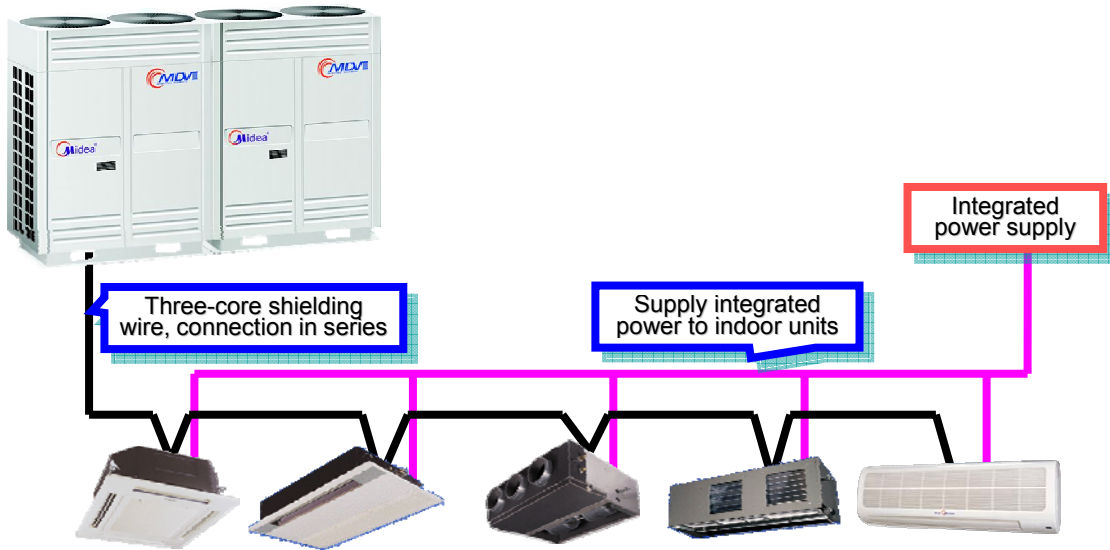


# Trouble-shooting for MDV Indoor Units

## I. Connection between indoor and outdoor units in MDV system



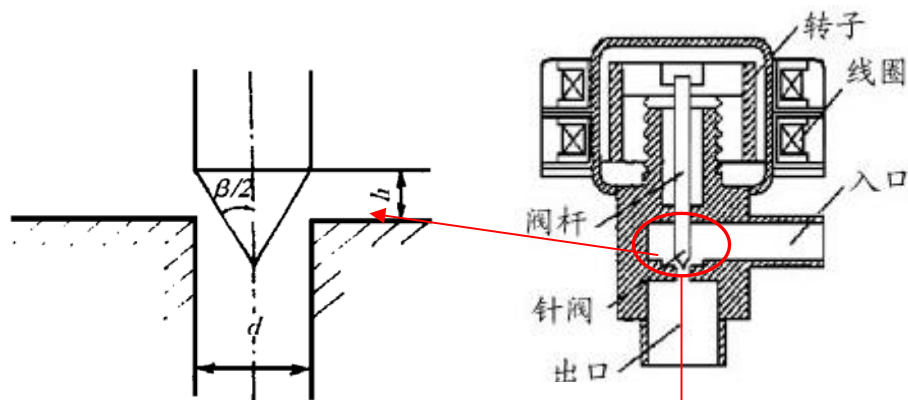
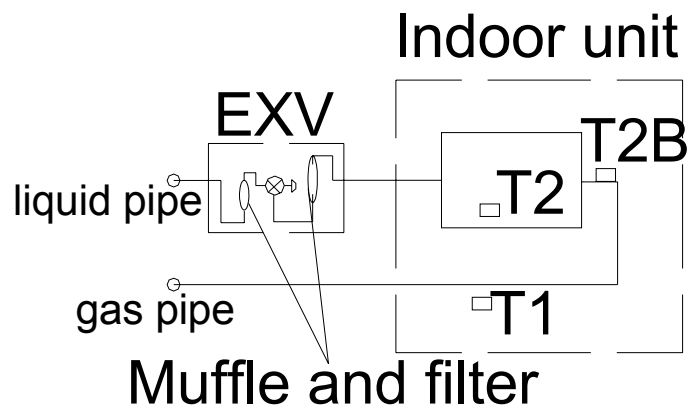
## II. Introduction to components in indoor unit

**T1:** Indoor side ambient temp. sensor, is used to judge the setting temperature and decide the opening degree of EXV as well as the output capacity (every indoor unit has a T1 temperature sensor).

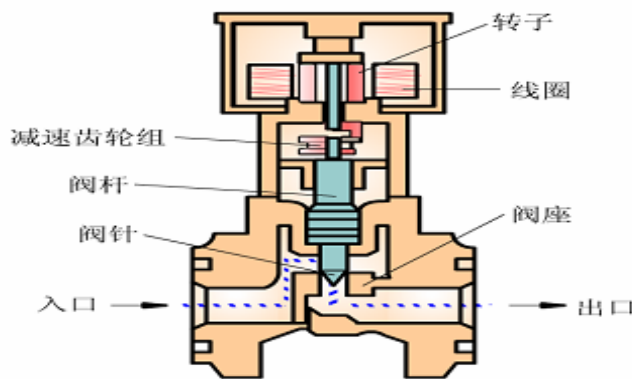
**T2:** Sensor of evaporator's middle temperature, is used to modify the opening degree of indoor unit EXV according to the average temperature of T2 (every indoor unit have a T2 temperature sensor), and available in cooling mode.

**T2B:** Sensor of evaporator's outlet temperature, is used to modify the opening degree of indoor unit EXV according to the average temperature of T2B (every indoor unit have a T2B temperature sensor), and available in heating mode.

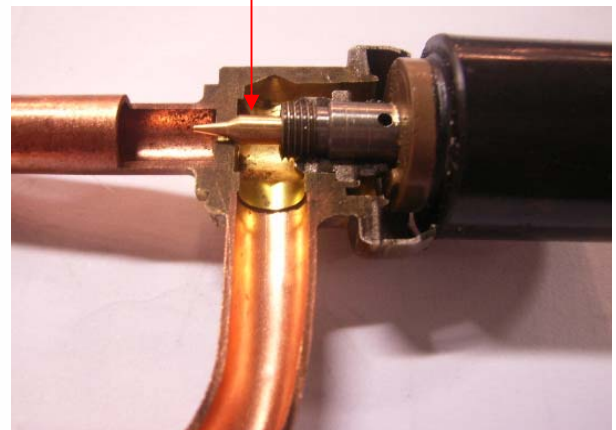
**EXV:** Function of electronic expansion valve in refrigerant system: Throttling function, that is, regulating flow of high-pressure liquid refrigerant entering evaporator through liquid pipe and maintaining the pressure difference between high-pressure side and low-pressure side in system, so as to ensure that the refrigerant could be evaporated under expected low-pressure in evaporator, meanwhile, condensed under high-pressure in condenser.



Complex interior structure of electronic expansion valve



电动式电子膨胀阀 (减速型)



Electronic expansion valve is characterized by wide regulative scope, precision in regulation, and being nimble, stable and reliable. Refrigerant could flow through the electronic expansion valve in positive and opposite directions, which avoids the weakness caused by only one direction in thermostatic expansion valve and dramatically simplifies refrigerant system when applied to heat-pump unit. As refrigerant system stops operating, the electronic expansion valve could be shut down completely, so there is no need to install magnetic valve on the inlet of refrigerant.

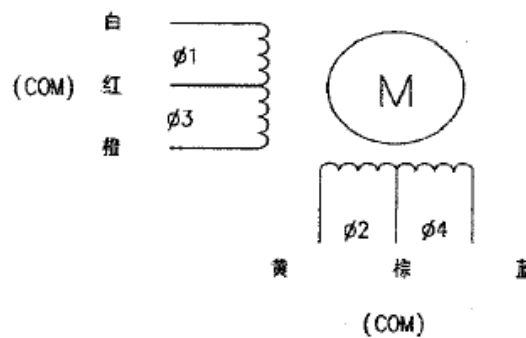
**Control logic of electronic expansion valve in Midea MDV indoor units:**

- 1) When indoor unit being initially powered on, shut down EXV first and open to certain opening, being on standby;
- 2) Once indoor unit running, regulate the opening of EXV according to the capability of indoor unit、T2 or T2B;
- 3) In the cooling mode, when the indoor unit is shut down, the EXV is shut down completely; in the heating mode, when the indoor unit is shut down, the EXV is somewhat open, so as to ensure the reliability of the system.

**Inspecting electronic expansion valve fault:**

- 1) Inspect the output of circuit board: Dismantle the electronic expansion valve assembly on device, and insert an electronic expansion valve with normal performance into the circuit board, to check whether the electronic expansion valve could work. If it works, conduct next inspecting operation; if it does not work, there should be something wrong with circuit board and examine the circuit board before conducting next inspecting operation.

- 2) Inspect the coil of electronic expansion valve: As shown in right figure, the electronic expansion valve is driven by 12V DC led by six wires (5 wires is also ok, that is, connecting two common terminals together). And the common terminals of electronic expansion valve are often red, brown wires (It is generally indoor unit when square AMP connected with wire group in opposite direction) or gray wire (It is generally outdoor unit when JST connected with wire group in parallel), and DC resistance value of each phase is  $46\pm5\Omega$ . Specific operation is as following: use the ohmmeter on multimeter to measure the DC resistance value between common terminal and wire in other colors.



If the resistance value is accordance with standard, it indicates that the coil is normal, and next operation can be conducted; otherwise, it indicates that the coil is burn out, and need to be replaced before next operation being conducted.

- 3) Check whether the body of electronic expansion valve is blocked and whether there is leakage and sundries. Most EXV fault is caused by the oxidized layer and welding dregs contained in system. Recommend to power on and power down the EXV over and over again (For indoor unit, use wireless remote controller to start up and shut down this indoor unit repeatedly and use your hands to feel the motion of throttle

component and the flow of refrigerant; as for outdoor unit, EXV will shut down completely and open to certain opening after few minutes later after the system is powered on, which also could be feel with hands), and at the same time, beat the body by using of hard object, so as to utilize the impulsive force of refrigerant to thrust obstruction aside. If this method does not work, replace valve body and flush system.

**Note:** The following influence may be caused by no integrated power supply to indoor unit. When some indoor units are powered down suddenly, their electronic expansion valves may still keep certain opening, then:

- 1) The EXVs in power-down indoor units are opened and there are still a large amount of refrigerant passing through, but fan does not operate, so the refrigerant could not be evaporated; Entire evaporator and pipeline is in low temperature, when the indoor hot air contact with the evaporator and pipeline, a large amount of condensation may be produced.
- 2) A large amount of low temperature refrigerant flows through power-down indoor units and directly returns to compressor in liquid form without being evaporated, which will cause liquid attack phenomena and damage the compressor.
- 3) Because partial refrigerant flows into power-down indoor units, the refrigerant flowing through other normally operating indoor units will be reduced relatively, and this will lead to comparatively poor cooling effect.

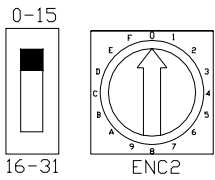
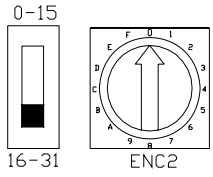


Electronic expansion valve view











### III. Address code and capacity code setting

The present address setting has been put outside the electric control board for convenient setting, and the range is 0-F. Before indoor units are power on, the address setting must be finished and the address setting of indoor units that match with the same outdoor unit can't be repeated, or it may cause compressor jumping-down, indoor EXV can't open, indoor fan motor jumping-down, and so on. After finishing address setting, indoor units must be power on again and address setting must be checked again to ensure no repeated setting. The checking method is as follows: press the button on the display board for 5 seconds, the display board will display address setting, continue to press for 5 seconds, the display board will display power setting. The setting is as follows:

Operation	Timer lamp	Defrosting lamp	Alarm lamp	Communication Address
OFF	OFF	OFF	OFF	 0
OFF	OFF	OFF	<b>ON</b>	1
OFF	OFF	<b>ON</b>	OFF	2
OFF	OFF	<b>ON</b>	<b>ON</b>	3
OFF	<b>ON</b>	OFF	OFF	4
OFF	<b>ON</b>	OFF	<b>ON</b>	5
OFF	<b>ON</b>	<b>ON</b>	OFF	6
OFF	<b>ON</b>	<b>ON</b>	<b>ON</b>	7
<b>ON</b>	OFF	OFF	OFF	8
<b>ON</b>	OFF	OFF	<b>ON</b>	9
<b>ON</b>	OFF	<b>ON</b>	OFF	10
<b>ON</b>	OFF	<b>ON</b>	<b>ON</b>	11
<b>ON</b>	<b>ON</b>	OFF	OFF	12
<b>ON</b>	<b>ON</b>	OFF	<b>ON</b>	13
<b>ON</b>	<b>ON</b>	<b>ON</b>	OFF	14
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	15
OFF	OFF	OFF	OFF	 16
OFF	OFF	OFF	<b>Flash</b>	17
OFF	OFF	<b>Flash</b>	OFF	18
OFF	OFF	<b>Flash</b>	<b>Flash</b>	19
OFF	<b>Flash</b>	OFF	OFF	20

OFF	Flash	OFF	Flash	21
OFF	Flash	Flash	OFF	22
OFF	Flash	Flash	Flash	23
Flash	OFF	OFF	OFF	24
Flash	OFF	OFF	Flash	25
Flash	OFF	Flash	OFF	26
Flash	OFF	Flash	Flash	27
Flash	Flash	OFF	OFF	28
Flash	Flash	OFF	Flash	29
Flash	Flash	Flash	OFF	30
Flash	Flash	Flash	Flash	31

Address Set		Address Code
		00 ~ 15
		16 ~ 31
		32 ~ 47
		48 ~ 63

**Power Setting:** The range is 0~9. In normal case, the power setting of indoor units has been set well. The matching capacity of indoor units is as follows:

Power setting	Capacity of indoor units
0	0.8 (2200W)
1	1.0 (2800W)
2	1.3 (3600W)
3	1.6 (4500W)
4	2.0 (5600W)
5	2.5 (7100W)
6	3.0 (8000W)
7	3.2 (9000W)
8	4.0 (11200W)
9	5.0(14000W)

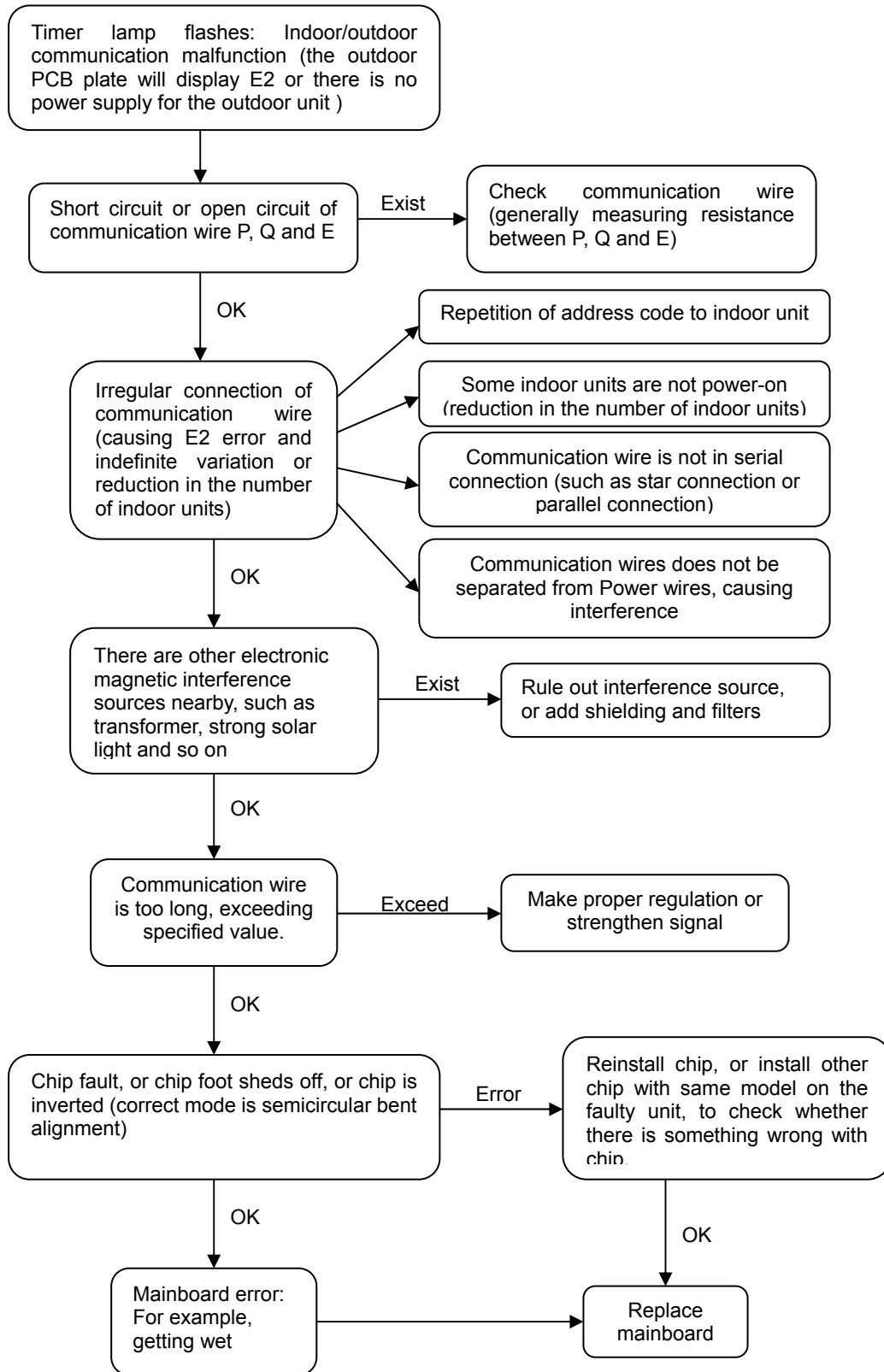
## IV. Trouble-shooting for fault diagnosis

### Indoor LED Malfunction Code

Display Contents	Explanation of Malfunction
All lamps are off	Standing-by
Operation lamp is on	ON
PRE./DEF. lamp is on	Anti-cooling or Defrosting
Timer lamp is on	Timer function is on
<b>Timer lamp flashes</b>	<b>Indoor/outdoor communication malfunction</b>
<b>Operation lamp flashes</b>	<b>Indoors temp. Sensor abnormal</b>
<b>PRE/DEF. Lamp flashes</b>	<b>Mode-confliction malfunction</b>
<b>Alarm lamp flashes quickly</b>	<b>Water-level switch abnormal</b>
<b>Alarm lamp flashes slowly</b>	<b>Outdoor malfunction or protection</b>



① **Timer lamp flashes: Indoor/outdoor communication malfunction**



**Note:**

1. Press the "manual" button on remote control receiver of indoor unit in turn (display the address code of this indoor unit when pressing and holding for 5 seconds (display capacity code when pressing and holding for 10 seconds), check all address codes.

Codes to be inspected are as follows:

Indicator	OPERATION	TIMER	DEF / FAN	ALARM
Code	8	4	2	1

Address code	0	1	2	3	4	5	6	7	8	9
Capacity (x 100W)	22	28	36	45	56	71	80	90	112	140
Horsepower (HP)	0.8	1.0	1.2	1.6	2.0	2.5	3.0	3.2	4.0	5.0

For example: After pressing and holding for 5 seconds, "Operation" light and "Alarm" light is constant-on, which indicates that the address code is  $(8 + 1) = 9$ ;

(Note: If the indicator is constant-on, calculate according to the above-mentioned formula.

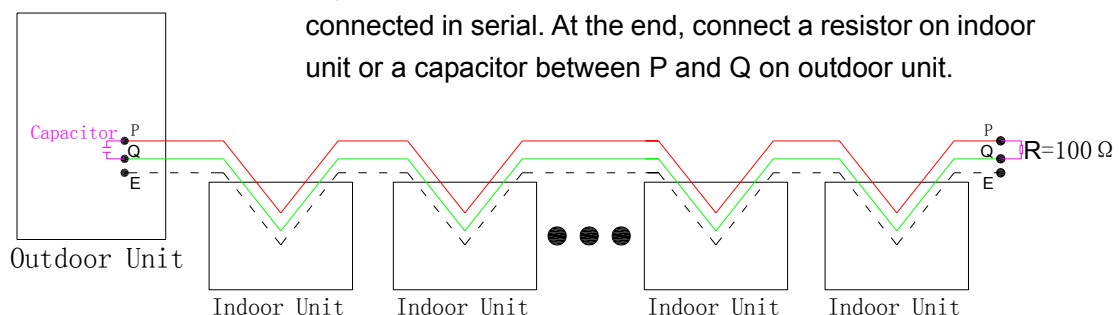
If the indicator is flashing, add 16 to the original calculated code, for example: After pressing and holding for 5 seconds, "Operation" light and "Alarm" light is flashing, which indicates that the address code is  $16 + (8 + 1) = 25$ .)

After pressing and holding for 10 seconds, "Operation" light and "Alarm" light is constant-on, which indicates that the address code is  $(4 + 1) = 5$ ; indicating the capacity of this unit is  $71 \times 100W$  ( 2.5 HP ).

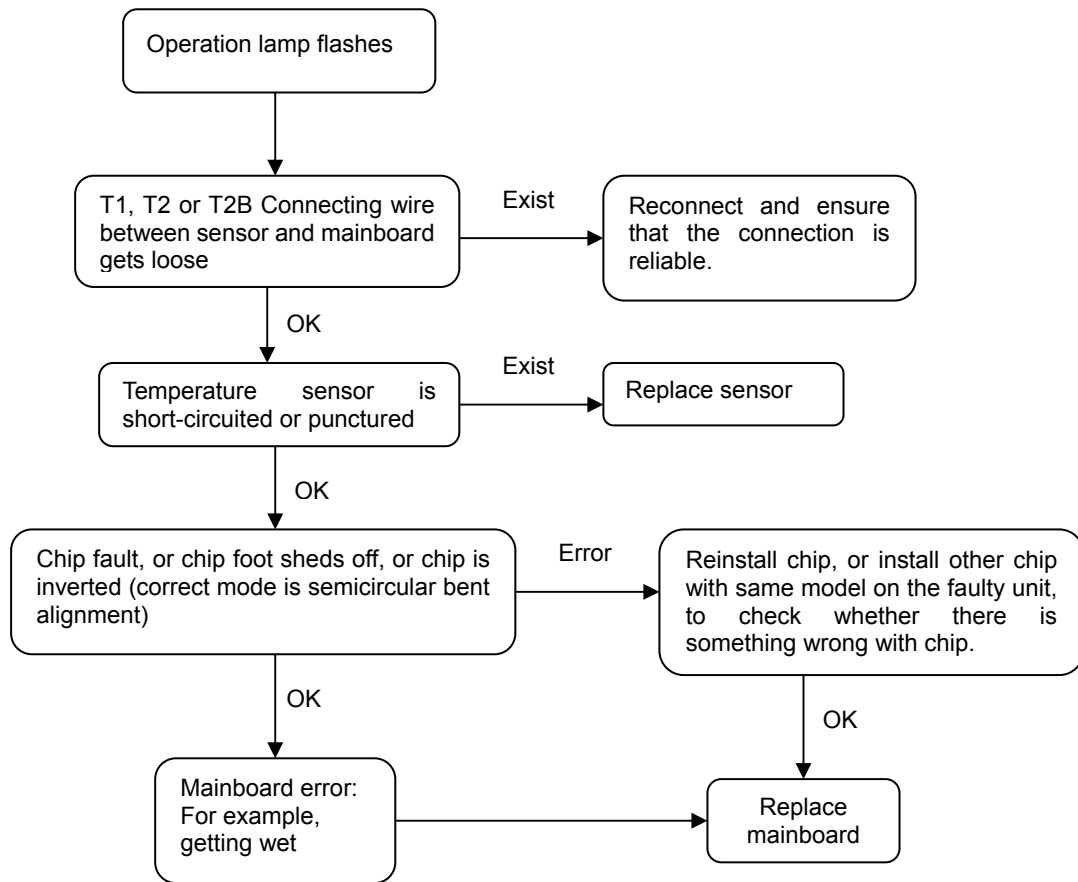


2. If the signal is weak, connect 100 Ω resistor between terminal P and Q on the end indoor unit in serial, or connect a small capacitor between terminal P and Q on outdoor unit in serial (as follows).

Signal wire must be shielded wire, indoor units must be connected in serial. At the end, connect a resistor on indoor unit or a capacitor between P and Q on outdoor unit.



② Operation lamp flashes: Indoors temp. Sensor abnormal



**Caution:** There are three temp. sensors in indoor unit, i.e. T1, T2 and T2B, of which fault in any one will cause operation light flashing and report error.

③ **DEF. Lamp flashes: Mode-conflict malfunction**

In the below table, “Yes” indicates existing mode conflict, “No” indicates no mode conflict.

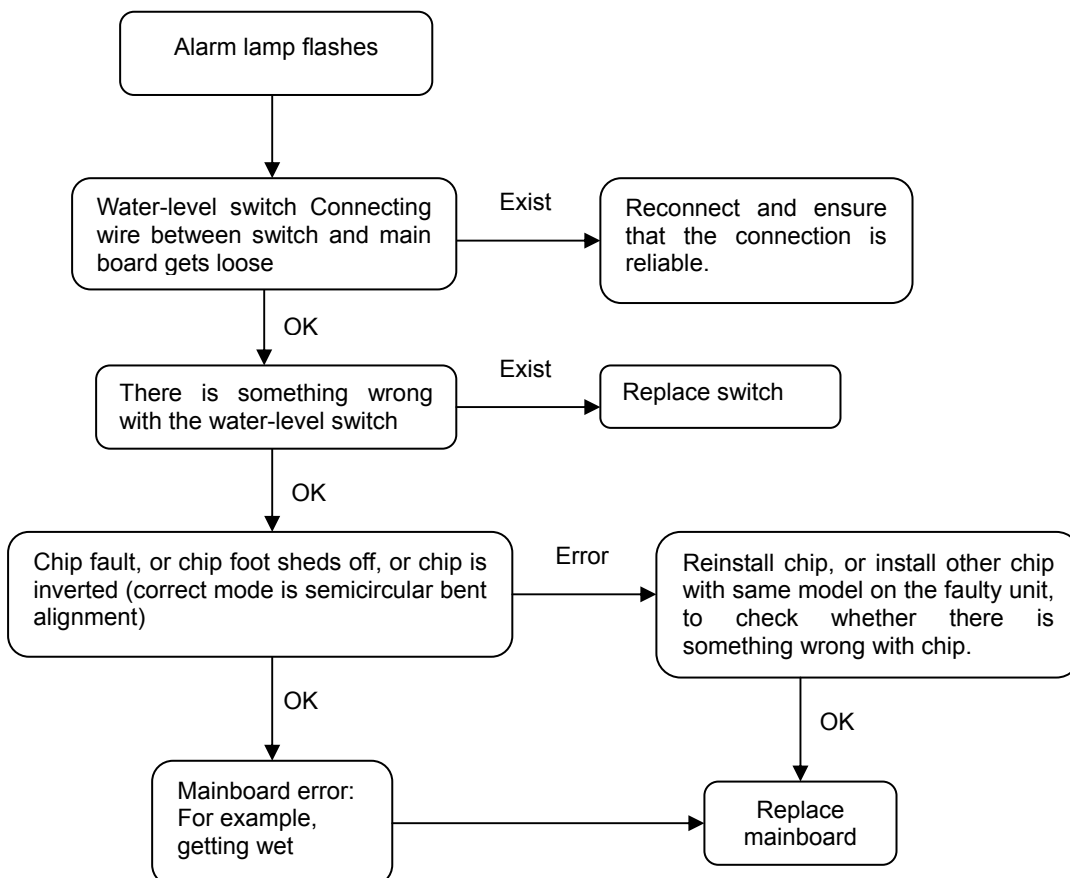
	Cooling	Heating	Air-supply	OFF
Cooling	No	Yes	No	No
Heating	Yes	No	Yes	No
Air-supply	No	Yes	No	No
OFF	No	No	No	No

When indoor unit receiving heating operation instruction, it will transmit the operation mode signal to outdoor unit to conduct prior heating control, including:

**In process of cooling and air-supply mode operation:** After receiving the heating operation instruction, outdoor unit stops cooling and supplying air, and transfers to heating mode three minutes later after the shutdown of compressor; indoor unit required to conduct cooling and air-supply mode operation is on standby mode and displays mode conflict fault.

**In process of heating mode operation:** Ignore cooling and air-supply mode operation instruction, outdoor unit keeps on operating according to heating mode; Indoor unit with cooling and air-supply mode operation displays mode conflict fault. If heating mode operation stops (except that indoor unit reaches setting temperature because of heating), cooling and air-supply mode restarts up and conducts operation three minutes later.

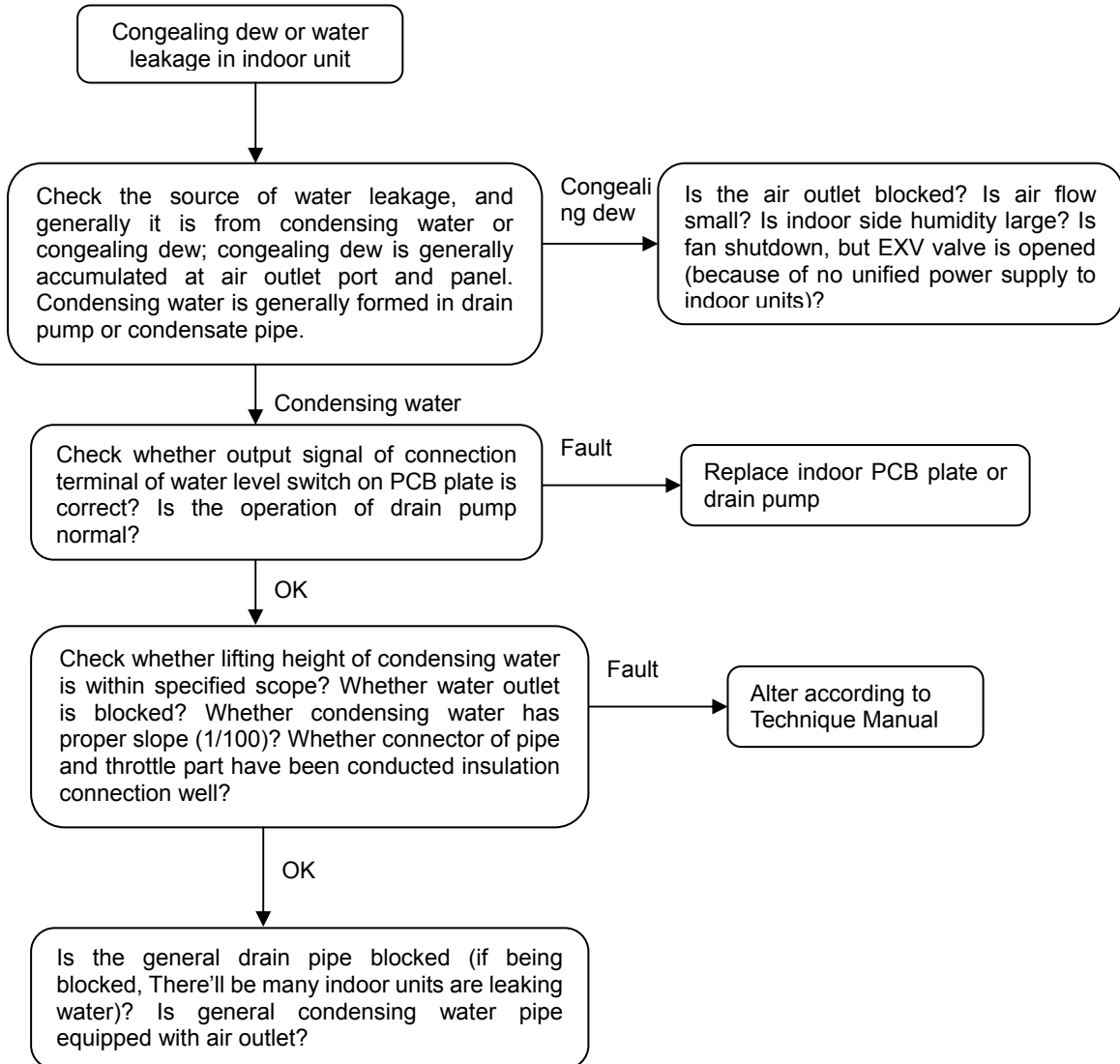
④ **Alarm lamp flashes: Water-level switch abnormal**



⑤ Alarm lamp flashes slowly: Outdoor malfunction or protection

Examine outdoor unit, and analyze according to actual condition

⑥ Congealing Dew or Water Leakage in Indoor Units



⑦ LED and LCD display on the new panel of 4-way cassette

No.	Error or Protection	OPERATION	TIMER	DEF/FAN	ALARM	RECOVERABLE OR NOT	CODE
1	Room temperature sensor checking channel is abnormal	X	☆	X	X	Yes	E2
2	Evaporator temperature sensor checking channel is abnormal	☆	X	X	X	Yes	E3
3	Condenser temperature sensor checking channel is abnormal	X	X	☆	X	Yes	E4
4	Pump sensor malfunction	X	X	X	☆	Yes	E5
5	Outdoor protection (lack of phase, phase sequence, etc.)	☆	☆	☆	☆	Yes	E6
6	EEPROM malfunction	☆	☆	X	X	No	E7
7	Water level alarm	X	X	X	☆	Yes or No (if last for 3 min the error hasn't been eliminated yet)	E8
8	Communication malfunction					Yes	E1

(X stands for Elimination(OFF), ☆ stands for flashing at 5Hz)