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Halcyon® HFI Hybrid Flex Inverter

410A MINI-SPLIT TROUBLESHOOTING GUIDE

FUJITSU

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(866) 952-8324
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RGLX Models: AUU18RGLX, AUU24RGLX, AUU30RGLX, AUU36RGLX, AUU42RGLX, AUU48RGLX , ARU12RGLX, ARU18RGLX, ARU24RGLX, ARU30RGLX, ARU36RGLX, ARU42RGLX, ARU48RGLX

Error Indication			Wired Remote Controller	Error	Diagnosis Method
Operation	Timer	Economy			
1 Time	1 Time	Continuous	11	Serial communication error	Communication Error – At Start Up, evaporator and condenser are not communicating. -Check wiring from panel to condenser, condenser to evaporator. Wire nuts and splices are not recommended. Check for correct voltages at panel, condenser and evaporator. Refer to the Service Instruction manual – Serial Signal troubleshooting for further details. **(Ref. Service Tip #043-HFI Communication Check and/or "Communication Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
1 Time	2 Times	Continuous	12	Wired remote controller communication error	Wired Remote Controller Communication Error – When the indoor unit cannot receive the signal from the Wired Remote Control for more than 1 minute during normal operation. -Check the connection of terminal between remote control and indoor unit and check if there is a disconnection of the cable.
1 Time	5 Times	Continuous	15	Automatic air flow adjustment error	-Check rotation of fan by hand when operation is off. Check if fan is caught, dropped off or locked motor. -Check ambient temp. around motor. Excessive high temp. around the motor, such as surrounding equipment. -Check indoor fan motor **(Ref. Service Tip #008-Fan Motor Check)**
1 Time	8 Times	Continuous	18	External communication error	Check any loose or removed connection of between the controller PCB to the external I/O PCB -If there is an abnormal condition, correct it by referring to the Installation Manual or the Design & Technical Manual. -Check the connection condition on the external I/O PCB and the controller PCB (If there is a loose connector, open cable or mis-wiring)
2 Times	3 Times	Continuous	23	Combination error	Check the type of indoor unit -Check the type of the connected indoor unit. Replace Main PCB -If connected type okay, replace Main PCB of outdoor unit. **(Ref. Service Tip #021-Incorrect Wiring)**
2 Times	6 Times	Continuous	26	Address setting error in wired remote control system	Wire Installation -Wrong wire connection in RC-group **(Refer to Installation Manual)** Wrong RC-group Setting -The given address number by auto setting (00) and the manual set number (Except 00) were not existing in one RCG. -The remote-control address setting by U.I. were not existing same address. -The duplicated address number is not existing in one RC-group. Check Indoor Unit Controller PCB -Check if controller PCB is damaged. -Change controller PCB and check the error after setting remote control address.

2 Times	9 Times	Continuous	29	Connection unit number error (indoor unit wired remote control error)	Wire Installation -Wrong number of connecting indoor units. Check Indoor Unit Controller PCB -Check if controller PCB is damaged. -Check controller PCB and check the error after setting remote control address.
3 Times	2 Times	Continuous	32	Indoor unit PCB model information error	EEPROM Error – Electronically Erasable and Programmable Read Only Memory. It is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal and cannot change partial contents. Rewriting shall be done upon erasing all the contents. There is a limit in several rewritings. -Check if the ground connection is proper. Check if there is any equipment that causes harmonic wave near the power cables, i.e. neon light bulb.
3 Times	3 Times	Continuous	33	Indoor unit motor electricity consumption detection error	Indoor unit motor electricity consumption detection error – When the voltage value or current value of the motor go beyond the limits. -Check rotation of fan by hand when operation is off. Check if fan is caught, dropped off or locked motor. -Check ambient temp. around motor. Excessive high temp. around the motor, such as surrounding equipment. -Check indoor fan motor **(Ref. Service Tip #008-Fan Motor Check)**
3 Times	5 Times	Continuous	35	Manual auto switch error	Manual Auto Switch Error – When the Manual Auto Switch becomes on for 60 or more consecutive seconds. -Check if Manual Auto switch is kept pressed. Check On/Off switching operation by using a meter. **(Ref. Service Tip #015-Auto/Manual Button)**
3 Times	9 Times	Continuous	39	Indoor fan motor power supply error	Check external cause at indoor and outdoor units (voltage drop or noise) -Check for a large electrical load apparatus in the same circuit. Check for defective contact or leak current in the power supply circuit. Check Connection of Connector -Check if connector is removed. -Check for an erroneous connection. -Check if cable is open. (Upon correcting removed connector, reset the power)
3 Times	10 Times	Continuous	3A	Indoor unit communication circuit (wired remote control) error	Check the Connection of the terminal -Check the connection of the terminal between remote control and indoor unit, or between indoor units and check if there is a disconnection or short of the cable. Check Indoor Unit Controller PCB -Check terminal voltage of controller PCB connector CNC01. (Power supply for remote) -If 12vDC present, remote control failure. (Controller PCB is OK) Replace remote control. -If 0vDC present, controller PCB failure (Remote is OK) Replace controller PCB. In case of re-installation is done due to removed connector or incorrect wiring, turn on the power again.
4 Times	1 Time	Continuous	41	Indoor room thermistor error	Indoor Room Thermistor Error – Room temperature thermistor detected an abnormal temperature. -Check thermistor for open or short. Check thermistor resistance value. (Refer to "Thermistor characteristics table"). -Controller PCB defective. **(Ref. Thermistor Resistance Chart)**

4 Times	2 Times	Continuous	42	Indoor heat ex. (Pipe) thermistor error	Indoor Heat Ex. (Pipe) Thermistor Error – Evaporator pipe thermistor detected an abnormal temperature. -Check thermistor for open for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Controller PCB defective.
4 Times	4 Times	Continuous	44	Human Sensor error	Check if the connector connection and if cable is open -Check if connector is loose or removed. -Check erroneous connection. -Check if sensor cable is open. Conduction Check -Disconnect the sensor and check the 4-5 pin on sensor connector. With conduction: Main PCB failure Without conduction: Sensor failure Voltage Check -Disconnect the sensor and check the voltage on 1 pin of the CN67 on the Main PCB. 5v: Sensor failure Other than 5v: Main PCB failure
5 Times	1 Time	Continuous	51	Indoor unit fan motor error	Indoor Unit Fan Motor Error – When the condition that actual frequency of indoor fan is below 1/3 of target frequency is continued more than 56 seconds. -Check rotation of fan. -Check ambient temperature around motor. -Check indoor unit fan motor resistance values. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Check" in Zendesk Help Center)**
5 Times	3 Times	Continuous	53	Drain pump error	Drain Pump Error – When the float switch is on for more than 3 minutes, error will trigger. -Check operation of float switch, blockages, dust, etc. -Remove float and check on/off switching operation by using a meter. -Check connector of (CN9) / wire. -Check drain hose for blockages.
6 Times	2 Times	Continuous	62	Outdoor unit main PCB error	Outdoor Unit Main PCB Error – Access to EEPROM failed due to some cause after outdoor unit started. -Reset power supply and operate. -Check external cause; voltage drop, poor ground connection. -Replace Main PCB.
6 Times	3 Times	Continuous	63	Inverter error	Inverter Error – Error information received from the inverter PCB. -Reset power to disconnect. -Check connection of molex plugs on inverter PCB for loose connections.

6 Times	4 Times	Continuous	64	Active filter / PFC Circuit error	Active Filter Error– When inverter input DC voltage is higher than 425v or lower than 80V. When a momentary power cut off occurred on low voltage. -Check external cause at the indoor and outdoor (voltage drop or noise). -Check connection of connector, loose, or erroneous connection. Check Active Filter Module resistance values. **(Ref. Service Tip #010-ACTPM Check and/or "ACTPM Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
6 Times	5 Times	Continuous	65	IPM error / Trip terminal L error	IPM Error – Abnormal current value at the IPM is detected. Heat radiation is blocked (inlet/outlet). -Check connections of outdoor unit electrical components. -Check outdoor fan, heat exchanger. -Check compressor resistance values. **(Ref. Service Tip #060-Compressor Check & Ref. Service Tip #014-IPM Check)**
7 Times	1 Time	Continuous	71	Discharge thermistor error	Discharge Thermistor Error – When discharge pipe temperature thermistor open or short-circuit is detected at power up or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	2 Times	Continuous	72	Compressor thermistor error	Compressor Thermistor Error – Compressor temperature thermistor is open or short-circuited while power is on or running the compressor. -Check for erroneous connection or removed connector. -Check resistance on thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.
7 Times	3 Times	Continuous	73	Heat Ex. (Pipe) thermistor error	Heat Exchanger (Pipe) Thermistor Error – When heat exchanger temperature thermistor open or short-circuit is detected at power on or while running the compressor. -Check connection of connector, loose, or erroneous connection. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	4 Times	Continuous	74	Outdoor thermistor error	Outdoor Thermistor Error – When outdoor temperature thermistor is open or a short-circuit is detected at power on or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)**
7 Times	7 Times	Continuous	77	Heat sink thermistor error	Heat Sink Thermistor Error – When heat-sink temperature thermistor is open or a short-circuit is detected at power up or while running the compressor. -Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.

8 Times	4 Times	Continuous	84	Current sensor error	Current Sensor Error – When input current sensor has detected 0A, while the inverter compressor is operating at higher than 56rps, after 1 minute upon starting the compressor. (Except during defrost operation) -Check if terminal connection is loose. -Check if connector is removed. -Check if erroneous connection.
8 Times	6 Times	Continuous	86	High pressure switch error (18,24,30,36) Pressure sensor error (42,48)	High Pressure Switch Error – When the pressure switch is detected open for longer than 10 seconds after the power is turned on. -Reset power to disconnect for 3-5 minutes. -Check voltage to pressure switch. -Check ohm resistance to high pressure switch. **(Ref. Thermistor Resistance Chart)**
9 Times	4 Times	Continuous	94	Over current error	Trip Detection – Protection stop by overcurrent generation after inverter compressor start processing completed generated consecutively 10 times. The number of generations is reset if the compressor is able to start up. -Clogged heat exchanger. -Condenser fan motor defective. **(Ref. Service Tip #008-Fan Motor Check)** -Discharged air not sucked in.
9 Times	5 Times	Continuous	95	Compressor rotor position detection error (permanent stop)	Compressor Motor Control Error – If the detected rotor location is out of phase with actual rotor location more than 90 degrees, the compressor stops. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again. -Check if connector is removed. -Check erroneous connection. -Check if cable is open. **(Ref. Service Tip #060-Compressor Check and/or "Fan Motor Error" under "Compressor Control / Compressor Location Error" Type in Zendesk Help Center)**
9 Times	7 Times	Continuous	97	Outdoor unit fan motor 1 error	Outdoor Unit Fan Motor Error – When outdoor fan motor rotation speed is less than 100 RPMs in 20 seconds after fan motor starts, fan motor stops. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. -Check rotation of fan, locked motor, or resistance for motor to rotate. -Check ambient temperature around motor, excessive high temperature around motor or surrounding equipment that causes heat. -Ohm fan motor windings, check for DC voltage to motor. **(Ref. Service Tip #008-Fan Motor Check)**
9 Times	8 Times	Continuous	98	Outdoor unit fan motor 2 error	Outdoor Unit Fan Motor Error – When outdoor fan motor rotation speed is less than 100 RPMs in 20 seconds after fan motor starts, fan motor stops. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. -Check rotation of fan, locked motor, or resistance for motor to rotate. -Check ambient temperature around motor, excessive high temperature around motor or surrounding equipment that causes heat. -Ohm fan motor windings, check for DC voltage to motor. **(Ref. Service Tip #008-Fan Motor Check)**

9 Times	9 Times	Continuous	99	4-way valve error	When the indoor heat-exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. Cooling or Dry operation [Indoor heat-exchanger temp.] – [Room temp.] > 18°F (10°C) Heating operation [Indoor heat-exchanger] – [Room temp.] < -18°F (-10°C)
10 Times	1 Times	Continuous	A1	Discharge temperature error	Discharge Temperature Error - Protection stop by discharge temperature ≥230°F (110°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-HFI Discharge Temperature Error and/or "Discharge Temperature Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)** -Check outdoor unit fan, heat exchanger. -Check discharge thermistor. **(Ref. Thermistor Resistance Chart)** -Check refrigerant amount, leak check.
10 Times	3 Times	Continuous	A3	Compressor temperature error	Compressor Temperature Thermistor Error – Protection stop by compressor temperature ≥226°F (107.8°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. **(Ref. Service Tip #008-Fan Motor Check)** -Check compressor thermistor, loose connection. **(Ref. Thermistor Resistance Chart)**
10 Times	5 Times	Continuous	A5	Low pressure error	Low Pressure Error – Protection stop by suction pressure ≤7.35 PSI continued for 5 minutes, repeats 5 times within 2 hours. -Check if 3-way valve (gas side) is open. -Clogged strainer. -Check ohm resistance value of EEV coil. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check suction pressure sensor. -Check refrigerant amount.

Wall Mounted: 9RL2, 9RLS3, 9RLS3H, 9RLS3Y, 12RL2, 12RLS3, 12RLS3H, 12RLS3Y, 15RLS3, 15RLS3H, 15RLS3Y, 18RLB, 24RLB, 30RLXB, 30RLXEH, 36RLXB

Error Indication			Wired Remote Controller	Error	Diagnosis Method
Operation	Timer	Economy			
1 Time	1 Time	Continuous	11	Serial communication error	Communication Error – At Start up, evaporator and condenser are not communicating. -Check wiring from panel to condenser, condenser to evaporator. Wire nuts and splices are not recommended. Check for correct voltages at panel, condenser and evaporator. Refer to the Service Instruction manual – Serial Signal Troubleshooting for further details. **(Ref. Service Tip #043-HFI Communication Check and/or "Communication Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
1 Time	2 Times	Continuous	12	Wired remote controller communication error	Wired Remote Controller Communication Error – When the indoor unit cannot receive the signal from the Wired Remote Control for more than 1 minute during normal operation. -Check the connection of terminal between remote control and indoor unit and check if there is a disconnection of the cable.

1 Time	8 Times	Continuous	18	External communication error	External Communication Error – After receiving a signal from the external I/O PCB, the same signal has not been received for 15 seconds. -Check any loose or removed connections between the controller PCB to the external I/O PCB, open cable or mis-wiring. -Replace controller PCB.
2 Times	3 Times	Continuous	23	Combination error	Combination Error – The outdoor unit received a signal that the applied indoor unit is that of a multi type. -Replace indoor unit with correct matching indoor unit. **(Ref. Service Tip #021-Incorrect Wiring)**
2 Times	6 Times	Continuous	26	Address setting error in wired remote controller system	Address Setting Error in Wired Remote Controller System – When the address number set by auto setting & manual setting are mixed in on RC group. When the duplicated address number exists in one RC group. -Check for wrong wiring connection in the RC group. (Refer to Installation Manual) -Wrong RC group setting; the given address number by auto setting (00) and the manual set number (except 00) were not existing in one RC group, the remote controller address setting by U.I. was not an existing same address, duplicated address number is not existing in one RC group. -Check indoor unit controller PCB; check if the controller PCB is damaged.
2 Times	9 Times	Continuous	29	Connection unit number error	Combination Unit Number Error – When the number of connecting indoor units are out of a specified rule. -Check wire installation; wrong number of connecting indoor unit. -Check indoor unit controller PCB; check if controller PCB is damaged, check for error after setting remote controller address.
3 Times	2 Times	Continuous	32	Indoor unit model information error EEPROM access abnormal	EEPROM Error – Electronically erasable and programmable read only memory. It is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal, and cannot change partial contents. Rewriting shall be done upon erasing all the contents. There is a limit in several rewritings. -Check if the ground connection is proper. -Check if there is any equipment that causes harmonic wave near the power cables, i.e. neon light bulb.
3 Times	5 Times	Continuous	35	Manual auto switch error	Manual Auto Switch Error – When the manual auto switch becomes on for 60 or more consecutive seconds. -Check if Manual/Auto switch is kept pressed. Check On/Off switching operation by using a meter. **(Ref. Service Tip #015-Auto/Manual Button)**
3 Times	10 Times	Continuous	3A	Indoor unit communication circuit (WRC) error	Indoor Unit Communication Circuit (WRC) Error – When the indoor unit detects the configuration of the remote controller group is abnormal or the indoor unit detects lack of primary remote controller. -Check the connection of the terminal; check the connection of the terminal between the remote controller and indoor unit, or check between indoor unit if there is a disconnect or short of the cable. -Check indoor unit Controller PCB; check terminal voltage of the controller PCB connector on CNC01 (power supply for remote) If 12vDC, remote controller failure, replace remote controller. If 0vDC, controller PCB failure, replace controller PCB.
4 Times	1 Time	Continuous	41	Indoor room thermistor error	Indoor Room Thermistor Error – Room temperature thermistor detected an abnormal temperature. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Controller PCB defective.

4 Times	2 Times	Continuous	42	Indoor heat ex. (Pipe) thermistor error	Indoor Heat Ex. (Pipe) Thermistor Error – Evaporator pipe thermistor detected an abnormal temperature. -Check thermistor for open for open or short. Check thermistor resistance value -Controller PCB defective. **(Ref. Thermistor Resistance Chart)**
5 Times	1 Time	Continuous	51	Indoor unit fan motor error	Indoor Unit Fan Motor Error – When the condition that actual frequency of indoor fan is below 1/3 of target frequency is continued more than 56 seconds. -Check rotation of fan. -Check ambient temperature around motor. -Check indoor unit fan motor resistance values. -Replace controller PCB. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Check" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
5 Times	8 Times	Continuous	58	Intake grille error	Intake Grille Error – When the micro switch is detected open while running the compressor. -Check limit switch. -Check connector (CN11) / wire. -Replace controller PCB.
6 Times	2 Times	Continuous	62	Outdoor unit main PCB error	Outdoor Unit Main PCB Error – Access to EEPROM failed due to some cause after outdoor unit started. -Reset power supply and operate. -Check external cause; voltage drop, poor ground connection. -Replace Main PCB.
6 Times	3 Times	Continuous	63	Inverter error	Inverter Error – Error information received from the transistor PCB. -Check wiring (Power supply to filter PCB to transistor PCB); connector and wiring connection, cable open. -Replace transistor PCB -Replace main PCB -Replace filter PCB
6 Times	4 Times	Continuous	64	PFC circuit error (9/12RLS3) Active filter error (15RLS3 15RLS3H, 30RLXEH)	PFC Circuit Error (9/12RLS3) – When inverter output DC voltage is higher than 415V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently. -Check external cause at the indoor and outdoor (voltage drop or noise). -Check connection of connector, loose, erroneous connection. -Replace Main PCB. Active Filter Error (15RLS3, 30RLXEH) – When inverter input DC voltage is higher than 425v or lower than 80V. When a momentary power cut off occurred on low voltage. -Check external cause at the indoor and outdoor (voltage drop or noise). -Check connection of connector, loose, erroneous connection. -Check Active Filter Module resistance values. **(Ref. Service Tip #010-ACTPM Check and/or "ACTPM Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
6 Times	5 Times	Continuous	65	IPM error	IPM Error – Abnormal current value at the IPM is detected. Heat radiation is blocked (inlet/outlet). -Check connections of outdoor unit electrical components. -Check outdoor fan, heat exchanger. **(Ref. Service Tip #008-Fan Motor Check)** -Check compressor resistance values. **(Ref. Service Tip #014-IPM Check & Ref. Thermistor Resistance Chart)**

7 Times	1 Time	Continuous	71	Discharge thermistor error	Discharge Thermistor Error – When discharge pipe temperature thermistor open or short-circuit is detected at power on or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open or short. Check thermistor resistance value **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	2 Times	Continuous	72	Compressor thermistor error	Compressor Thermistor Error – When the compressor temperature thermistor is open or short-circuit is detected at power up or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open or short. Check thermistor resistance value -Check voltage of Main PCB. **(Ref. Thermistor Resistance Chart & Service Tip #060 Compressor Test)**
7 Times	3 Times	Continuous	73	Heat Ex. (Pipe) thermistor error Heat Ex. middle temp. thermistor error / Heat ex. liquid temp. thermistor error (30RLXEH)	Heat Exchanger (Pipe) Thermistor Error – When heat exchanger temperature thermistor open or short-circuit is detected at power up or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	4 Times	Continuous	74	Outdoor thermistor error	Outdoor Thermistor Error – When outdoor temperature thermistor is open or a short-circuit is detected at power on or while running the compressor. - Check connection of connector, loose, erroneous connection. -Check thermistor for open for open or short. Check thermistor resistance value **(Ref. Thermistor Resistance Chart)**
7 Times	7 Times	Continuous	77	Heat sink thermistor error	Heat Sink Thermistor Error – Heat sink temperature thermistor (built-in IPM) is open or shorted. -Inverter PCB failure. -Replace inverter PCB.
8 Times	4 Times	Continuous	84	Current sensor error	Current Sensor Error – When input current sensor has detected 0A, while the inverter compressor is operating at higher than 56rps, after 1 minute upon starting the compressor. (Except during defrost operation) -Check if terminal connection is loose. -Check if connector is removed. -Check if erroneous connection.
8 Times	6 Times	Continuous	86	Pressure sensor error	High Pressure Switch Error – When the pressure switch is detected open for longer than 10 seconds after the power is turned on. -Reset power to disconnect for 3-5 minutes. -Check voltage to pressure switch. -Check ohm resistance to high pressure switch.

9 Times	4 Times	Continuous	94	Over current error	Over Current Error – Protection stop by overcurrent generation after inverter compressor start processing completed generated consecutively 10 times. The number of generations is reset if the start-up of the compressor succeeds. -Clogged heat exchanger. -Condenser fan motor defective. **(Ref. Service Tip #008-Fan Motor Check)** -Discharged air not sucked in.
9 Times	5 Times	Continuous	95	Compressor control error	Compressor Motor Control Error – If the detected rotor location is out of phase with actual rotor location more than 90 degrees, the compressor stops. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again. -Check if connector is removed. -Check erroneous connection. -Check if cable is open. **(Ref. Service Tip #060-Compressor Check and/or "Fan Motor Error" under "Compressor Control / Compressor Location Error" Type in Zendesk Help Center)**
9 Times	7 Times	Continuous	97	Outdoor unit fan motor error	Outdoor Unit Fan Motor Error – When outdoor fan motor rotation speed is less than 100 RPMs in 20 seconds after fan motor starts, fan motor stops. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. -Check rotation of fan, locked motor, or resistance for motor to rotate. -Check ambient temperature around motor, excessive high temperature around motor or surrounding equipment that causes heat. -Ohm fan motor windings, check for DC voltage to motor. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
9 Times	8 Times	Continuous	98	Outdoor unit fan motor 2 error	Outdoor Unit Fan Motor 2 Error – When the outdoor fan rotation speed is less than 100 RPMs in 20 seconds after the fan motor starts, the fan will stop. After motor restarts, if same operation within 60 seconds is repeated 3 times in a row, compressor and fan stop. If above repeats 5 times in a row, compressor and fan stop permanently. -Check rotation of fan, locked motor, or resistance for motor to rotate. -Check ambient temperature around motor, excessive high temperature around motor or surrounding equipment that causes heat. -Ohm fan motor windings, check for DC voltage to motor. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
9 Times	9 Times	Continuous	99	4-Way valve error	4-Way Valve Error – When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops: Cooling or Dry operation [Indoor heat exchanger temp.] – [Room temp.] > 20°F (10°C) Heating operation [Indoor heat exchanger temp.] – [Room temp.] < -20°F (-10°C) -Check connection of molex plug. -Check each thermistor. -Check the solenoid coil and 4-way valve. -Check voltage of 4-way valve.

10 Times	1 Time	Continuous	A1	Discharge temperature error	Discharge Temperature Error - Protection stop by discharge temperature ≥230°F (110°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. -Check discharge thermistor. **(Ref. Thermistor Resistance Chart)** -Check refrigerant amount, leak check. **(Ref. Service Tip #001-HFI Discharge Temperature Error and/or "Discharge Temperature Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
10 Times	3 Times	Continuous	A3	Compressor temperature error	Compressor Temperature Thermistor Error – Protection stop by compressor temperature ≥226°F (107.8°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. **(Ref. Service Tip #008-Fan Motor Check)** -Check compressor thermistor, loose connection. **(Ref. Service Tip #060-Compressor Check and "Compressor Temperature Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)** -Check refrigerant amount, leak check.
10 Times	5 Times	Continuous	A5	Low pressure error	Low Pressure Error – Protection stop by suction pressure < 0.02MPaG continued for 5 minutes, repeats 5 times within 2 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001 Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. -Check discharge thermistor. **(Ref. Thermistor Resistance Chart)** -Check refrigerant amount, leak check. **(Ref. Outdoor Installation Manual)**

Multi-Zones: ASU7RLF1, ASU9RLF1, ASU12RLF1, ASU18RLF, ASU15RLS, ASU15RLS2, ASU15RLF1, ASU24RLF, ARU7RLF, ARU9RLF, ARU12RLF, ARU18RLF, ARU24RLF, AUU7RLF, AUU9RLF, AUU12RLF, AUU18RLF, AGU9RLF, AGU12RLF, AGU15RLF

Error Indication			Wired Remote Controller	Error	Diagnosis Method
Operation	Timer	Economy			
1 Time	1 Time	Continuous	11	Serial communication error	Communication Error – At Start Up, evaporator and condenser are not communicating. -Check wiring from panel to condenser, condenser to evaporator. Wire nuts and splices are not recommended. Check for correct voltages at panel, condenser and evaporator. Refer to the Service Instruction manual – Serial Signal troubleshooting for further details. **(Ref. Service Tip #043-HFI Communication Check and/or "Communication Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
1 Time	2 Times	Continuous	12	Wired remote controller communication error	Wired Remote Controller Communication Error – When the indoor unit cannot receive the signal from the Wired Remote Control for more than 1 minute during normal operation. -Check the connection of terminal between remote control and indoor unit and check if there is a disconnection of the cable.

1 Time	5 Times	Continuous	15	Check run unfinished	Check-Run Unfinished – When the operation command is inputted by the remote controller without check operation completion. -Check indoor unit number connection. -Power down all indoors units with remote controller, reset disconnect and branch box power for 5 minutes, reinitiate check-run operation. **(Ref. "Check Run Unfinished" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
2 Times	1 Time	Continuous	21	Number of wires and pipes error	Number of Wires and Pipes Error – When the operation command is inputted by the remote controller without check operation completion. -Check indoor unit connection. -Check for crossed wiring or piping. **(Ref. Service Tip #021 Incorrect Wiring)**
2 Times	2 Times	Continuous	22	Indoor unit capacity error	Indoor Unit Capacity Error – The total capacity of the indoor units has been exceeded or is under the minimum acceptable range. -Check total capacity of the connected indoor units. -Check all field wiring to ensure no breaks. **(Ref. Service Tip #043-HFI Communication Check and/or "Communication Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
2 Times	3 Times	Continuous	23	Connected combination error	Connected Combination Error – When power is on and one of the below occurs: When the wiring is incorrect. When the connection of an unsupported multi-zone condenser is installed. **(Ref. Service Tip #021-Incorrect Wiring)**
2 Times	4 Times	Continuous	24	Number of indoor units' error / Number of branch boxes error	Number of Indoor Units Error / Number of Branch Boxes Error – When the total connection number of indoor units is outside of range between 2 and 8. / When the number of branch boxes 1 and 2 are different and the operation command is input to the outdoor unit. -Check indoor unit number connection for overcapacity. -Check power to the branch boxes. **(Ref. Service Tip #041-EJ2U Branch Box Error)**
3 Times	2 Times	Continuous	32	Indoor unit model information error EEPROM access abnormal	EEPROM Error – Electronically Erasable and Programmable Read Only Memory. It is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal and cannot change partial contents. Rewriting shall be done upon erasing all the contents. There is a limit in several rewritings. -Check if the ground connection is proper. Check if there is any equipment that causes harmonic wave near the power cables, i.e. neon light bulb.
3 Times	5 Times	Continuous	35	Manual auto switch error	Manual Auto Switch Error – When the Manual Auto Switch becomes on for 60 or more consecutive seconds. -Check if Manual Auto switch is kept pressed. Check On/Off switching operation by using a meter. **(Ref. Service Tip #015-Auto/Manual Button)**
4 Times	1 Time	Continuous	41	Indoor room thermistor error	Indoor Room Thermistor Error – Room temperature thermistor detected an abnormal temperature. -Check thermistor for open or short. Check thermistor resistance value. **(Refer to "Thermistor characteristics table").** **-Controller PCB defective. (Ref. Thermistor Resistance Chart)**
4 Times	2 Times	Continuous	42	Indoor heat ex. (Pipe) thermistor error	Indoor Heat Ex. (Pipe) Thermistor Error – Evaporator pipe thermistor detected an abnormal temperature. -Check thermistor for open for open or short. Check thermistor resistance value (Refer to "Thermistor characteristics table"). -Controller PCB defective. **(Ref. Thermistor Resistance Chart)**

5 Times	1 Time	Continuous	51	Indoor unit fan motor error	Indoor Unit Fan Motor Error – When the condition that actual frequency of indoor fan is below 1/3 of target frequency is continued more than 56 seconds. -Check rotation of fan. -Check ambient temperature around motor. -Check indoor unit fan motor resistance values. -Replace controller PCB. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Check" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
5 Times	3 Times	Continuous	53	Drain pump error	Drain Pump Error – When the float switch is on for more than 3 minutes, error will trigger. -Check operation of float switch, blockages, dust, etc. -Remove float and check on/off switching operation by using a meter. -Check connector of (CN9) / wire. -Check drain hose for blockages.
5 Times	7 Times	Continuous	57	Damper error	Damper Error – When limit switch was not able to detect the closing though the damper is closed. (Upper air flow) -Check operation of limit switch. -Check for loose connection of CN18 / shorted or pinched wire. -Check damper for obstructions of damper movement. -Check damper movement.
5 Times	8 Times	Continuous	58	Intake grille error	Intake Grille Error – When the micro switch is detected open while running the compressor. -Check limit switch. -Check connector (CN11) / wire. -Replace controller PCB.
6 Times	2 Times	Continuous	62	Outdoor unit main PCB error	Outdoor Unit Main PCB Error – Access to EEPROM failed due to some cause after outdoor unit started. -Reset power supply and operate. -Check external cause; voltage drop, poor ground connection. -Replace Main PCB.
6 Times	3 Times	Continuous	63	Inverter error	Inverter Error – Error information received from the inverter PCB. -Reset power to disconnect -Check connection of molex plugs on inverter PCB for loose connections.
6 Times	4 Times	Continuous	64	PFC circuit error (9/12RLS3) / Active filter error (15RLS3, 30RLXEH)	PFC Circuit Error (9/12RLS3) – When inverter output DC voltage is higher than 415V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently. -Check external cause at the indoor and outdoor (voltage drop or noise). -Check connection of connector, loose, erroneous connection. -Replace Main PCB. Active Filter Error (15RLS3, 30RLXEH) – When inverter input DC voltage is higher than 425v or lower than 80V. When a momentary power cut off occurred on low voltage. -Check external cause at the indoor and outdoor (voltage drop or noise). -Check connection of connector, loose, or erroneous connection. Check Active Filter Module resistance values. (ACTPM) **(Ref. Service Tip #010-ACTPM Check and/or "ACTPM Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**

6 Times	5 Times	Continuous	65	IPM error	IPM Error – Abnormal current value at the IPM is detected. Heat radiation is blocked (inlet/outlet). -Check connections of outdoor unit electrical components. -Check outdoor fan, heat exchanger. **(Ref. Service Tip #008-Fan Motor Check)** -Check compressor resistance values. **(Ref. Service Tip #060-Compressor Check & Ref. Service Tip #014-IPM Check)**
6 Times	10 Times	Continuous	6A	Display PCB communication error	Display P.C.B. Error – Communication not received from I/O PCB for more than 10 seconds. -Check molex plug connection for loose or erroneous connection.
7 Times	1 Time	Continuous	71	Discharge thermistor error	Discharge Thermistor Error – When discharge pipe temperature thermistor open or short-circuit is detected at power up or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open for open or short. -Check voltage of Main PCB. **(Ref. Thermistor Resistance Chart)**
7 Times	2 Times	Continuous	72	Compressor thermistor error	Compressor Thermistor Error – Compressor temperature thermistor is open or short-circuited while power is on or running the compressor. -Check for erroneous connection or removed connector. -Check resistance on thermistor. **(Ref. Thermistor Resistance Chart & Service Tip #060 Compressor Test)** -Check voltage to thermistor.
7 Times	3 Times	Continuous	73	Heat Ex. (Pipe) thermistor error	Heat Exchanger (Pipe) Thermistor Error – When heat exchanger temperature thermistor open or short-circuit is detected at power on or while running the compressor. -Check connection of connector, loose, or erroneous connection. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	4 Times	Continuous	74	Outdoor thermistor error	Outdoor Thermistor Error – When outdoor temperature thermistor is open or a short-circuit is detected at power on or while running the compressor. -Check connection of connector, loose, erroneous connection. -Check thermistor for open or short. Check thermistor resistance value. **(Ref. Thermistor Resistance Chart)**
7 Times	5 Times	Continuous	75	Suction gas thermistor error	Suction Gas Thermistor Error – Suction gas temperature thermistor has shorted or open detected. -Check the connection of the molex plug, loose or erroneous connection. -Check ohm resistance readings of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage of Main PCB.
7 Times	6 Times	Continuous	76	2-Way valve thermistor error	2-Way Valve Thermistor Error – When 2-way valve temperature thermistor is open or short-circuited while power is on or while running the compressor. -Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.

7 Times	6 Times	Continuous	76	3-Way valve thermistor error	3-Way Valve Thermistor Error – When 2-way valve temperature thermistor is open or short-circuited while power is on or while running the compressor. -Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.
7 Times	7 Times	Continuous	77	Heat sink thermistor error	Heat Sink Thermistor Error – When heat-sink temperature thermistor is open or a short-circuit is detected at power up or while running the compressor. -Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.
8 Times	2 Times	Continuous	82	Sub-cool heat ex. gas inlet thermistor error / Sub cool heat ex. gas outlet thermistor error	Sub-Cool Heat Ex. Gas Inlet Thermistor Error / Sub Cool Heat Ex. Gas Outlet Thermistor Error – Sub cooling heat exchanger gas inlet temperature thermistor short or open detected. -Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.
8 Times	3 Times	Continuous	83	Liquid pipe thermistor	Liquid Pipe Thermistor Error - Heat exchanger liquid pipe thermistor short or open detected. Check for erroneous connection or removed connector. -Check resistance of thermistor. **(Ref. Thermistor Resistance Chart)** -Check voltage to thermistor.
8 Times	4 Times	Continuous	84	Current sensor error	Current Sensor Error – When input current sensor has detected 0A, while the inverter compressor is operating at higher than 56rps, after 1 minute upon starting the compressor. (Except during defrost operation) -Check if terminal connection is loose. -Check if connector is removed. -Check if erroneous connection.
8 Times	6 Times	Continuous	86	High pressure switch error	High Pressure Switch Error – When the pressure switch is detected open for longer than 10 seconds after the power is turned on. -Reset power to disconnect for 3-5 minutes. -Check voltage to pressure switch. -Check ohm resistance to high pressure switch.
9 Times	4 Times	Continuous	94	Over current error	Trip Detection – Protection stop by overcurrent generation after inverter compressor start processing completed generated consecutively 10 times. The number of generations is reset if the compressor is able to start up. -Clogged heat exchanger. -Condenser fan motor defective. **(Ref. Service Tip #008-Fan Motor Check)** -Discharged air not sucked in.

9 Times	5 Times	Continuous	95	Compressor control error	Compressor Motor Control Error – If the detected rotor location is out of phase with actual rotor location more than 90 degrees, the compressor stops. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again. -Check if connector is removed. -Check erroneous connection. -Check if cable is open. **(Ref. Service Tip #060-Compressor Check and/or "Fan Motor Error" under "Compressor Control / Compressor Location Error" Type in Zendesk Help Center)**
9 Times	7 Times	Continuous	97	Outdoor unit fan motor error	Outdoor Unit Fan Motor Error – When outdoor fan motor rotation speed is less than 100 RPMs in 20 seconds after fan motor starts, fan motor stops. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. -Check rotation of fan, locked motor, or resistance for motor to rotate. -Check ambient temperature around motor, excessive high temperature around motor or surrounding equipment that causes heat. -Ohm fan motor windings, check for DC voltage to motor. **(Ref. Service Tip #008-Fan Motor Check and/or "Fan Motor Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
9 Times	9 Times	Continuous	99	4-Way valve error	4-Way Valve Error – When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops: Cooling or Dry operation [Indoor heat exchanger temp.] – [Room temp.] > 20°F (10°C) Heating operation [Indoor heat exchanger temp.] – [Room temp.] < -20°F (-10°C) -Check connection of molex plug. -Check each thermistor. -Check the solenoid coil and 4-way valve. -Check voltage of 4-way valve.
10 Times	1 Time	Continuous	A1	Discharge temperature error	Discharge Temperature Error - Protection stop by discharge temperature ≥230°F (110°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. -Check discharge thermistor. **(Ref. Thermistor Resistance Chart)** -Check refrigerant amount, leak check. **(Ref. Service Tip #001-HFI Discharge Temperature Error and/or "Discharge Temperature Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**
10 Times	3 Times	Continuous	A3	Compressor temperature error	Compressor Temperature Thermistor Error – Protection stop by compressor temperature ≥226°F (107.8°C) during compressor operation generated 2 times within 24 hours. -Check if 3-way valve is open. -Check EEV, strainer. **(Ref. Service Tip #001-Discharge Temperature Thermistor Error)** -Check outdoor unit fan, heat exchanger. **(Ref. Service Tip #008-Fan Motor Check)** -Check compressor thermistor, loose connection. **(Ref. Service Tip #060-Compressor Check and "Compressor Temperature Error" under "Troubleshooting by Error Code" Type in Zendesk Help Center)**

10 Times	5 Times	Continuous	A5	Low pressure error	Low Pressure Error – Protection stop by suction pressure ≤7.35 PSI continued for 5 minutes, repeats 5 times within 2 hours. -Check if 3-way valve (gas side) is open. -Clogged strainer. -Check ohm resistance value of EEV coil. **(Ref. Service Tip #001 Discharge Temperature Thermistor Error)** -Check suction pressure sensor. -Check refrigerant amount.
13 Times	2 Times	Continuous	J2	Branch box error	Branch Box Error – When the branch box stops communicating with connected indoor units. -Reset power supply and operate. -Check molex plugs for loose or erroneous connections; Check for defective or crossed field wiring. **(Ref. Service Tip #041 EJ2U Branch Box Error)**

Multi-Zone Outdoor Units: AOU18RLXFZ, AOU18RLXFZH, AOU24RLXFZ, AOU24RLXFZH, AOU36RLXFZ, AOU36RLXFZ1

Error Contents	LED			
	1	2	3	4
Outdoor communication signal error (forward transfer)	1 flash	Off	Off	Off
	Off	1 flash	Off	Off
	Off	Off	1 flash	Off
	Off	Off	Off	1 flash
Outdoor discharge pipe thermistor error	2 flashes	Off	Off	Off
Heat Ex. thermistor error	3 flashes	Off	Off	Off
Outdoor temperature error	4 flashes	Off	Off	Off
2-way valve thermistor error (for indoor unit A)	5 flashes	Off	Off	Off
2-way valve thermistor error (for indoor unit B)	Off	5 flashes	Off	Off
2-way valve thermistor error (for indoor unit C)	Off	Off	5 flashes	Off
3-way valve thermistor error (for indoor unit A)	6 flashes	Off	Off	Off
3-way valve thermistor error (for indoor unit B)	Off	6 flashes	Off	Off
3-way valve thermistor error (for indoor unit C)	Off	Off	6 flashes	Off
3-way valve thermistor error (for indoor unit D)	Off	Off	Off	6 flashes
Compressor thermistor error	7 flashes	Off	Off	Off
Heat sink thermistor error	8 flashes	Off	Off	Off

High pressure switch 1 error	9 flashes	Off	Off	Off
High pressure switch 2 error	10 flashes	Off	Off	Off
Indoor unit capacity error	11 flashes	Off	Off	Off
Over current error	12 flashes	Off	Off	Off
Compressor control error	13 flashes	Off	Off	Off
IPM error	14 flashes	Off	Off	Off
Outdoor unit fan motor error	15 flashes	Off	Off	Off
Heat Ex. MID thermistor error	16 flashes	Off	Off	Off
Outdoor unit PCB microcomputer communication error	17 flashes	Off	Off	Off
Discharge temp. error	18 flashes	Off	Off	Off
Compressor temp. error	19 flashes	Off	Off	Off
4-way valve error	20 flashes	Off	Off	Off
Outdoor unit PCB model information error	21 flashes	Off	Off	Off
Active filter error	22 flashes	Off	Off	Off

Multi-Zone Outdoor Units: AOU36RLXFZH, AOU45RLXFZ

●: Flashing ○: No indication

Error Contents	Outdoor Unit LED Display					
	A	B	C	D	E	F
Serial communication error	●1	●1	○	○	●	●
Serial communication error during operation	●1	●1	○	●	○	○
Communication error between controller and outdoor unit	●1	●6	○	●	○	●
Indoor unit capacity error	●2	●2	○	○	○	●
Indoor unit error	●5	●15	○	○	○	●
PCB model information error	●6	●2	○	○	○	●
EEPROM access error	●6	●2	○	○	●	●
EEPROM data corruption error	●6	●2	●	○	○	○
Inverter error	●6	●3	○	○	○	●
IPM error (trip terminal L error)	●6	●5	○	○	●	●
Discharge temp. sensor error	●7	●1	○	○	○	●
Compressor temp. sensor error	●7	●2	○	○	○	●
Heat Ex. liquid sensor error	●7	●3	○	○	●	●
Outdoor temp. sensor error	●7	●4	○	○	○	●
Valve sensor error	●7	●6	○	○	○	●

Valve sensor error	●7	●6	○	○	●	○
Current sensor 1 error (stoppage permanently)	●8	●4	○	○	○	●
Discharge pressure sensor error	●8	●6	○	○	○	●
Trip detection	●9	●4	○	○	○	●
Compressor motor control error	●9	●5	○	○	○	●
Fan motor 1 error (duty error)	●9	●7	○	○	●	●
4-way valve error	●9	●9	○	○	○	●
Coil 1 (expansion valve 1) error	●9	●10	○	○	○	●
Discharge temperature 1 error (stoppage permanently)	●10	●1	○	○	○	●
Compressor 1 temperature error	●10	●3	○	○	○	●

Single-Zone Outdoor Unit : AOU30RLXEH ○: Light OFF ●: Light ON ◊2: 2 Times Blinking ◊1 ~ ◊15: 1 ~ 15 Times Blinking ●: Light ON

Error Contents	LED Display							
	Power Mode	Error	Pump Down	Low Noise		Peak Cut		
			(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
Serial communication error	◊2	●	◊1	◊1	○	○	●	●
	◊2	●	◊1	◊1	○	●	○	○
Indoor unit error	◊2	●	◊5	◊15	○	○	○	●
Outdoor unit main PCB model information error	◊2	●	◊6	◊2	○	○	○	●
Inverter error	◊2	●	◊6	◊3	○	○	○	●
IPM error	◊2	●	◊6	◊5	○	○	●	●
Discharge thermistor error	◊2	●	◊7	◊1	○	○	○	●
Compressor thermistor error	◊2	●	◊7	◊2	○	○	○	●
Heat Ex. middle temp. sensor error	◊2	●	◊7	◊3	○	○	●	○
Heat Ex. liquid temp. sensor error	◊2	●	◊7	◊3	○	○	●	●
Outdoor thermistor error	◊2	●	◊7	◊4	○	○	○	●
Heat sink temp. sensor error	◊2	●	◊7	◊7	○	○	○	●
Current sensor error	◊2	●	◊8	◊4	○	○	○	●
Pressure sensor error	◊2	●	◊8	◊6	○	●	●	○
Trip detection error	◊2	●	◊9	◊4	○	○	○	●
Compressor control error	◊2	●	◊9	◊5	○	○	○	●
Outdoor unit fan motor 1 error	◊2	●	◊9	◊7	○	○	●	●
Outdoor unit fan motor 2 error	◊2	●	◊9	◊8	○	○	●	●
4-way valve error	◊2	●	◊9	◊9	○	○	○	●
Discharge temp. error	◊2	●	◊10	◊1	○	○	○	●
Compressor temp. error	◊2	●	◊10	◊3	○	○	○	●
Low pressure error	◊2	●	◊10	◊5	○	○	○	●

Halcyon HFI Flex Branch Boxes: UTY-PU03A, UTP-PU03B

When an error occurs, an error description displays in the LED (No. 401 – 405).	
○	Lit
○ **(n)**	Flashing (number of flashing)
○	Unlit

Normal Status

Green	Red				Comment
LED 401	**LED 402**	**LED 403**	**LED 404**	**LED 405**	
●	○	○	○	○	This box is functioning properly.

Error Status

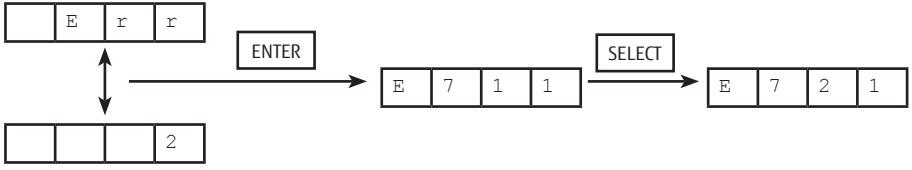
Green	Red				Error Description
LED 401	**LED 402**	**LED 403**	**LED 404**	**LED 405**	
●	●	●	●	●	Connected combination error
●	●	●	●	○	Power frequency error
●	○	○	○	●	
Branch Box identifying display	○ (1)	○	○	○	EEPROM
	○ (2)	○	○	○	Model information error
	○ (3)	○	○	○	• Serial communication error between outdoor unit and branch box • Serial communication error between branch boxes
Primary unit: ○ (1)	○ (4)	○	○	○	Serial communication error between branch boxes
	○ (5)	●	○	○	Serial communication error between indoor unit A and branch box
		○	●	○	Serial communication error between indoor unit B and branch box
			○	●	Serial communication error between indoor unit C and branch box
Secondary unit 1: ○ (2)	○ (6)	●	○	○	Indoor Unit A, liquid pipe thermistor error (CN309)
		○	●	○	Indoor Unit B, liquid pipe thermistor error (CN309)
		○	○	●	Indoor Unit C, liquid pipe thermistor error (CN310)
Secondary unit2: ○ (3)	○ (7)	●	○	○	Indoor Unit A, gas pipe thermistor error (CN309)
		○	●	○	Indoor Unit B, gas pipe thermistor error (CN309)
		○	○	●	Indoor Unit C, gas pipe thermistor error (CN310)
	○ (8)	●	○	○	Indoor Unit A, EEV control error (CN305)
		○	●	○	Indoor Unit B, EEV control error (CN306)
		○	○	●	Indoor Unit C, EEV control error (CN307)
	○ (9)	○	○	○	Remote controller communication error

Halcyon HFI Flex Outdoor Unit
AOU48RLXFZ, AOU48RLXFZ1

- When error occurs, "Err" and "Number of error occurred" are alternately displayed in 7 seg. Display.
- The latest error code can be confirmed by pressing the ENTER button.
- When error codes are displayed, all the error codes can be confirmed by pressing the SELECT button.

Example: When "Discharge thermistor error" and "Compressor thermistor error" have occurred.

SELECT — Press the "SELECT" button.
ENTER — Press the "ENTER" button.



CODE	DESCRIPTION	CODE	DESCRIPTION
E113	Serial communication error	E751	Suction gas thermistor error
E114		E771	Heat sink thermistor error
E156	Check-run unfinished	E821	Sub-cool heat EX. gas inlet thermistor error
E212	Number of wires and pipe error	E882	Sub-cool heat EX. gas outlet thermistor error
E221	Indoor unit capacity error	E831	Liquid pipe thermistor error
E242	Number of indoor units error	E841	Current sensor error
E243	Number of Branch boxes error	E861	Discharge pressure sensor error
E5U1	Indoor unit error	E863	Suction pressure sensor error
E621	Outdoor unit model	E864	High pressure switch error
E631	Inverter error	E941	Over current error
E641	A.F. voltage error	E951	Compressor control error
E653	IPM error	E973	Outdoor unit fan motor error
E6A1	Display P.C.B. communication error	E991	4-way valve error
E711	Discharge thermistor error	EA11	Discharge temp. error
E721	Compressor thermistor error	EA31	Compressor temp. error
E733	Heat Ex. Liquid outlet thermistor error	EA51	Low pressure error
E741	Outdoor thermistor error	EJ2U	Branch boxes error

Universal Mount / Ceiling Suspended: ABU18RULX, ABU24RULX, ABU36RSLX

Operation	Timer	Swing	Error Contents
Continuous blink	Continuous blink	OFF	Indoor EEPROM abnormal
Continuous blink	Continuous blink	Continuous blink	Outdoor EEPROM abnormal
2 flashes	Continuous blink	OFF	Indoor room temperature sensor open
2 flashes	Continuous blink	Continuous blink	Indoor room temperature sensor short circuited
3 flashes	Continuous blink	OFF	Indoor heat exchanger temperature sensor open
3 flashes	Continuous blink	Continuous blink	Indoor heat exchanger temperature sensor short circuited
4 flashes	Continuous blink	OFF	Float switch operated
5 flashes	Continuous blink	OFF	Communication error (serial reverse transfer error)
5 flashes	Continuous blink	Continuous blink	Outdoor communication error (forward reverse transfer error)
6 flashes	Continuous blink	OFF	Indoor fan abnormal
Continuous blink	2 flashes	OFF	Outdoor power source connection abnormal
Continuous blink	3 flashes	OFF	Outdoor heat exchanger temperature sensor open
Continuous blink	3 flashes	Continuous blink	Outdoor heat exchanger temperature sensor short circuited
Continuous blink	4 flashes	OFF	Outdoor temperature sensor open
Continuous blink	4 flashes	Continuous blink	Outdoor temperature sensor short circuited
Continuous blink	5 flashes	OFF	Outdoor discharge pipe temperature sensor or Compressor temperature sensor open
Continuous blink	5 flashes	Continuous blink	Outdoor discharge pipe temperature sensor or Compressor temperature sensor short circuited
Continuous blink	6 flashes	OFF	Outdoor high pressure abnormal
Continuous blink	7 flashes	OFF	Outdoor discharge pipe temperature or Compressor temperature sensor abnormal
Continuous blink	8 flashes	OFF	Compressor temperature thermistor error
Continuous blink	9 flashes	OFF	Pressure switch error
Continuous blink	10 flashes	OFF	IPM error
Continuous blink	11 flashes	OFF	CT error
Continuous blink	12 flashes	OFF	Active Filter Module error (AFM)
Continuous blink	13 flashes	OFF	Compressor rotor location cannot be detected (Permanent stop)
Continuous blink	14 flashes	OFF	Outdoor unit fan motor error

Outdoor Cassette & Ceiling Suspended : AOU18RLX, AOU24RLX, AOU36RLX, AOU42RLX

LED	Error Contents
1 flash	Communication error (indoor unit to Outdoor unit)
2 flashes	Discharge pipe temperature sensor
3 flashes	Outdoor heat exchanger temperature sensor
4 flashes	Outdoor temperature sensor
7 flashes	Compressor temperature sensor
8 flashes	Heat sink temperature sensor
9 flashes	Pressure switch abnormal
12 flashes	IPM error
13 flashes	Compressor rotor position cannot detect
14 flashes	Compressor cannot operate/Start up error
15 flashes	Outdoor fan abnormal (upper fan)
16 flashes	Outdoor fan abnormal (lower fan)
Lighting	No error

Indoor Ceiling Cassettes
AUU18RCLX, AUU24RCLX, AUU36RCLX, AUU42RCLX

Error code	Error Contents
01	Indoor unit doesn't accept signal from outdoor unit
02	Room temperature sensor open
03	Room temperature sensor short circuited
04	Indoor heat exchanger temperature sensor open
05	Indoor heat exchanger temperature sensor short circuited
06	Outdoor heat exchanger temperature sensor
08	Power source connection error
09	Float switch operated
0A	Outdoor temperature sensor error
0c	Discharge pipe temperature sensor
11	Model abnormal/indoor EPROM abnormal
12	Indoor fan abnormal
13	Outdoor unit doesn't accept the signal from the indoor unit
14	Excessive outdoor pressure (permanent stop)
15	Compressor temperature sensor
16	Pressure switch error
17	IPM error
18	CT error
19	Active filter module (AFM) error
1A	Compressor does not operate
1b	Outdoor unit fan error
1c	Communication error (inverter to multi controller)
1d	2-way valve sensor error
1E	Expansion valve error
1F	Connection indoor unit error

FGLair Mobile App
9RLS3Y, 12RLS3Y, 15RLS3Y

Error Code	Error Message
11.1	Serial communication error between indoor/outdoor units
11.2	
11.3	
11.4	
12.1	Remote controller communication error
18.1	External communication error
32.1	Indoor unit main PCB error
35.1	Indoor unit manual auto switch error
41.1	Indoor unit room temp. thermistor error
42.2	Indoor unit heat ex. temp. thermistor error
51.1	Indoor unit fan motor 1 error
51.2	
62.1	Outdoor unit main PCB error
62.2	
63.1	Outdoor unit inverter PCB error
63.2	
64.1	
64.3	Outdoor unit active filter / PFC circuit error
64.4	
64.8	
65.3	Outdoor unit IPM error
71.1	Outdoor unit discharge temp. thermistor error
73.3	Outdoor unit heat ex. temp. thermistor error
74.1	Outdoor air temp. thermistor error
84.1	Outdoor current sensor error
94.1	Outdoor unit trip detection
95.1	Outdoor unit compressor motor control error
95.3	
97.3	Outdoor unit fan motor 1 error
99.1	Outdoor unit 4-way valve error
A1.1	Outdoor unit discharge temperature 1 error

System	Pre-charge Amount	Pre-charge Length	Max Length	Additional Charge	Minimum Length	Locked Rotor Amps
9R2	1 lb. 10 oz.	25 ft.	49 ft.	.21 oz./ft.	9 ft.	47A
9CQ	1 lb. 9 oz.	25 ft.	49 ft.	.2 oz./ft.	9 ft.	47A
9RQ	1 lb. 10 oz.	25 ft.	49 ft.	.2 oz./ft.	9 ft.	47A
9RLQ	2 lbs. 2 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
9RL	1 lb. 7 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
9RLS	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
9RLS2 / 9RLS2H	2 lbs. 10 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	26A / N/A
9RLS3 / 9RLS3H / 9RLS3Y	2 lbs. 14 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
9RL2	1 lb. 7 oz.	49 ft.	66 ft.	.22 oz./ft.	9 ft.	18A
9RLFC	2 lbs. 10 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	N/A
9RLFW / 9RLFW1	1 lb. 14 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	26A / N/A
9RLFF / 9RLFFH	2 lbs. 10 oz.	49 ft.	66 ft.	.22 oz./ft.	9 ft.	N/A
12R2	2 lbs. 3 oz.	25 ft.	49 ft.	.21 oz./ft.	9 ft.	47A
12CQ	2 lbs. 1 oz.	25 ft.	49 ft.	.2 oz./ft.	9 ft.	53A
12RQ	2 lbs. 3 oz.	25 ft.	49 ft.	.2 oz./ft.	9 ft.	53A
12RLQ	2 lbs. 3 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
12RL	1 lb. 12 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
12RLS	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
12RLS2 / 12RLS2H	2 lbs. 10 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	26A
12RLS3 / 12RLS3H / 12RLS3Y	2 lbs. 14 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
12RLFC	2 lbs. 10 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	N/A
12RLFW / 12RLFW1	2 lbs. 5 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	26A / N/A
12RL2	1 lb. 12 oz.	49 ft.	66 ft.	.22 oz./ft.	9 ft.	18A
12RLFF / 12RLFFH	2 lbs. 10 oz.	49 ft.	66 ft.	.22 oz./ft.	9 ft.	N/A
12RGLXD	2 lbs. 10 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
15RLQ	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
15RLS	2 lbs. 10 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	26A
15RLS2 / 15RLS2H	2 lbs. 12 oz.	49 ft.	66 ft.	.21 oz./ft.	9 ft.	30A
15RLS3 / 15RLS3H / 15RLS3Y	3 lbs. 1 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
15RLFF / 15RLFFH	2 lbs. 12 oz.	49 ft.	66 ft.	.22 oz./ft.	9 ft.	N/A
18CL	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A

18RL	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
18RLB	3 lbs. 1 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
18RLQ	2 lbs. 9 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	26A
18RLX	4 lbs. 3 oz.	49 ft.	165 ft.	.2 oz./ft.	16 ft.	34A
18RLXS	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	34A
18RLXFW / 18RLXFW1	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	34A
18RLXFWH	4 lbs. 10.1 oz.	66 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
18RLFC	2 lbs. 14 oz.	49 ft.	66 ft.	.2 oz./ft.	9 ft.	N/A
18RLXFZ	4 lbs. 13.5 oz.	98 ft.	164 ft.	.21 oz./ft.	16 ft. (49 ft. total)	24A
18RLXFZH	4 lbs. 3 oz.	98 ft.	164 ft.	.21 oz./ft.	16 ft. (49 ft. total)	N/A
18RGLXC	4 lbs. 10.1 oz.	65 ft.	164 ft.	.22 oz./ft.	16 ft.	N/A
18RGLXD	4 lbs. 10.1 oz.	65 ft.	164 ft.	.22 oz./ft.	16 ft.	N/A
24CL	3 lbs. 8 oz.	49 ft.	99 ft.	.21 oz./ft.	9 ft.	29A
24RL	3 lbs. 8 oz.	49 ft.	99 ft.	.21 oz./ft.	9 ft.	29A
24RLB	3 lbs. 1 oz.	49 ft.	66 ft.	.22 oz./ft.	10 ft.	N/A
24RLQ	3 lbs. 8 oz.	49 ft.	99 ft.	.21 oz./ft.	9 ft.	29A
24RLX	4 lbs. 3 oz.	49 ft.	165 ft.	.43 oz./ft.	16 ft.	34A
24RLXQ	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	36A
24RLXS	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	34A
24RLXFW / 24RLXFW1	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	34A
24RLXFWH	4 lbs. 10.1 oz.	66 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
24CL1	2 lbs. 14 oz.	49 ft.	99 ft.	.21 oz./ft.	9 ft.	24A
24RML / 24RML1	4 lbs. 10 oz.	98 ft.	98 ft.	N/A	16 ft.	34A
24RLXFZ	4 lbs. 14 oz.	98 ft.	164 ft.	.21 oz./ft.	16 ft.	24A
24RLXFZH	4 lbs. 14 oz.	98 ft.	229 ft.	.21 oz./ft.	16 ft. (49 ft. total)	N/A
24RGLXC	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
24RGLXD	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
30CLX / 30CLX1	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	36A / 34A
30RLXB	4 lbs. 10 oz.	66 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
30RLXQ	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	36A
30RLX	4 lbs. 10 oz.	66 ft.	166 ft.	.43 oz./ft.	16 ft.	34A

30RLXEH	6 lbs. 12 oz.	65 ft.	246 ft.	.43 oz./ft.	16 ft.	N/A
30RGLXC	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
30RGLXD	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
36CLX / 36CLX1	4 lbs. 10 oz.	66 ft.	165 ft.	.43 oz./ft.	16 ft.	36A / 34A
36RLX	4 lbs. 14 oz.	49 ft.	165 ft.	.43 oz./ft.	16 ft.	37A
36RLXB	4 lbs. 10 oz.	66 ft.	164 ft.	.43 oz./ft.	16 ft.	N/A
36RML / 36RML1	7 lbs. 1 oz.	98 ft.	164 ft.	.27 oz./ft.	16 ft.	37A
36RLXFZ	7 lbs. 4.5 oz.	164 ft.	230 ft.	.27 oz./ft.	16 ft. (49 ft. total)	37A
36RLXFZ (18+18)	7 lbs. 4.5 oz.	66 ft.	131 ft.	.27 oz./ft.	25 ft. (49 ft. total)	37A
36RLXFZ1	7 lbs. 1 oz.	164 ft.	230 ft.	.21 oz./ft.	16 ft. (49 ft. total)	N/A
36RLXFZ1 (18+18)	7 lbs. 1 oz.	66 ft.	131 ft.	.21 oz./ft.	25 ft. (49 ft. total)	N/A
36RLXFZH	8 lbs. 13 oz.	164 ft.	230 ft.	.21 oz./ft.	17 ft.	N/A
36RGLXC	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz/ft.	16 ft.	N/A
36RGLXD	4 lbs. 10.1 oz.	65 ft.	164 ft.	.43 oz/ft.	16 ft.	N/A
42RLX	7 lbs. 8 oz.	66 ft.	230 ft.	.43 oz./ft.	16 ft.	77A
42RGLXC	7 lbs. 10.1 oz.	98 ft.	246 ft.	.43 oz./ft.	16 ft.	N/A
42RGLXD	7 lbs. 10.1 oz.	98 ft.	246 ft.	.43 oz./ft.	16 ft.	N/A
45RLXFZ	8 lbs. 13 oz.	164 ft.	262 ft.	.21 oz./ft.	16 ft.	N/A
48RLXFZ	7 lbs. 10 oz.	N/A	377 ft.	N/A	16 ft. with no tube	44A
48RLXFZ1	7 lbs. 10 oz.	N/A	377 ft.	N/A	17 ft. with tube	44A
48RGLXC	7 lbs. 10.1 oz.	98 ft.	246 ft.	0.43 oz./ft.	16 ft.	N/A
48RGLXD	7 lbs. 10.1 oz.	98 ft.	246 ft.	0.43 oz./ft.	16 ft.	N/A

Thermistor Resistance Chart

Temp. °F (°C)	MODELS: ALL R410a INDOOR UNITS				MODELS: ALL R410a OUTDOOR UNITS					
	Room Temperature Thermistor	Room Temperature Thermistor w/ board	Indoor Pipe Thermistor	Indoor Pipe Thermistor w/ board	Discharge Thermistor	Compressor Thermistor	Outdoor Pipe Thermistor	Outdoor Temperature Thermistor	Heat Sink Thermistor	2/3 Way Valve Thermistor
	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ	Ohms kΩ
-15 (26)					829.82	783.48	71.84	172.03	71.84	866.9
-6 (21)					601.26	569.61	52.63	123.77	52.63	622.7
-4 (-20)					590.69	531.56	49.2	115.24	49.2	579.59
0 (-17)					488.46	463.75	36.58	100.09	43.07	503.06
5 (-15)					412.49	392.31	36.58	84.21	36.58	422.89
14 (-10)					307.02	292.91	27.51	62.28	27.51	312
23 (-5)					231.05	221.09	20.91	46.58	20.91	233
32 (0)	33.62	8.29	176.03	39.48	175.7	168.6	16.05	35.21	16.1	176
41 (5)	25.93		134.23		134.93	129.84	12.44	26.88	12.4	134
50 (10)	20.18	7.12	103.34	34.1	104.59	100.91	9.73	20.72	9.73	103
59 (15)	15.84		80.28		81.79	79.12	7.67	16.12	7.67	80.3
68 (20)	12.54	5.86	62.91	28.14	64.5	62.55	6.1	12.64	6.1	62.9
77 (25)	10	5.24	49.7	25.15	51.27	49.84	4.89	10	4.89	49.7
86 (30)	8.04	4.64	39.57	22.26	41.07	40.01	3.95	7.97	3.95	39.6
95 (35)	6.51		31.74		33.13	32.35	3.21	6.4	3.21	31.74
104 (40)	5.3	3.58	25.64	17.05	26.91	26.34	2.62	5.18	2.62	25.6
113 (45)	4.35		20.85		22.01	21.58	2.16	4.21	2.16	20.85
122 (50)	3.59	2.71	17.06	12.78	18.1	17.79	1.79	3.45	1.79	17.1
131 (55)	2.98		14.1		14.98	14.75	1.49	2.85	1.49	14.05
140 (60)	2.47	2.03	11.64	9.47	12.47	12.3	1.25	2.39	1.25	11.6
149 (65)	2.09		9.69		10.44	10.32	1.05	1.97	1.05	9.69
158 (70)	1.76		8.12		8.78	8.69	0.89	1.65	0.89	8.12
167 (75)	1.49		6.83		7.42	7.39	0.76	1.39	0.76	6.83
176 (80)	1.27		5.78		6.31	6.27	0.65	1.18	0.65	5.78
185 (85)	1.09		4.91		5.38	5.39	0.56	1	0.55	4.91
194 (90)	0.93		4.19		4.61	4.6	0.48	0.85	0.48	4.19
203 (95)	0.81		3.59		3.97	3.96	0.41	0.73	0.41	3.59
212 (100)	0.7		3.09		3.43	3.43	0.36	0.63	0.36	3.09
221 (105)					2.98	2.98	0.31	0.55	0.31	2.67
230 (110)					2.59	2.6	0.27	0.47	0.27	2.32
239 (115)					2.26	2.27	0.24	0.41	0.24	2.02
248 (120)					1.99	2	0.21	0.36	0.21	1.76
284 (140)					1.21	1.22	0.13	0.22	0.13	1.06
320 (160)					0.77	0.79	0.09	0.14	0.09	0.67
356 (180)					0.51	0.52	0.06	0.09	0.06	0.44