TROUBLESHOOTING:

1. See Troubleshooting Table
2. Cycle Power To Reset Boiler if things don't seem to be responding.

Gas Pressure:

1. Verify gas pressure.
    a. Is low gas pressure switch tripped?
    b. Did the gas pressure spike? Bleed air off from the top port on the gas valve
    c. Is there air in the gas line?
2. Verify gas lines are connected and didn't come loose.

Electrical:

3. Verify all wiring connections to each black control module
4. Verify correct power supply. Is the Neutral wired in?

Condensate & Flue Errors:

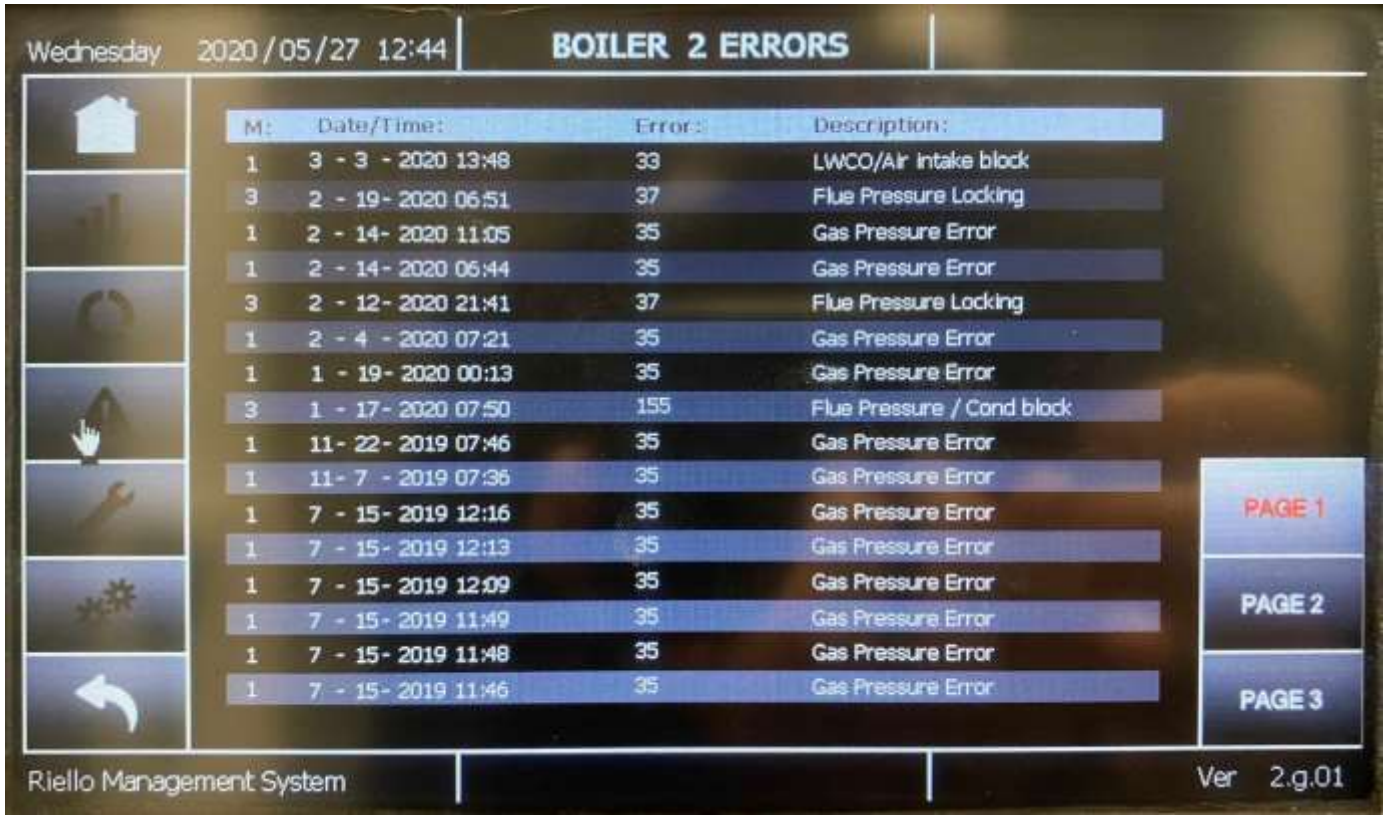
1. These pressure switches can go bad. Follow IOM for testing.
2. Errors can occur if the condensate fills the condensate traps too rapidly.
    a. Pull tube relieve the pressure.
3. Flue pressure for each module should be less than 2.2" w.c.
    a. Verify when all units are running.
4. AR-2000 pressure and condensate switch are wired in series. Verify both.
5. Verify flue check valves are installed correctly and working.

Touchscreen:

1. Take a picture of any issues. Contact BGP
2. EPROME Error. The inside PB Service Panel may be defective.
3. Module lost communication. Power is off or somehow disconnected.
4. Boiler lost communication. Wiring issues or Modbus settings were changed. Leave at 1 & 2

Outdoor Temp Wrong: No outdoor sensor was hooked up. Ok, if not being used.

Supply sensor on Boiler Screen says defective. Is it hooked up or wired correctly?


Wednesday 2020/05/27 12:44
BOILER 2 ERRORS
M: Date/Time: Error: Description:
1 3 - 3 - 2020 13:48 33 LWCO/Air intake block
3 2 - 19 - 2020 06:51 37 Flue Pressure Locking
1 2 - 14 - 2020 11:05 35 Gas Pressure Error
1 2 - 14 - 2020 06:44 35 Gas Pressure Error
3 2 - 12 - 2020 21:41 37 Flue Pressure Locking
1 2 - 4 - 2020 07:21 35 Gas Pressure Error
1 1 - 19 - 2020 00:13 35 Gas Pressure Error
3 1 - 17 - 2020 07:50 155 Flue Pressure / Cond block
1 11 - 22 - 2019 07:46 35 Gas Pressure Error
1 11 - 7 - 2019 07:36 35 Gas Pressure Error
1 7 - 15 - 2019 12:16 35 Gas Pressure Error
1 7 - 15 - 2019 12:13 35 Gas Pressure Error
1 7 - 15 - 2019 12:09 35 Gas Pressure Error
1 7 - 15 - 2019 11:49 35 Gas Pressure Error
1 7 - 15 - 2019 11:48 35 Gas Pressure Error
1 7 - 15 - 2019 11:46 35 Gas Pressure Error
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Riello Management System
Ver 2.g.01

Error no.	Error	Description	Checks	Solutions
141	T_SELECTION3_OPEN	Selection 3 sensor open		
142	T_OPTIONAL1_OPEN	Optional 1 sensor open		
143	T_OPTIONAL2_OPEN	Optional 2 sensor open		
144	T_AMBIENT_OPEN	Ambient sensor open		
145	T_CHIMNEY_CLOSED	Chimney sensor shorted		
146	T_EXCHANGE1_CLOSED	Exchange 1 sensor shorted		
147	T_EXCHANGE2_CLOSED	Exchange 2 sensor shorted		
148	T_SELECTION1_CLOSED	Selection 1 sensor shorted		
149	T_SELECTION2_CLOSED	Selection 2 sensor shorted		
150	T_SELECTION3_CLOSED	Selection 3 sensor shorted		
151	T_OPTIONAL1_CLOSED	Optional 1 sensor shorted		
152	T_OPTIONAL2_CLOSED	Optional 2 sensor shorted		
153	T_AMBIENT_CLOSED	Ambient sensor shorted		
154	WD_CONFIG_ERROR	Watchdog fan configuration setting error		
155	FLUE_PRESSURE_ERROR	Flue pressure switch is closed	a- Check for any obstruction in the exhaust system; b- Check the condensate discharge.	a- Remove any obstructions from the exhaust system; b- Remove any obstruction from condensate discharge and confirm if the condensate can flow freely.
156	AIR_DAMPER_ERROR	Air Damper feedback is not received when the relevant output is closed		
157	T_SECONDARY_SUPPLY_OPEN	Secondary circuit supply sensor open		
158	T_SECONDARY_RETURN_OPEN	Secondary circuit return sensor open		
159	T_SECONDARY_SUPPLY_CLOSED	Secondary circuit supply sensor shorted		
160	T_SECONDARY_RETURN_CLOSED	Secondary circuit return sensor shorted		
161	FILL_WARNING	Pressure is too low, demand has stopped but no error needed to be stored at this time		
162	FLUE_BLOCKED	Flue is blocked, demand needs to be stopped with fan at ignition speed but no error needed to be stored at this time		
163	LOWEXFLOW_PROTECTION	Flow is too low, demand needs to be stopped with fan at ignition speed but no error needed to be stored at this time		

WARNINGS

Error no.	Error	Description	Checks	Solutions
200	CC_LOSS_COMMUNICATION	Cascade System: Leading burner lost communication with one of the depending burners		
201	CC_LOSS_BOILER_COMM	Cascade System: Leading boiler lost communication with one of the depending boilers	Boiler wiring not correct Modbus 1 &2 settings changed	
202	OUTDOOR_WRONG	Outdoor sensor is open or shorted		
203	T_SYSTEM_WRONG	T_System sensor is open or shorted		
204	T_CASCADE_WRONG	T_Cascade sensor is open or shorted		
205	HIGH_LIMIT_TEST_WAIT_ACTIVE	Too many physical high limit test attempts within 24 hours.		
206	CH_SETPOINT_TOO_HIGH	Current setpoint is higher than 176°F (80°C)		
207	DHW_SENSOR_WRONG	DHW sensor is open or shorted		
208	ZONE_SENSOR_WRONG	Zone sensor is open or shorted		
209	BOILER_DEMAND-DISABLED	All incoming demand is disabled		

NOTE
In order to check if the control is functioning properly the following readings can be taken:

AL Link
24VDC (with S1 Switch On and open circuit). Voltage is variable while in normal operation depending on data stream.

Pressure Switches
(ie: Gas Pressure, Water Pressure, Flue Pressure, etc) 3.3VDC while circuit is open.

Safety Switch
(High Limit) 24VDC while open

Flow Meter
5VDC at all times

In addition to the ones listed on the Troubleshooting table, there are two error messages showing a combination of two potential failures.
In order to detect which of the combined failures is stopping the boiler, please go through the following procedures:

1. For Array AR 1500 and AR 2000: "Low water press./Bottom module cond. block" error message on TS Boiler screen.

That message shows on touchscreen as a result of two possible errors:

- Boiler water pressure lower than 7.5 psi, detected by the pressure switch on the Return header;
- Condensate blockage that leads to a pressure higher than 2.2" wc inside the condensate traps of the **module 3 (for AR 1500)** or **module 4 (for AR 2000)**, detected by the condensate pressure switch through the flexible hose connected to the condensate trap.

In order to discriminate between those two causes, it is suggested to access the condensate pressure switch on such modules and go through the following steps:

- The pressure switch is normally closed (NC). Confirm it is wired correctly, with connections on 1 (NC) and 3 (COM), see pictures below.

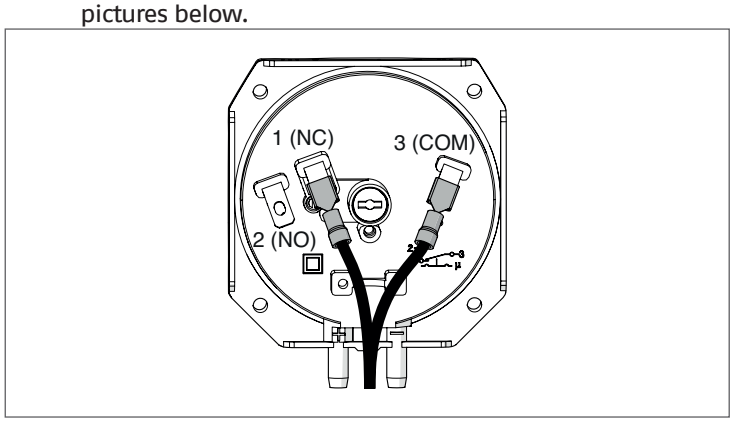

Fig. 71 *Wired pressure switch*

- Disconnect both wires.

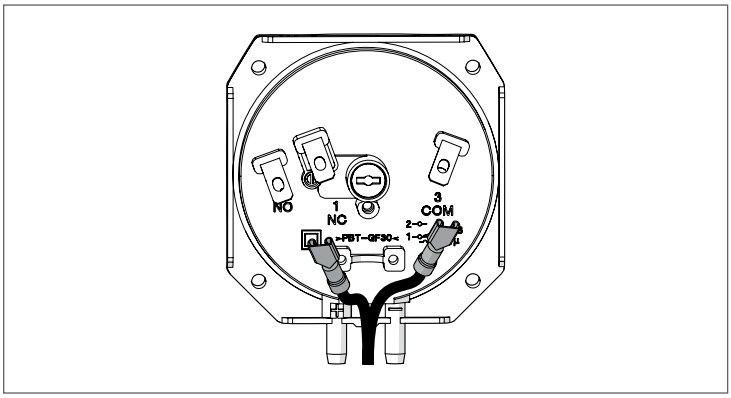

Fig. 72 *Disconnect wires*

- Set the multimeter device on 0hm (Ω).

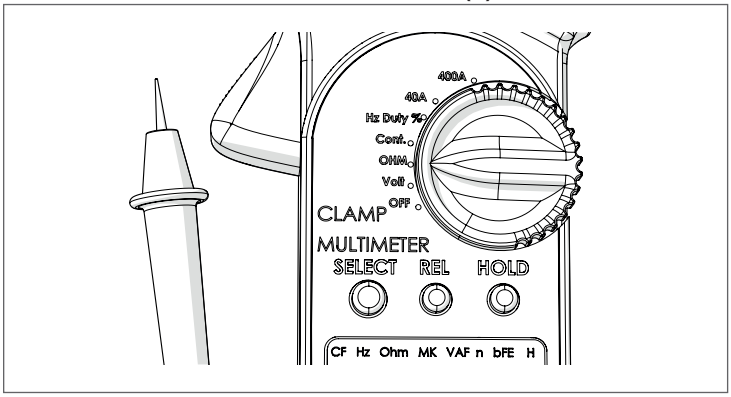

Fig. 73 *Set multimeter device*

- Connect the multimeter probes to 1 and 3 on pressure switch.
- Check the multimeter display. If the pressure switch works and is closed (that means the inner pressure of the condensate trap is lower than 2.2" wc), the display shows "0" or any other symbol indicating there is electrical continuity between connections 1 and 3.

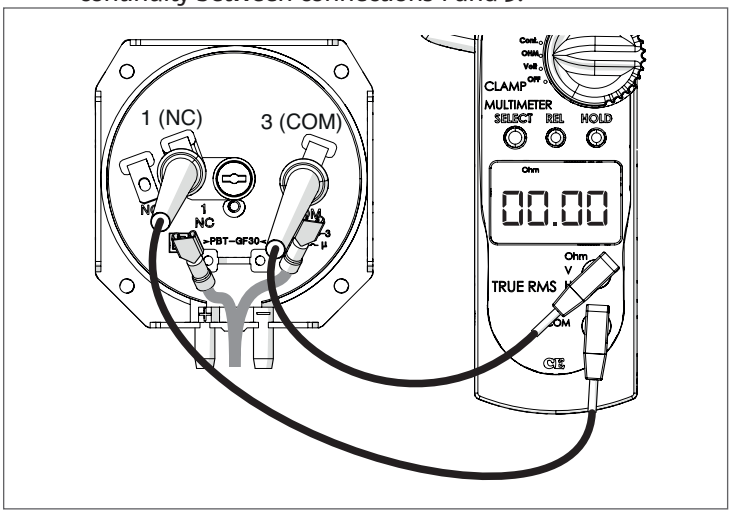

Fig. 74 *Connect the multimeter probes*

- Disconnect the multimeter and reconnect the wires, as shown in the picture below.

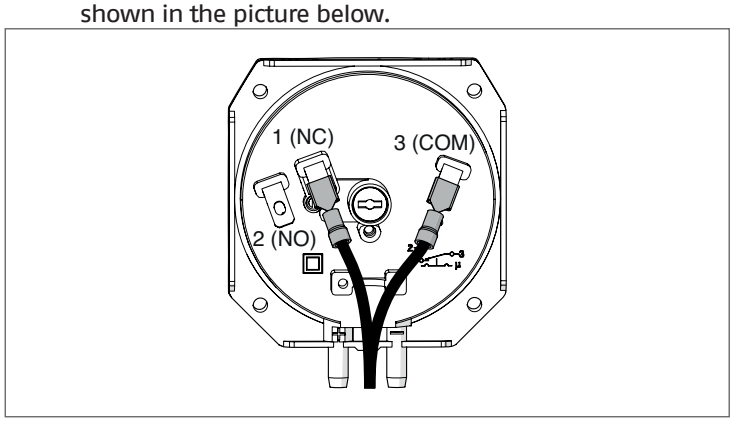

Fig. 75 *Wired pressure switch*

- Test the pressure switch on the other side of the boiler (module 4 or 8); repeat the process from Fig. 72 through Fig. 75.

If the multimeter shows "0" (or any other symbol confirming the electrical continuity between 1 (NC) and 3 (COM) of the condensate pressure switches), the error on the boiler is due to a water pressure lower than 7.5psi (or a failure of the pressure switch itself).

If on the condensate pressure switch the multimeter shows the circuit between 1 (NC) and 3 (COM) is open, there is a blockage downstream of the relevant condensate trap (or a failure of the pressure switch itself).

2. For Array AR 1000, AR 1500 and AR 2000: "LWCO/Air inlet block" error message on TS Boiler screen.

This message shows on touchscreen as a result of two possible errors:

- Boiler water level below the LWCO probe on the Supply header.
- Differential between air pressure inside the boiler cabinet and air pressure of the boiler room higher than 1.4" wc.

In order to discriminate between those two causes, it is suggested to access the differential air pressure switch inside the boiler cabinet (left side).
This pressure switch is also normally closed (NC). Confirm it is wired correctly, with connections on 1 (NC) and 3 (COM), see picture below.

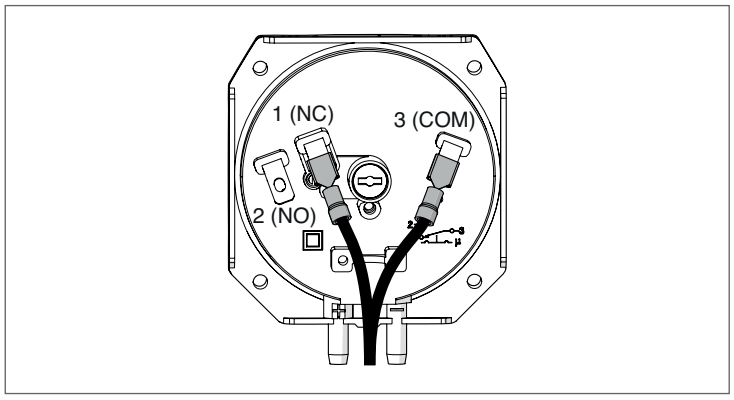

Fig. 76 *Wired pressure switch*

- Follow the steps from Fig. 72 through Fig. 75.

If the multimeter shows "0" (or any other symbol confirming the electrical continuity between 1 (NC) and 3 (COM) of the air pressure switch), the error on the boiler is due to a lack of water on the hydraulic circuit (or a failure of the pressure switch itself).

If the multimeter shows the air pressure switch circuit between 1 (NC) and 3 (COM) is open, the error is due to an air pressure differential between boiler cabinet and boiler room higher than 1.4"wc (or a failure of the pressure switch itself).
The root cause is most likely an obstruction/blockage on combustion air inlet.