FUJITSU

Service Tips

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Notes

Notes

Notes

Thermistor

- **Take temperature at location of sensor.**
- **Compare Chart temperature to expected Ω ohms reading.**
- **Reading should be within about 10% of the chart**

	MODELS: ALL R410A INDOOR UNITS				MODELS: ALL R410A OUTDOOR UNITS				
	Room T Thermistor	Room T Thermistor w/ board	Indoor Pipe Thermistor	Indoor Pipe Thermistor w/ board	Discharge/ Compressor Thermistor	Outdoor Pipe Thermistor	Outdoor Temperature Thermistor	Heat Sink Thermistor	2/3 Way Valve Thermistor
Temp °F(°C)	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ
-4(-20)						49.20	115.24		
5(-15)						36.58	84.21		
14(-10)						27.51	62.28		312
23(-5)						20.91	46.58		233
32(0)	33.62	8.29	176.03	39.48	175.70	16.05	35.21	16.1	176
41(5)	25.93	-	134.23	-	134.93	12.44	26.88	12.4	134
50(10)	20.18	7.12	103.34	34.10	104.59	9.73	20.72	9.73	103
59(15)	15.84	-	80.28	-	81.79	7.67	16.12	7.67	80.3
68(20)	12.54	5.86	62.91	28.14	64.50	6.10	12.64	6.10	62.9
77(25)	10.00	5.24	49.70	25.15	51.27	4.89	10.00	-	-
86(30)	8.04	4.64	39.57	22.26	41.07	3.95	7.97	3.95	39.6
95(35)	6.51	-	31.74	-	33.13	3.21	6.40	-	-
104(40)	5.30	3.58	25.64	17.05	26.91	2.62	5.18	2.62	25.6
113(45)	4.35	-	20.85	-	22.01	2.16	4.21	-	-
122(50)	3.59	2.71	17.06	12.78	18.10	1.79	3.45	1.79	17.1
131(55)	2.98	-	14.10	-	14.98	1.49	2.85	-	-
140(60)	2.47	2.03	11.64	9.47	12.47	1.25	2.36	1.25	11.6
149(65)	2.09		9.69		10.44	1.05	1.97	-	-
158(70)	1.76		8.12		8.78	0.89	1.65	0.89	8.12
167(75)	1.49		6.83		7.42	0.76	1.39	-	-
176(80)	1.27		5.78		6.31	0.65	1.18	0.65	5.78
185(85)	1.09		4.91		5.38	0.56	1.00	-	-
194(90)	0.93		4.19		4.61	0.48	0.85	0.48	4.19
203(95)	0.81		3.59		3.97	0.41	0.73	-	-
212(100)	0.70		3.09		3.43	0.36	0.63	0.36	3.09
221(105)					2.98			-	
230(110)					2.59			0.27	
239(115)					2.26			-	
248(120)					1.99			0.21	
284(140)					1.21				
320(160)					0.77				
356(180)					0.51				

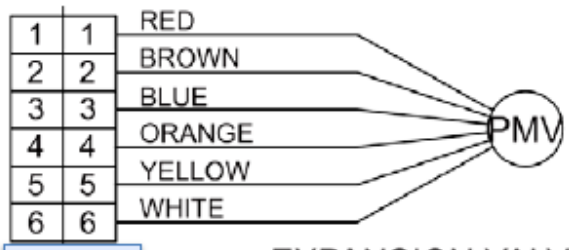
Discharge Temperature Thermistor Error

Some examples of a Discharge Temperature Thermistor error on most models:
7x Operation & 2x Timer / 10 Operation & 1x Timer / E:A11 (HFI) / E:A51 (HFI) / 18x LED 1 / E:0F (wired remote)

Conditions:

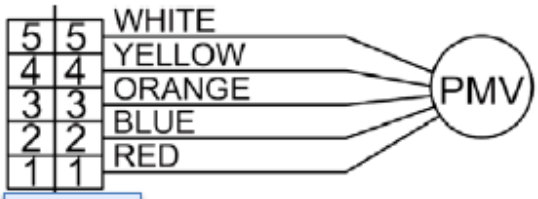
- Low Charge
- Restrictions
- Defective Electronic Expansion Valve (EEV)

To check running pressure on the system, power off the outdoor unit for 5 minutes. While the power is off check the EEV's resistance and ensure it is operating correctly.



6 wire

EXPANSION VALVE



5 wire

Check Point 2 : Check coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	46 Ω ± 4 Ω at 68°F (20°C)
Yellow - Red	
Orange - Red	
Blue - Red	

▶ If Resistance value is abnormal, replace EEV.

Check Point 2 : Check coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	46 Ω ± 4 Ω at 20°C
Yellow - Brown	
Orange - Red	
Blue - Brown	

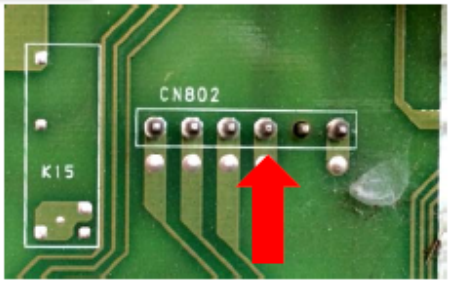
▶ If Resistance value is abnormal, replace EEV.

If the EEV's ohm readings are bad replace it. The EEV coil snaps onto the valve. If the EEV is good there is likely a leak in the system. The most common places for leaks are on the flare connections at the indoor and outdoor units. If the EEV coil is good and there is no leak there may by a restriction. Pump down the system and blow the lines out with nitrogen.

Checking for 12 volts DC output from Control Board

Test on all 6 solder points on the board and verify voltage reads 12-13 volts DC.

Find and use a DC ground on the main control board.



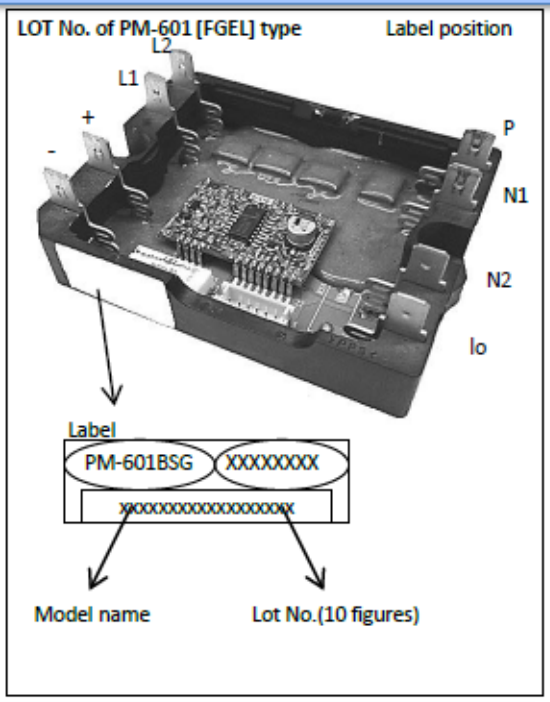
On multi-zone systems look for CN802(fan motor)
Use pin 3 for DC ground.

ACTPM Check

Some examples of an Active Filter Module error on most models:
8x Operation & 2x Timer / 8x Operation & 3x Timer / 6x Operation & 4x Timer / Continuous Operation blink & 12x Timer / E:641
22x flashes LED 1 / E:19
The Active Filter Module on inverter units is a PCB that will filter the harmonic current. It's output is supplied to the IPM PCB. If the unit has been installed and operating normally but suddenly shows an communication error after a power outage or thunderstorm, you may suspect the ACTPM failure. Although your first reaction may be to replace it, test it with an ohm meter and determine if it needs a replacement. Remember to remove power and wait five minutes before unplugging the PCB for testing.

Check Points: Check Open or Short-circuit and Diode.

Remove all connectors first !!!
Check the open or short-circuit



Terminal		Resistance Value			
		Type A		Type B	
Multimeter (+)	Multimeter (-)	SACT32010 [HITACHI] LACT33020 [HITACHI] PM-601 [FGEL] LOT No. 1302931395		PM-604 [FGEL] PM-703 [FGEL] PM-601 [FGEL] LOT No. 1302931396	
+ (+IN)*	- (-IN)*	360kΩ ± 20%		360kΩ ± 20%	
- (-IN)*	N1 (N)*	0Ω		0Ω	
P	+ (+IN)*	720kΩ ± 20%		900kΩ ± 20%	
L1	L2	1.01MΩ (Ref. 1)	0.76MΩ (Ref. 2)	1.01MΩ (Ref. 1)	0.76MΩ (Ref. 2)
P	N1 (N)*	360kΩ ± 20%		540kΩ ± 20%	
L1, L2	Control Box	∞Ω		∞Ω	
L2	N1 (N)*	1.65MΩ (Ref. 1)	1.14MΩ (Ref. 2)	1.65MΩ (Ref. 1)	1.14MΩ (Ref. 2)

Check the diode

Terminal		Resistance value	
Multimeter (+)	Multimeter (-)		
L2	P	1.32MΩ (Ref. 1)	0.66MΩ (Ref. 2)
P	L2	1.01MΩ (Ref. 1)	0.76MΩ (Ref. 2)

>> If it is abnormal, replace ACTIVE FILTER MODULE.

Standard values change depending on the meter used for testing (Type A and B are the same values).

Ref. 1

Specifications for Multimeter
Manufacturer : FLUKE
Model name: FLUKE11
Power source: DC9V

Ref. 2

Specifications for Multimeter
Manufacturer : SANWA
Model name: PM3
Power source: DC3V

<u>If error codes shows pointing at the ACTPM PCB:</u>
Check the Output DC voltage (between P and N1) while compressor is stopped and while it's operating. If the output voltage while compressor is operating is less than the output voltage while compressor is stopped, Active Filter Module is defective. Error condition other than communication mentioned above will show. If ACTPM PCB is defective, always test the IPM PCB as well.
FOR DETAILS ON 4Ton system ACTPM PCB see Page 2/2

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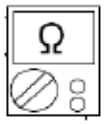
ACTPM Check

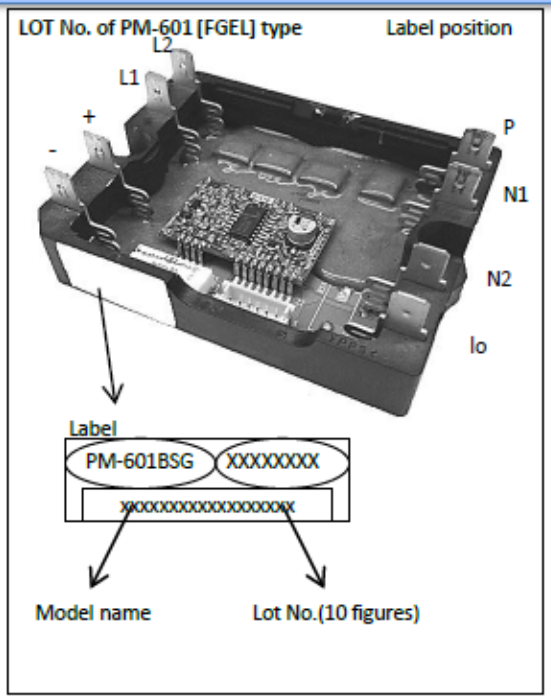
Some examples of an Active Filter Module error on most models:
8x Operation & 2x Timer / 8x Operation & 3x Timer / 6x Operation & 4x Timer / Continuous Operation blink & 12x Timer / E:641
22x flashes LED 1 / E:19
The Active Filter Module on inverter units is a PCB that will filter the harmonic current. It's output is supplied to the IPM PCB. If the unit has been installed and operating normally but suddenly shows an communication error after a power outage or thunderstorm, you may suspect the ACTPM failure. Although your first reaction may be to replace it, test it with an ohm meter and determine if it needs a replacement. Remember to remove power and wait five minutes before unplugging the PCB for testing.

Check Points: Check Open or Short-circuit and Diode.

AOU48RLXFZ / AOU48RLXFZ1

Remove all connectors first !!!
Check the open or short-circuit.





Terminal		Resistance Value
Multimeter (+)	Multimeter (-)	
(+IN)	(-IN)	360kΩ ± 20%
(-IN)	N	0Ω
P	(+IN)	900kΩ ± 20%
L1	L2	2.03MΩ ± 20% / 4.83MΩ ± 20% (Ref. 1) (Ref. 2)
P	N	540kΩ ± 20%
L1, L2	Control Box	∞Ω
L2	N	1.69MΩ ± 20% / 1.23MΩ ± 20% (Ref. 1) (Ref. 2)

Check the diode

Terminal		Resistance Value
Multimeter (+)	Multimeter (-)	
L2	P	1.12MΩ ± 20% / 504kΩ ± 20% (Ref. 1) (Ref. 2)
P	L2	2.23MΩ ± 20% / 503kΩ ± 20% (Ref. 1) (Ref. 2)

>> If it is abnormal, replace ACTIVE FILTER MODULE.

Standard values change depending on the meter used for testing (Type A and B are the same values).

Ref. 1

Specifications for Multimeter
Manufacturer : FLUKE
Model name: FLUKE11
Power source: DC9V

Ref. 2

Specifications for Multimeter
Manufacturer : SANWA
Model name: PM3
Power source: DC3V

If error codes shows pointing at the ACTPM PCB:
Check the Output DC voltage (between P and N1) while compressor is stopped and while it's operating. If the output voltage while compressor is operating is less than the output voltage while compressor is stopped, Active Filter Module is defective. Error condition other than communication mentioned above will show. If ACTPM PCB is defective, always test the IPM PCB as well.

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IPM Check

This Engineering Bulletin is to be used if you are getting an IPM error and/or the compressor does not start.

Some examples of an IPM error on most models:

5x Operation & 2x Timer / 6x Operation & 5x Timer / E:65 (wired remote) / E:653 (HFI) / Continuous Operation blink & 10x Timer (universal mount/ceiling suspended) / E:17 (wired remote) / 12x flashes LED 1 (condenser)

1. Turn power off to outdoor unit and wait 3 minutes for DC voltage to discharge.
2. Check that IPM is wired correctly. (According to Schematic)
3. Check the following resistance values on the IPM. (Before taking resistance readings remove all wires connected to the IPM. On certain models the red and black wires to the ACTPM and white and black wires to CN200 on control board should also be removed.)
4. All readings on test 1 should be within +/- 20 ohms of each other and test 2 should be within values shown.

The Inverter Power Module (IPM) is located where the compressor leads attach to the printed circuit board(PCB). They are marked U,V and W on the PCB and where the Yellow and Blue wires attach P and N.

5. If the readings on Tests 1 or 2 are incorrect and the wiring is correct replace the board that contains the IPM and depending on model the ACTPM board if it has one.
6. When your IPM is bad you will also need to ohm out compressor and test outdoor fan motor according to Tech Tip #008 and confirm both are good before replacing the IPM or any other boards.

Test 1

Place meter in (Mega Ohms)

Terminal		Resistance Value
Tester (+)	Tester (-)	
P	U	Over 2k Ω (Including ∞ Ω)
P	V	
P	W	
U	P	Over 20k Ω (Including ∞ Ω)
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	Over 2k Ω (Including ∞ Ω)
V	N	
W	N	

Test 2

Place meter in (Diode mode)

Terminal		Tester Display
Tester (+)	Tester (-)	
P	U	∞
P	V	
P	W	
U	P	0.3 V ~ 0.7 V
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	∞
V	N	
W	N	

Disclaimer:

In order to perform some of these tests an electrical and/or refrigerant license is required. We strongly advise to check the Service manual for more detailed explanation. If you are not sure about these recommendations please contact us at 866-952-8324.

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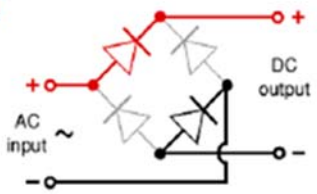
Diode Bridge Rectifier Test



Meter Lead		Diode Check
Black	Red	⊣◁⊢
(+)	~	0.4 to 0.7
	~	0.4 to 0.7
~	(-)	0.4 to 0.7
~		0.4 to 0.7

Select this symbol on the meter.

⊣◁⊢

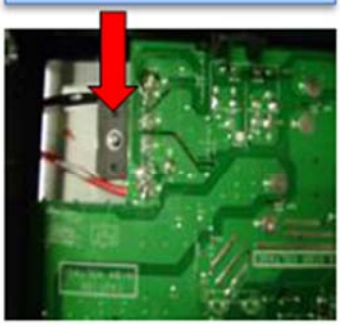
When checking for a communication error and you find the outdoor unit is not communicating; one test you are required to take is the Bridge Rectifier Test.

Meter Lead		Diode Check
Black	Red	⊣◁⊢
(-)	~	O/L
	~	O/L
~	(+)	O/L
~		O/L

For the Diode Bridge Rectifier location refer to the below pictures by model.

IPM board on a 5 board setup condenser.

Multi-zone, large cassette, & universal model condensers.



42RLX, large cassette condenser.

Main Control board, single board configuration

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Testing Fan Motors

Some examples of a fan motor error on most models:

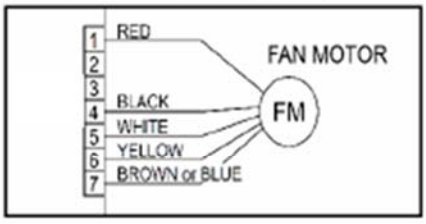
5x Operation & 6x Timer / 6x Operation & 2x Timer / 6x Operation & 3x Timer / 9x Operation & 7x Timer / 5x Operation & 1x Timer / 6x Operation & continuous Timer blink / Continuous Operation blink & 14x Timer / E:973 / 15x LED 1 (condenser) / 16x LED 1 / E:1b (wired remote) / E:51 (wired remote) / E:97 (wired remote) / E:12 (wired remote)

- Use caution when checking DC volts for fan motors.
- When checking ohms, the fan motor must be de-energized.
- Always check the 3.15 amp fuse on the control board with a continuity test. (If fuse is open replace control board and fan motor).
- Unplug fan motor from control board and spin fan blade by hand to check for any resistance.
- It should turn/spin freely over 2 full revolutions.
- Always ohm fan motor when replacing a Main Control Board.
- When ohming fan motor use a meter that has ohm rating of 400k or higher. Unplug fan motor and place black lead of meter on black wire of fan motor and red lead of meter will go to the other fan leads one at a time. See attached charts for proper ohm readings for your specific motor.
- When checking DC volts for fan motor to determine if board is the problem or fan motor is the problem use the charts below.

Check Point 4 : Check Output Voltage of Main PCB

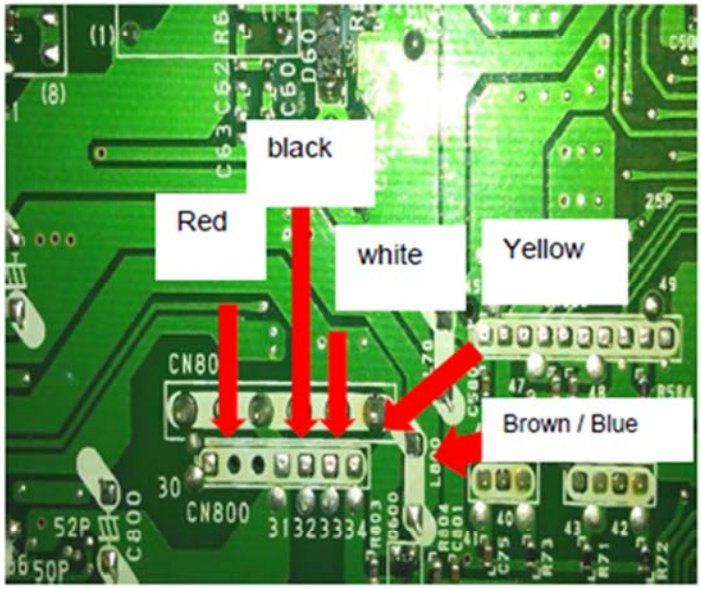
- Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector)

DC



Read wire	DC voltage
Red - Black	290V (AC115V-10%)~ 360V (AC115+10%)
White - Black	15±1.5V

▶ **If the voltage is not correct, replace Main PCB.**



OUTDOOR FAN MOTOR RESISTANCES

Engineering Bulletin

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
Motor MFE-71TVAL: AOU9RLFC, AOU9RLFF, AOU9RLFFH, AOU9RLS, AOU9RLS2, AOU9RLS2H, AOU9RLS3, AOU9RLS3H, AOU12RLFC, AOU12RLFF, AOU12RLFFH, AOU12RLS, AOU12RLS2, AOU12RLS2H, AOU12RLS3, AOU12RLS3H, AOU15RLS, AOU24CL1	300K–OL	110K–130K	70K–90K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
Motor MFE-60TVT: AOU18RLXFW, AOU18RLXFWH, AOU18RLXFW1, AOU18RLXFZ, AOU18RLXS, AOU24RLXFW, AOU24FLXFWH, AOU24RLXFW1, AOU24RLXFZ, AOU24RLXS, AOU30CLX1, AOU30RLX, AOU30RLXB, AOU36CLX1, AOU36RLXB	300K-OL	45K-55K	120K-140K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
Motor MFE-45VVT_White (MFE-45ROM_Black): AOU18RLX, AOU18RLXFZH, AOU24RLX, AOU24RLXFZH, AOU24RLXQ, AOU24RML, AOU24RML1, AOU30CLX, AOU30RLXQ, AOU30RLXEH, AOU36CLX, AOU36RLX, AOU36RLXFZ, AOU36RLXFZ1, AOU36RML, AOU36RML1, AOU42RLX	300K-OL	40K-100K (1.2K)	120K-140K (190K-210K)	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AOU9RLQ, AOU12RLQ Motor MFE-12ROAM	300K-OL	1K-2K	190k-210K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AOU48RLXFZ, AOU48RLXFZ1 Motor MFE-45WVN	300K-OL	40K-60K	125K-150K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU15RLFF, AOU15RLFFH, AOU15RLS2, AOU15RLS2H, AOU15RLS3, AOU15RLS3H, AOU18RLB, AOU18RLFC, AOU24RLB Motor MFE-71TVL	300K–OL	110K–130K	75K-100K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AOU15RLQ, AOU18CL, AOU18RL, AOU18RLQ Motor MFE-18ROM	300K-OL	1K-2K	190K-210K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AOU9CQ, AOU9R2, AOU9RQ, AOU12CQ, AOU12R2, AOU12RQ Motor MFE-12POM	300K-OL	1K-2K	190K-210K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU24CL, AOU24RL, AOU24RLQ Motor MFE-24ROM	300K-OL	1K-2K	190K-210K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU9RLFW Motor MFE-28TVAL	300K-OL	120K-150K	80K-100K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU12RLFW Motor MFE-40WL	300K-OL	30K-45K	80K-100K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU9RL Motor MFE-12TVBM	300K-OL	1K-2K	190k-210K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
AOU9RL2, AOU12RL2 Motor MFE-22AVL	300K-OL	115K-145K	75K-100K	Mega Ohms-OL
AOU36RLXFZH, AOU45RLXFZ MFE-ZA2VA2N	N/A	N/A	N/A	N/A

INDOOR FAN MOTOR RESISTANCES

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Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU7RLF ASU9RL ASU9RLF ASU12RL ASU12RLF ASU15RLS Motor MFD-12YYAN	300K–OL	30K–120K	225K–260K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU9RLQ ASU9RMLQ ASU12RLQ ASU12RMLQ ASU15RLQ ASU18RLQ ASU18CL ASU18RL ASU18RMLQ	300K-OL	1K-2K (40K-60K)	90K-120K (140K-160K)	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU18RLF ASU18RLXS ASU18RLB ASU24RLB ASU24CL ASU24CL1 ASU24RL ASU24RLF ASU24RLQ ASURLXQ ASU24RLXS ASU30CLX ASU30CLX1 ASU30RLX ASU30RLXB ASU30RLXQ ASU36CLX Motor MFD-50RON	300K–OL	40K–60K	140K-160K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU9R2 ASU9RQ ASU9CQ ASU12R2 ASU12RQ ASU12CQ Motor MFD-12POM	300K-OL	25K-50K	280K-320K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AUU7RLF AUU9RML AUU9RLF AUU12RML AUU12RLF AUU18RML AUU18RLF Motor MFF-24VVL	300K-OL	80K-100K	80K-110K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU7RLF1 ASU9RLF1 ASU12RLF1 Motor MFD-12CYAN	OL	110K-140K	260K-310K	OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU9RLS3 ASU12RLS3 ASU15RLS3 Motor MFD-W60XA2F	2M-3M	30K-50K	100K-105K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
AGU9RLF AGU12RLF AGU15RLF Motor MFD-14SXAN_upper (MFD-14TXAN_lower)	2M/3M OL	30K-35K 45K-50K	155K-160K 150K-155K	OL OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU36RLXB ASU36CLX1 Motor MFD-71TXAN	OL	40K-60K	140K-170K	OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU9RLS2 ASU12RLS2 ASU15RLS2 Motor MFD-12TYL	300K-OL	100K-125K	240K-265K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Brown-Black
ARU9RLF ARU12RLF Motor MFG-14WV	300K-OL	20K-50K	80K-110K	Mega Ohms-OL

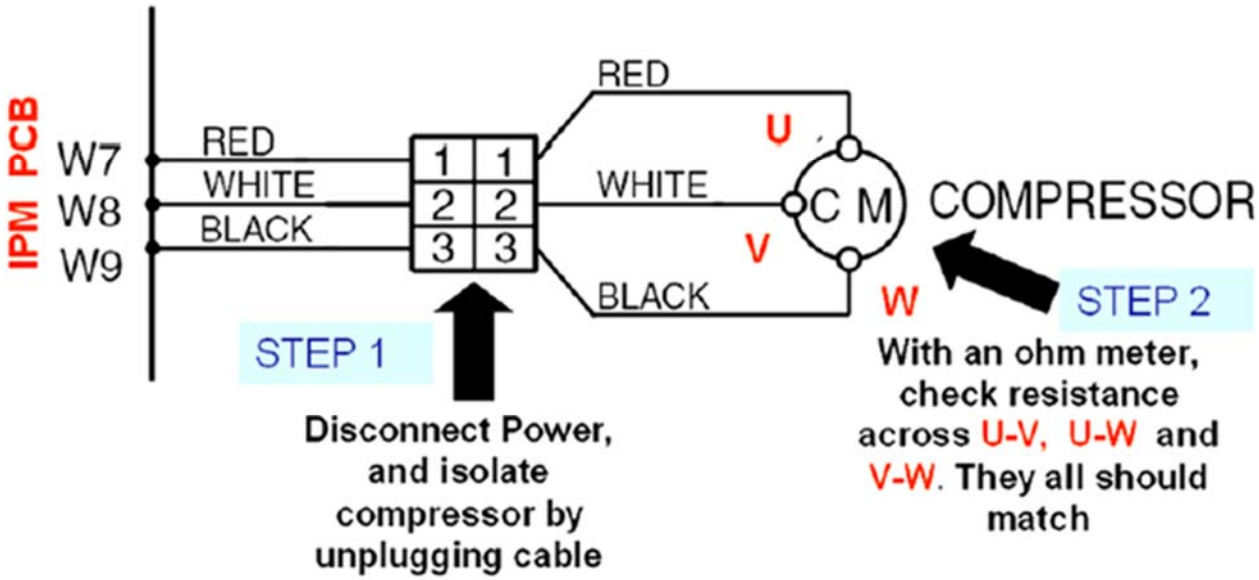
Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ARU18RLF ARU24RLF Motor MFG24WV	300K-OL	25K-55K	70K-100K	Mega Ohms-OL

Model	Red-Black	White-Black	Yellow-Black	Blue-Black
ASU9RL2 ASU12RL2 Motor MFD-12CWN	300K-OL	100K-125K	240K-265K	Mega Ohms-OL

Checking an Inverter Compressor

Inverter DC Compressors differ from the AC type. While resistance across the Start, Run and Common terminals of AC compressors are not the same, DC type compressors terminal resistances are.

Terminals on a DC type compressor are labeled U, V and W as opposed to Common, Start and Run. Resistance is the same across of any two terminal of the compressor (U-V,V-W or W-U). Although resistance may be the same, it will vary according to the compressor temperature. Below is a simple way to test if a compressor is open or shorted.



RESISTANCE VALUE WILL VARY DEPENDING ON THE TEMPERATURE OF THE COMPRESSOR.

060
11/3/15

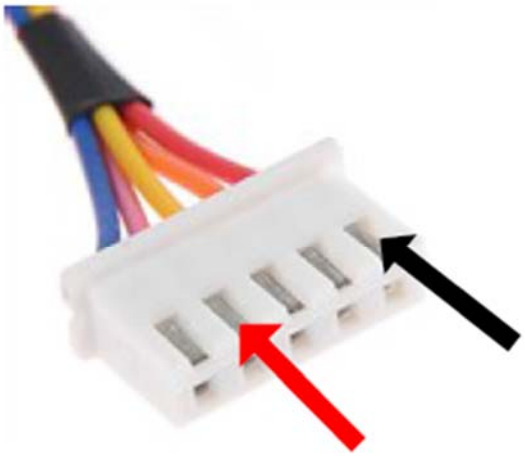
Louver Motor Testing

This Tech Tip is for testing the louver motors used in Fujitsu model indoor units.

To complete this test shut off main power , Unplug stepper motor from board and place your meter in **Ohms Ω.**

Place Your **Black (-)** lead on the Red wire and your Red (+) lead to each wire and you should read the same values on all wires.

Ohms Ω Readings
(All Fujitsu Stepper Motors)
225-325 Ohms Ω



If you read either open or shorted on any of the wires or out of the range listed, replace the stepper motor.

017
1/8/14

Incorrect Wiring

Halcyon inverters units communicate via terminal 3 and 2. While terminal 1 & 2 is the AC input, terminal 2 also carries data between the indoor and outdoor unit (Fig.1). A common miss wiring mistake done in the field will make the system go into an error lockout mode, and perhaps the most common error is the crossed connection between terminals 1 & 2 (Fig.2).

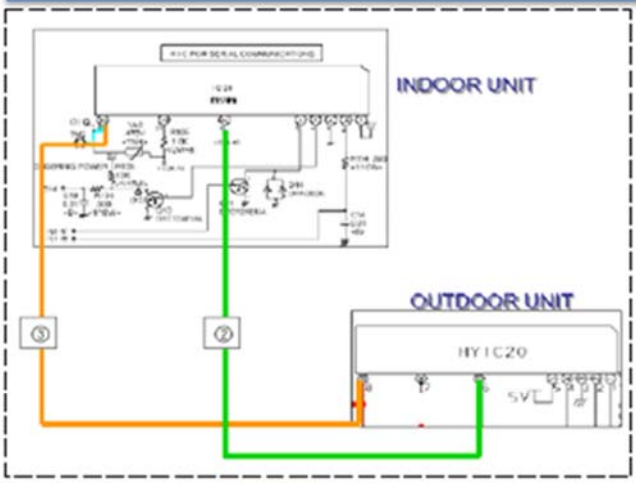


Fig. 1

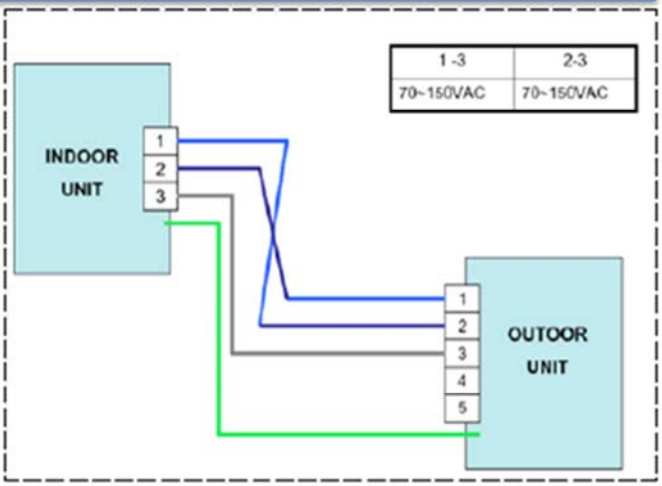


Fig. 2

If an error code (2 green blinks) is shown upon installation of the system, you may suspect terminals 1 & 2 being crossed. How to determine if this your problem, when all the wiring are already between walls or inside conduits? There are two simple tests, one is checking AC voltage and the second is checking continuity. If the oscillating voltage between 1-3 is the same as 2-3 as shown on Chart 1 (70~150VAC), the probability of these two wires being crossed is great, after cutting power to the system you can confirm it with a simple continuity test.

021
4/10/12

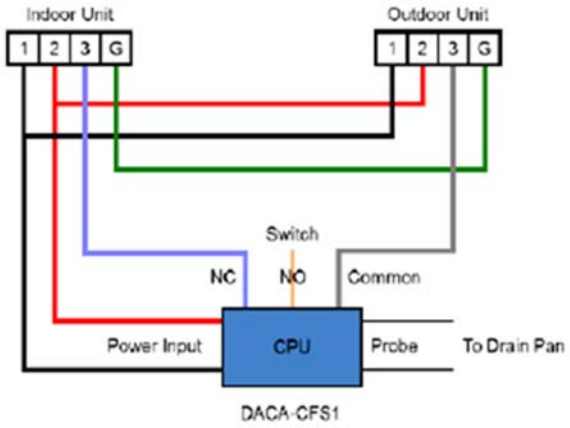
Electronic Condensate Overflow Switch

The Safe-T-Switch SS610E condensate switch is compatible with all wall mounted ASU's models. It senses high condensate levels in the drain pan and shuts the system off to prevent condensate overflow.

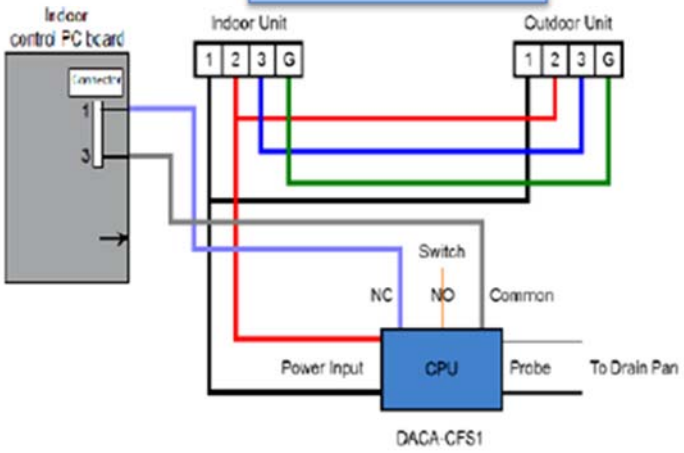
Option:1

This option is for non-HFI models only. You will need to break the terminal 3 (communication wire) through the NC contacts of the float switch. This will shut off the outdoor unit and create a communication error code.

Wiring Diagram Option: 1



Wiring Diagram Option: 2



NOTE: Keep the wires as short as possible when installing the float switch.

Option:2

This option is only available for HFI models. A forced stop function and dry contact kit are required to use this function. Additional parts are required if you have the following models. ASU7,9,12RLF,15RLS and 15RLS2. Refer to page 10 of our Fujitsu catalog for the right accessories for your system.

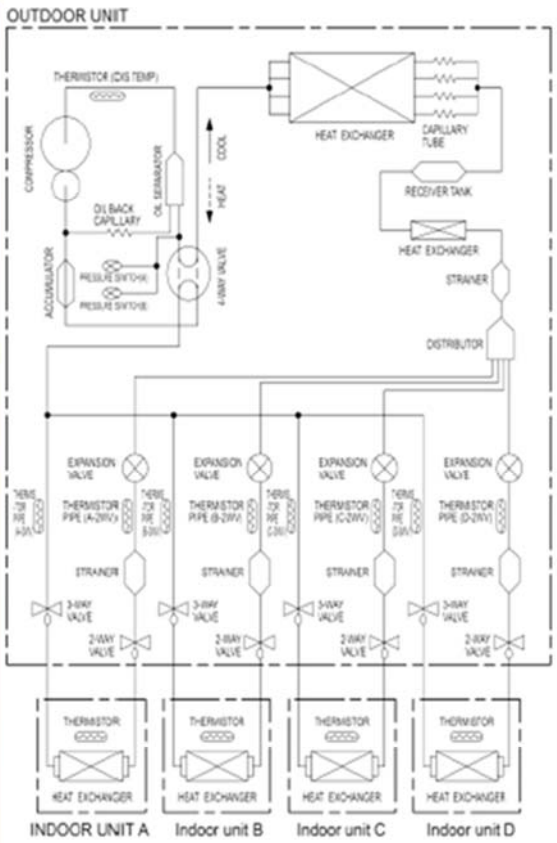
030
10/19/12

Multi-Zones & Auto Mode

Auto Changeover alternates between heating or cooling if the room temperature falls 4°F below the set temperature when cooling or rises 4°F above the set temperature when heating. Auto changeover is not designed to provide rapid changes between heating and cooling operation or simultaneous heating and cooling. This feature is not recommended for systems with more than one indoor unit unless all indoor units have similar heating and cooling requirements and have similar temperature set points.

Inverter multi-zone units have one refrigerant system Fig. 1, and operation of each indoor unit should be harmonized with the primary settings. The first unit with the heating or cooling settings takes precedence. If an indoor unit is set to operate on a mode it can't perform or not in accordance with the primary settings, the OPERATON LED (Red) of the indoor unit will flash (1 second ON and 1 second OFF) and will go into standby mode.

EXAMPLE:
If indoor unit (A) was started in fan mode and then the indoor unit (B) was then operated in heating mode, indoor unit (A) would temporarily start operation in fan mode but when indoor unit (B) started operating in heating mode, the OPERATION indicator lamp (red) for indoor unit (A) would begin to flash (1 second on, 1 second off) and it would go into standby mode.
Indoor unit (B) would continue to operate in heating.



Not Permissible Mode Combination	
Mode	•Heating (COIL DRY) mode and cooling mode (or dry mode)
	•Heating (COIL DRY) mode and fan mode
Permissible Mode Combination	
Mode	•Cooling mode and dry mode
	•Cooling mode and fan mode
	•Dry mode and fan mode
	•Heating mode and COIL DRY mode

023
1/30/14

Entering Function Settings

UTY-LNHUM / UTY-LRHUM

Entering the Function Setting Mode:

Press the Fan (Control) button, Set Temp.(^) and the Reset button simultaneously then release the Reset button to enter the function setting mode.

Selecting the Function Number and Setting Value

1. Press the Mode button first then press the Set Temp. (^)(ˇ) buttons to select the function number. (Press the Mode button to switch between the left and right digits.)
2. Press the Fan button to proceed to setting the value. (Press the Fan button again to return to the function number selection.)
3. Press the Set Temp.(^)(ˇ) buttons to select the setting. (Press the Mode button to switch between the left and right digits.)
4. Press the Timer Mode button and Start/Stop button, in the order listed to confirm the settings.
5. Press the Reset button to cancel the function setting mode.
6. After completing the Function Setting, be sure to turn off power to the outdoor disconnect for a minimum of one minute and turn it on again.

AR-REC1U / AR-RED1U / AR-REG1U

Entering the Function Setting Mode:

Press the Powerful button, Set Temp.(^) and Reset button simultaneously then release the Reset button to enter the function setting mode.

Selecting the Function Number and Setting Value

1. Press the Set Temp.(^)(ˇ) buttons to select the function number. (Press the Min. Heat button to switch between the left and right digits.)
2. Press the Powerful button to proceed to setting the value. (Press the Powerful button again to return to the function number selection.)
3. Press the Set Temp.(^)(ˇ) buttons to select the setting. (Press the Min. Heat button to switch between the left and right digits.)
4. Press the Mode button and then the Start/Stop button, in the order listed to confirm the settings.
5. Press the Reset button to cancel the function setting mode.
6. After completing the Function Setting, be sure to turn off power to the outdoor disconnect for a minimum of one minute and turn it on again.

UTY-RVNUM

Entering the Function Setting Mode:

1. Make sure the indoor unit is powered down and not running otherwise you will be restricted from entering the Function Settings menu.
2. From the monitor screen, press the Menu button twice.
3. Once at the submenu, press and hold the Screen Left and Screen Right buttons for 5 seconds.
4. Select the Function Setting option from the list. From there you will be in the Function Settings Menu and free to select function number and setting values.
5. After completing the Function Setting, be sure to turn off power to the outdoor disconnect for a minimum of one minute and turn it on again.

UTY-RNBYU / UTY-RNNUM

Entering the Function Setting Mode:

1. Press the Set Temp.(^)(ˇ) buttons and Fan button simultaneously for more than 5 seconds to enter the function setting mode.
2. Press the Set Back button to select the indoor unit number.
3. Press the Set Time buttons to select the function number.
4. Press the Set Temp. buttons (^)(ˇ) to select the setting value. The display flashes as shown to the right during setting value selection.
5. Press the Timer Set button to confirm the setting. Press the Set button for a few seconds until the setting value stops flashing. If the setting value display changes or if "- -" is displayed when the flashing stops, the setting value has not been set correctly. (An invalid setting value may have been selected for the indoor unit.)
6. Repeat steps 2 to 5 to perform additional settings. Press the Set Temp. buttons (^)(ˇ) and Fan button simultaneously again for more than 5 seconds to cancel the function setting mode. In addition, the function setting mode will be automatically canceled after 1 minute if no operation is performed.
7. After completing the Function Setting, be sure to turn off power to the outdoor disconnect for a minimum of one minute and turn it on again.

UTY-RSNUM

Entering the Function Setting Mode:

1. Press both the Temp. Up and Down buttons (^)(ˇ) and FAN together for more than 5 seconds simultaneously. Then, shift to Function Setting Mode.
2. Press the Temp. Up or Temp. Down button (^)(ˇ) and select the indoor unit number. Then, press the Fan button.

Function Number & Setting Number Setting

3. "Function Number" display blinks. Then, display Number by pressing the Temp. Up or Temp. Down button.
4. When the "Setting Number" blinks, press the Fan button to set the Setting number by pressing the Temp. Up or Temp. Down button (^)(ˇ).
5. Fix the setting by pressing the power button. (Data is transferred to the indoor unit).
6. After completing the Function Setting, be sure to turn off power to the outdoor disconnect for a minimum of one minute and turn it on again.

050
9/10/14

Technician Troubleshooting Checklist

Common Questions

1. What are the correct model/s and serial number/s?
2. Do you have a case file number?
3. What is the nature of the problem you are having?
4. Do you have an Inverter model?
5. Are you getting any error codes?
6. What error codes are you getting? (please refer to our troubleshooting guides)
7. Please have a quality mega meter (5megs minimum) as well as a diode reader ( )
8. Please verify all wiring is correctly installed per Fujitsu installation manual.
9. Please verify copper line sets are installed and wrapped according to Fujitsu install manual.
10. Please verify drain line is pitched downward (gravity)
11. Please verity if there is a condensate pump installed?
12. Please verify proper distances for indoor unit and outdoor unit (Installation manual)
13. Are you using a wireless remote or wired-in remote? Model of remote being used?
14. Are all coils (evaporator & condenser) and filters (primary & plasma) clean?
15. Have you been to our portal website?

Electrical Questions

1. What is the voltage of the unit you are working on? Is it 115V? Or 208/230V?
2. Is there a dedicated line from main electrical panel to outdoor disconnect?
3. Are you using 14/3 AWG wire? (Refer to Fujitsu Installation manual)
4. Are you wired from outdoor unit to indoor unit, Fujitsu recommends color coding or numerical sequence.
5. Are there any wire nuts, junction boxes, condensate pumps being used? (Main causes for serial signal error codes) Please refer to troubleshooting guide for remaining codes.
6. Have you checked for any crossed wires (between indoor and outdoor)
7. Is there an emergency/safety switch wired in line with the indoor unit (3 pole single throw switch)
8. NEC codes requires switch in eye sight of indoor unit as well as local codes)
9. Please check Diode Bridge
10. Please check Active filter module
11. Please check IPM- Inverter power module (Questions 8,9,10 refer to Engineering Bulletins)

Refrigerant Questions

1. What are the room dimensions?
2. Was the system leak checked?
3. Was there nitrogen used when leak checked?`
4. How much nitrogen was used to leak check?
5. How much of a vacuum was pulled?
6. Did you use our load calculator?
7. Was a load calculation done for each room?
8. What is the total load calculation you came up for each room?

044
1/30/14

Mini-Split Maintenance

Six key steps in maintaining Ductless mini-split systems

Once the equipment is installed, an annual maintenance regimen is very straight-forward.
There are six key stages in the routine maintenance of multi-zone ductless systems:

1. It's important to keep the primary filters clean. Consider the environment they're in, the presence of airborne dust and debris and hours of operation. Some indoor units ("evaporator units," or "air handlers") will require only annual cleaning of the easily-removed mesh filters. In warehouse or laundry areas, it may be important to clean them monthly.

2. Some manufacturers offer sophisticated indoor air quality (IAQ) filtration. Most are easily removed and cleaned. The Fujitsu system is programmed to alert an occupant or building owner of the need to clean the IAQ filter after 400 hours of operation. Be sure to keep plasma IAQ filtration clean.

3. Check to be sure that the evaporator coils are clean. Though indoor air handler coils are amply protected by the various levels of filtration, it's good to examine coil cleanliness each year. If the evaporator units are mounted in unusually hostile environments where pollutants and airborne debris are common, it may be necessary to clean the coils every year or every two years. Coils usually require cleaning on a bi-annual basis. Typically, evaporator coil cleaning entail... Remove front cover of the unit in question, visually inspect evaporator coil, if needed vacuum the evaporator coil with a soft bristle brush attachment removing all dust and debris. Chemicals can be used but should be diluted with water so that it will not damage the metals as well as the surroundings of where the unit is installed, NOTE; if chemicals and water is needed to clean please SHUT OFF MAIN POWER to the equipment. Next step is too be sure drain pan is free of any mold, mildew and or algae that would cause any unpleasant odor or clogging, again using household bleach and diluting with water would be sufficient enough to remove any grime mentioned. Also check to make sure that the flexible or rigid drain hose is also free of all clogs as well. Last be sure that all equipment is dry of any water before re-assembling and turning power back on.
4. Are the fan wheel and blower assembly in balance? It's very uncommon for this to be a problem, but units can be challenged by heavy accumulations of airborne grime and debris, such as in fast food kitchen locations, or in feed mill operations.

5. Is the condensing unit in top shape? Check refrigerant lines for apparent bumps or dents. Are the insulation wraps in good shape, or have they deteriorated from exposure to UV radiation? Is the unit mounted solidly on its base? Has the base moved, or is it slipping for any reason?

6. Make sure that the outdoor condensing unit's horizontal discharge is free of debris. These systems rarely attract debris, but if grass clippings are thrown into them from nearby mowing, or if an abundance of wet leaves collect around the unit, these should be removed. If cleaning is required . . .
   Shut off electrical power to the entire system; you can shut off main breaker in main panel or shut off power at the main outdoor disconnect located near the outdoor unit. Next important job is cleaning the condenser coil; a fan that basically sucks outside air through the fins, leaving them covered with lawn clippings, dirt, bugs, dead leaves and other debris. This fun little job may need to be done every couple of weeks during the spring and summer when pollen and dandelion "wishies" are flying around freely in the air! Use a garden hose and a soft nylon brush to clean the condenser coil fins. Chemicals can be used please refer to indoor unit coil cleaning. Two copper tubes that should be wrapped separately from one another connect the compressor and the condenser coil to the evaporator coil back inside the house. Visually inspect the insulation for signs of wear or damage. If need be replace insulation on copper tubing if worn or dried out and disintegrated. If you see any signs of refrigerant or oil leaking inside or around the compressor or condenser, its also time to give your A/C pro a call.

Disclaimer:

In order to perform some of these tests an electrical and/or refrigerant license is required. We strongly advise to check the Service manual for more detailed explanation. If you are not sure about these recommendations please contact us at 866-952-8324.

022
4/1/12

Cleaning Indoor Unit Coils

- Disconnect power to indoor and outdoor units.
- Remove exterior shell of indoor unit to expose coil.

- Fix plastic sheeting around the indoor unit; enough to protect the wall, floor and a reasonable sized area around the unit.

- Use a spray cleaner, a ready to use non-acid foaming HVAC coil cleaner , I.E. Bio Fresh CD.

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1/30/14

QuestVapco Corporation

Discovery Products

- 661700001- 41GL Mini Split Cleaner
- 661800001- 41GL Mini Split Neutralizer

http://questvapco.com/literature/6617-6618_Mini-Splits-Flyer.pdf

Cleaning Indoor Unit Coils

- Spray onto the blower wheel and coil, let the solution sit for the correct amount of time as per spray manufacturer's instructions and rinse with water. Repeat this process until coil is clean and free of dirt and mold.
- Allow the unit to dry for 24 hours. Inspect all Components ensuring the unit is completely dry. Reassemble the plastic outer cover of the unit.
- Before starting the fan, place a cloth in front of the fan to catch any debris left behind after the cleaning process.

Fujitsu recommends using the Speed Clean Mini Split Bib Kit when cleaning wall mount indoor units. More information can be found at: www.speedclean.com

SPEEDCLEAN

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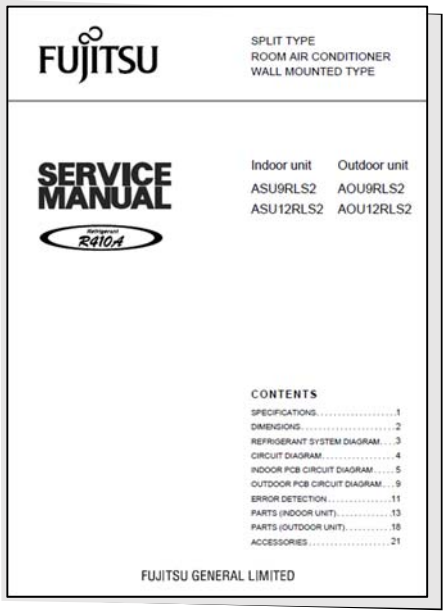
1/30/14

Service & Installation Documents


FUJITSU

SPLIT TYPE
ROOM AIR CONDITIONER
WALL MOUNTED TYPE

SERVICE MANUAL

Refrigerant R410A

Indoor unit	Outdoor unit
ASU9RLS2	AOU9RLS2
ASU12RLS2	AOU12RLS2

CONTENTS

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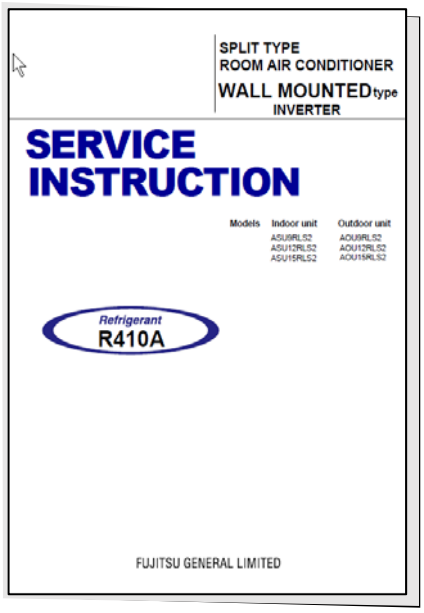
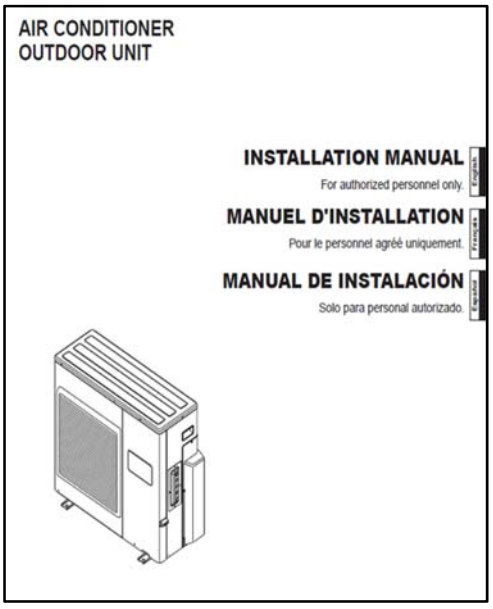

SPLIT TYPE
ROOM AIR CONDITIONER
WALL MOUNTED type
INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	ASU9RLS2	AOU9RLS2
	ASU12RLS2	AOU12RLS2
	ASU15RLS2	AOU15RLS2

Refrigerant R410A

FUJITSU GENERAL LIMITED


AIR CONDITIONER
OUTDOOR UNIT

INSTALLATION MANUAL
For authorized personnel only.

MANUEL D'INSTALLATION
Pour le personnel agréé uniquement.

MANUAL DE INSTALACIÓN
Solo para personal autorizado.

Technical Support

- Contact your local Distributor first

www.fujitsugeneral.com

Troubleshooting Assistant

Google Play

Android version 4.0 or later

iOS 6.0 or later and is compatible with iPhone, iPod touch and iPad*, it's optimized for the iPhone 5.

Free Technician App

Resources

- **Fujitsu General Web Portal**
  http://www.fujitsugeneral.com

- **Fujitsu Personal Web Portal Login**
  https://portal.fujitsugeneral.com

- **Fujitsu Contractor Toolbox**
  http://www.fujitsugeneral.com/dealer_toolbox.htm

- **Fujitsu Contractor Training (Contractor Toolbox Online)**

- **Fujitsu** YouTube
  https://www.youtube.com/user/FujitsuGeneralUSA

- **Fujitsu Technical Support Email**
  servicehvac@fujitsugeneral.com