

# DVM S Compressor Failure Trouble Shooting

SAMSUNG ELECTRONICS Co. LTD.

HQ CS

# - Case of Compressor failure -

# ❖ Error code & Trouble shooting

## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

- ✓ Check whether compressor defect or Inverter PCB defect
- ✓ Compressor defect by oil shortage or itself

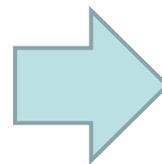


Inverter PCB

Or



compressor



E461/464 / 466

E361/364 / 366

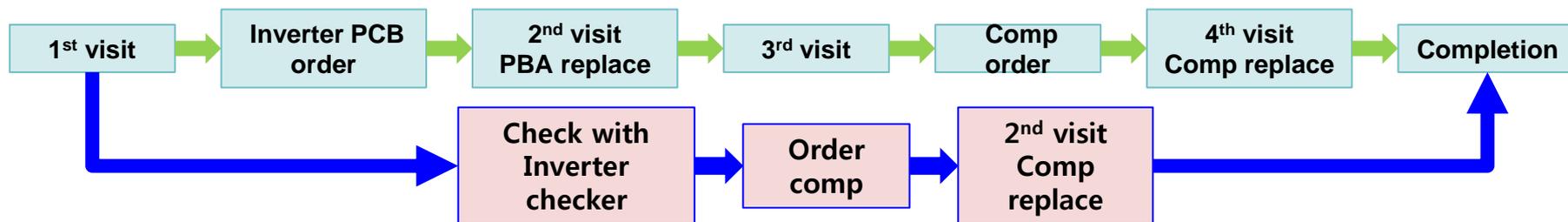
# - Inverter PCB Check -

# Error code & Trouble shooting

## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

✓ Diagnosis 1 : Using inverter checker

1. Power Off
2. Wait more than 15 minutes after the Power Off as in case of IPM failure, discharge mode may not work properly.
3. Connect inverter checker(Phase checker)(U : RED / V : WHT / W : BLK)
4. Execute inverter checker function in OUD main PCB.
5. If any LED is not blinking → PCB defect → Change PCB



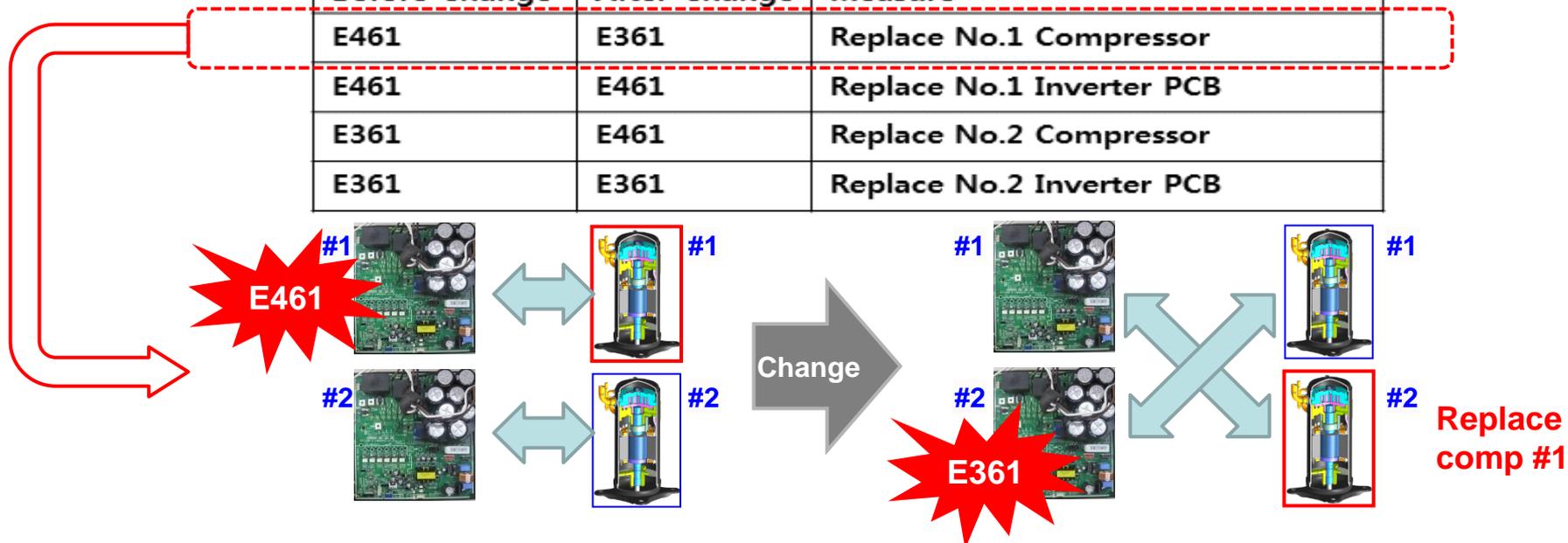
# Error code & Trouble shooting

## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

✓ Diagnosis 2 : When 2comp system

1. Power Off
2. Wait more than 15 minutes after the Power Off.
3. Exchange comp wire ( Inver PCB 1 ↔ comp 2 & Inverter PCB 2 ↔ comp 1)
4. Take measure according to the result

Before Change	After Change	Measure
E461	E361	Replace No.1 Compressor
E461	E461	Replace No.1 Inverter PCB
E361	E461	Replace No.2 Compressor
E361	E361	Replace No.2 Inverter PCB



## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

✓ Diagnosis 3 : Check Inveter PCB defect with Tester

1. Power Off.
2. Wait more than 15 minutes after the Power Off as in case of IPM failure, discharge mode may not work properly.
3. Remove all of the Inverter PCB connectors and wire that is fixed as screw.  
(Include wire that is fixed to compressor and DC Reactor.)
4. Prepare the digital multi tester.

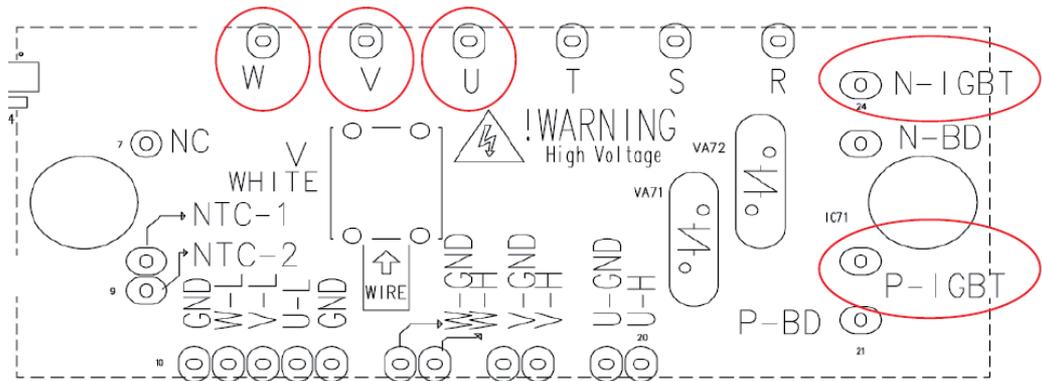
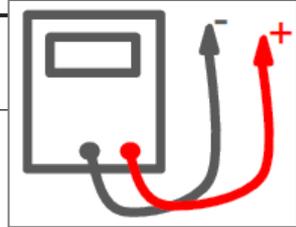


# Error code & Trouble shooting

## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

✓ Diagnosis 3 : Check Inverter PCB defect with Tester

Division	Measured Point		Criterion	Remark
	+	-		
Measure the resistance values	P-IGBT	U	More than 3 MΩ	Measurement error can occur for reasons such as the initial measurement condenser discharge. Measured over at least three times.
	P-IGBT	V		
	P-IGBT	W		
	U	N-IGBT		
	V	N-IGBT		
	W	N-IGBT		
Measure the diode voltage values	U	P-IGBT	0.3~0.7V	
	V	P-IGBT		
	W	P-IGBT		
	N-IGBT	U		
	N-IGBT	V		
	N-IGBT	W		



# - Compressor Check -

# Error code & Trouble shooting

## ◆ Trouble shooting for E461/361 & E464/364 & E466/366

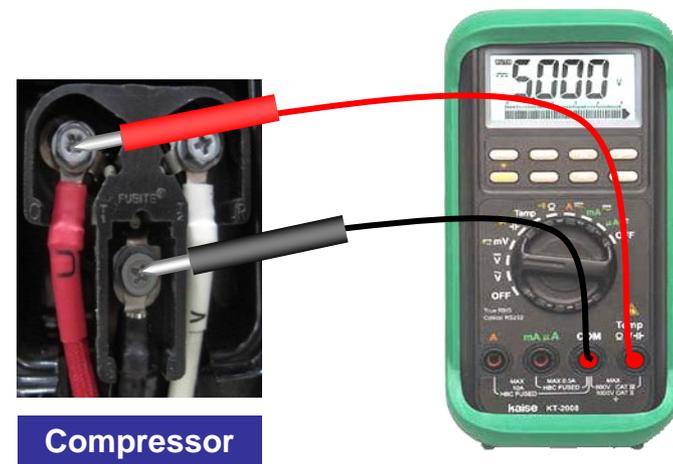
✓ Diagnosis 1 : Check compressor defect with Tester

1. Power Off.
2. Wait more than 15 minutes after the Power Off as in case of IPM failure, discharge mode may not work properly.
3. Prepare the digital multi tester.

Resistance test	Normal Value
Resistance value of (U↔V,V↔W,W↔U) on compressor	less than 2Ω
Resistance value between the body of compressor and chassis	MΩ

(Example)

No	Comp Name	Resistance (20°C)								
		C-R or U-V (Ω)			C-S or U-W (Ω)			V-W (Ω)		
		Spec.	Min	Max	Spec.	Min	Max	Spec.	Min	Max
1	DS-GB052FA++	0.21	0.20	0.22	0.21	0.20	0.22	0.21	0.20	0.22
2	DS-GB052FB++	0.13	0.12	0.13	0.13	0.12	0.13	0.13	0.12	0.13
3	DS-GB066FA++	0.14	0.13	0.15	0.14	0.13	0.15	0.14	0.13	0.15
4	DS-GB070FA++	0.11	0.11	0.12	0.11	0.11	0.12	0.11	0.11	0.12

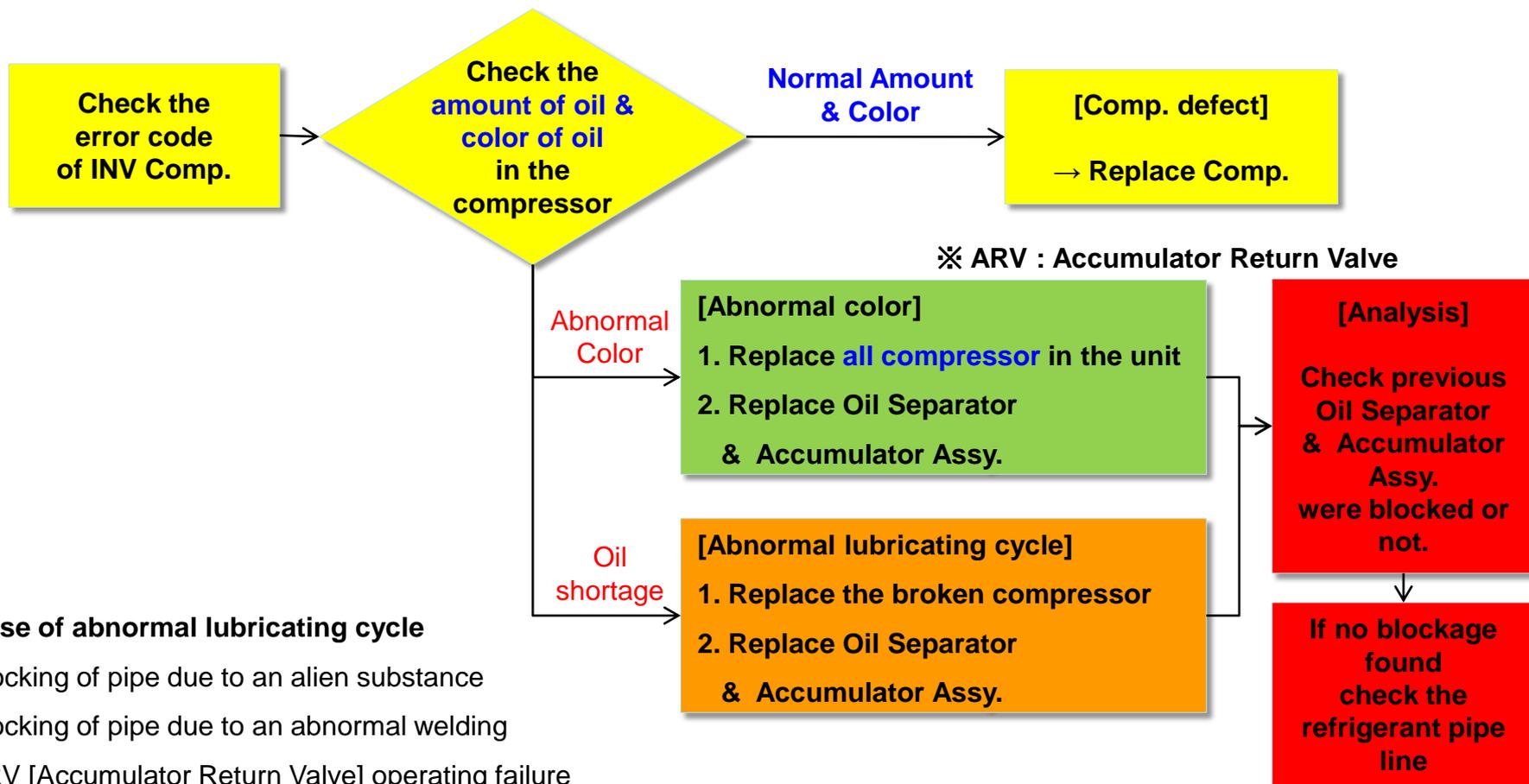


**- Replace the Compressor -**

# ❖❖❖ Error code & Trouble shooting

## ◆ How to change the compressor

- If you find compressor error code, you have to check whether the **compressor defect** itself or compressor failure due to an **abnormal lubricating cycle**.



- \* Cause of abnormal lubricating cycle
- Blocking of pipe due to an alien substance
  - Blocking of pipe due to an abnormal welding
  - ARV [Accumulator Return Valve] operating failure

# Error code & Trouble shooting

## ◆ How to change the compressor

- ✓ Part replacement and inspection

Lubricating problem can be caused by other units so other unit's lubricating parts must be checked.

Main ODU Comp #1 broken		Main ODU		Sub 1	Sub 2
		comp #1	comp #2	comp #1	comp #1
If oil is contaminated	Comp	Replace	Replace	X	X
	Accum	Replace		X	X
	Oil separate	Replace	Chocking test by nitrogen gas	X	X
If oil is shortage	Comp	Replace	X	X	X
	Accum	Replace		X	X
	Oil separate	Replace	Chocking test by nitrogen gas	X	X
Remark				Check chocking of lubricating parts	

## ◆ How to change the compressor

- ✓ Detach the faulty compressor

Step	When compressor is 1 inside outdoor unit	When compressor is 2 inside outdoor unit
1		Set faulty compressor cut from ODU PCB setting
2		Proceed pump out only 1 time. ※ Continues pump out will cause compressor breakdown
3	Lock all SVC valve of liquid pipe and gas pipe.	
4	Enter in vacuum mode to open all EEV and Valve	
5	Reclaim refrigerant of outdoor unit using Recovery Unit. ※ 1. After pump out, amount of refrigerant remaining is about 1.5kg ordinarily. In the winter, refrigerant can remain more because refrigerant fills to Accumulator 2. Refer to factory charging refrigerant had registered to Label of outdoor unit.	
6	Turn off the power of outdoor unit.	
7	Separate faulty compressor from outdoor unit. ※ Use pipe cutter or confirm whether refrigerant of outdoor unit was reclaimed all through manifold gauge before use welding machine to detach the compressor.	

## ◆ How to change the compressor

- ✓ Oil condition check and replace new compressor

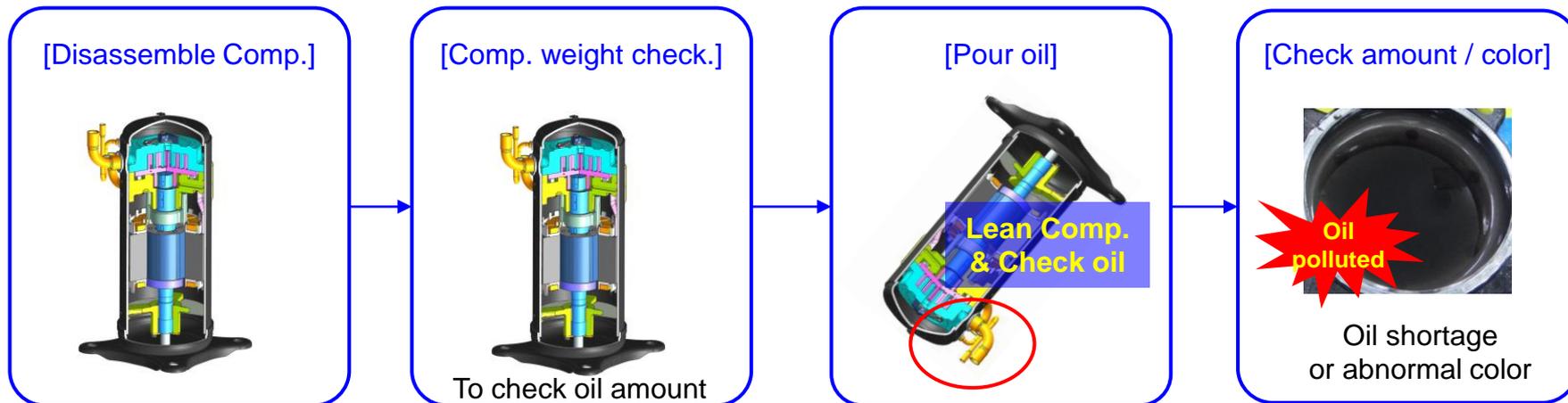
Step	When compressor is 1 inside outdoor unit	When compressor is 2 inside outdoor unit
1	Measure quantity of broke down oil of compressor.	
2	Check amount and color of compressor oil that broke down	
3	When oil is polluted(ASTM : more than 3) replace all comp. & the Oil Separator & Accumulator Assy. as well. When shortage replace the broken comp. & Oil Separator & Accumulator Assy. as well.	
4		When oil is shortage, check other compressor's oil separator if chocking and if so replace the oil separator. (See the page 18)
5	Decide amount of oil to be added after compressor replacement	
6	Install new compressor & Add oil as decided in the previous step	
7	Supply the power and then enter in vacuum mode to open all EEV and Valve	
8	Execute leakage examination using nitrogen then proceed vacuum work	
9	Add refrigerant as much as recovered from step 5. ※ Can get help to decide additional refrigerant amount if use refrigerant amount check function in ODU	
10	Execute Auto Trial Operation after open SVC Valve.	

# ❖ Error code & Trouble shooting

## ◆ How to change the compressor

- ✓ Oil color decision

Exchange all compressor in the system if the oil color is same or worse than 3.



\* ASTM D1500



## ◆ How to change the compressor

- ✓ Decide additional amount of oil

Decide amount of oil to be added after compressor replacement

Otherwise new compressor will be broken continuously by bad lubricating cycle.

※ Amount oil amount(kg)= Weight(kg) of replaced part - Weight(kg) of new part((Refer to the weight info.)

※ Add 100cc of oil every 0.1kg difference

※ DVM S oil service code : DB81-02598A [ 1ℓ can ]



1. Check the weight of broken compressor

\* GB052FAVA : 31.6kg(including oil 1100cc) / GB066FAVA : 35.4kg(including oil 1100cc)

\* If broken compressor is **0.8kg or more lighter** than new one, **Oil return line** is **blocked**.

2. Check the weight of oil lubricating part(Assy. accumulator, Assy. oil separator)

3. If module installation, install Filter dryer to liquid of each unit to prevent further problem.

# Error code & Trouble shooting

## ◆ Check point before replace the compressor

### - How to check the Oil separator blockage

1. Close the Gas & Liquid valve.
2. Put the system in the vacuum mode.
3. Remove the refrigerant by refrigerant recovery unit.
4. Reset the system(K3 button) then down the power breaker.
5. Remove the broken compressor
6. Nitrogen gas blowing to Discharge line

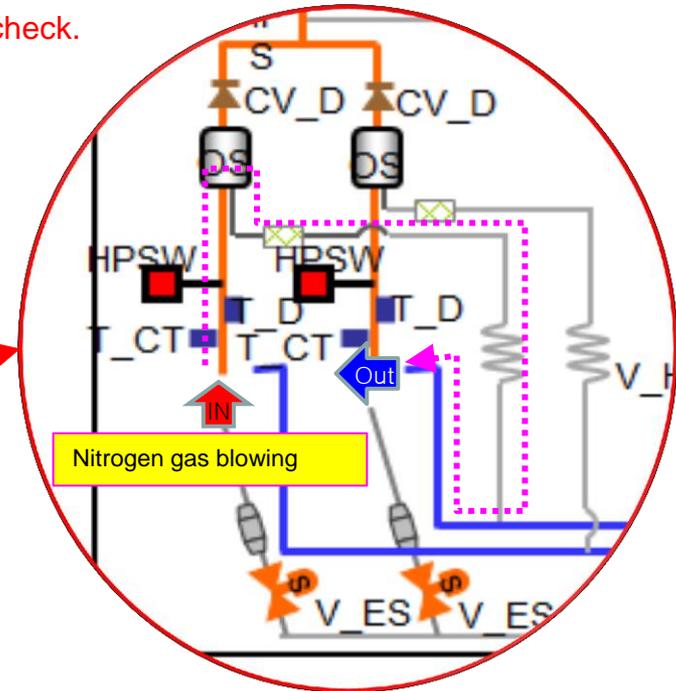
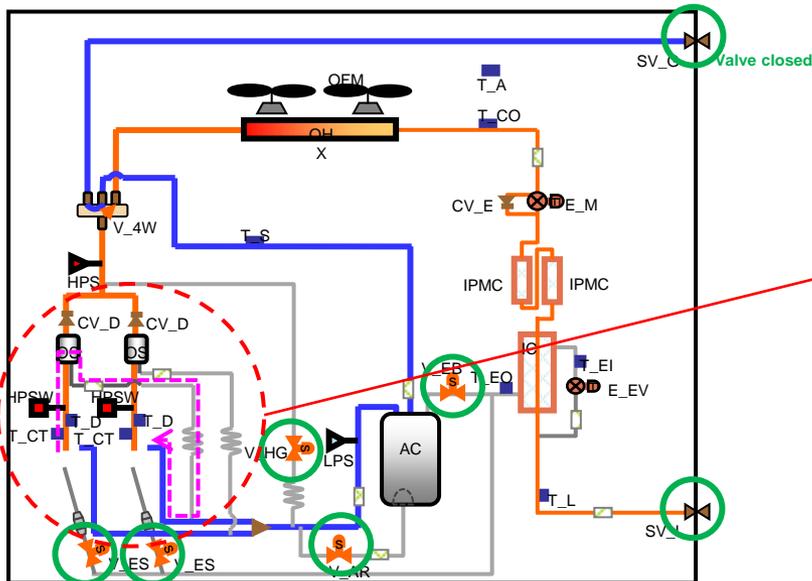
### \* How to judge the result

OK : Nitrogen gas come out from suction line

NG : No gas come out from suction line

\* Some sol valve may have leak. So even though the result was ok, check the temperature of oil separator return line again after install the new compressor (Next page)

\* When one compressor replace in 2 comp unit, use test run to check.



# Error code & Trouble shooting

## ◆ Check point after replace the compressor

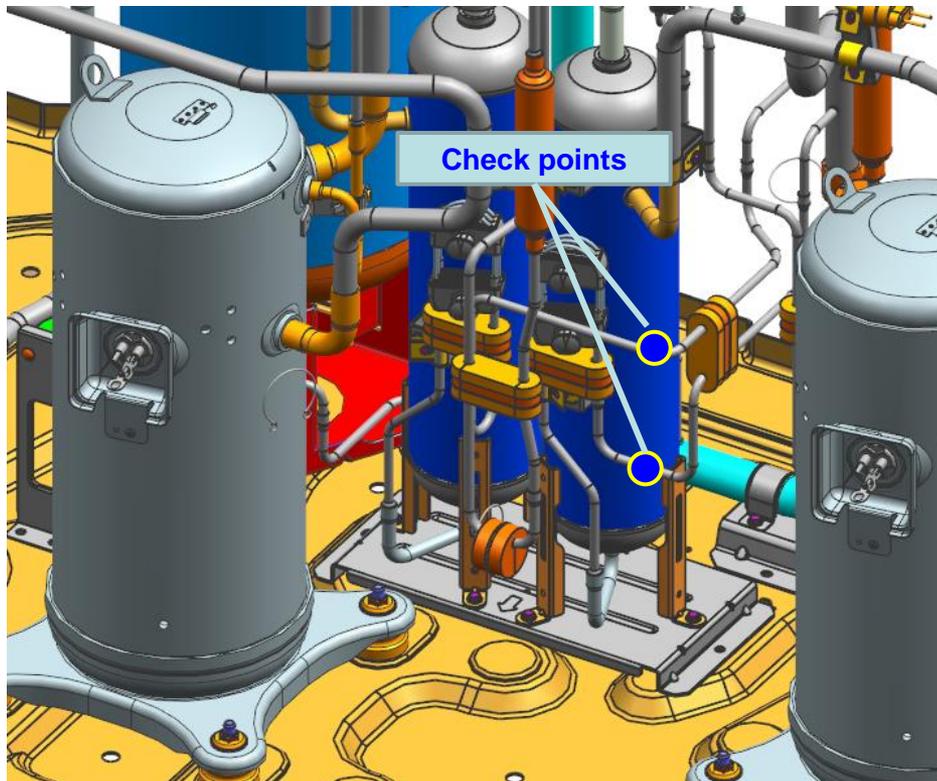
### - Test run to check Oil separator(high pressure side)

Normal : Check point temp.  $\approx$  Saturated T<sub>Pd</sub>

Abnormal : Check point temp.  $\approx$  surrounding temp.

\* Check point : Oil out line of oil separator

Address	10,06,00	10,06,01
Serial Number	-	-
Operation Mode	Test	Test
Operation Status	Heat	Heat
Error Code	911	911
Capacity	22HP	22HP
Target Frequency1	58	61
Order Frequency1	58	61
Current Frequency1	58	61
Target Frequency2	61	64
Order Frequency2	61	64
Current Frequency2	61	64
High Pressure	23,6	24,6
Saturated T <sub>Pd</sub>	40℃	42℃
Low Pressure	5,4	5
Saturated T <sub>Ps</sub>	-7℃	-9℃
Discharge1	53,1℃	68℃
Discharge2	53,5℃	62,7℃



# ❖ Error code & Trouble shooting

## ◆ Check point after replace the compressor

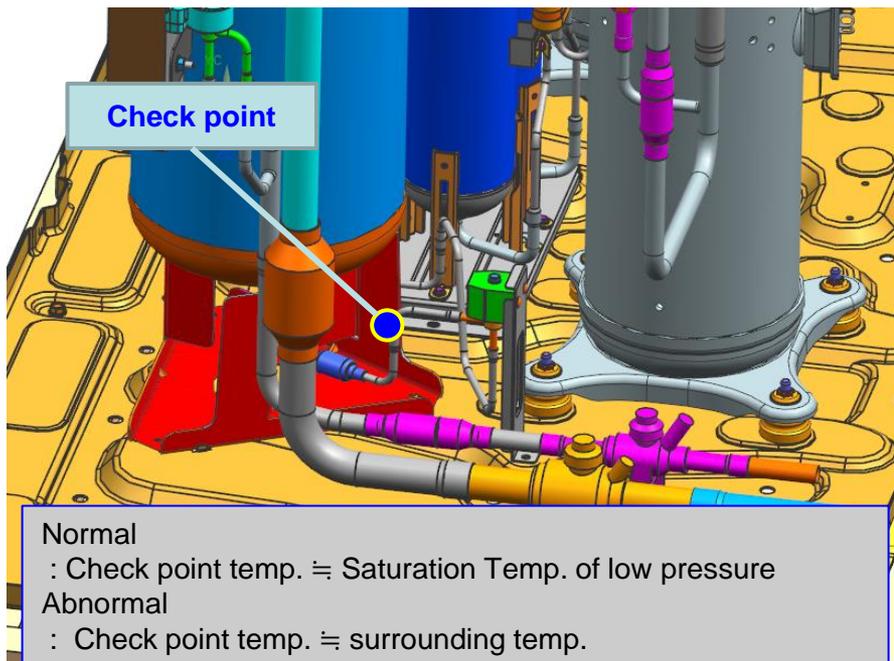
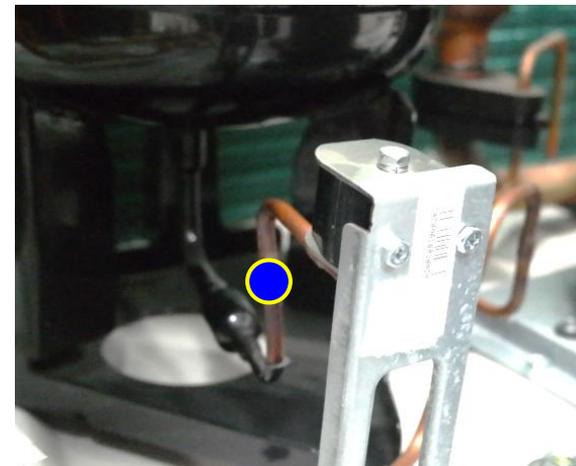
### - Test run to check Accumulator(low pressure side)

1. Normal : ARV close temp. – ARV open temp. >5°C

\* Test run(30mins) → ARV disconnect(closed)

→ Worm up the pipe by hand → 5mins wait → temp. check

→ ARV connect(open) → 5mins wait → temp. check



No	ODU No1		ODU No2	
	Outdoor Temp	8.2	8.7	8.6
High Pressure	28.4	28.5	28.4	28.5
Low Pressure	5.4	4.6	5.4	4.6
Current Freq	53	64	49	58
Hotgas	OFF	OFF	OFF	OFF
Suction	4.9	3.8	4.8	4.2
ARV off	22	-	20	-
ARV On	-	10.7	-	19

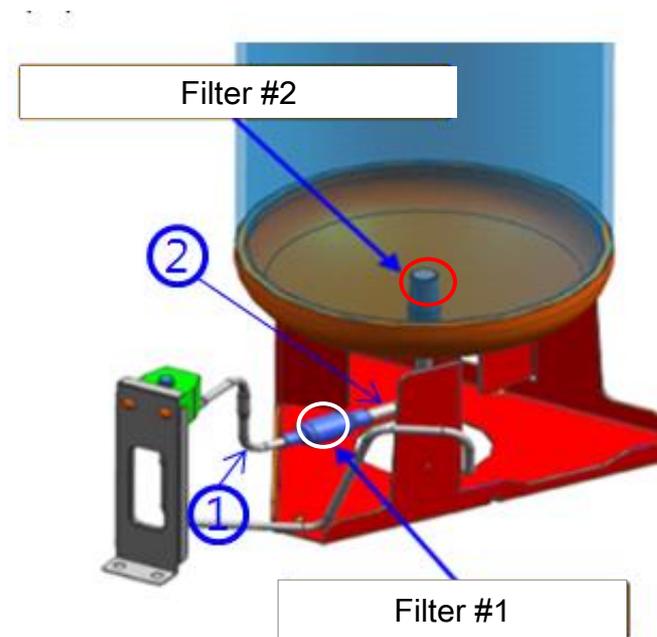
**NG**

# Error code & Trouble shooting

## ◆ Check point after replace the compressor

### 1. How to check the broken accumulator blockage

- Cut ① and check
  - : No oil flow - filter#1 or pipe block / Oil flow - ARV valve block
- Cut ② and check
  - : No oil flow - filter#2 or pipe block / Oil flow - filter #1 block



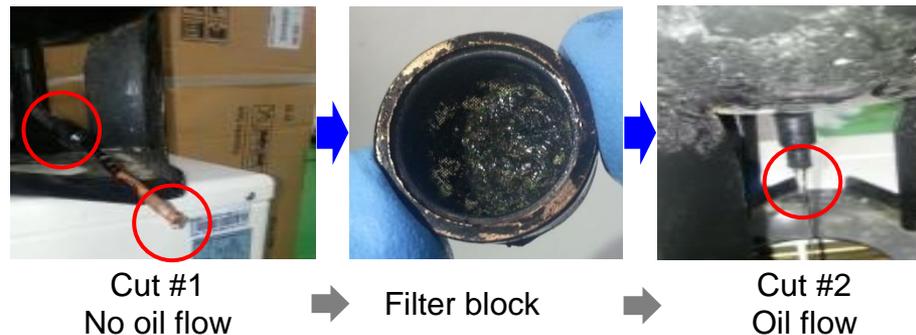
\* If there is moisture in the system  
In heating mode, saturated temperature is below 0°C and it makes ice which can block the filter

< oil with add 200cc water test >



Address	10,06,00
Serial Number	-
Operation Mode	Test
Operation Status	Heat
Error Code	911
Capacity	22HP
Target Frequency1	58
Order Frequency1	58
Current Frequency1	58
Target Frequency2	61
Order Frequency2	61
Current Frequency2	61
High Pressure	23,6
Saturated T_Pd	40°C
Low Pressure	5,4
Saturated T_Ps	-7°C
Discharge1	53,1°C
Discharge2	53,5°C

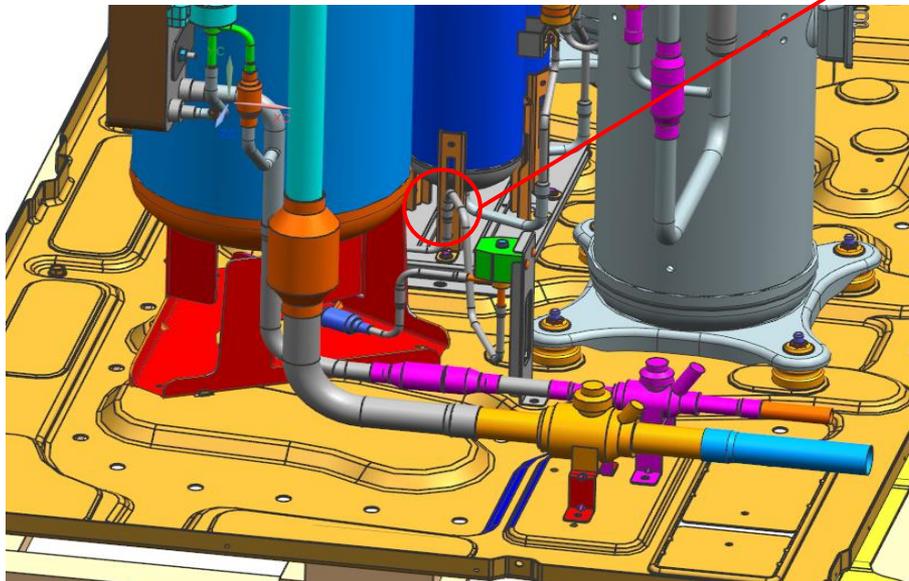
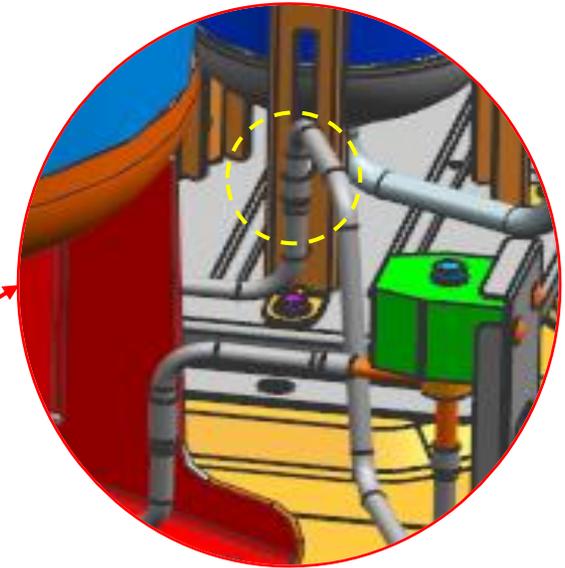
\* If It happen block in filter by substance there is no out oil



## ◆ Check point after replace the compressor

### 2. How to check the broken ARV blockage

- There is oil in accumulator but there is no block after check 1 case
- It should check ARV blazing point
- Cut the brazing point and check



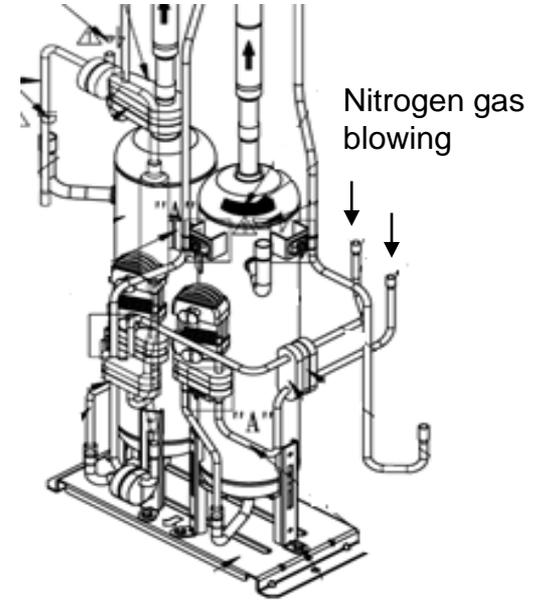
It is possible to be blocked by blazing substance



## ◆ Check point after replace the compressor

### 3. How to check the broken Oil separator blockage

- If there is little oil in accumulator, it is possible to be in Oil separator
- It should check blazing point
  1. Blowing by nitrogen gas
  2. Cut and see



It is possible to be blocked by blazing substance



## ◆ Check point after replace the compressor

✓ Installation of Filter drier

- Filter Drier must be installed in liquid pipe when compressor is replaced for service
- To remove moisture / foreign object / carbide in the system.

- Type of Filter Drier

(※ Type 1 & 2 had different adsorbent)

Type 1. BFK GD-6326-XXXX BK

: Remove moisture & filter role

- ① When initial installing
- ② Part exchange in ODU except compressor

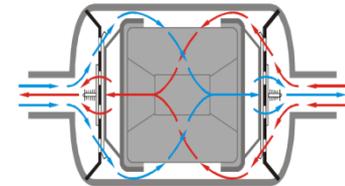


Type 2. BFK-XXXX BK (HH Core)

: Remove carbide + moisture + filter role

(remove moisture is 20% capacity compare to type 1)

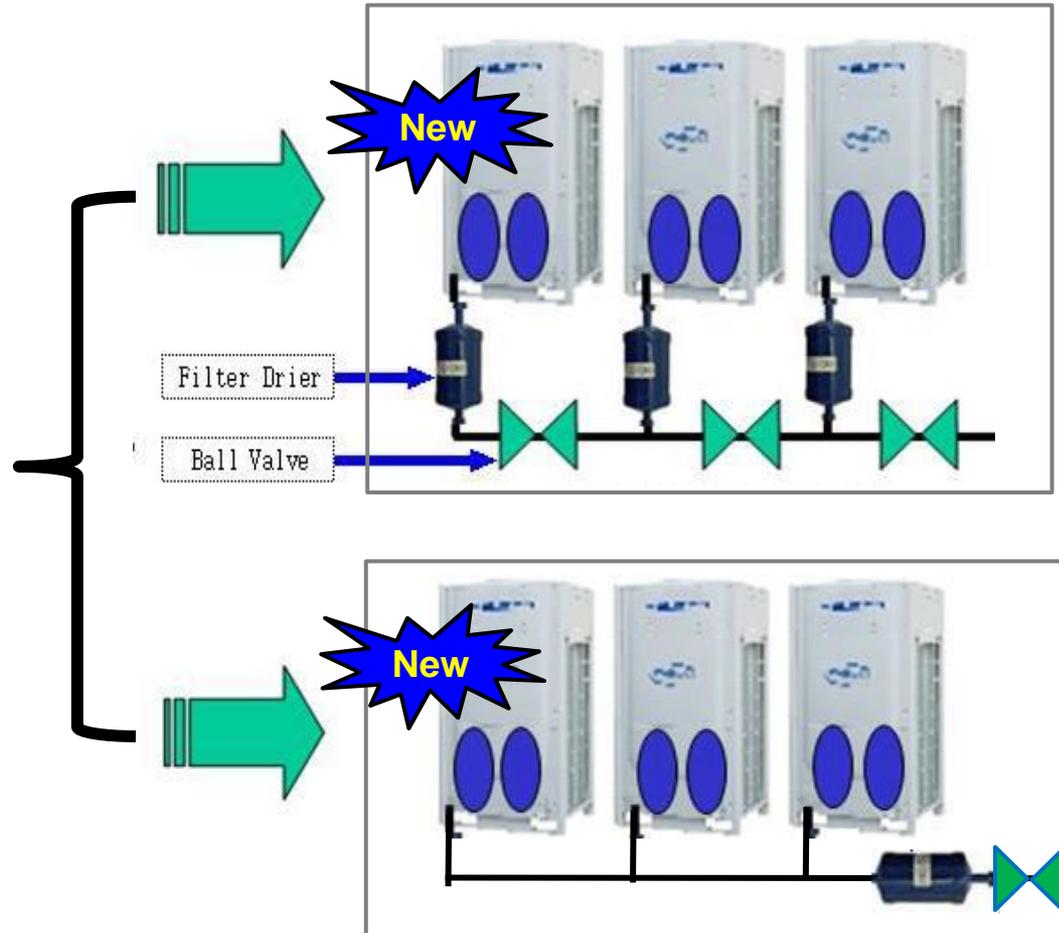
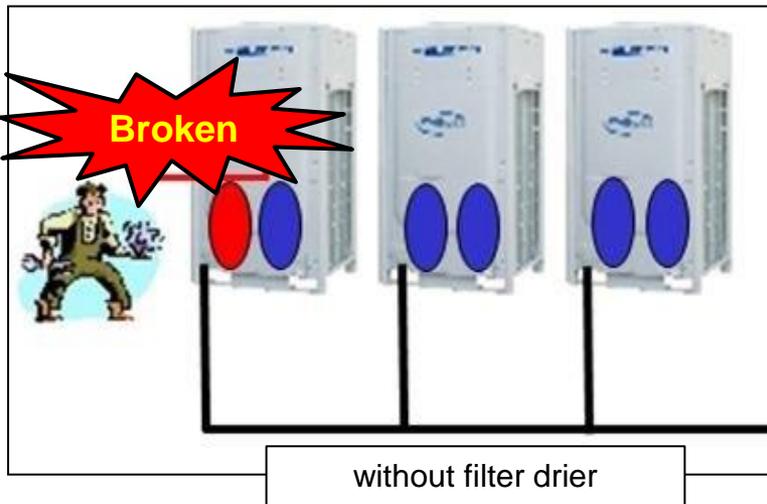
- ① **After compressor exchange**



# ❖ Error code & Trouble shooting

## ◆ Check point after replace the compressor

- ✓ Installation of Filter drier & Ball valve
  - Ball valve will make easy to replace filter drier next time



## ◆ Check point after replace the compressor

### ✓ Filter drier replace period

1. Pipe is opened for service.
2. E407(high pressure error) or E416(discharge temp error) → filter drier may blocked
3. Cooling mode : IDUs' avg. EEV > 400step, Avg. SH ≥ 3°C ( SH : Evap out – Evap in)
4. Heating mode : Main EEV full open & SH > 5°C (SH : low pressure saturated. temp – cond out temp)

Item	Liquid pipe size	DRIER FILTER code	BALL VALVE code	Flare Nut
Type 1 Normal <b>(Moisture)</b>	3/8" (9.52mm)	DB97-01222A	DB62-07619A	DB60-30010B
	1/2" (12.7mm)	DB97-01222B	DB62-07618A	DB60-30010C
	5/8" (15.8mm)	DB97-01222C	DB62-07617A	DB60-30010D
Type 2 After exchange compressor <b>(Carbide)</b>	3/8" (9.52mm)	DB62-10799A	DB62-07619A	Brazing
	1/2" (12.7mm)	DB62-10799B	DB62-07618A	Brazing
	5/8" (15.8mm)	DB62-10799C	DB62-07617A	Brazing
	3/4" (19.1mm)	DB62-10799E	DB62-07616A	Brazing
	7/8" (22.2mm)	DB62-10799D	DB62-07615A	Brazing

**Thank You !!!**

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