

Contents

| | | |
|-------|--|----|
| I. | Safety Precautions..... | 1 |
| II. | IDU Dimensions | 3 |
| | 1. TMVW wall-mounted unit - outline drawing | 3 |
| | 2. TMCS one-way cassette IDU – outline drawing..... | 4 |
| | 3. TMCD two-way cassette IDU – outline drawing..... | 5 |
| | 4. TMCF four-way cassette IDU - outline drawing..... | 6 |
| | 5. TMDN slim/standard duct IDU - outline drawing..... | 8 |
| | 6. TMDH high static pressure duct IDU - outline drawing | 10 |
| | 7. TMVX ceiling exposed IDU - outline drawing | 11 |
| | 8. TMDF fresh air processing unit – outline drawing..... | 12 |
| III. | IDU Installation | 14 |
| | 1. Installation of TMVW wall-mounted unit | 14 |
| | 2. Installation of TMCS one-way/TMCD two-way cassette IDU - outline drawing..... | 15 |
| | 3. Installation of TMCF four-way cassette IDU | 17 |
| | 4. Installation of TMDN/TMDH duct IDU | 20 |
| | 5. Installation of TMVX floor ceiling IDU | 21 |
| | 6. Installation of TMDF fresh air processing unit | 21 |
| | 7. Duct preparation and installation | 24 |
| | 8. Selection and installation of IDU electronic expansion valve module | 25 |
| IV. | Refrigerant Pipe Connection | 26 |
| | 1. Principles of refrigerant pipe connection | 26 |
| | 2. Connection to flared joint of refrigerant pipe..... | 26 |
| | 3. Welding of refrigerant pipe..... | 27 |
| | 4. Blowing of refrigerant pipe | 27 |
| | 5. Leakage detecting and insulation of refrigerant pipe..... | 29 |
| V. | Drain Pipe Installation | 30 |
| | 1. Precautions | 30 |
| | 2. Drainage pipe connection | 30 |
| | 3. Centralized drainage | 31 |
| | 4. Drainage test..... | 31 |
| VI. | Electric Control Installation | 34 |
| | 1. Power cable specifications and precautions..... | 34 |
| | 2. Communications cable specifications and precautions..... | 34 |
| VII. | IDU Code Settings | 37 |
| | 1. S1: IDU capacity code..... | 37 |
| | 2. S2: Address DIP | 38 |
| | 3. S3: Model, functional DIP | 38 |
| VIII. | Precautions When Using/Maintaining Air Conditioner..... | 39 |
| | 1. Precautions for air conditioner usage | 39 |
| | 2. Precautions for air conditioner maintenance | 39 |
| | 3. Troubleshooting non-air conditioner faults | 40 |
| | 4. Troubleshooting air conditioner faults | 40 |

I. Safety Precautions



Caution: Read this manual carefully before installation and use of the unit.

This installation manual is applied to TICA TIMS series inverter VRF air conditioning indoor units. The manual is subject to change based on improvement on air conditioners without further notice.

Preparations before installation

- Ask the professional technician who has obtained a qualification certificate for air conditioner installation to install the unit. Users are not allowed to install, repair or relocate the air conditioner independently.
- Ask the professional electrician who has obtained a qualification certificate to connect electric wires, check whether the line capacity is enough, and whether power cords are damaged, etc.
- Install the air conditioning unit following this document. Improper installation may result in water leakage, electric shock or fire.

Precautions during installation

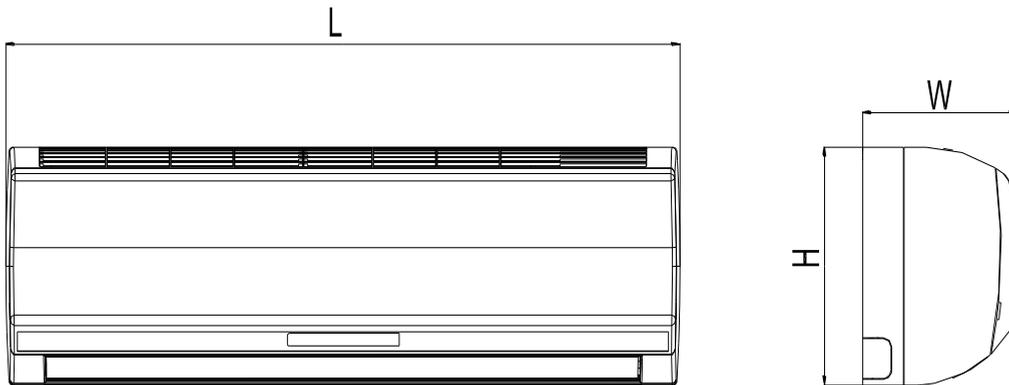
- Places unsuitable for installation:
 - ◆ The place where flammable gases or volatile combustibles (e.g., gasoline and combustible dust) may leak and lead to a fire;
 - ◆ The place where acid or alkaline substance or corrosive gas (e.g., sulfur dioxide and hydrogen sulfide) may be produced, easily corroding the unit and leading to refrigerant leakage;
 - ◆ The place where dust, steam, lampblack or special spraying agent is diffused, e.g., a kitchen.
- Set a dedicated circuit that complies with the "Electrical equipment engineering standards" and "Indoor electrical wiring specifications".
- The unit must be properly grounded. The grounding wire must be reliably connected to the earth. Do not connect the grounding wire to the water pipe, gas pipe, and telephone line.
- Use the power cords with enough current capacity and rated power. Do not make the power cords too tight.
- All the IDUs and ODUs of the same system must be supplied with power simultaneously.
- Securely fix the power cords so that external force is not imposed on the terminal board. If the power cords are not securely connected or fixed, heat is generated, which will cause electric shock or fire.
- Electric parts of the unit shall be moisture-proof and far away from the water source. Do not install the wired controller at the places where the flammable gas, sulfide gas, or engine oil is accessible.
- Install the drainage pipe according to this manual. Ensure that water will drain smoothly. Take thermal insulation measures well. Prevent generation of condensing water.
- When the unit is installed in a small room, take necessary measures to prevent refrigerant concentration from exceeding the limit in case refrigerant leaks.
- During installation, if refrigerant leaks, ventilate the room because toxic gas may be generated when refrigerant encounters fire.
- After installation, make an air tightness test to check for leak.
- For air conditioning units adopting the R410A refrigerant, use the tools and accessories dedicated to R410A.

Precautions at trial operation

- Do not operate the wired controller or remote controller with wet hands. Prevent water from entering the wired controller or remote controller.
- Do not pull hard or bend the cable of the wired controller or centralized wired controller. Do not press the buttons with a sharp object. Otherwise, the buttons may be faulty.
- Do not put your fingers, sticks or any other object into the air inlet or outlet of a running unit.
- Do not touch refrigerant pipeline during operation or just at the end of operation, to avoid injury from the hot/cold pipeline.
- Do not turn off the power right after the unit stops running. Wait at least for five minutes; otherwise, water leakage may occur.

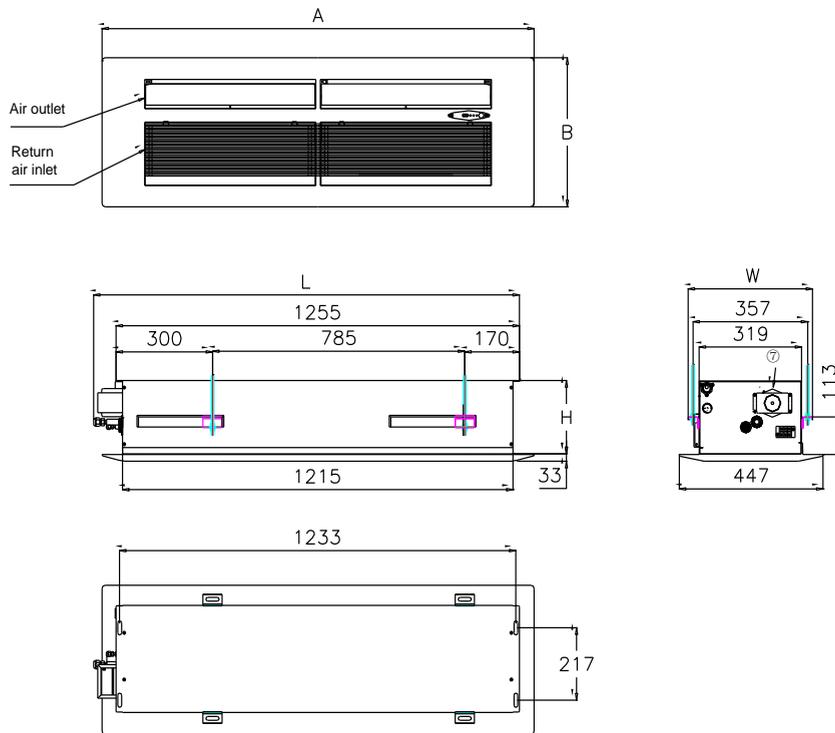
II. IDU Dimensions

1. TMVW wall-mounted unit - outline drawing



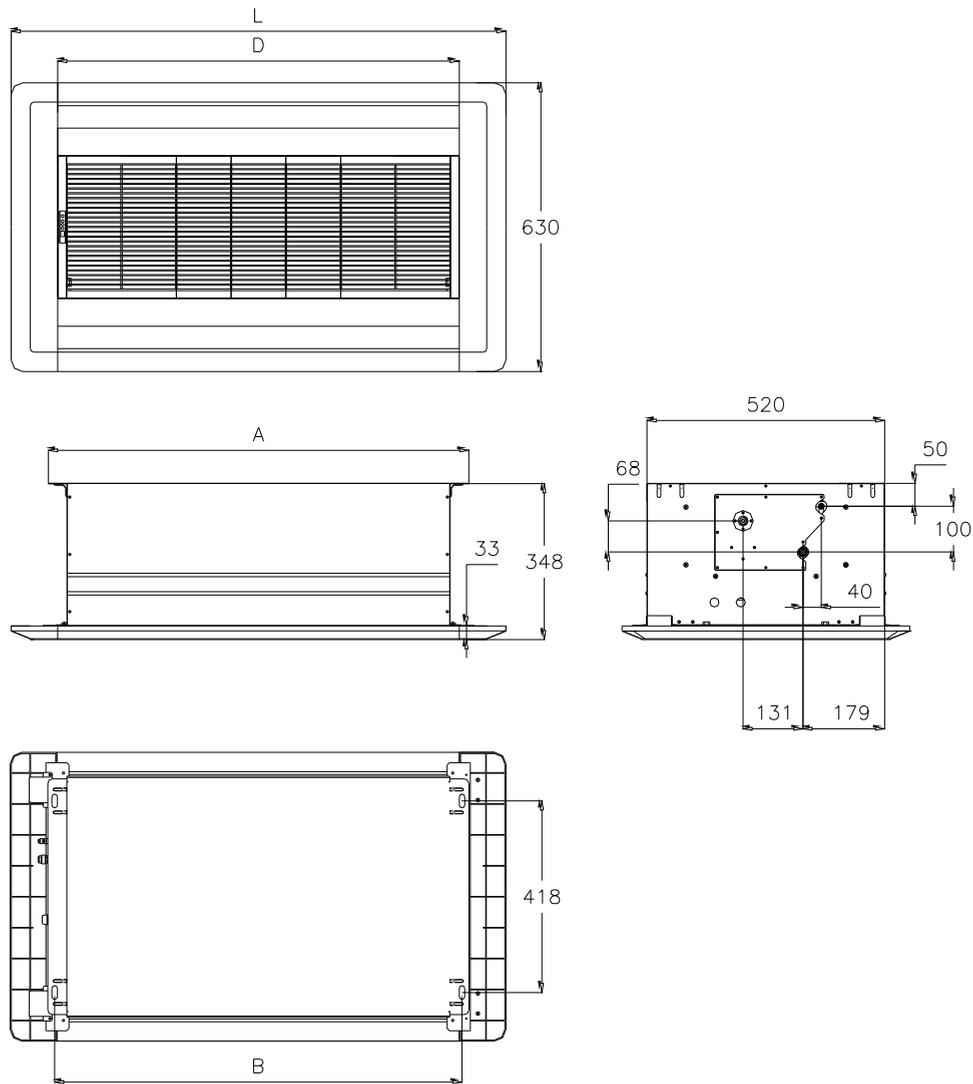
| Model | L (mm) | W (mm) | H (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) |
|-----------|-----------|-----------|-----------|--|---------------------|------------------|
| TMVW028AB | 970 | 235 | 315 | φ20 | φ6.35 | φ12.7 |
| TMVW036AB | | | | | | |
| TMVW040AB | | | | | | |
| TMVW056AB | | | | | | |
| TMVW063AB | 1100 | 235 | 330 | | | φ15.88 |
| TMVW071AB | | | | | | |

2. TMCS one-way cassette IDU – outline drawing



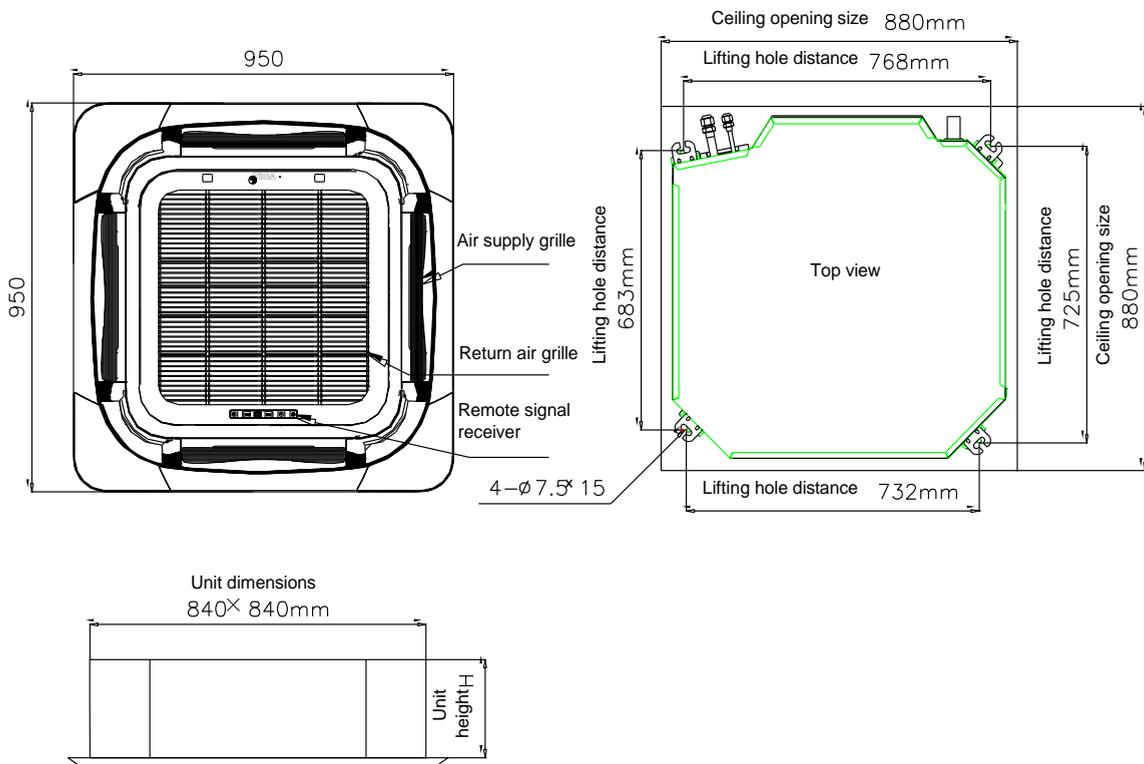
| Model | A (mm) | B (mm) | L (mm) | W (mm) | H (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) |
|----------|--------|--------|--------|--------|--------|--|------------------|---------------|
| TMCS028A | 1070 | 520 | 870 | 250 | 460 | φ20 | φ6.35 | φ12.7 |
| TMCS036A | | | | | | | | |
| TMCS045A | | | | | | | | |
| TMCS056A | 1380 | 550 | 1180 | 290 | 495 | φ20 | φ9.52 | φ15.88 |
| TMCS071A | | | | | | | φ9.52 | φ15.88 |

3. TMCD two-way cassette IDU – outline drawing



| Model | A (mm) | B (mm) | D (mm) | L (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) |
|----------|--------|--------|--------|--------|--|------------------|---------------|
| TMCD028A | 840 | 892 | 881 | 1083 | φ20 | φ6.35 | φ12.7 |
| TMCD036A | | | | | | | |
| TMCD045A | 960 | 1012 | 1001 | 1203 | | | |
| TMCD056A | | | | | | | |
| TMCD071A | 1200 | 1252 | 1241 | 1443 | | | |
| TMCD080A | | | | | | | |
| TMCD090A | 1680 | 1492 | 1481 | 1923 | | φ9.52 | φ15.88 |
| TMCD100A | | | | | | | |
| TMCD125A | | | | | | | |
| TMCD140A | | | | | | | |

4. TMCF four-way cassette IDU - outline drawing

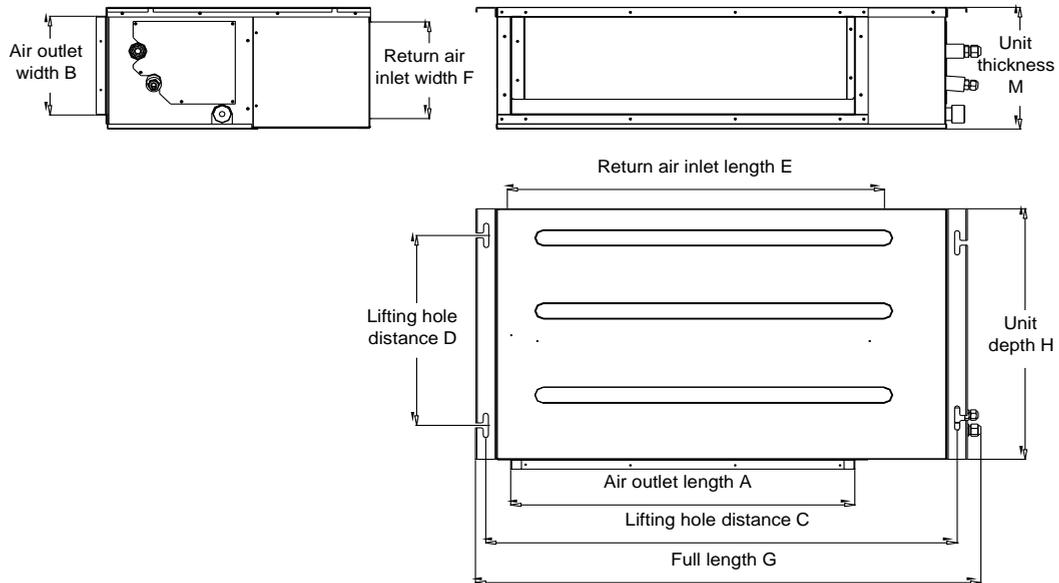


Note: The "top view" in this drawing is the actual top view of the unit. For drilling hole in ceiling, refer to the "bottom view" in the delivery-attached drilling installation guide.

| Model | Unit height H (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) |
|-----------|--------------------|---|------------------|---------------|
| TMCF028AB | 230 | $\phi 32$ Note: For TMCF unit, the outer diameter of condensate drain pipe is $\phi 32$. A $\phi 32$ -to- $\phi 25$ hose for drainage is provided, but the $\phi 25$ drainage pipe should be prepared separately. | $\phi 6.35$ | $\phi 12.7$ |
| TMCF036AB | | | | |
| TMCF045AB | | | | |
| TMCF050AB | | | | |
| TMCF056AB | | | | |
| TMCF063AB | | | | |
| TMCF071AB | | | | |
| TMCF080AB | 300 | | $\phi 9.52$ | $\phi 15.88$ |
| TMCF090AB | | | | |
| TMCF100AB | | | | |
| TMCF112AB | | | | |
| TMCF125AB | | | | |
| TMCF140AB | | | | |
| TMCF160AB | | | | |

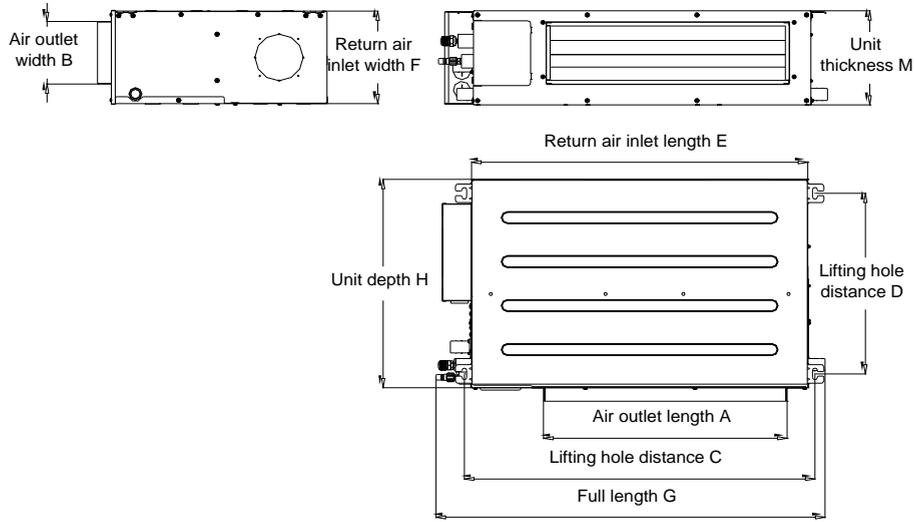
5. TMDN slim/standard duct IDU - outline drawing

B series



| Model | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) | G (mm) | H (mm) | M (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) | | | | |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|---------------|--------------|--|-------------|-------------|
| TMDN022AB | 673 | 200 | 920 | 290 | 738 | 199 | 988 | 515 | 250 | Note: For TMDN-AB series unit, the outer diameter of condensate drain pipe is $\phi 32$. A $\phi 32$ -to- $\phi 25$ hose for drainage is provided, but the $\phi 25$ drainage pipe should be prepared separately. | $\phi 6.35$ | $\phi 12.7$ | | | | |
| TMDN025AB | | | | | | | | | | | | | | | | |
| TMDN028AB | | | | | | | | | | | | | | | | |
| TMDN032AB | | | | | | | | | | | | | | | | |
| TMDN036AB | | | | | | | | | | | | | | | | |
| TMDN040AB | | | | | | | | | | | | | | | | |
| TMDN045AB | 843 | 200 | 1090 | 290 | 908 | 199 | 1158 | 515 | 250 | | Note: For TMDN-AB series unit, the outer diameter of condensate drain pipe is $\phi 32$. A $\phi 32$ -to- $\phi 25$ hose for drainage is provided, but the $\phi 25$ drainage pipe should be prepared separately. | $\phi 6.35$ | $\phi 12.7$ | | | |
| TMDN050AB | | | | | | | | | | | | | | | | |
| TMDN056AB | | | | | | | | | | | | | | | | |
| TMDN063AB | | | | | | | | | | | | | | | | |
| TMDN071AB | 1143 | 200 | 1390 | 290 | 1208 | 199 | 1458 | 515 | 250 | | | | | Note: For TMDN-AB series unit, the outer diameter of condensate drain pipe is $\phi 32$. A $\phi 32$ -to- $\phi 25$ hose for drainage is provided, but the $\phi 25$ drainage pipe should be prepared separately. | $\phi 6.35$ | $\phi 12.7$ |
| TMDN080AB | | | | | | | | | | | | | | | | |
| TMDN090AB | | | | | | | | | | | | | | | | |
| TMDN100AB | 1143 | 242 | 1390 | 329 | 1208 | 241 | 1458 | 557 | 292 | Note: For TMDN-AB series unit, the outer diameter of condensate drain pipe is $\phi 32$. A $\phi 32$ -to- $\phi 25$ hose for drainage is provided, but the $\phi 25$ drainage pipe should be prepared separately. | | $\phi 9.52$ | $\phi 15.88$ | | | |
| TMDN112AB | | | | | | | | | | | | | | | | |
| TMDN125AB | | | | | | | | | | | | | | | | |
| TMDN140AB | | | | | | | | | | | | | | | | |

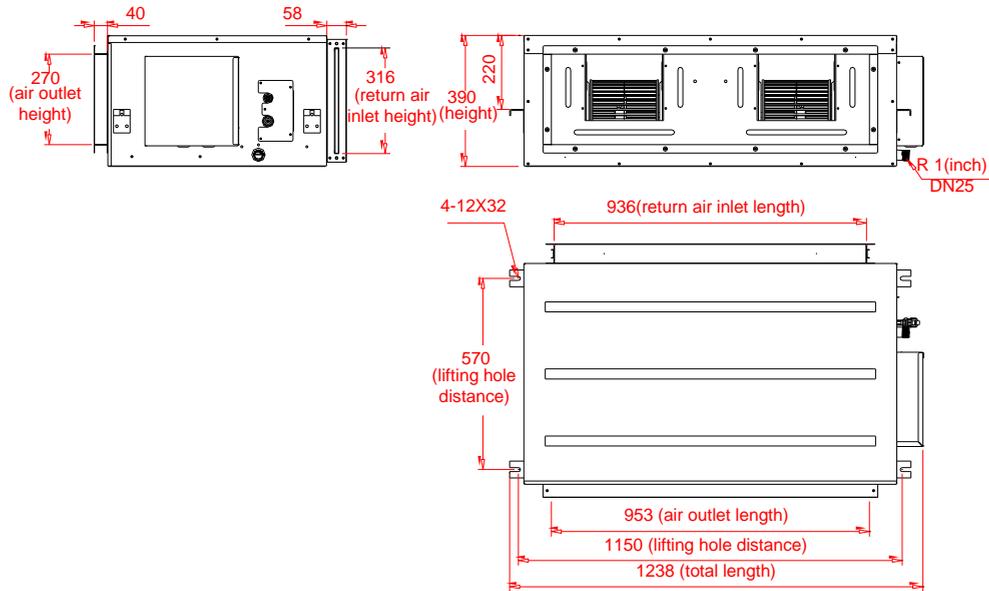
C series



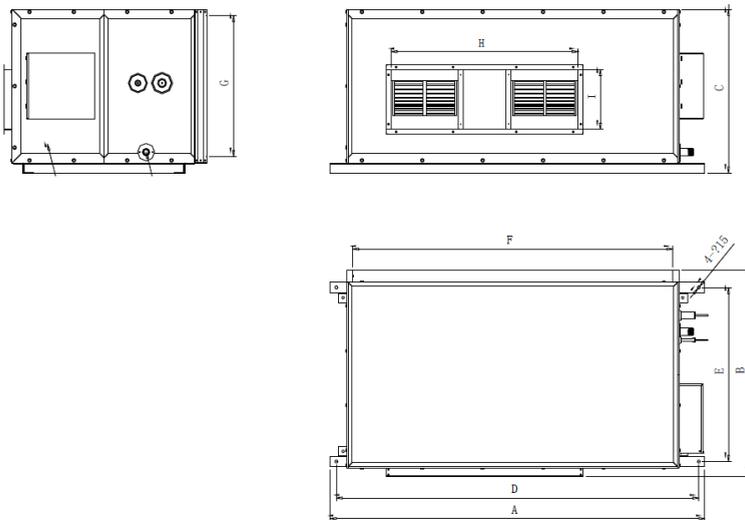
| Model | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) | G (mm) | H (mm) | M (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|------------------|---------------|
| TMDN022AC | 510 | 135 | 730 | 390 | 700 | 200 | 810 | 450 | 200 | φ25 | φ6.35 | φ9.52 |
| TMDN025AC | | | | | | | | | | | | φ12.7 |
| TMDN028AC | | | | | | | | | | | | |
| TMDN032AC | | | | | | | | | | | | |
| TMDN036AC | | | | | | | | | | | | 730 |
| TMDN040AC | | | | | | | | | | | | |
| TMDN045AC | | | | | | | | | | | | |
| TMDN050AC | | | | | | | | | | | | |
| TMDN056AC | 950 | 135 | 1170 | 390 | 1140 | 200 | 1250 | 200 | φ25 | φ6.35 | φ12.7 | |
| TMDN063AC | | | | | | | | | | | | |
| TMDN071AC | | | | | | | | | | | | φ9.52 |

6. TMDH high static pressure duct IDU - outline drawing

B series, Model:TMDH100AB/TMDH112AB/TMDH125AB/TMDH140AB

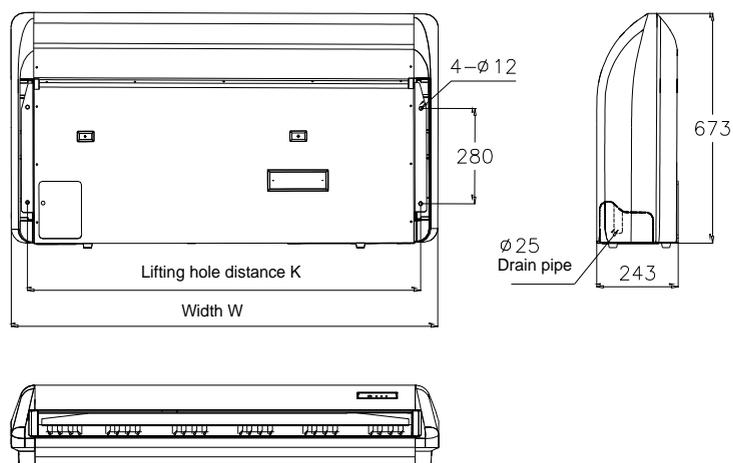


BI series, Model:TMDH200/250/335/400/450/500/560/615BI



| Model | A(mm) | B(mm) | C(mm) | D(mm) | E(mm) | F(mm) | G(mm) | H(mm) | I(mm) |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| TMDH200BI | 1410 | 906 | 590 | 1350 | 750 | 1140 | 480 | 820 | 150 |
| TMDH250BI | 1410 | 906 | 590 | 1350 | 750 | 1140 | 480 | 820 | 150 |
| TMDH335BI | 1860 | 1006 | 800 | 1800 | 850 | 1590 | 690 | 930 | 291 |
| TMDH400BI | 1860 | 1006 | 800 | 1800 | 850 | 1590 | 690 | 930 | 291 |
| TMDH450BI | 1860 | 1006 | 800 | 1800 | 850 | 1590 | 690 | 930 | 291 |
| TMDH500BI | 1860 | 1006 | 800 | 1800 | 850 | 1590 | 690 | 930 | 291 |
| TMDH560BI | 2360 | 1006 | 840 | 2300 | 850 | 2090 | 730 | 1116 | 343 |
| TMDH615BI | 2360 | 1006 | 840 | 2300 | 850 | 2090 | 730 | 1116 | 343 |

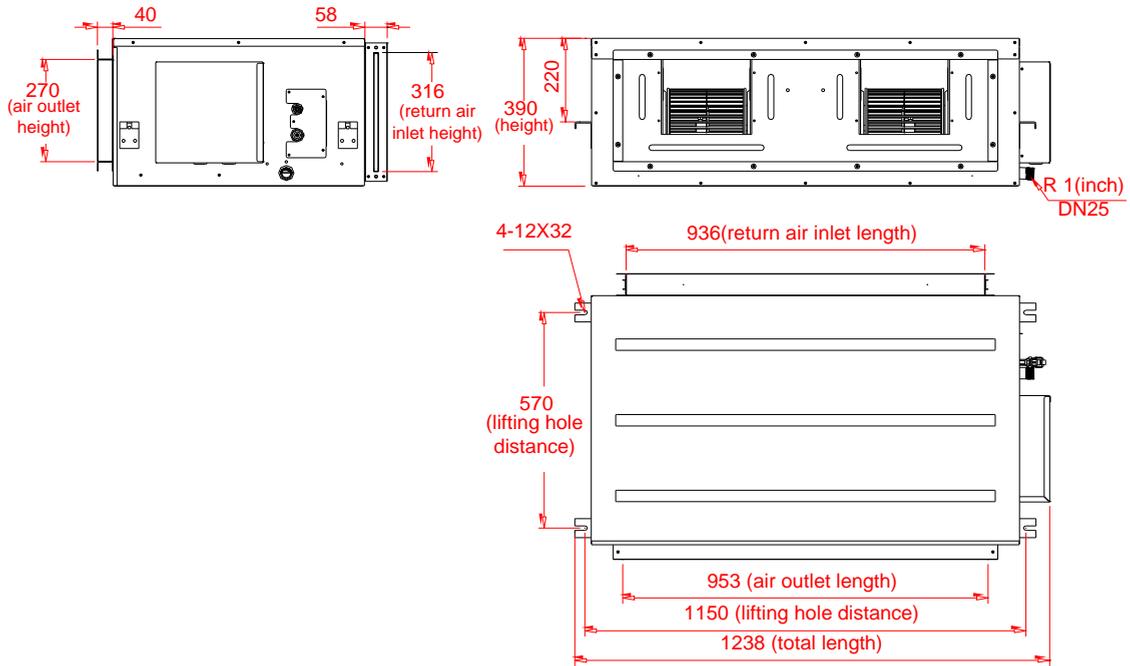
7. TMVX ceiling exposed IDU - outline drawing



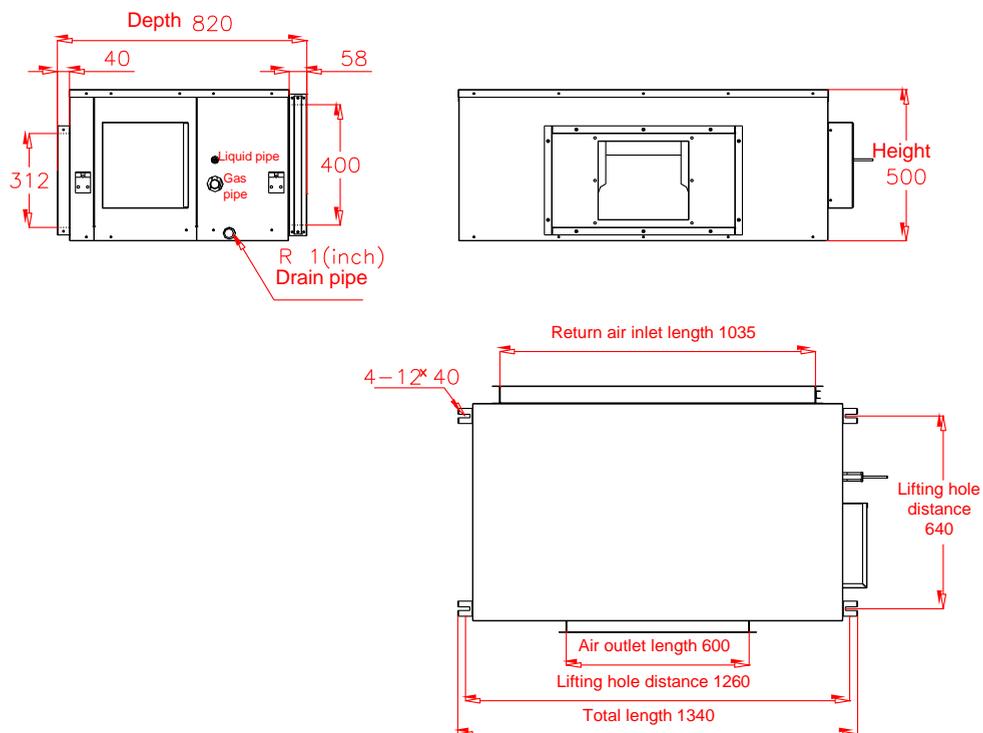
| Model | Width W (mm) | K (mm) | Outer diameter of condensate drain pipe (mm) | Liquid pipe (mm) | Gas pipe (mm) | | |
|----------|--------------|--------|--|------------------|---------------|--------|-------|
| TMVX028A | 905 | 800 | φ25 | φ6.35 | φ12.7 | | |
| TMVX036A | | | | | | | |
| TMVX056A | | | | | | | |
| TMVX071A | 1288 | 1185 | | φ25 | φ9.52 | φ15.88 | |
| TMVX090A | | | | | | | |
| TMVX112A | 1672 | 1568 | | | φ25 | | φ9.52 |
| TMVX125A | | | | | | | |
| TMVX140A | | | | | | | |

8. TMDF fresh air processing unit – outline drawing

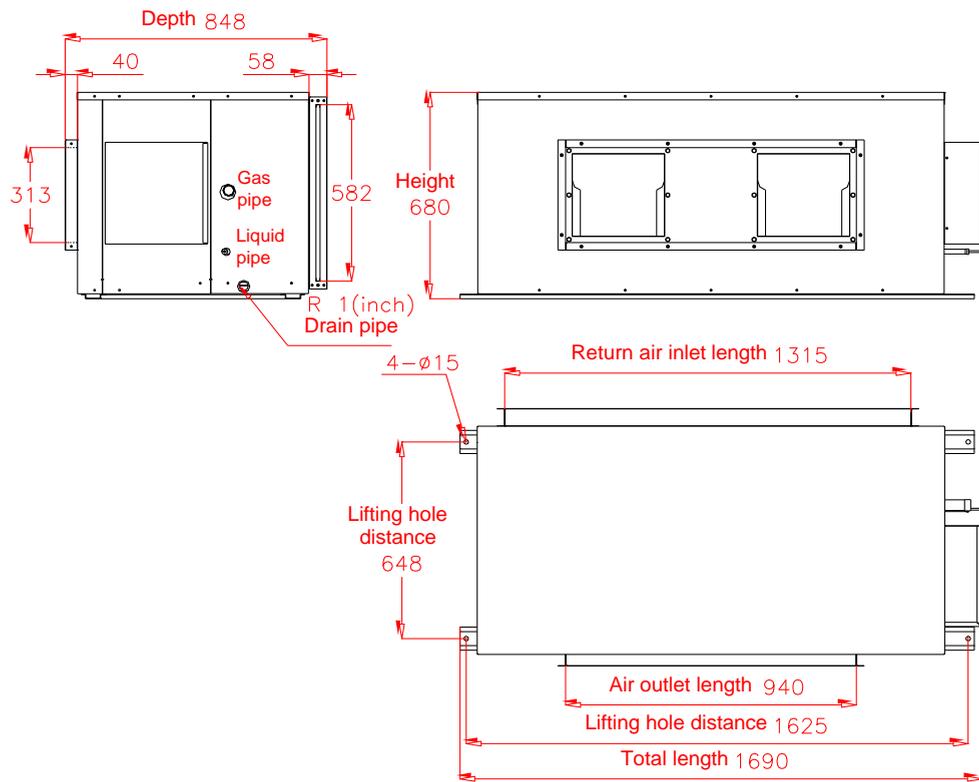
TMDF120, TMDF140



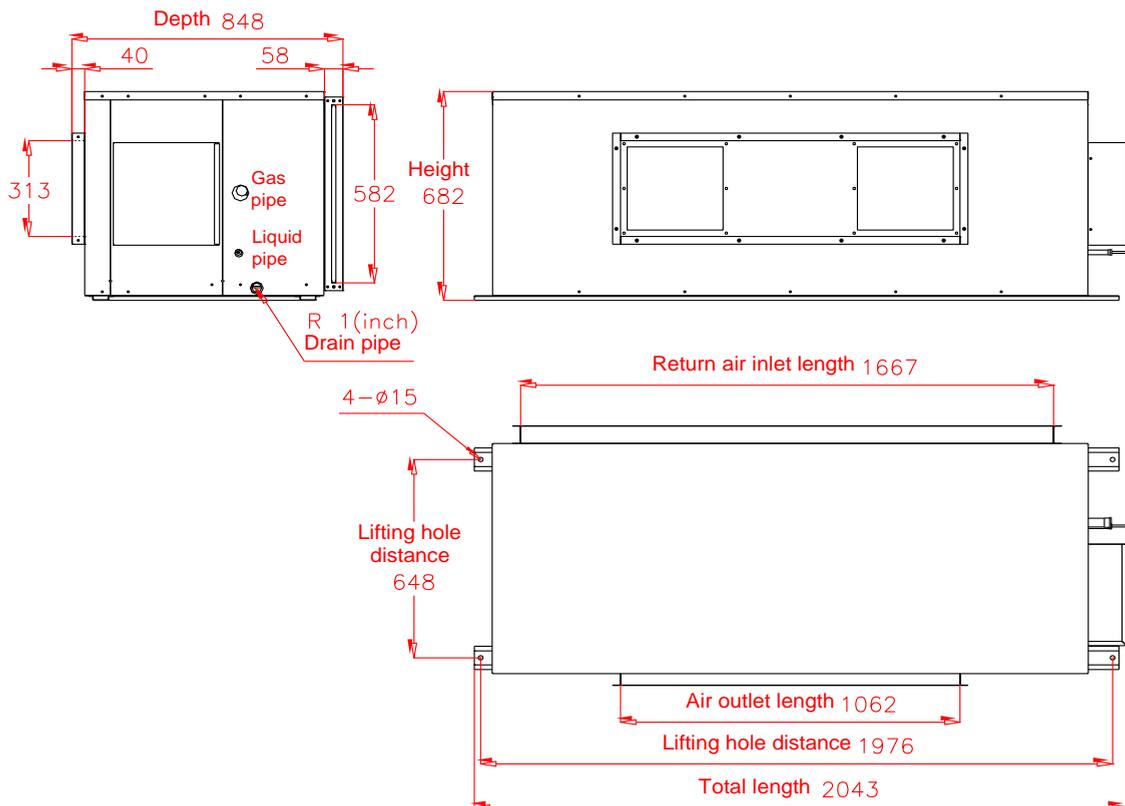
TMDF175, TMDF210, TMDF250, TMDF300



T MDF400



T MDF500, T MDF600



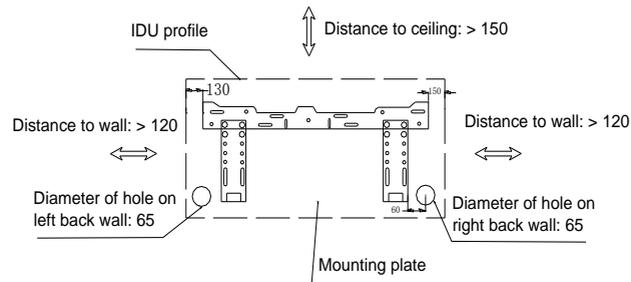
III. IDU Installation

Precautions

- Carefully hold the lifting point or other force bearing parts when taking the IDU out from the package. Do not apply force to the gas pipe, liquid pipe or drainage pipe.
- Select an installation position that can minimize pipe connection and use a shorter duct if possible, and can provide sufficient space for convenient wiring and piping.
- Ensure that the installation position is strong enough to bear the weight of the IDU. Otherwise, bodily injury and machine damage may be caused.
- Ensure that the lifting screws are strong enough to bear the weight of the IDU. Use four or more lifting screws to hang the IDU.
- The room for IDU installation must be well ventilated.
- To ensure proper airflow, there should not be any obstructions at the air inlet and outlet.
- Reserve sufficient space for maintenance and repair. The manhole should be placed at the electric control box side for convenience.
- Keep the IDU away from lighting facilities that use ballasts, because the ballasts will trigger reception failure of remote controller.
- Avoid direct sunlight.

1. Installation of TMVW wall-mounted unit

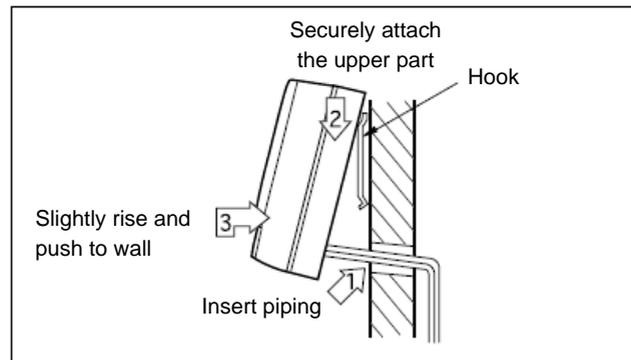
1) Installation position



Install the unit according to parameters listed in the above figure. The unit performance may be somewhat affected if the actual installation is not in full compliance with the requirements.

2) Unit installation

- Measure and mark the position for hanging the IDU.
- Remove the under plate on the rear side of the IDU. As indicated by the mark made in step one, use 4 to 6 masonry nails (or steel nails, expansion bolts) to fix the under plate onto the wall.
- Drill a $\phi 65$ mm hole on the wall. Install the unit pipe through the hole.
- Hang the IDU on the upper hook of the mounting plate. Slightly push the unit leftward and rightward to verify that the unit is securely placed.
- Slightly raise the bottom of the unit, push the unit towards the wall and pull it downward at the same time. Then, try to move the unit in all directions to check if it is securely fixed, as shown in the following figure.



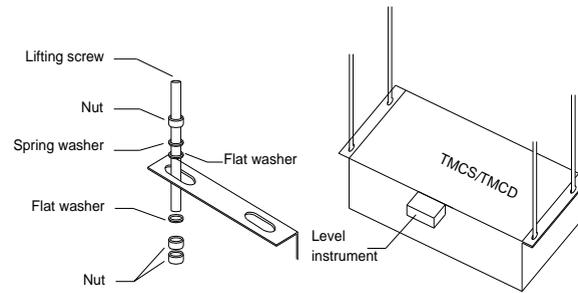
- Use a level instrument to check if the unit is placed horizontally.
- Connect the refrigerant pipe and drainage pipe.

3) Precautions

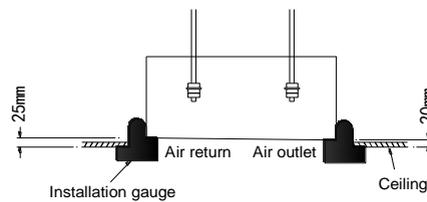
- The filter screen shall be easily removed and cleaned.
- Ensure that sufficient space for maintenance is reserved around the unit.
- If the pipe outlet is at the left or rear left of the unit, place a support between the rear right of the IDU and the wall. After piping connection is finished, remove the support.
- Do not place any electrical apparatus, power strip or other object under the unit. Otherwise, drip caused by poor drainage of the unit may contaminate the furniture.
- Decide the location of drainage pipe on site. Be aware of the unit's degree of inclination.

2. Installation of TMCS one-way/TMCD two-way cassette IDU - outline drawing

1) Unit lifting

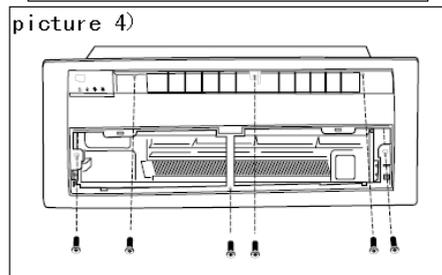
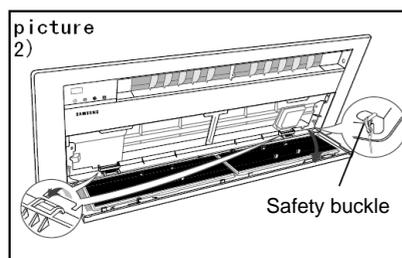
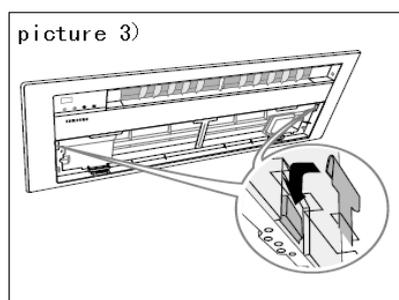
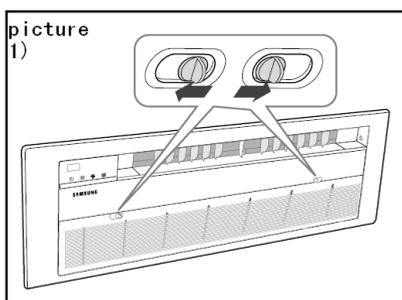


- Measure and mark the place where the unit is located. Drill holes on the ceiling. Install the booms and make sure that the booms are securely fixed.
- Use nuts, flat washers and spring washers to install the IDU onto the booms.
- Use a level instrument to check if the unit is placed horizontally.
- Use an installation gauge to adjust the height of the IDU. The air inlet side should be about 5 mm higher than the air outlet side (air inlet: 25 mm; air outlet: 20 mm). The installation gauge must align to the opening on the ceiling during measuring.
- After the IDU is confirmed to be horizontal, fasten the nuts on the booms to prevent the IDU from falling or vibration.

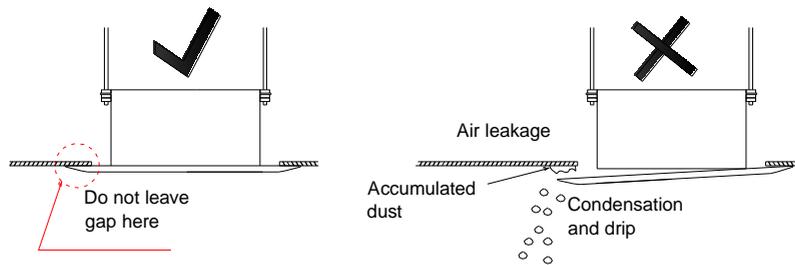


2) Panel installation

- (1) Remove the return air grille from the panel. Fix the panel onto the unit body.
 - Push the sliders on the grille to the left and right sides, and then push them up to open the grille, as shown in Figure 1.
 - Remove the safety buckles on both sides of the front grille, and then remove the front grille, as shown in Figure 2.
 - Insert panel hooks into the holes on both sides of the IDU body, as shown in Figure 3.
 - Install the fixing screws (6 in total) on the panel. Adjust the panel location to ensure that there is no gap between the panel and the ceiling. Then, fasten all the screws, as shown in Figure 4.



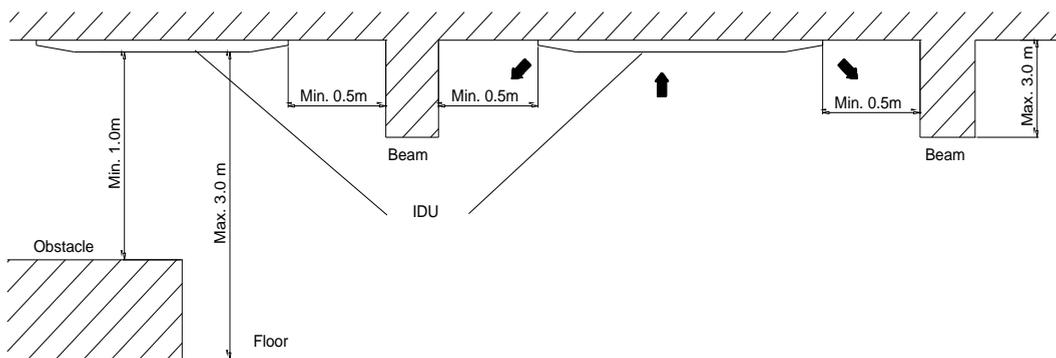
- Check if the panel is correctly connected to the IDU. If there is a gap between the panel and the ceiling, adjust the height of the IDU body. Incorrect installation of panel on the IDU will lead to air leakage, condensation, drip and may other problems.



- (2) Respectively connect the connection cable of remote control light board and the connection cable of fan motor on the panel to the corresponding connector in the electric control box of IDU (matching cables have the consistent color).
- (3) Install the return air grille back to the panel.

3. Installation of TMCF four-way cassette IDU

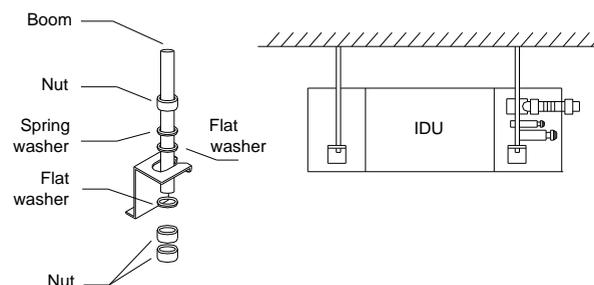
1) Installation position



Install the unit according to parameters listed in the above figure. The unit performance may be somewhat affected if the actual installation is not in full compliance with the requirements.

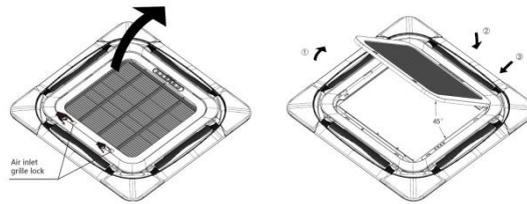
2) Unit lifting

- Measure and mark the place where the unit is located. Drill holes on the ceiling. Install the booms and make sure that the booms are securely fixed.
- Determine the distance between booms, as indicated in the following figure.
- Use nuts, flat washers and spring washers to install the IDU onto the booms.
- Check if the unit is horizontally installed. After the IDU is confirmed to be horizontal, fasten the nuts on the booms to prevent the IDU from falling or vibration.
- Verify that the unit body is placed at the center of the opening on the ceiling.

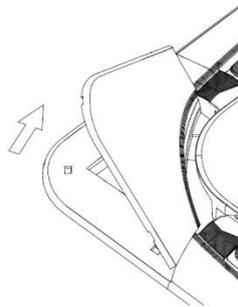


3) Panel installation

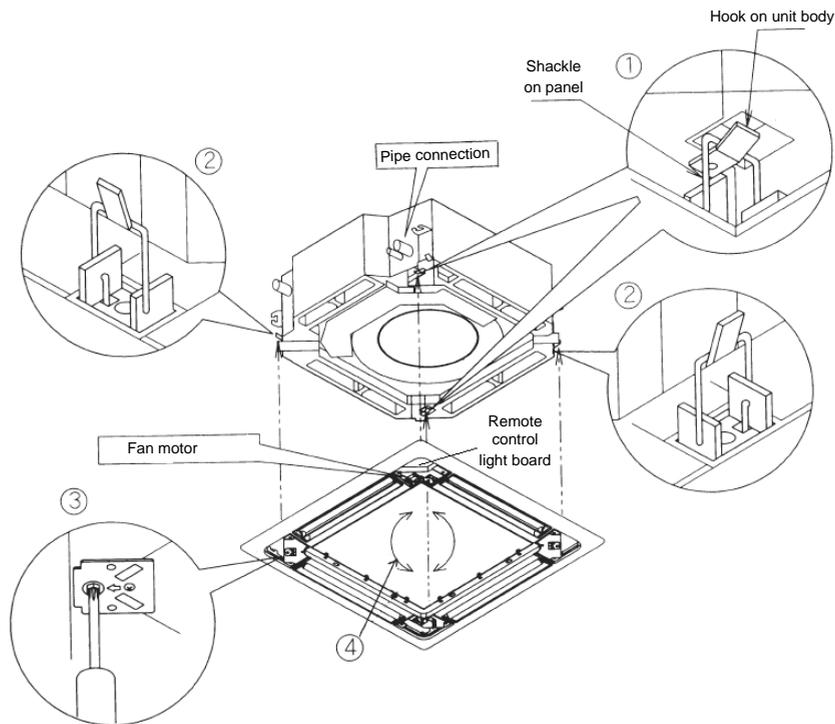
- (1) Remove the air inlet grille: Hold and push inward the air inlet grille lock, and open the grille in the direction of the arrow ①. Then, remove the grille from the panel in the direction and sequence as indicated by the arrows ② and ③.



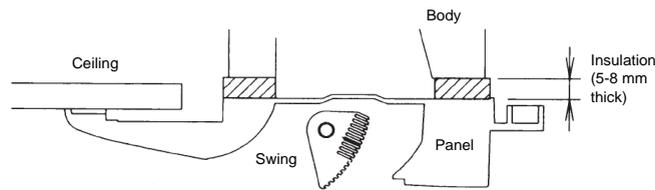
- (2) Remove the covers at the four corners of the panel.



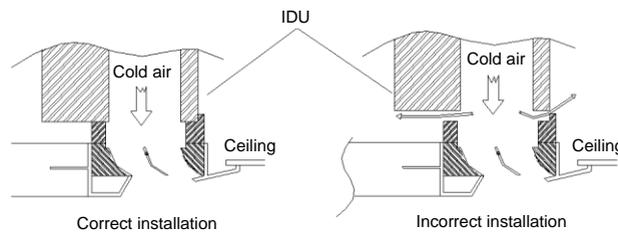
- (3) Install the panel:
- Align the directions of the fan motor on the panel and the unit body pipe. Attach the shackles (2 in total) on the fan motor side and the diagonal side to the hooks on the unit body, as shown in Figure ①.
 - Attach the two shackles on the sides adjacent to the fan motor side to the hooks on the unit body, as shown in Figure ②.
 - Since the covers at the four corners are removed, the hex screws inside are visible. Screw these four hex screws. The panel rises, as shown in Figure ③.
 - Slightly adjust the panel in the arrow direction as shown in Figure ④, to ensure that the panel properly fits the opening on the ceiling.



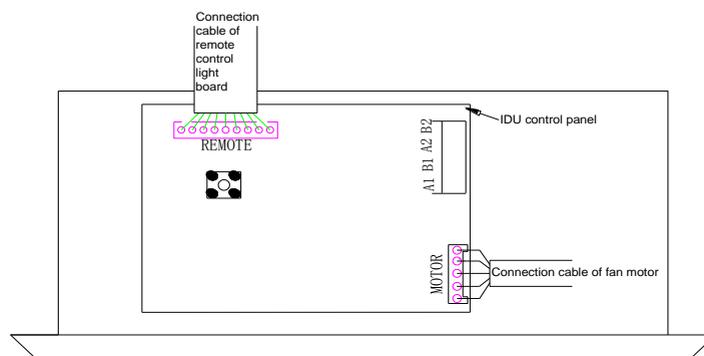
- Tighten the four hex screws to keep a 5 to 8 mm thick insulation between the panel and the unit body.



Note: Hex screws must be fastened. Otherwise, cold air flow leakage, water condensation, water leakage or even electric control box circuit may occur.



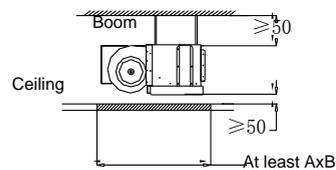
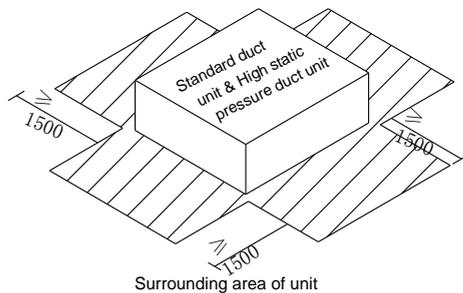
- (4) Connect the connection cable of remote control light board and that of fan motor to the IDU control panel, as shown in the following figure:



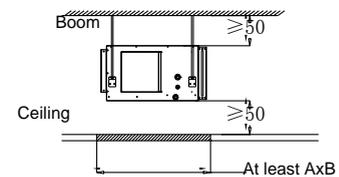
4) Return air grille installation

- Verify that the filter is correctly and securely installed in the return air grille.
- Install back the return air grille to the panel.

4. Installation of TMDN/TMDH duct IDU



Space for repairing and maintaining the standard duct unit



Space for repairing and maintaining the high static pressure duct unit

1) Installation of TMDN standard duct IDU

- Ensure a sufficient maintenance space around the unit, as shown above (in the figure: $A \times B = \text{Unit length} \times \text{Width}$).
- Determine the place where the unit is located. Install the booms and make sure that the booms are securely fixed.
- Check whether the booms are properly aligned with the unit. Install the unit on the booms.
- Make sure that the IDU has a tilt to the drainage direction, and tighten the nut on the hanger rod.

2) Installation of TMDH high static pressure duct unit

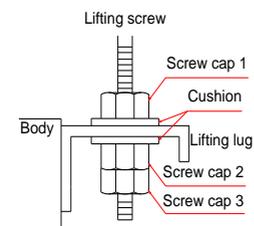
(1) Precautions

- The filter screen shall be easily removed and cleaned.
- If the lifting screw is over 1.5 m long, anti-vibration measures must be taken.
- Ensure that sufficient space for maintenance is reserved around the unit.

(2) Unit lifting

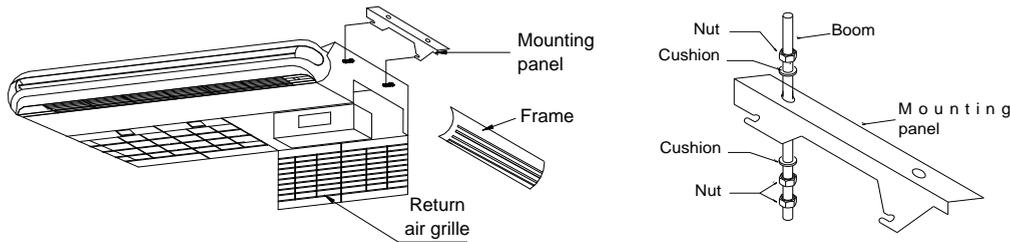
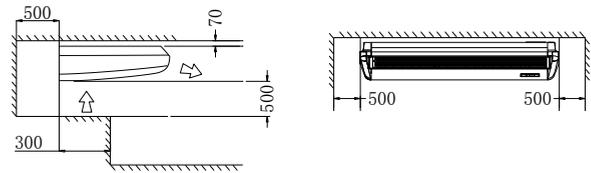
- Determine the place where the unit is located. Install the booms and make sure that the booms are securely fixed.
- Check whether the lifting lug is reliable.
- Lift the unit:

- Mount the lifting lugs of the unit between screw caps 1 and 2 on the lifting screw.
- Use screw cap 2 to adjust height of the device.
- Guarantee that the machine is installed horizontally.
- Tighten screw caps 1 and 3 to prevent the unit from falling off and vibrating.



5. Installation of TMVX floor ceiling IDU

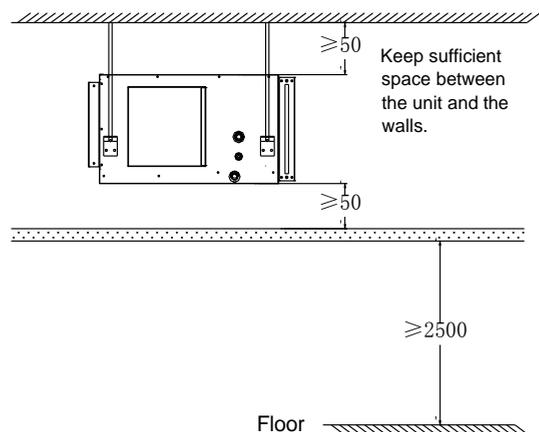
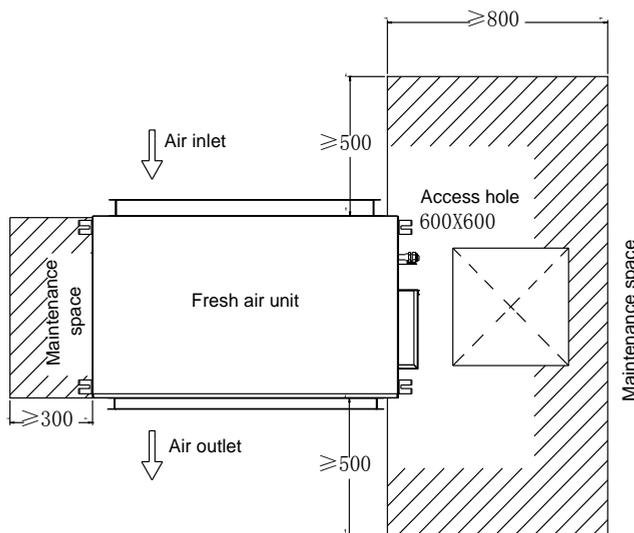
- Ensure that sufficient space for maintenance is reserved around the unit, as shown in the right figure.
- Determine the place where the unit is located. Install the booms and make sure that the booms are securely fixed.
- Remove the return air grille, frame and mounting panel.
- Install the mounting panel onto booms.
- Attach the unit to the mounting panel and fasten the nuts. Install the refrigerant pipe and drainage pipe. Then, install back the return air grille and frame.



6. Installation of TMDF fresh air processing unit

1) Precautions

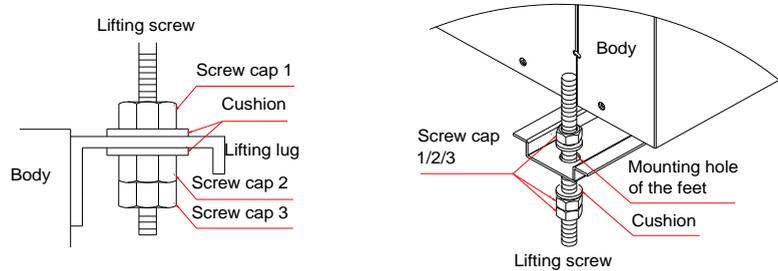
- If the temperature and humidity above the ceiling are expected to exceed 30°C and 80% respectively, apply an insulation layer on the unit body.
- Do not share the same ODU with other digital VRF IDU(s).
- Fresh air unit may exert larger noise. Noise mitigation and vibration isolation measures are required sometimes.
- A separate fresh air inlet is required. This inlet cannot be set at the air return side of other IDU; otherwise, the return air temperature sensor may not be able to correctly detect the actual indoor temperature.
- Reserve sufficient space around the unit for maintenance and repair.
- The filter screen shall be easily removed and cleaned.



2) Unit lifting

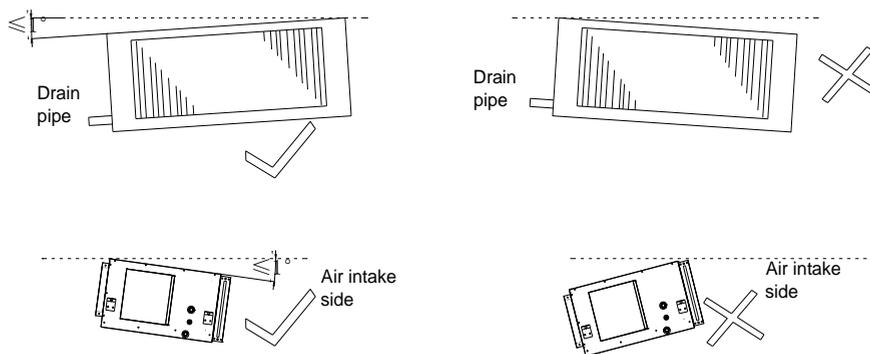
- Determine the place where the unit is located. Install the booms and make sure that the booms are securely fixed.
- Verify that the unit is ready for lifting.
- Lift the unit:

- Mount the lifting lugs of the unit between screw caps 1 and 2 on the lifting screw.
- Use screw cap 2 to adjust height of the device.
- Guarantee that the machine is installed horizontally.
- Tighten screw caps 1 and 3 to prevent the unit from falling off and vibrating.



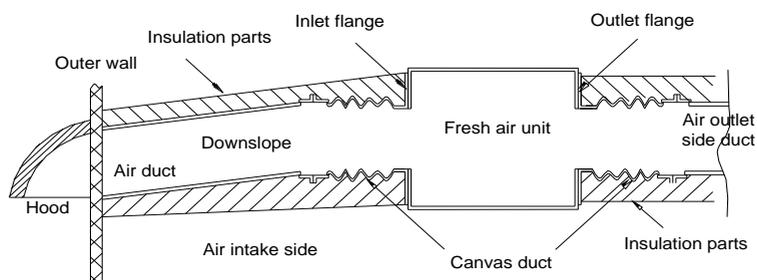
Notes:

- For TMDF120-TMDF300, the parts for lifting are lifting lugs (as shown in the left figure above).
- For TMDF400-TMDF600, the parts for lifting are mounting holes of the feet (as shown in the right figure above).
- Put the drainage outlet and air intake vent side to a lower position to prevent water leakage, as shown in the following figure:



3) Duct installation

- Connect the duct and inlet/outlet flange.
- Use aluminum adhesive belt to seal the connection of inlet flange and duct and that of outlet flange and duct to prevent leakage.
- Use screws to connect the inlet/outlet flange to the unit.



Notes:

- Make sure that the air intake side of air duct tilts down to prevent water accumulation.
- Connect the air duct so that the air intake side can take in outside air; otherwise the unit cannot operate normally.

- To prevent condensation, take heat insulation measures for the air duct (material: glass wool or expanded polyethylene; thickness: 25 mm).

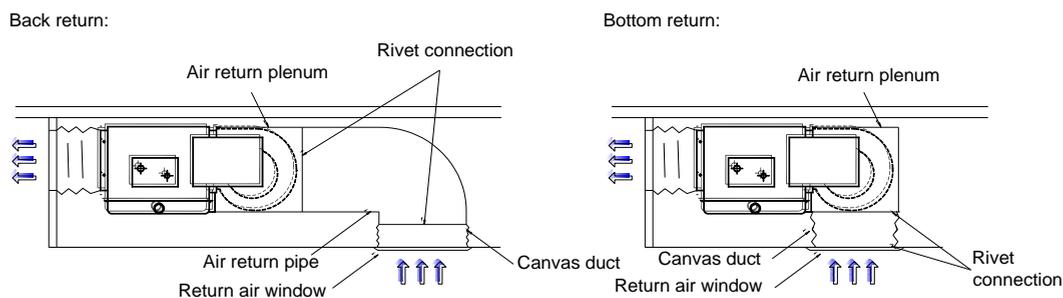
7. Duct preparation and installation

1) Precautions

- Design the air channel based on the unit external static pressure. The air channel resistance must be equal to the unit external static pressure. Otherwise, excessive or insufficient air flow may lead to unit malfunction.
- The distance between the indoor air return and the heat exchanger's air inlet must be at least 1 m.
- Proper duct design could effectively eliminate the noise.
- A balance between the unit external static pressure and the pipeline resistance could be reached by changing the fan speed or adjusting the duct resistance (for example, adjust the diffuser's air supply speed).
- The return air pipe and air supply pipe must be insulated to minimize energy loss and condensation.
- The return air pipe and air supply pipe must be fixed onto the precast slab by iron support. All connections of duct must be sealed.
- The distance between the edge of the return air pipe/air supply pipe and the wall must be at least 150 mm.

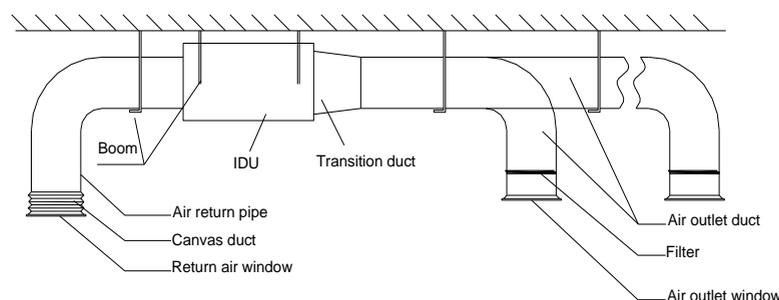
2) Installation of return air pipe (applicable to TMDN series)

- When bottom return air mode is adopted, purchase or make a segment of canvas duct, fold the canvas duct and use it to connect the return air inlet and the return air window. It can be flexibly adjusted to suit the height of the ceiling and avoid ceiling vibration when the unit is running.
- When back return air mode is adopted, make a return air pipe and use rivet to connect one end of the pipe to the IDU return air inlet, and connect the other end to the return air window, as shown in the figure below.

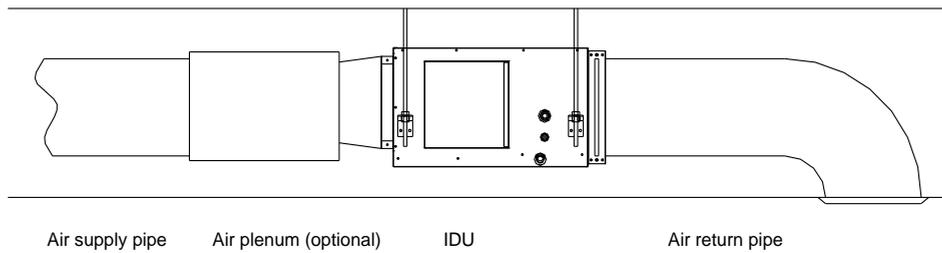


3) Installation of air outlet duct (applicable to TMDN series)

- Usually the air outlet duct is of the rectangle or circular type. The rectangle duct can be connected to the IDU air outlet through rivets directly. The circular duct requires adding a transition duct to connect to the IDU air outlet, and the other end can connect to the air outlet window separately or after diversion, as shown below:
- The wind speed of each air outlet window should be adjusted basically consistent to meet the room air conditioning requirements.



4) Duct installation (applicable to TMDH series)



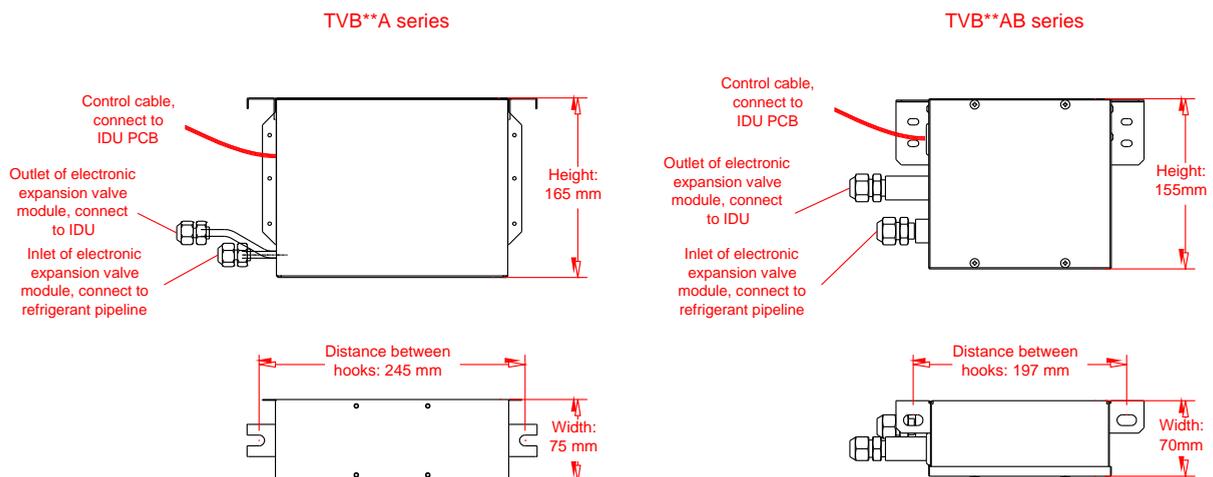
8. Selection and installation of IDU electronic expansion valve module

Electronic expansion valve module is required for the TMCS-A, TMCD-A, and TMVX-A series. Select the proper electronic expansion valve module according to the "Application identifier of electronic expansion valve module" label attached to the specific IDU.

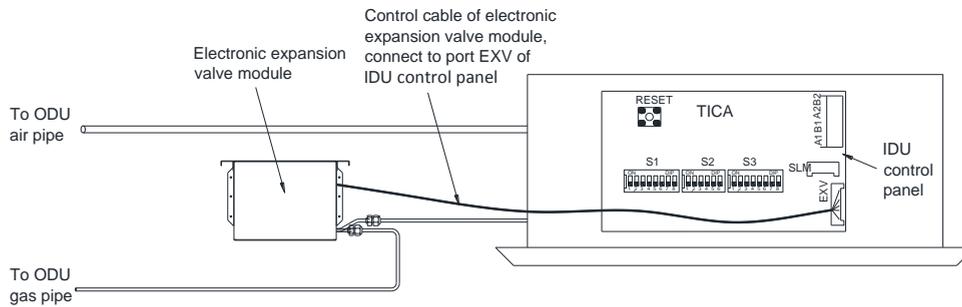
1) Precautions

- Make sure that the electronic expansion valve module is placed straight up.
- The electronic expansion valve module must be installed in the liquid pipe of the corresponding IDU, by screwing the electronic expansion valve module to the flared joint of the liquid pipe.
- The inlet of the electronic expansion valve module is connected to the copper pipe from the ODU's liquid pipe, and the outlet is connected to the IDU's liquid pipe.
- The control cable lead from the electronic expansion valve module must be securely connected to the control module of the corresponding IDU.
- The pipe connecting the electronic expansion valve module and the IDU should be no longer than 1 m.
- The copper pipe connecting the electronic expansion valve module and the IDU must be properly insulated to avoid drip.

2) Dimensions of electronic expansion valve module



3) Installation diagram of electronic expansion valve module



IV. Refrigerant Pipe Connection

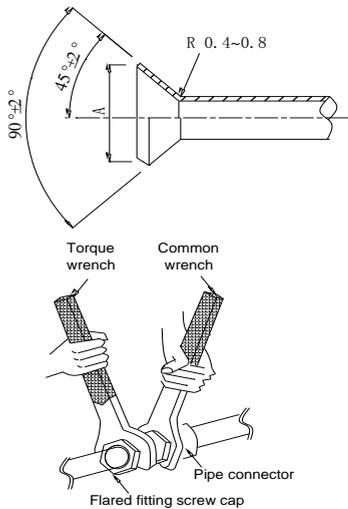
1. Principles of refrigerant pipe connection

| | Cause | Preventive measures |
|---------------|---|---|
| Drying | <ul style="list-style-type: none"> External water intrusion (rain, water supply for construction, etc) | Piping processing → blowing → vacuum drying |
| | <ul style="list-style-type: none"> Condensate water intrusion from inside the pipe | |
| Cleanness | <ul style="list-style-type: none"> Oxide generation inside the pipe when welding | Replacement of nitrogen |
| | <ul style="list-style-type: none"> Dust or other foreign object entering | Blowing |
| Air tightness | <ul style="list-style-type: none"> Incomplete welding | Use proper material → (copper pipe, welding rod) |
| | <ul style="list-style-type: none"> Flare pipe leak | Operate in strict accordance with relevant requirements on flare pipe usage |
| | <ul style="list-style-type: none"> Edge leak | Operate in strict accordance with relevant requirements on welding Operate in strict accordance with relevant requirements on piping |

2. Connection to flared joint of refrigerant pipe

- Use a special cutting tool to cut the pipe. For pipes with too large diameter, a metal cut saw may be used, but make sure to avoid the saw dust from entering the pipe.
- Use the delivery-attached flared joint screw cap only. Before flaring, install the screw cap on the copper pipe first.
- Verify that the flared joints are concentric, and the surface is free from damage and defects such as burr, crack and wrinkle.

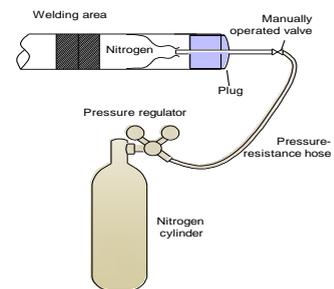
- Before connecting the flared joint, apply ester oil or ethereal oil on both sides of the flared joint, and finger-tight the screw cap for 3 to 4 screws.
- Fasten the screw cap with a proper torque. Use two wrenches to hold the pipe.



| Diameter (mm) | Torque | Pipe flared joint size A (mm) |
|---------------|-------------------------------------|-------------------------------|
| φ6.35 | 14.2-17.2 N·m (144-176 kgf·cm) | 8.7~9.1 |
| φ9.52 | 32.7-39.9 N·m (333-407 kgf·cm) | 12.8~13.2 |
| φ12.70 | 49.5-60.3 N·m (504-616 kgf·cm) | 16.2~16.6 |
| φ15.88 | 61.8-75.4 N·m (630-770 kgf·cm) | 19.3~19.7 |
| φ19.05 | 92.7-118.6 N·m (990-1210 kgf·cm) | 23.1~23.7 |

3. Welding of refrigerant pipe

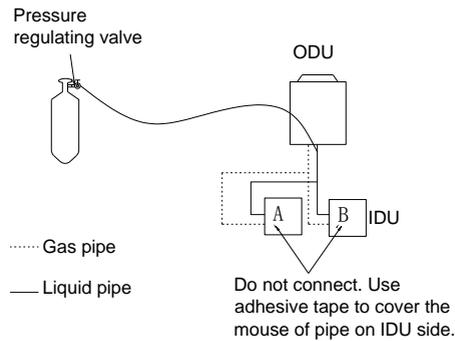
- Perform welding downward or horizontally. Avoid overhead welding if possible.
- Install the liquid pipe and gas pipe in proper direction and angle to avoid inadequate supply of refrigerant and build-up of oil.
- Replacement of nitrogen during welding: During welding, fill 0.02-0.05 MPa nitrogen into the pipe to avoid system block due to oxide generation. After welding, use nitrogen to blow or let it cool down. Do not spray cold water for cooling because cracks will be generated upon sudden cooling of the weld junction.
- Try to reduce bended piping and use bends with larger radius.
- Requirement for distance between support of horizontal pipeline is listed in the following table:



| Pipe diameter | Below 20 mm | 20 to 45 mm | Above 45mm |
|------------------|-------------|-------------|------------|
| Max distance (m) | 1.0 | 1.5 | 2.0 |

4. Blowing of refrigerant pipe

Entering of dust and moisture into the pipe is unavoidable during installation and construction. Therefore, the pipe must be blow dry with nitrogen after pipe construction is completed.



- Use nitrogen for blowing. The nitrogen cylinder should be equipped with a pressure regulating valve.
- Use an inflation tube to connect the pressure regulating valve to the inlet on the liquid pipe side of the ODU.
- Use blind plugs to block up all copper pipe connectors on the liquid pipe side, except for IDU A.
- Open the nitrogen cylinder and set the pressure to 0.5MPa.
- Check whether the nitrogen flows through the liquid pipe leading to IDU A (the corresponding connector on the IDU must be sealed with adhesive tape to prevent dirt from entering the pipe).
- Blowing:
 - a) Use insulating material to block up the liquid pipe of IDU A.
 - b) When you feel that you cannot block up the pipe anymore as the pressure increases, remove the insulating material quickly and let the nitrogen released quickly from the pipe (first blowing).
 - c) Use insulating material to block up the liquid pipe again (second blowing).
 - d) Place a clean cloth at the pipe mouth. You may find the dirt brought out by the nitrogen on the cloth. If the cloth turns a bit damp, it indicates that there is water inside the pipe. Blow the pipe repeatedly until nothing can be blow out and the cloth is no longer damp.
- Repeat the above procedure on IDU B.
- After blowing the liquid pipe, blow the gas pipe.

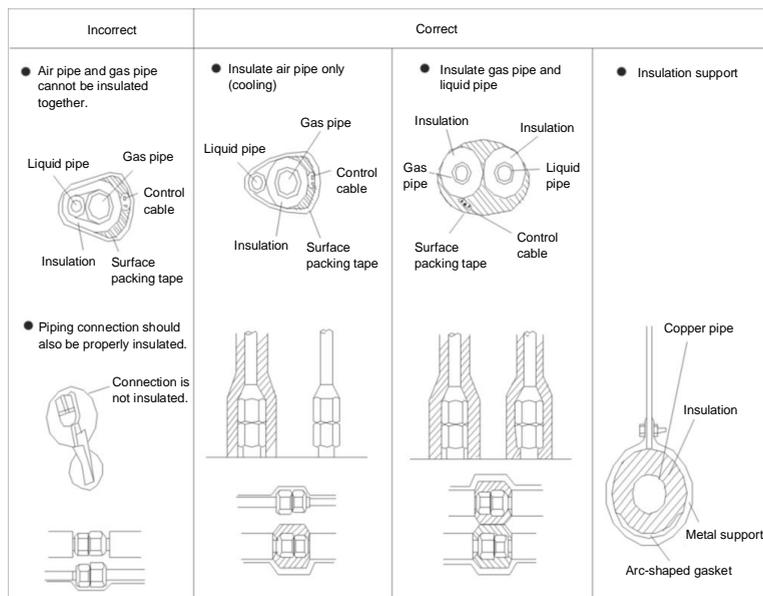
5. Leakage detecting and insulation of refrigerant pipe

- After piping work is completed, make sure to do air tightness test for the entire refrigeration system (IDU and piping). Fill nitrogen from both the gas pipe and liquid pipe sides simultaneously until the pressure reaches the stipulated value (R410A model: 4.0 MPa). Maintain the pressure for 24 hours. Then, check if the pressure changes. In this way, you can determine the air tightness of the entire system and find the leak source (if any).

Note: If the temperature during pressure increasing is different from the temperature when observing, adjust according to the following formula:

$$\text{Actual value} = \text{Pressure during pressure increasing} + (\text{Temperature during pressure increasing} - \text{Temperature when observing}) \times 0.1 \text{ kgf/cm}^2$$

- When there is no leak, insulate the piping. The gas pipe and liquid pipe need to be insulated separately.



V. Drain Pipe Installation

1. Precautions

- Before installing the drainage pipe, remove the drainage plug on the left or right side of the underpan.
- Keep the condensate water pipe as short as possible and make the water drains in a downward direction along the slope (en route). Avoid zigzag layout of the drainage pipe; otherwise, the condensate water may flow backward.
- For the installation of horizontal drainage pipe, a slop grade of at least 1/100 should be guaranteed, and the pipe should be fixed with booms every 1.0 to 1.5 m.

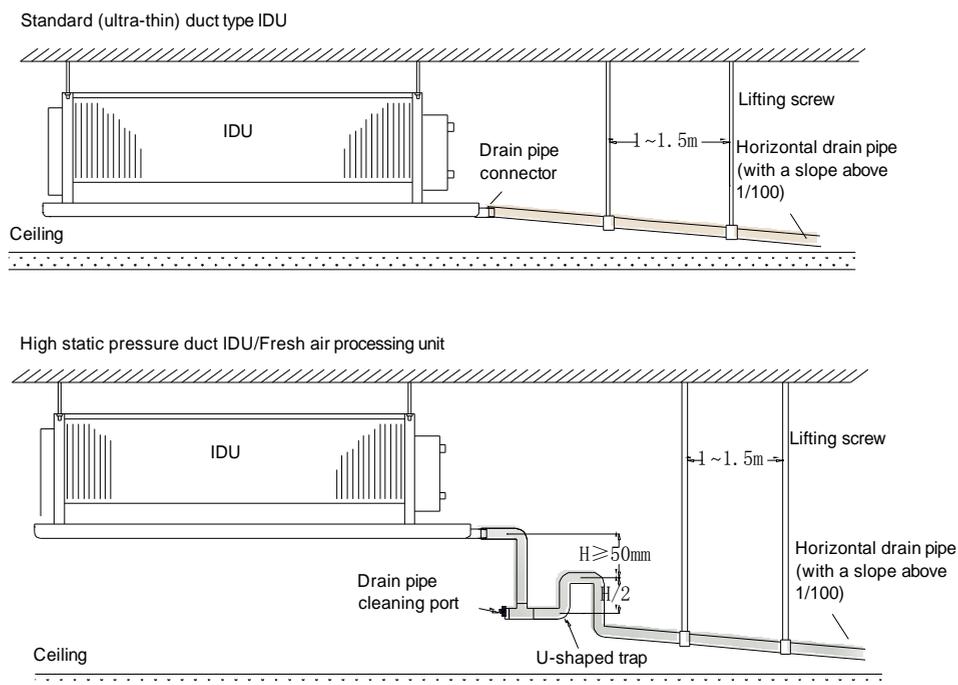
The interval of booms for fixing the horizontal drainage pipe is:

| Material | Nominal diameter | Interval |
|-----------|------------------|----------|
| Rigid PVC | 25 to 40 mm | < 1.5 m |

2. Drainage pipe connection

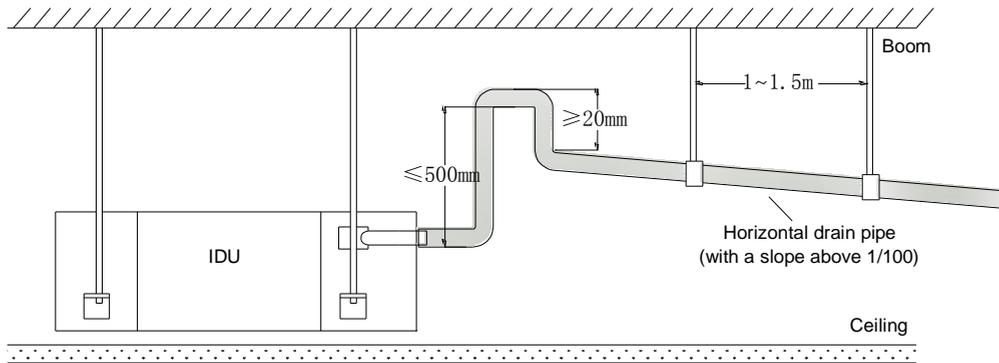
1) When no drain pump is provided:

- Do not install the drain pipe upward; otherwise water may flow back into the machine.
- Install a U-shaped water trap at the end of drain pipe for the high static pressure and fresh air handling units to prevent water from flowing back into the IDU, and install a drain cleaning port at the same time.



2) When a drain pump is provided:

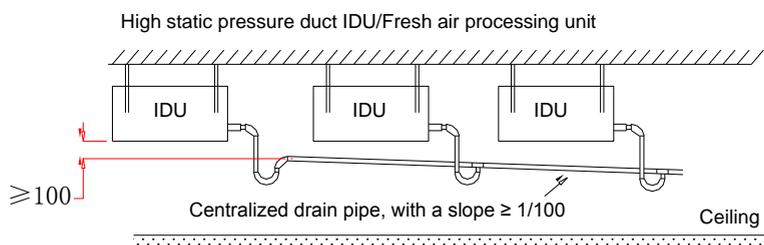
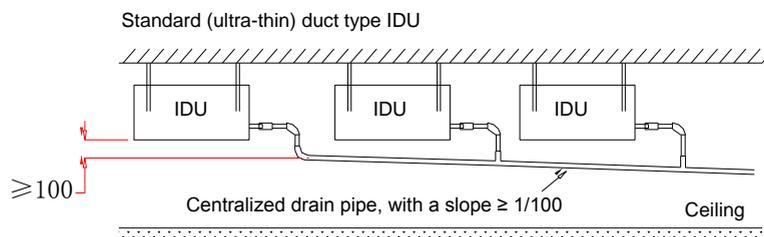
- The drainage height outside the unit cannot exceed 500 mm; otherwise water may leak.
- Raise the drainage pipe by 300 to 500 mm, and then lower it for at least 20 mm.



3. Centralized drainage

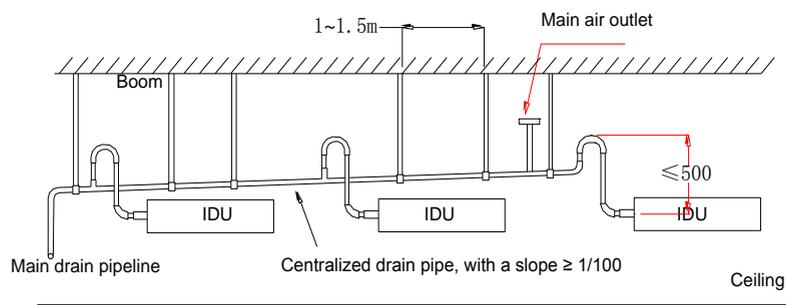
Select a drainage header matched with the unit operating capacity.

1) When no drain pump is provided:



2) When a drain pump is provided:

When more than three IDUs are installed, install the main exhaust port in the front of the IDU farthest from the main drain pipeline.

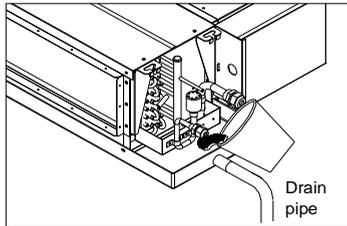


4. Drainage test

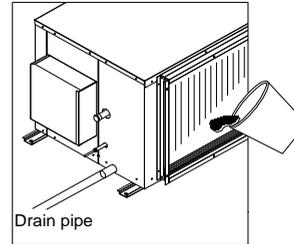
- After the drainage pipe is installed, check whether water is drained smoothly. Prepare 2 liter water. Inject water to the water tray of the IDU.

- For the model configured with a drain pump, run the machine under the cooling mode and check pumping of the drain pump.
- Check for water drainage at the end of the drainage pipe. Ensure that condensate water can be smoothly drained and water does not leak at the water drainage position.
- After drainage test is completed, apply insulation materials to the condensing water pipe.

Duct unit



High static pressure/fresh air handling unit



VI. Electric Control Installation

TIMS series inverter VRF air conditioning unit has both high voltage (power) line and control (communications) line. The high voltage line consists of the power of the chiller and that of the IDU; the control line consists of the communications cable for the IDU and ODU and that for the centralized wired controller.

- Select cables in accordance with relevant local or national regulations. The model of cable must comply with relevant local and national specifications.
- The cables must be securely connected. Do not exert force on the terminal strip.

1. Power cable specifications and precautions

For the power cable specifications of the chiller, refer to the ODU installation instruction. The power cable specifications of IDU are listed as follows:

| Power supply | Voltage range (V) | Power cord | Earth line |
|--------------|-------------------|-------------------------|--------------------|
| 220V~/50Hz | 242/198 | $\geq 1.5 \text{ mm}^2$ | 1.5 mm^2 |

Notes:

- In case the total power of the IDU exceeds 1700 W (for example, when the electric heater is equipped), adopt the power cable with higher specifications.
- The distribution box shall be provided with a set of electric leakage protection device and air switch for each module.
- A circuit breaker with larger capacity is required if it is used to connect to multiple IDUs.
- If the power cord is damaged, to avoid dangers, make sure to ask a professional from the manufacturer or its maintenance department or similar department to replace it.

2. Communications cable specifications and precautions

- The $0.75\sim 1.25 \text{ mm}^2$ shielded twisted pair is used as for communications between the IDU, ODU, centralized controller and unit).
- Do not connect power line to the connecting terminal of communication cables!
- The total length of communications cable is less than 1000 m.
- The communications cable, the shield layer and the chiller must be grounded.
- Communications cable is well connected before being powered on. Do not remove the power plug with power on, lest the communication chips would be damaged.
- To prevent high voltage signal from disturbing control signal, shielded twisted pair must be used. Try to select shielded twisted pair with dense shielding layers and smaller lay.
- Control signal has two polarities A and B, and different polarities cannot be connected; otherwise, communication failures may be caused, as shown in the figure on the right.
- When power line is parallel with the communications cable, they shall be covered by respective conduits and kept at some distance away.
- After installation, protect the communications cables of the wired controller or the centralized controller and ensure good connection.

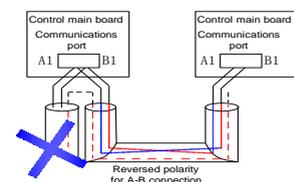
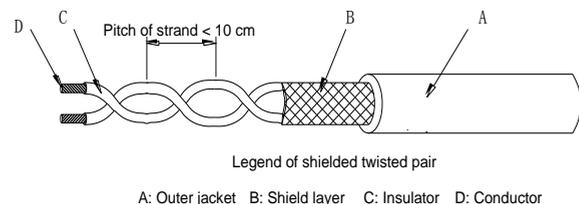
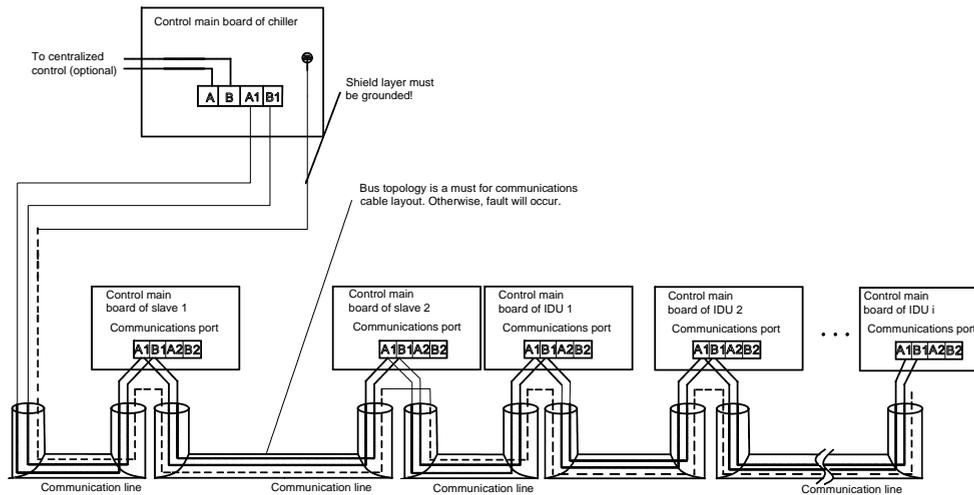
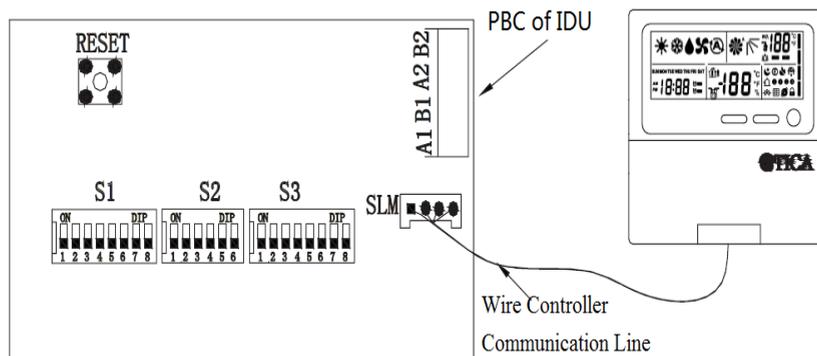


Diagram of IDU and ODU communications cable layout:



3. Wire Controller Communication Line Installation

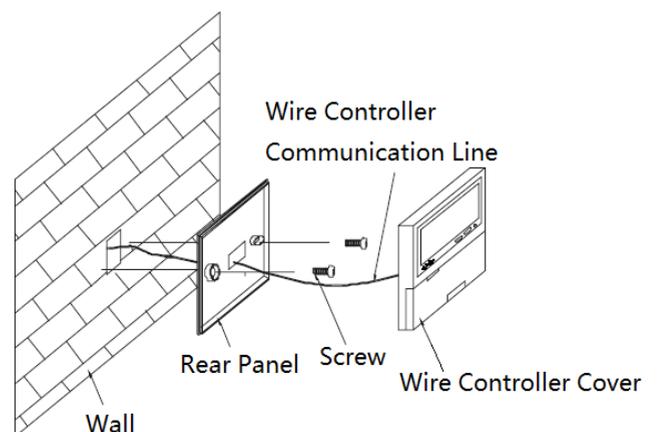
Diagram of Wire Controller Installation:



Note: When leaving the factory, a certain length of line-controlled communication lines have been equipped. If the length is not enough, you can buy from the distributor.

Diagram of Wire Controller Communication Line Installation:

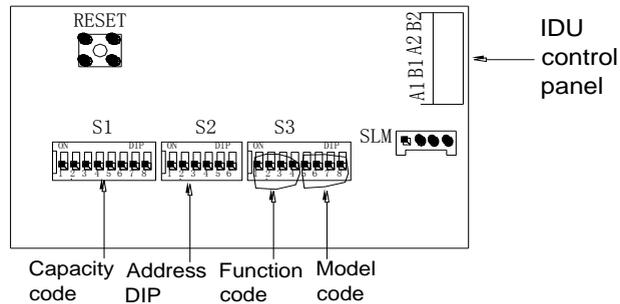
- When the internal machine is installed and positioned, the communication line is drawn from the internal machine.
- Remove the rear panel from the line controller.
- Fix the fixing plate and the back plate to the wall with self-tapping screw. 1.5 meters high to prevent children from changing settings by pushing buttons at will.
- Connect the communication line drawn from the machine through the back board to the communication line on the cable controller cover.
- When the cover of the line controller is aligned with the clamp position of the rear panel and a "click" is heard, the line controller is reliably fixed on the wall.



(Wire Controller Communication Wire Attached to Wire Controller)

VII. IDU Code Settings

IDU capacity code and model code are preset before delivery. Check whether they are correct.

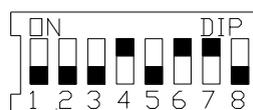


1. S1: IDU capacity code

(1) Applicable to all IDUs except TMDF series

| IDU model | S1 | | | | | | | |
|-----------|----|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| TM**022 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| TM**025 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| TM**028 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| TM**032 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| TM**036 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| TM**040 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| TM**045 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| TM**050 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| TM**056 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| TM**063 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| TM**071 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| TM**080 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| TM**090 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| TM**100 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TM**112 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| TM**125 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| TM**140 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| TM**160 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

For example, for model TMCF022, the S1 code is 00010110, as shown in the following figure:



S1

(2) Applicable to TMDF series

| IDU model | S1 | | | | | | | |
|--------------|----|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| TMDF120A-020 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| TMDF140A-020 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| TMDF175A-022 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| TMDF210A-020 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TMDF250A-015 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TMDF250A-020 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TMDF250A-030 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TMDF300A-020 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| TMDF400A-020 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| TMDF400A-030 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| TMDF500A-020 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| TMDF500A-030 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| TMDF600A-020 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| TMDF600A-030 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |

2. S2: Address DIP

| IDU address | Digit 1 | Digit 2 | Digit 3 | Digit 4 | Digit 5 | Digit 6 |
|-------------|---------|---------|---------|---------|---------|---------|
| 1# | 0 | 0 | 0 | 0 | 0 | 1 |
| 2# | 0 | 0 | 0 | 0 | 1 | 0 |
| 3# | 0 | 0 | 0 | 0 | 1 | 1 |
| | | | | | | |
| 62# | 1 | 1 | 1 | 1 | 1 | 0 |
| 63# | 1 | 1 | 1 | 1 | 1 | 1 |

3. S3: Model, functional DIP

| S/N | | Function | 0 | 1 |
|-------------------------|---------|----------------------------------|---|--|
| S3 Functional DIP | Digit 1 | Remote switch/Hotel card | Remote switch | Hotel card |
| | Digit 2 | Air return temperature selection | Use air return temperature on control panel | Use air return temperature on wired controller |
| | Digit 3 | Electric heater 2 | Electric heater 2 unavailable | Electric heater 2 available |
| | Digit 4 | Electric heater 1 | Electric heater 1 unavailable | Electric heater 1 available |

| S3 DIP | Digit 5 | Digit 6 | Digit 7 | Digit 8 |
|--------|---------|---------|---------|---------|
| TMDN | 0 | 0 | 0 | 0 |
| TMDH | 0 | 0 | 1 | 0 |
| TMCF | 0 | 0 | 1 | 1 |
| TMVX | 0 | 1 | 0 | 0 |
| TMVW | 0 | 1 | 0 | 1 |
| TMDF | 0 | 1 | 1 | 0 |
| TMCS | 0 | 1 | 1 | 1 |

| | | | | |
|------|---|---|---|---|
| TMCD | 1 | 0 | 0 | 0 |
|------|---|---|---|---|

VIII. Precautions When Using/Maintaining Air Conditioner

1. Precautions for air conditioner usage

- Set to a proper indoor temperature.
- ◆ Recommended temperature for cooling: 26~28°C; recommended temperature for heating: 18~23°C. Over-high or over-low indoor temperature is uncomfortable. If the set temperature is 1°C higher in cooling mode or 2°C lower in heating mode, 10% energy could be saved.
- Clean the filter screen.
- ◆ Clogged filter will severely affect the air supply efficiency and may lead to malfunction.
- ◆ If the air conditioner is left unused for a long time period, clean the filter screen before running it in cooling/heating mode.
- Do not open the door and window if possible to reduce heat exchange inside and outside the room.
- ◆ When the unit is running in cooling/heating mode, do not open the door and window when unnecessary, to reduce capacity loss.
- ◆ Use curtain or louver to block direct sunshine.
- Ventilate the room when necessary.
- ◆ The heat, humidity and odor given off by sweating bodies and other objects in the room accumulate and make the atmosphere close. Ventilate the room from time to time to keep the air fresh.
- Use the timer effectively.
- ◆ Use the timer when you are asleep or out. In this way, the unit can operate efficiently.
- Do not touch the air conditioner with wet hand.
- ◆ Do not operate the wired controller or remote controller with wet hands. Prevent water from entering the wired controller or remote controller.
- Do not use the air conditioner to store food, keep animals/plants, or store precision instruments or works of art.
- ◆ Otherwise, the quality of such item may be affected.
- Do not place the indoor heating device under the IDU.
- ◆ Because the heat will deform the suction grille of the IDU.

2. Precautions for air conditioner maintenance

- If the air conditioner is not to be used for a long time period:
 - ◆ Run the air conditioner in air supply mode for 3 to 4 hours to completely dry it. Then, turn off the air conditioner and power off.
- If the air conditioner is to be used after being left idle for a long time:
 - ◆ Make sure that the machine is in stop status and the power is not connected. Then, clean the filter and the IDU body.
 - ◆ Do not clean the IDU and ODU with water. Otherwise, electric shock and fire may be caused.
 - ◆ Use a soft cloth to wipe the IDU body. Do not use gasoline, benzene, NaOH, abrasive powder, detergent or pesticide to clean the machine.
 - ◆ Make sure that the inlet and outlet of the IDU and ODU are not blocked.
 - ◆ Make sure that the ground cable is securely fixed. Power on the machine for at least 12 hours and keep it in standby status.
 - ◆ Keep the power on in seasons when the air conditioner needs to be frequently used.
- Clean the filter:

- ◆ Remove the filter. Use a vacuum cleaner or water to clean it.
- ◆ Use neutral detergent as required.
- ◆ Do not use hot water (temperature higher than 50°C); otherwise, the filter may deform.
- ◆ After cleaning with water, let the filter dry in a shady and well-ventilated place. Do not expose the filter to direct sunshine or dry it on fire.

3. Troubleshooting non-air conditioner faults

- Common troubleshooting:

| Symptom | Reason | Solution |
|--|--|--|
| IDU fan malfunction | Room temperature is higher than the set temperature (when heating) or lower than the set temperature (when cooling) | Reset temperature |
| | Measure to prevent cold air supply upon turn-on in heating mode | Wait for about 4 minutes |
| Air conditioning unit malfunction | The unit is not powered on | Check and connect the power supply |
| | A timed on function is enabled | Wait or cancel the timer setting |
| | Main power fuse disconnection | Replace the fuse |
| Insufficient air supply | The filter screen is too dirty | Clean or replace the filter |
| | IDU air return is blocked | Remove the block |
| | ODU is not well-ventilated | |
| Remote controller malfunction | Low battery | Replace the battery |
| | Battery is not correctly installed | Install the battery correctly |
| | Remote controller is far away from the unit (> 6 m) | Use the remote control at a place nearer the unit |
| | Electronic ballast or other electrical apparatus is turned on/off | Wait for a while |
| Generation of condensate water on front panel of IDU | High humidity of air | Dehumidify |
| IDU stops running in heating mode | ODU frosting after long-term running of air conditioner in heating mode, it is defrosting | The IDU resumes running automatically after defrosting |
| Fan stops running in dry mode | Dehumidification is controlled by microcomputer. The start/stop of fan motor and compressor is determined by a special program. This is a normal phenomenon. | Auto recovery |

4. Troubleshooting air conditioner faults

- If the problem cannot be resolved, contact local maintenance service personnel and record the fault code of the wired controller and remote control.

When the remote control is faulty, the corresponding indicator on the IDU panel blinks (once every 2.5s, each blink takes 1s):

| Times of blinks of the indicator | Fault name | Times of blinks of the indicator | Fault name |
|---|--------------------------------------|----------------------------------|---------------------------------------|
| 1 | Inlet temperature sensor failure | 2 | Middle temperature sensor failure |
| 3 | Outlet temperature sensor failure | 4 | Return air temperature sensor failure |
| 5 | Communication failure of IDU and ODU | 6 | Operation mode conflict |
| 7 | Water level alarm failure | | |
| Note: Wall-mounted units (TMVW) display failures via the indicator of running status; while units of other models via the indicator of defrosting. | | | |
| IDU model | Fault indicator | IDU model | Fault indicator |
| TMCF | Indicator of defrosting | TMVW | Indicator of running status |
| TMCS | Indicator of defrosting | TWCD | Indicator of defrosting |
| TMVX | Indicator of defrosting | | |



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