



PF3101-00 BMS CONTROLLER

SHUTDOWN CODE SUMMARY

v1.1

Revised Nov 29, 2016



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1 Document Information

This document is a reference for all of the Shutdown Codes and Alarms that can currently be reported by the BMS in a system that is running firmware release NA-00030. This list may be updated or changed in future releases.



2 Shutdown Codes and Alarms

The following table contains all of the Shutdown Codes or Alarms that can be reported in the NA-00030 Firmware release.

Shutdown Code (Decimal)	Name	Description
0	No Alarms	
1	Pilot Flame Detected While Off	Pilot flame is detected before the BMS has ignited the pilot.
2	Main Flame Detected While Off	Main Flame is detected before the BMS Ignited the pilot, or before entering the low fire or high fire state.
3	POC Contact Open	The Proof Of Closure Contact is open when the BMS is not running in Low Fire or High Fire.
4	POLF Contact Open	Proof Of Low Fire (Auxiliary) Contact is open when the BMS is not running in High Fire.
5	POC2 Contact Open	The Proof of Closure 2 (Auxiliary) Contact is open when the BMS is not running in Low Fire or High Fire
6	POP Contact Open	Proof Of Pilot (Auxiliary) Contact is open when the BMS is not running in Pilot, Low Fire or High Fire.
7	Tank Level Contact Open	The Tank Level Contact is open.
8	Low Tank Level	The 4-20mA Tank Level reading is below the Tank Level Low Setpoint.
9	Fuel Pressure Contact Open	The Fuel Pressure Contact is open.
10	Low Fuel Pressure	The 4-20mA Fuel Pressure reading is below the Fuel Pressure Low Setpoint.
11	Low Fuel Pressure Dry Contact	The Low Fuel Pressure (Auxiliary) Contact is open.
12	ESD Contact Open	The Emergency Shut Down contact is open.
13	Primary Process Temperature High ESD	The Process Temperature is above the High Temperature Shutdown Setpoint.
14	Incompatible Firmware	An IO Module connected to the BMS has a firmware version that does not match the BMS firmware version.
15	Process Thermocouple Error	A wiring or hardware error is detected on the Process Thermocouple.
16	Aux Thermocouple Error	A wiring or hardware error is detected on the Auxiliary Thermocouple
17	Pilot Solenoid LSS Error	A wiring or hardware error is detected on the Pilot-Contact of the pilot solenoid.
18	SSV1 Solenoid LSS Error	A wiring or hardware error is detected on the SSV1-Contact of the Safety Shutoff Valve 1 solenoid.
19	SSV2 Solenoid LSS Error	A wiring or hardware error is detected on the SSV2-Contact of the Safety Shutoff Valve 2 solenoid.
20	HF Solenoid LSS Error	A wiring or hardware error is detected on the HFV-Contact of the High Fire Valve solenoid.
21	Pilot Solenoid HSS Error	A wiring or hardware error is detected on the Pilot+Contact of the pilot solenoid.
22	SSV1 Solenoid HSS Error	A wiring or hardware error is detected on the SSV1+Contact of the Safety Shutoff Valve 1 solenoid.
23	SSV2 Solenoid HSS Error	A wiring or hardware error is detected on the SSV2+Contact of the Safety Shutoff Valve 2 solenoid.



Shutdown Code (Decimal)	Name	Description
24	HF Solenoid HSS Error	A wiring or hardware error is detected on the HFV+ Contact of the High Fire Valve solenoid.
25	Low Voltage	The BMS, Temperature or Ignition Modules have detected that the system voltage is lower than the Low Voltage Alarm Threshold
26	High Voltage	The BMS, Temperature or Ignition Modules have detected that the system voltage is higher than the high Voltage Alarm Threshold
27	IO Communications Error	The PFRN connection with one or more of the IO modules has been lost.
28	Incomplete Commissioning	The commissioning date has not been set.
29	Cross Compare Failure	One of the microcontrollers on the BMS or IO modules does not agree with the other microcontroller when comparing status.
30	Cross Compare Packet Timeout	One of the microcontrollers on the BMS or IO modules failed to perform a cross comparison with the other microcontroller.
31	Factory Calibration Error	One or more of the configured modules have an incorrect or incomplete factory calibration.
32	Settings Out Of Range Error	One or more of the configured modules have an incorrect settings configuration.
33	Ignition Switch Stuck	The BMS Ignition Switch input is stuck in the start position.
34	Aux Temperature High ESD	The Auxiliary Temperature reading is above the Auxiliary High Temperature Setpoint.
35	Temperature Module Ambient Temp Mismatch	The Temperature Module has a hardware fault.
36	Pilot Load Monitor Error	A wiring or hardware error is detected on a Pilot Flame Detection input.
37	Pilot Flame Detect Voltage Error	A wiring or hardware error is detected on a Pilot Flame Detection input.
38	Pilot Flame Quality Mismatch	A wiring or hardware error is detected on a Pilot Flame Detection input.
39	Main Load Monitor Error	A wiring or hardware error is detected on a Main Flame Detection input.
40	Main Flame Detect Voltage Error	A wiring or hardware error is detected on a Main Flame Detection input.
41	Main Flame Quality Mismatch	A wiring or hardware error is detected on a Main Flame Detection input.
42	Ignition Module HSS Valve Test Failed	A wiring or hardware error is detected on the Valve+ Contact of the Ignition Module solenoid.
43	Ignition Module LSS Valve Test Failed	A wiring or hardware error is detected on the Valve- Contact of the Ignition Module solenoid.
44	Process Temp Mismatch	The two Process Thermocouples are not reading the same temperature value (within 10 percent)
45	Aux Temp Mismatch	The two Auxiliary Thermocouples are not reading the same temperature value (within 10 percent)
46	Pilot Flame Fail	The system failed to ignite the Pilot Flame within the allocated number of retry attempts.



Shutdown Code (Decimal)	Name	Description
47	Main Flame Fail	The system failed to ignite the Main Flame within the allocated number of retry attempts.
48	High Fuel Pressure After Main On	High fuel pressure was detected on the 4-20mA input after the SSV1 and SSV2 valves have opened.
49	Stopped Via External Switch	The Ignition Switch on the BMS is in the Stop position.
50	User Stop	The BMS has been stopped via User Interface or Modbus command.
51	Safety Core Temperature Too High	The microcontroller on the BMS has detected that it is running above 115C.
52	Safety Core Temperature Too Low	The microcontroller on the BMS has detected that it is running below -40C.
53	Controller Firmware CRC Failed	The BMS Firmware is no longer valid.
54	Controller Settings CRC Failed	The BMS settings are no longer valid.
55	Ignition Module Valve Test Failed	The valve test on the Ignition Module has failed.
56	Unused/Reserved	This shutdown code is not in use and has been reserved for future considerations.
57	POLF Contact Failed to Open	The Proof Of Low Fire (auxiliary) contact is closed when the BMS is running in High Fire.
58	POC2 Contact Failed to Open	The Proof Of Closure 2 (auxiliary) contact is closed when the BMS is running in Low Fire or High Fire.
59	POP Contact Failed to Open	The Proof Of Pilot (auxiliary) contact is closed when the BMS is running in Pilot, Low Fire or High Fire.
60	Input Pin Connection Test Fail	An internal problem was found on the BMS card.
61	State Mismatch	One of the microcontrollers on the BMS or IO modules does not agree with the other microcontroller on the system state.
62	LEL Contact Open	The LEL Contact is open.
63	LEL Exceeded	The 4-20mA LEL reading is above the LEL Trip Setpoint.
64	LEL Contact Range Error	The LEL input is reading a value out of range.
65	LEL Contact Mismatch Error	One of the two internal LEL Input reading measurements is faulty.
66	LEL Contact Cross Compare Failure	The two microcontrollers on the Ignition Module disagree on the state of the LEL input.
67	Level Contact Range Error	The Level Input is measuring out of range.
68	Level Contact Mismatch Error	One of the two internal Level Input reading measurements is faulty.
69	Pressure Contact Range Error	Pressure Contact is measuring out of range.
70	Pressure Contact Mismatch Error	One of the two internal Pressure Input reading measurements is faulty.
71	Start Contact Mismatch Error	One of the two internal Start Input reading measurements is faulty.
72	ESD Contact Mismatch Error	One of the two internal ESD Input reading measurements is faulty.
73	POC Contact Mismatch Error	One of the two internal POC Input reading measurements is faulty.
74	Aux In Contact Mismatch Error	One of the two internal Auxiliary Input reading measurements is faulty.



Shutdown Code (Decimal)	Name	Description
75	No Valid Primary Process Temperature	There are no Process Temperature inputs configured in the appliance.
76	No Valid Auxiliary Temperature	There are no Auxiliary Temperature inputs configured in the appliance, when it is configured for use as the Process Temperature
77	Appliance Process Temp Mismatch	At least one of the Process Thermocouple Inputs in an appliance does not match the other process temperature measurements.
78	Appliance Aux Temp Mismatch	At least one of the Auxiliary Thermocouples in an appliance does not match the other Auxiliary Thermocouple measurements when the Auxiliary Temperature is configured for process control.
79	No Appliance Level	The appliance does not have a Level Input configured.
80	Appliance Level Mismatch	At least one of the Level Inputs in an appliance does not match the other Level Input measurements.
81	Appliance Startup Cancelled	The appliance startup was cancelled by the User Interface or Modbus Module.
82	Appliance Startup Timeout	The appliance was not able to successfully start all of the BMS controllers within the appliance.
83	Appliance Startup Mismatch	During appliance startup one of the BMS modules reported settings that did not match the other BMS modules.
84	Unused/Reserved	This shutdown code is not in use and has been reserved for future considerations.
85	Controller Disabled	This BMS has been disabled in the appliance settings.
86	Minimum Controllers Rule Violated	Less than the minimum number of controllers are running in the appliance so the entire appliance had a big ole shutdown party.
87	Controller Network Wiring Error	An IO Module is communicating on the Network PFRN Bus (Connected to the UI directly or through a Network Switch/Modbus Card)
88	IO Network Wiring Error	An interface module is communicating on the IO Module Network.
89	Chamber Pressure Failed To Close While Running	The Chamber Pressure Input (Auxiliary) is open while the system driving the High Fire Valve open.
90	Chamber Pressure Failed To Close While Purging	The Chamber Pressure Input (Auxiliary) is open while the system is purging.
91	Chamber Pressure Failed To Open	The Chamber Pressure Input (Auxiliary) is closed when the high fire valve is not being driven open.
92	Multiple Primary Process Temperatures	More than one Primary Process Temperature Input is configured on the BMS.
93	Primary Process Temperature Configuration Error	The Process Temperature configuration is not valid.
94	Auxiliary Temperature Configuration Error	The Auxiliary Temperature configuration is not valid.
95	No Primary Process Temperature Configured	The Process Temperature Input has not been configured.
96	Feature Key - Over Controller limit	The Feature Key is missing, or has been changed while the system was running.



Shutdown Code (Decimal)	Name	Description
97	Feature Key - Over Logical Temp Input Limit	Too many controllers have been configured for use in the appliance than is allowed by the current feature key.
98	Feature Key - Over Pilots Per Controller Limit	Too many Logical Temperature Inputs have been configured for use in the appliance than is allowed by the current feature key.
99	Feature Key - Over IO Per Appliance Limit	Too many Pilots have been configured for use in the BMS than is allowed by the current feature key.
100	Feature Key - Invalid Redundancy Implemented	More IO have been configured for use in the appliance than is allowed by the current feature key.
101	UV Flame Detect Fault	UV Scanner Fault Contact Open
102	UV Flame Detect Mismatch	UV Scanner "Flame On" and "Flame Off" contacts are indicating opposite flame state.
103	UV Input Out of Range	UV Scanner 4-20mA flame signal is invalid
104	UV Input Address Fault	The UV Pilot Module has experienced a system error.
105	IO Expansion Input Invalid	One or more IO Expansion inputs configured as alarms have measurement errors.
106	IO Expansion Analog Input High	One or more IO Expansion inputs configured as a 4-20mA alarm are reading above the high setpoint.
107	IO Expansion Analog Input Low	One or more IO Expansion inputs configured as a 4-20mA alarm are reading below the low setpoint.
108	IO Expansion Digital Input Open	One or more IO Expansion inputs configured as a digital alarm are open
109	IO Expansion Configuration Error	An IO Expansion module is configured incorrectly.
110	Invalid Appliance Firing Rate Input	The IO Expansion input configured for firing rate is not measuring a valid 4-20mA signal.



3 Document Revision History

Version Number	Date	Who	Description of Changes
v0.1	2016-08-08	CS	Initial Draft
v1.0	2016-08-10	CS	Initial Release – matches release NA-00030.
v1.1	2016-11-29	CS	Minor formatting changes