

# Technical Information

## Title

**Refrigerant noise (bubbling noise) from indoor units during cooling operation**

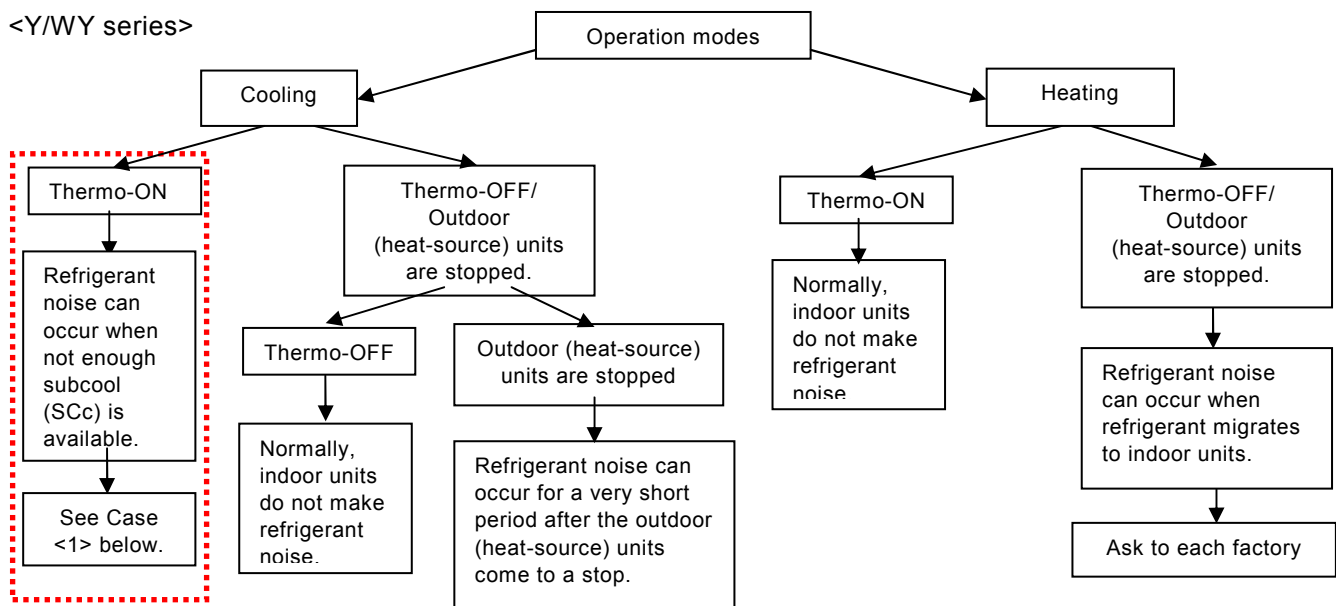
## Model

**City Multi indoor unit**

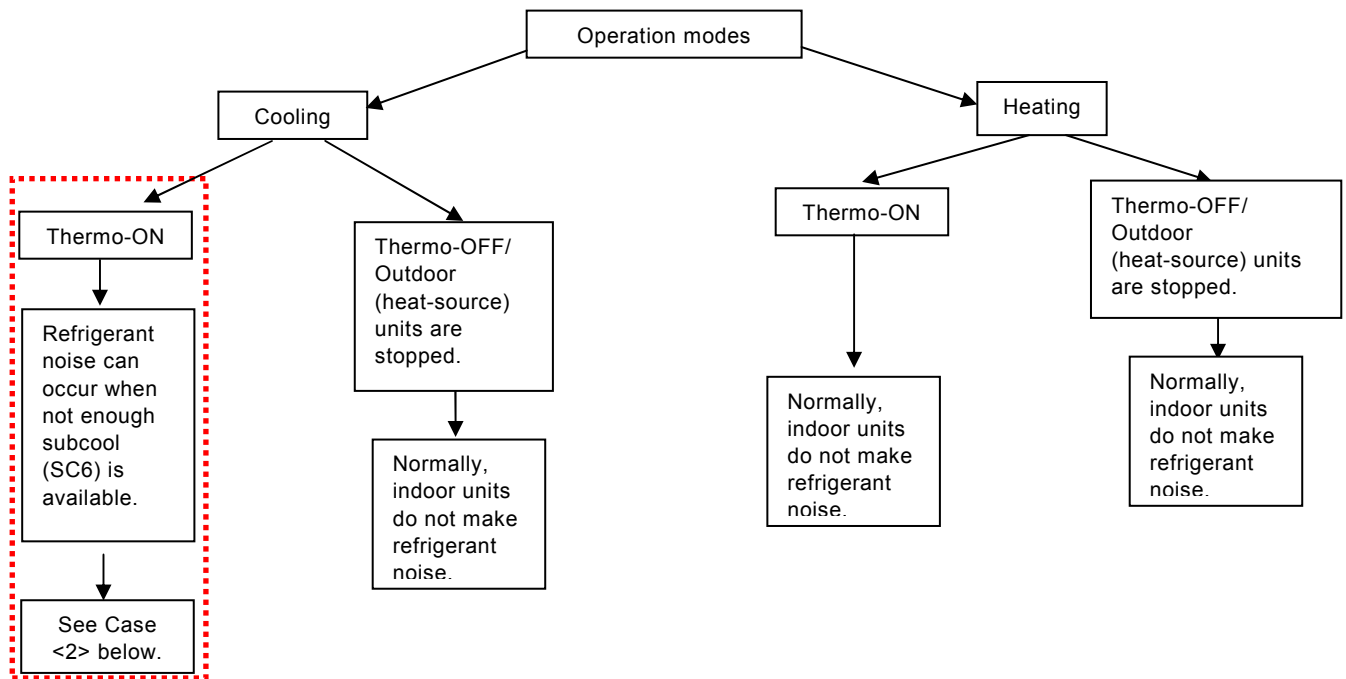
### 1. Summary

Refrigerant noise (bubbling noise) from indoor units during cooling operation may not be permissible in certain environments. This noise is believed to come from the liquid-gas refrigerant mixture passing through the LEV on indoor units.

Flowcharts 1 and 2 show possible operation modes, in which indoor units can make refrigerant noise. This document mainly relates to case <1> in Flowchart 1 and case <2> in Flowchart 2.



Flowchart 1 Refrigerant noise from indoor units in the Y- and the WY-series systems



Flowchart 2 Refrigerant noise from indoor units in the R2- and the WR2-series systems

## **2. Solutions for refrigerant noise during cooling operation**

Case <1>

When case <1> applies, follow the steps below.

1. Check the refrigerant charge by operating the units in the Refrigerant Charge Adjustment mode.

Note 1: The Refrigerant Charge Adjustment mode uses the target control value different than that used in the normal cooling operation mode. To check the refrigerant charge, be sure to operate the units in the Refrigerant Charge Adjustment mode.



2. Check for bypassed refrigerant caused by damaged components.



3. If no problems were found, take the steps listed in Table 1 to ensure enough SCc in outdoor (heat-source) unit will be available.

Note 2: Taking the steps below will increase the tendency for the indoor units to go into the Freeze Protection mode. If this tendency presents a problem, adjust the settings to suit the local conditions.

Table 1 Changing the settings for the Y/WY series (Cooling Thermo-ON)

| No        | Step                                                  | How to change the setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Notes                                                                                                                                                                                                                          |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
|-----------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|--|--|--|-----|----|-------|-----|---|----|----|----|----------|-----|--|-----------|--|--|--|-----|----|-----------|-----|---|----|----|----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Change the minimum LEV opening on indoor units.       | <p>[Models without SWP1 (push switch)]</p> <ol style="list-style-type: none"> <li>Set DipSW1-2, 5, 6, 7, 8, 9, and 10 on the outdoor (heat-source) unit to ON to display the current value on the LED.</li> <li>Change the minimum LEV opening on the indoor units by turning on and off DipSW5-6 on the outdoor (heat-source) unit. The setting will change in the following sequence. The settings below correspond to percentages between -30% and +30% (in 10-percent increments) respectively.<br/> <math>\pm 0 \rightarrow -0.1 \rightarrow -0.2 \rightarrow -0.3 \rightarrow +0.1 \rightarrow +0.2 \rightarrow +0.3</math> cycles back to <math>\pm 0</math><br/> For solving the refrigerant noise that occurs during cooling operation, set this setting to a value between -0.3 and -0.1, and check its effects.</li> <li>Stopping all indoor units and then restarting them will reflect the change.</li> </ol> <p>-----</p> <p>[Models with SWP1 (push switch)]</p> <ol style="list-style-type: none"> <li>Change the minimum LEV opening on the indoor units by turning on and off SWP1 with DipSW6-10 on the outdoor (heat-source) units set to ON and set to SW4(977). The setting will change in the following sequence. The settings below correspond to percentages between -30% and +30% (in 10-percent increments) respectively.<br/> <math>\pm 0 \rightarrow -0.1 \rightarrow -0.2 \rightarrow -0.3 \rightarrow +0.1 \rightarrow +0.2 \rightarrow +0.3</math> cycles back to <math>\pm 0</math><br/> For solving the refrigerant noise that occurs during cooling operation, set this setting to a value between -0.3 and -0.1, and check its effects.</li> <li>Set DipSW1-2, 5, 6, 7, 8, 9, and 10 to ON with DipSW6-10 on the outdoor (heat-source) unit set to OFF to display the changed value on the LED, and make sure the value is set to the desired value.</li> <li>Stopping all indoor units and then restarting them will reflect the change.</li> </ol> | <p>Note 1: In a system with multiple outdoor (heat-source) units, the setting needs to be changed only on the OC unit (but not on the OS unit).</p> <p>Note 2: Set DipSW SW4-1, 5, 7, 8, 9, and 10 to ON to set SW4 (977).</p> |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
| 2         | Change the SHm value for indoor units.                | <ol style="list-style-type: none"> <li>Set DipSW3-9 on the indoor units to ON to change the SHm value for the indoor units to 5 deg.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>Note 1: On the indoor units that do not have DipSW3-9, set DipSW3-7 to ON.</p>                                                                                                                                              |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
| 3.        | Change the Tem value for outdoor (heat-source) units. | <p>[Models without SWP1 (push switch)]</p> <ol style="list-style-type: none"> <li>The Tem value for outdoor units can be changed by using different combinations of DipSW3-5 and DipSW2-9 settings as shown in the table below.</li> </ol> <table border="1"> <thead> <tr> <th colspan="2">Tem</th><th colspan="2">SW2-9</th></tr> <tr> <th colspan="2"></th><th>OFF</th><th>ON</th></tr> </thead> <tbody> <tr> <td rowspan="2">SW3-5</td><td>OFF</td><td>0</td><td>-4</td></tr> <tr> <td>ON</td><td>-2</td><td>-15 (-6)</td></tr> </tbody> </table> <p>-----</p> <p>[Models with SWP1 (push switch)]</p> <ol style="list-style-type: none"> <li>The Tem value for outdoor (heat-source) units can be changed by using different combinations of SW4 (964) and SW4 (982) with DipSW6-10 on the outdoor (heat-source) units set to ON.</li> </ol> <table border="1"> <thead> <tr> <th colspan="2">Tem</th><th colspan="2">SW4 (982)</th></tr> <tr> <th colspan="2"></th><th>OFF</th><th>ON</th></tr> </thead> <tbody> <tr> <td rowspan="2">SW4 (964)</td><td>OFF</td><td>0</td><td>-4</td></tr> <tr> <td>ON</td><td>-2</td><td>-15 (-6)</td></tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Tem                                                                                                                                                                                                                            |  | SW2-9 |  |  |  | OFF | ON | SW3-5 | OFF | 0 | -4 | ON | -2 | -15 (-6) | Tem |  | SW4 (982) |  |  |  | OFF | ON | SW4 (964) | OFF | 0 | -4 | ON | -2 | -15 (-6) | <p>Note 1: Set DipSW4-3, 7, 8, 9, and 10 to ON to set SW4 (964).</p> <p>Note 2: Set DipSW4-2, 3, 5, 7, 8, 9, and 10 to ON to set SW4 (982).</p> |
| Tem       |                                                       | SW2-9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
|           |                                                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ON                                                                                                                                                                                                                             |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
| SW3-5     | OFF                                                   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -4                                                                                                                                                                                                                             |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
|           | ON                                                    | -2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -15 (-6)                                                                                                                                                                                                                       |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
| Tem       |                                                       | SW4 (982)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
|           |                                                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ON                                                                                                                                                                                                                             |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
| SW4 (964) | OFF                                                   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -4                                                                                                                                                                                                                             |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |
|           | ON                                                    | -2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -15 (-6)                                                                                                                                                                                                                       |  |       |  |  |  |     |    |       |     |   |    |    |    |          |     |  |           |  |  |  |     |    |           |     |   |    |    |    |          |                                                                                                                                                 |

## Case <2>

When case <2> applies, follow the steps below.

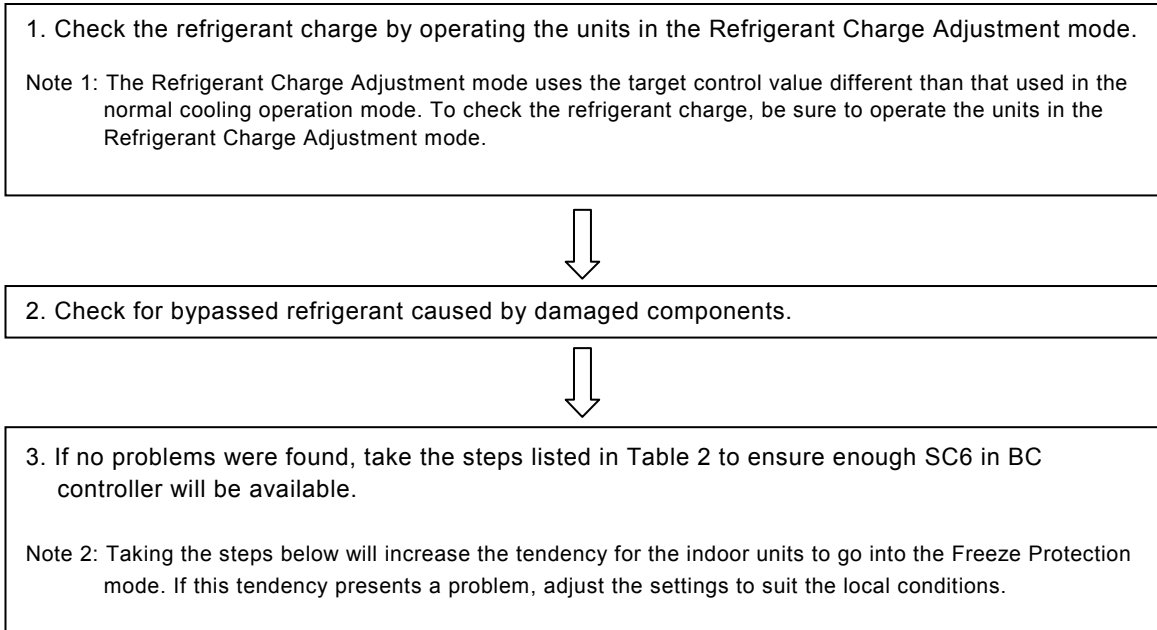


Table 2 Changing the settings for the R2/WR2 series (Cooling Thermo-ON)

| No | Step                                                       | How to change the setting                                                                                                                                                                                                                                                                                                                                                                                                                   | Notes                                                                                                                                        |
|----|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Change the minimum LEV opening on indoor units.            | [Models without SWP1 (push switch)]<br>Same as with No. 1 in Table 1.                                                                                                                                                                                                                                                                                                                                                                       | Note 1: In a system with multiple outdoor (heat-source) units, the setting needs to be changed only on the OC unit (but not on the OS unit). |
|    |                                                            | [Models with SWP1 (push switch)]<br>Same as with No. 1 in Table 1.                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                              |
| 2  | Change the SHm value for indoor units.                     | Same as with No. 2 in Table 1                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                              |
| 3. | Change the Tem value for outdoor (heat-source) units.      | [Models without SWP1 (push switch)]<br>1. Set DipSW1-2, -5, and -7 on the outdoor (heat-source) units to ON to display the current value on the LED.<br>2. Change the Tem value for outdoor (heat-source) units by turning on and off DipSW2-9. The value will change in the following sequence.<br>±0→-2→±0→-4→±0→-6→ cycles back to ±0<br>3. Stopping all indoor units and then restarting them will reflect the change.                  | Note 1: Set DipSW4-2, 3, 5, 7, 8, 9, and 10 to ON to set SW4 (982).                                                                          |
|    |                                                            | [Models with SWP1 (push switch)]<br>1. Change the Tem value for outdoor (heat-source) units by turning on and off SWP1 with DipSW6-10 on the outdoor (heat-source) units set to ON and set to SW4(982). The value will change in the following sequence.<br>±0→-2→±0→-4→±0→-6→ cycles back to ±0<br>2. Set DipSW1-2, 5, and 7 to ON to display the value.<br>3. Stopping all indoor units and then restarting them will reflect the change. |                                                                                                                                              |
| 4  | Change the initial LEV opening on indoor units             | [Models without SWP1 (push switch)]<br>1. Set DipSW4-8 on the outdoor (heart-source) units to ON.                                                                                                                                                                                                                                                                                                                                           | Note 1: Set DipSW4-1, 2, 7, 9, and 10 to ON to set SW4 (835).                                                                                |
|    |                                                            | [Models with SWP1 (push switch)]<br>1. Set SWP1 to ON with DipSW6-10 on the outdoor (heart-source) units set to ON and set to SW4 (835).                                                                                                                                                                                                                                                                                                    |                                                                                                                                              |
| 5  | Change the maximum LEV1 and LEV3 opening on BC controller. | 1. Set DipSW4-4, 4-5, and 5-5 on BC controller to ON.                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                              |