | 132 | 135 | 143 | 165 | 176 |
| | 90/73 (32.22/22.78) | | 114 | 115 | 142 | 155 | 152 | 141 | 148 | 157 | 184 | 193 |
| MPa | 70/59 (21.11/15) | | 0.65 | 0.66 | 0.74 | 0.82 | 0.84 | 0.80 | 0.83 | 0.88 | 1.03 | 1.08 |
| | 75/63 (23.89/17.22) | | 0.68 | 0.69 | 0.81 | 0.88 | 0.88 | 0.85 | 0.89 | 0.93 | 1.09 | 1.14 |
| | 80/67 (26.67/19.44) | | 0.72 | 0.73 | 0.87 | 0.97 | 0.95 | 0.91 | 0.93 | 0.98 | 1.14 | 1.21 |
| | 90/73 (32.22/22.78) | | 0.79 | 0.80 | 0.98 | 1.07 | 1.05 | 0.97 | 1.02 | 1.08 | 1.26 | 1.33 |



Heating chart(R32):

| °F(°C) | ODU(DB/WB) | 57/53 (13.89/11.67) | 47/43 (8.33/6.11) | 37/33 (2.78/0.56) | 27/23 (-2.78/-5) | 17/13 (-8.33/ -10.56) | 0/-2 (-17/-19) | -17/-18 (-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|-------------------|----------------------|
| | IDU(DB) | | | | | | | |
| BAR | 55(12.78) | 30.9 | 29.1 | 25.8 | 23.3 | 21.2 | 18.9 | 16.8 |
| | 65(18.33) | 33.2 | 30.6 | 27.1 | 25.9 | 23.8 | 20.9 | 19.4 |
| | 75(23.89) | 34.5 | 32.1 | 28.4 | 26.8 | 25.4 | 21.9 | 20.4 |
| PSI | 55(12.78) | 448 | 421 | 374 | 337 | 308 | 273 | 244 |
| | 65(18.33) | 480 | 444 | 394 | 375 | 346 | 303 | 282 |
| | 75(23.89) | 499 | 466 | 411 | 389 | 369 | 318 | 296 |
| MPa | 55(12.78) | 3.09 | 2.91 | 2.58 | 2.33 | 2.12 | 1.89 | 1.68 |
| | 65(18.33) | 3.32 | 3.06 | 2.71 | 2.59 | 2.38 | 2.09 | 1.94 |
| | 75(23.89) | 3.45 | 3.21 | 2.84 | 2.68 | 2.54 | 2.19 | 2.04 |



System Pressure Table-R22

| Pressure | | | Temperature | | Pressure | | | Temperature | |
|----------|------|--------|-------------|---------|----------|------|--------|-------------|---------|
| Kpa | bar | PSI | °C | °F | Kpa | bar | PSI | °C | °F |
| 100 | 1 | 14.5 | -41.091 | -41.964 | 1600 | 16 | 232 | 41.748 | 107.146 |
| 150 | 1.5 | 21.75 | -32.077 | -25.739 | 1650 | 16.5 | 239.25 | 43.029 | 109.452 |
| 200 | 2 | 29 | -25.177 | -13.319 | 1700 | 17 | 246.5 | 44.281 | 111.706 |
| 250 | 2.5 | 36.25 | -19.508 | -3.114 | 1750 | 17.5 | 253.75 | 45.506 | 113.911 |
| 300 | 3 | 43.5 | -14.654 | 5.623 | 1800 | 18 | 261 | 46.706 | 116.071 |
| 350 | 3.5 | 50.75 | -10.384 | 13.309 | 1850 | 18.5 | 268.25 | 47.882 | 118.188 |
| 400 | 4 | 58 | -6.556 | 20.199 | 1900 | 19 | 275.5 | 49.034 | 120.261 |
| 450 | 4.5 | 65.25 | -3.075 | 26.464 | 1950 | 19.5 | 282.75 | 50.164 | 122.295 |
| 500 | 5 | 72.5 | 0.124 | 32.223 | 2000 | 20 | 290 | 51.273 | 124.291 |
| 550 | 5.5 | 79.75 | 3.091 | 37.563 | 2050 | 20.5 | 297.25 | 52.361 | 126.250 |
| 600 | 6 | 87 | 5.861 | 42.550 | 2100 | 21 | 304.5 | 53.43 | 128.174 |
| 650 | 6.5 | 94.25 | 8.464 | 47.234 | 2150 | 21.5 | 311.75 | 54.48 | 130.064 |
| 700 | 7 | 101.5 | 10.92 | 51.656 | 2200 | 22 | 319 | 55.512 | 131.922 |
| 750 | 7.5 | 108.75 | 13.249 | 55.848 | 2250 | 22.5 | 326.25 | 56.527 | 133.749 |
| 800 | 8 | 116 | 15.465 | 59.837 | 2300 | 23 | 333.5 | 57.526 | 135.547 |
| 850 | 8.5 | 123.25 | 17.58 | 63.644 | 2350 | 23.5 | 340.75 | 58.508 | 137.314 |
| 900 | 9 | 130.5 | 19.604 | 67.287 | 2400 | 24 | 348 | 59.475 | 139.055 |
| 950 | 9.5 | 137.75 | 21.547 | 70.785 | 2450 | 24.5 | 355.25 | 60.427 | 140.769 |
| 1000 | 10 | 145 | 23.415 | 74.147 | 2500 | 25 | 362.5 | 61.364 | 142.455 |
| 1050 | 10.5 | 152.25 | 25.216 | 77.389 | 2550 | 25.5 | 369.75 | 62.288 | 144.118 |
| 1100 | 11 | 159.5 | 26.953 | 80.515 | 2600 | 26 | 377 | 63.198 | 145.756 |
| 1150 | 11.5 | 166.75 | 28.634 | 83.541 | 2650 | 26.5 | 384.25 | 64.095 | 147.371 |
| 1200 | 12 | 174 | 30.261 | 86.470 | 2700 | 27 | 391.5 | 64.98 | 148.964 |
| 1250 | 12.5 | 181.25 | 31.839 | 89.310 | 2750 | 27.5 | 398.75 | 65.852 | 150.534 |
| 1300 | 13 | 188.5 | 33.371 | 92.068 | 2800 | 28 | 406 | 66.712 | 152.082 |
| 1350 | 13.5 | 195.75 | 34.86 | 94.748 | 2850 | 28.5 | 413.25 | 67.561 | 153.610 |
| 1400 | 14 | 203 | 36.308 | 97.354 | 2900 | 29 | 420.5 | 68.399 | 155.118 |
| 1450 | 14.5 | 210.25 | 37.719 | 99.894 | 2950 | 29.5 | 427.75 | 69.226 | 156.607 |
| 1500 | 15 | 217.5 | 39.095 | 102.371 | 3000 | 30 | 435 | 70.042 | 158.076 |
| 1550 | 15.5 | 224.75 | 40.437 | 104.787 | | | | | |

System Pressure Table-R410A

| Pressure | | | Temperature | | Pressure | | | Temperature | |
|----------|------|--------|-------------|---------|----------|------|--------|-------------|---------|
| Kpa | bar | PSI | °C | °F | Kpa | bar | PSI | °C | °F |
| 100 | 1 | 14.5 | -51.623 | -60.921 | 2350 | 23.5 | 340.75 | 38.817 | 101.871 |
| 150 | 1.5 | 21.75 | -43.327 | -45.989 | 2400 | 24 | 348 | 39.68 | 103.424 |
| 200 | 2 | 29 | -36.992 | -34.586 | 2450 | 24.5 | 355.25 | 40.531 | 104.956 |
| 250 | 2.5 | 36.25 | -31.795 | -25.231 | 2500 | 25 | 362.5 | 41.368 | 106.462 |
| 300 | 3 | 43.5 | -27.351 | -17.232 | 2550 | 25.5 | 369.75 | 42.192 | 107.946 |
| 350 | 3.5 | 50.75 | -23.448 | -10.206 | 2600 | 26 | 377 | 43.004 | 109.407 |
| 400 | 4 | 58 | -19.953 | -3.915 | 2650 | 26.5 | 384.25 | 43.804 | 110.847 |
| 450 | 4.5 | 65.25 | -16.779 | 1.798 | 2700 | 27 | 391.5 | 44.592 | 112.266 |
| 500 | 5 | 72.5 | -13.863 | 7.047 | 2750 | 27.5 | 398.75 | 45.37 | 113.666 |
| 550 | 5.5 | 79.75 | -11.162 | 11.908 | 2800 | 28 | 406 | 46.136 | 115.045 |
| 600 | 6 | 87 | -8.643 | 16.444 | 2850 | 28.5 | 413.25 | 46.892 | 116.406 |
| 650 | 6.5 | 94.25 | -6.277 | 20.701 | 2900 | 29 | 420.5 | 47.638 | 117.748 |
| 700 | 7 | 101.5 | -4.046 | 24.716 | 2950 | 29.5 | 427.75 | 48.374 | 119.073 |
| 750 | 7.5 | 108.75 | -1.933 | 28.521 | 3000 | 30 | 435 | 49.101 | 120.382 |
| 800 | 8 | 116 | 0.076 | 32.137 | 3050 | 30.5 | 442.25 | 49.818 | 121.672 |
| 850 | 8.5 | 123.25 | 1.993 | 35.587 | 3100 | 31 | 449.5 | 50.525 | 122.945 |
| 900 | 9 | 130.5 | 3.826 | 38.888 | 3150 | 31.5 | 456.75 | 51.224 | 124.203 |
| 950 | 9.5 | 137.75 | 5.584 | 42.052 | 3200 | 32 | 464 | 51.914 | 125.445 |
| 1000 | 10 | 145 | 7.274 | 45.093 | 3250 | 32.5 | 471.25 | 52.596 | 126.673 |
| 1050 | 10.5 | 152.25 | 8.901 | 48.022 | 3300 | 33 | 478.5 | 53.27 | 127.886 |
| 1100 | 11 | 159.5 | 10.471 | 50.848 | 3350 | 33.5 | 485.75 | 53.935 | 129.083 |
| 1150 | 11.5 | 166.75 | 11.988 | 53.578 | 3400 | 34 | 493 | 54.593 | 130.267 |
| 1200 | 12 | 174 | 13.457 | 56.223 | 3450 | 34.5 | 500.25 | 55.243 | 131.437 |
| 1250 | 12.5 | 181.25 | 14.879 | 58.782 | 3500 | 35 | 507.5 | 55.885 | 132.593 |
| 1300 | 13 | 188.5 | 16.26 | 61.268 | 3550 | 35.5 | 514.75 | 56.52 | 133.736 |
| 1350 | 13.5 | 195.75 | 17.602 | 63.684 | 3600 | 36 | 522 | 57.148 | 134.866 |
| 1400 | 14 | 203 | 18.906 | 66.031 | 3650 | 36.5 | 529.25 | 57.769 | 135.984 |
| 1450 | 14.5 | 210.25 | 20.176 | 68.317 | 3700 | 37 | 536.5 | 58.383 | 137.089 |
| 1500 | 15 | 217.5 | 21.414 | 70.545 | 3750 | 37.5 | 543.75 | 58.99 | 138.182 |
| 1550 | 15.5 | 224.75 | 22.621 | 72.718 | 3800 | 38 | 551 | 59.591 | 139.264 |
| 1600 | 16 | 232 | 23.799 | 74.838 | 3850 | 38.5 | 558.25 | 60.185 | 140.333 |
| 1650 | 16.5 | 239.25 | 24.949 | 76.908 | 3900 | 39 | 565.5 | 60.773 | 141.391 |
| 1700 | 17 | 246.5 | 26.074 | 78.933 | 3950 | 39.5 | 572.75 | 61.355 | 142.439 |
| 1750 | 17.5 | 253.75 | 27.174 | 80.913 | 4000 | 40 | 580 | 61.93 | 143.474 |
| 1800 | 18 | 261 | 28.251 | 82.852 | 4050 | 40.5 | 587.25 | 62.499 | 144.498 |
| 1850 | 18.5 | 268.25 | 29.305 | 84.749 | 4100 | 41 | 594.5 | 63.063 | 145.513 |
| 1900 | 19 | 275.5 | 30.338 | 86.608 | 4150 | 41.5 | 601.75 | 63.62 | 146.516 |
| 1950 | 19.5 | 282.75 | 31.351 | 88.432 | 4200 | 42 | 609 | 64.172 | 147.510 |
| 2000 | 20 | 290 | 32.344 | 90.219 | 4250 | 42.5 | 616.25 | 64.719 | 148.494 |
| 2050 | 20.5 | 297.25 | 33.319 | 91.974 | 4300 | 43 | 623.5 | 65.259 | 149.466 |
| 2100 | 21 | 304.5 | 34.276 | 93.697 | 4350 | 43.5 | 630.75 | 65.795 | 150.431 |
| 2150 | 21.5 | 311.75 | 35.215 | 95.387 | 4400 | 44 | 638 | 66.324 | 151.383 |
| 2200 | 22 | 319 | 36.139 | 97.050 | 4450 | 44.5 | 645.25 | 66.849 | 152.328 |
| 2250 | 22.5 | 326.25 | 37.047 | 98.685 | 4500 | 45 | 652.5 | 67.368 | 153.262 |
| 2300 | 23 | 333.5 | 37.939 | 100.290 | | | | | |

System Pressure Table-R32

| Pressure | | | Temperature | | Pressure | | | Temperature | |
|----------|------|--------|-------------|---------|----------|------|--------|-------------|---------|
| Kpa | bar | PSI | °C | °F | Kpa | bar | PSI | °C | °F |
| 100 | 1 | 14.5 | -51.909 | -61.436 | 1850 | 18.5 | 268.25 | 28.425 | 83.165 |
| 150 | 1.5 | 21.75 | -43.635 | -46.543 | 1900 | 19 | 275.5 | 29.447 | 85.005 |
| 200 | 2 | 29 | -37.323 | -35.181 | 1950 | 19.5 | 282.75 | 30.448 | 86.806 |
| 250 | 2.5 | 36.25 | -32.15 | -25.87 | 2000 | 20 | 290 | 31.431 | 88.576 |
| 300 | 3 | 43.5 | -27.731 | -17.916 | 2050 | 20.5 | 297.25 | 32.395 | 90.311 |
| 350 | 3.5 | 50.75 | -23.85 | -10.93 | 2100 | 21 | 304.5 | 33.341 | 92.014 |
| 400 | 4 | 58 | -20.378 | -4.680 | 2150 | 21.5 | 311.75 | 34.271 | 93.688 |
| 450 | 4.5 | 65.25 | -17.225 | 0.995 | 2200 | 22 | 319 | 35.184 | 95.331 |
| 500 | 5 | 72.5 | -14.331 | 6.204 | 2250 | 22.5 | 326.25 | 36.082 | 96.948 |
| 550 | 5.5 | 79.75 | -11.65 | 11.03 | 2300 | 23 | 333.5 | 36.965 | 98.537 |
| 600 | 6 | 87 | -9.150 | 15.529 | 2350 | 23.5 | 340.75 | 37.834 | 100.101 |
| 650 | 6.5 | 94.25 | -6.805 | 19.752 | 2400 | 24 | 348 | 38.688 | 101.638 |
| 700 | 7 | 101.5 | -4.593 | 23.734 | 2450 | 24.5 | 355.25 | 39.529 | 103.152 |
| 750 | 7.5 | 108.75 | -2.498 | 27.505 | 2500 | 25 | 362.5 | 40.358 | 104.644 |
| 800 | 8 | 116 | -0.506 | 31.089 | 2550 | 25.5 | 369.75 | 41.173 | 106.111 |
| 850 | 8.5 | 123.25 | 1.393 | 34.507 | 2600 | 26 | 377 | 41.977 | 107.559 |
| 900 | 9 | 130.5 | 3.209 | 37.777 | 2650 | 26.5 | 384.25 | 42.769 | 108.984 |
| 950 | 9.5 | 137.75 | 4.951 | 40.911 | 2700 | 27 | 391.5 | 43.55 | 110.39 |
| 1000 | 10 | 145 | 6.624 | 43.923 | 2750 | 27.5 | 398.75 | 44.32 | 111.776 |
| 1050 | 10.5 | 152.25 | 8.235 | 46.823 | 2800 | 28 | 406 | 45.079 | 113.142 |
| 1100 | 11 | 159.5 | 9.790 | 49.621 | 2850 | 28.5 | 413.25 | 45.828 | 114.490 |
| 1150 | 11.5 | 166.75 | 11.291 | 52.324 | 2900 | 29 | 420.5 | 46.567 | 115.821 |
| 1200 | 12 | 174 | 12.745 | 54.941 | 2950 | 29.5 | 427.75 | 47.296 | 117.133 |
| 1250 | 12.5 | 181.25 | 14.153 | 57.475 | 3000 | 30 | 435 | 48.015 | 118.427 |
| 1300 | 13 | 188.5 | 15.52 | 59.936 | 3050 | 30.5 | 442.25 | 48.726 | 119.707 |
| 1350 | 13.5 | 195.75 | 16.847 | 62.325 | 3100 | 31 | 449.5 | 49.428 | 120.970 |
| 1400 | 14 | 203 | 18.138 | 64.648 | 3150 | 31.5 | 456.75 | 50.121 | 122.218 |
| 1450 | 14.5 | 210.25 | 19.395 | 66.911 | 3200 | 32 | 464 | 50.806 | 123.451 |
| 1500 | 15 | 217.5 | 20.619 | 69.114 | 3250 | 32.5 | 471.25 | 51.482 | 124.668 |
| 1550 | 15.5 | 224.75 | 21.813 | 71.263 | 3300 | 33 | 478.5 | 52.15 | 125.87 |
| 1600 | 16 | 232 | 22.978 | 73.360 | 3350 | 33.5 | 485.75 | 52.811 | 127.060 |
| 1650 | 16.5 | 239.25 | 24.116 | 75.409 | 3400 | 34 | 493 | 53.464 | 128.235 |
| 1700 | 17 | 246.5 | 25.229 | 77.412 | 3450 | 34.5 | 500.25 | 54.11 | 129.398 |
| 1750 | 17.5 | 253.75 | 26.317 | 79.371 | 3500 | 35 | 507.5 | 54.748 | 130.546 |
| 1800 | 18 | 261 | 27.382 | 81.288 | | | | | |