



6. Maintenance Procedures

This chapter covers maintenance scheduling, procedures, and other maintenance issues.

6.1 Maintenance Schedules

6.1.1 Daily Schedule

Action	Description
Inspect	Trigger beam emitter and receiver lenses
Clean	Trigger beam emitter and receiver lenses
Inspect	Bulged lid beam emitter and receiver lenses*
Clean	Bulged lid beam emitter and receiver lenses
Inspect	Down can beam emitter and receiver lenses*
Clean	Down can beam emitter and receiver lenses

* If your Filtec system is equipped with this option

6.1.2 Weekly Maintenance

Action	Description
Inspect	Inspection head cover attachment
Clean	Inspection head housing
Inspect	Air supply regulator pressure adjustment
Inspect	Air filter
Clean	Purge air filter
Clean	Purge air flow to inspection head
Inspect	Rejector pad
Replace	Rejector pad

6.1.3 Monthly Maintenance

Action	Description
Check	Inspection head cover gaskets
Lubricate	Trigger raising mechanism lead screw and ways
Check	All external wiring
Check	All beacon lamps
Inspect	Nameplate, stickers, and instruction plates

Action	Description
Service	Pneumatic components according to the rejector documentation
Inspect	Inspection head housing for dirt and moisture

6.1.4 120 Day Maintenance

Action	Description
Inspect	Nameplate, stickers, and instruction plates
Service	Pneumatic components according to the rejector documentation
Inspect	Inspection head housing for dirt and moisture
Inspect	Wiring, insulation, terminals, and terminal blocks inside the inspection head and external junction box*
Inspect	Source autoshutter assembly
Inspect	Source housing safety wire and lead seal
Inspect	Source window for damage
Inspect	Gamma ray emitter and detector apertures for damage or blockage

* Not all FILTEC systems are equipped with the optional external junction box.

6.2 Maintenance Procedures

6.2.1 Before You Perform Any Maintenance Procedure

For your safety, power down the equipment to be serviced before you begin any maintenance procedure. To power down the rejector, turn off the main power switch on the junction box.



Warning: Turn off *all* power before performing any procedure or serious injury can occur.

6.2.2 Trigger Beam and Emitter Lenses

1. Inspect each lens for debris and damage.
2. Clean each lens with a cotton swab, lens tissue, or a soft cloth. Do not use paper towels because they are abrasive and can scratch the lens.
3. Apply several drops of medium viscosity oil to the lead screw on the trigger raising mechanism. Be careful not to disturb the trigger raising mechanism.
4. Inspect the beacons for cracks in the lenses and moisture inside the lenses.

6.2.3 Bulged Lid and Missing Lid Sensors, Down Can

1. Inspect each sensor for debris and damage.
2. Clean each sensor with a cotton swab, lens tissue, or a soft cloth. Do not use paper towels because they are abrasive and can scratch the lens.
3. Insure that all parts are firmly attached to the mounting brackets and locking knobs are tight.



Important: Do not disturb the position of the mounting brackets.

6.2.4 Filtec 3-G Housing

1. Inspect for damage to metal housing and for wear on the cover gaskets.
2. Check to be sure the cover is securely tightened
3. Clean using a non-caustic nonabrasive soap, water, and a soft brush.
 - Do not wash with a high pressure nozzle
 - Do not steam clean
4. Rinse with clean water.

6.2.5 Autoshutter Assembly

If your Filtec 3-G is equipped with this option, check the motion of armature by hand and under power. The armature should move freely without binding.

6.2.6 Source Housing Assembly

Check for presence of safety wire and lead seal.

6.2.7 Pressure Regulator and Air Filter

1. Inspect the polycarbonate sediment bowl for cracks and abrasion.
2. Clean and drain the air filter sediment bowl.
3. Inspect the air filter in the inspection head for clogging.

6.2.8 External Wiring

1. Check the external wiring between the sensors and the Filtec 3-G for damage. Check all connections carefully to be sure they are not loose.
2. Check that insulating sleeves are in place.

6.2.9 Replacing the Rejector Pad

The actual life span of the rejector pad depends upon the operating conditions of your production line. Inspect the pad weekly and replace if worn, cracked, or hardened.



Warning: Turn off all power to your system before attempting any repair procedure. See *Before You Perform Any Maintenance Procedure*, at the beginning of this section.

1. Power down the rejector.
2. Remove the retaining screw and washer on the top of the rejector shoe.
3. Slide the pad up to remove it from the shoe.
4. Insert the new pad by sliding it onto the shoe. Be sure the notch in the pad backing is positioned at the bottom.
5. Replace the retaining screw and washer.
6. Power up the rejector.

6.2.10 Servicing the Regulator and Coalescing Air Filters

Servicing the air filter consists of cleaning and/or replacing the air filter, sediment bowl, and gasket. You can obtain replacement parts for these items from the air controls manufacturer.



Warning: Turn off all power to your system before attempting any repair procedure. See *Before You Perform Any Maintenance Procedure*, at the beginning of this section.

1. Turn off the air flow control valve and depressurize all connected air lines.
2. Remove and clean the sediment bowl. If your unit contains a polycarbonate bowl, inspect it for cracking or cloudiness; if present, replace it.



Warning: Cracked or cloudy polycarbonate bowls can explode when repressurized, causing serious injury.

3. Clean other parts using soap and water.
4. Dry the bowl and other parts, and blow out internal passages in the body using filtered, dry compressed air.
5. Using filtered, dry compressed air, blow through the filter element from inside to outside to dislodge surface contaminants. If the filter element is plugged, replace it.

Apply a light coating of Dow Corning 44M grease (or equivalent) to the bowl gasket, and reassemble.



7. Diagnostic and Repair Procedures

This chapter includes a list of diagnostic error messages and describes how to view and clear them. This chapter also includes troubleshooting and repair procedures.

7.1 Diagnostic Errors

7.1.1 Introduction

This section contains a diagnostic error code list to help you quickly identify error codes and diagnostic error descriptions to provide additional information on the error.

7.1.2 Diagnostic Error Codes

The following list contains the Filtec 3-G error codes. Depending upon your machine type, some of these errors may not apply to your Filtec 3-G.

- 0 NO DIAGNOSTIC ERROR
- * 2 REJECTOR STATUS IS OFF
- 5 CONSECUTIVE REJECT QUEUE ERROR
- 6 CONSECUTIVE REJECT TIMING ERROR-MISSED ENCODER PULSE
- 8 THE EEPROM CANNOT BE ERASED
- 9 THE WRITE TO EEPROM WAS NOT SUCCESSFUL
- 10 FILL LEVEL DETECTION ERROR-EXCEEDED CONSECUTIVE REJECT LIMIT
- 11 MISSING CAP DETECTION ERROR-EXCEEDED CONSECUTIVE REJECT LIMIT
- 12 HIGH CAP DETECTION ERROR-EXCEEDED CONSECUTIVE REJECT LIMIT
- 13 X-RAY COUNTS BELOW REJECT THRESHOLD ERROR
- 14 X-RAY DETECTOR ERROR
- 15 MISSING CAP SENSOR ERROR
- 16 TRIGGER BEAM ERROR
- 17 ENCODER SENSOR ERROR
- 18 SLAT REJECTOR BACKUP SENSOR IS BLOCKED
- 19 MORE THAN 32 CONTAINERS BETWEEN TRIGGER BEAM AND LABEL SENSOR
- 20 CONSECUTIVE LABEL TIMING ERROR WITH ENCODER: ENCODER PULSE MISSED
- 22 ENCODER PULSE MISSED
- 23 EXTRA ENCODER PULSE DETECTED
- 24 HIGH RESOLUTION ENCODER MINIMUM DISTANCE ERROR
- 25 HIGH RESOLUTION ENCODER MINIMUM TIME ERROR
- * 27 HIGH RESOLUTION ENCODER FAILURE

- 28 CONSECUTIVE MISSING LABEL (FRONT/BACK) ALARM
- * 46 CONSECUTIVE EXTERNAL REJECT ALARM
- 47 ENCODER RESOLUTION TOO LOW
- * 48 AC INPUT VOLTAGE LOW, BROWNOUT DETECTED
- * 49 USER DEFAULTS CLOSED FOR ONE OR MORE SETTINGS
- 50 SYSTEM DEFAULTS LOADED FOR ONE OR MORE SETTINGS
- 51 CONTAINER PASSED WITH NO ENCODER PULSES
- 52 CONTAINER LESS THAN 10 MS
- 53 REJECT WATCHDOG DETECTED QUEUE ERROR
- 54 REJECT QUEUE COUNT
- 58 ABNORMALLY LARGE CONTAINER DETECTED
- 61 REJECT DELAY POSITION ERROR
- 64 LABEL LOOK DISTANCE IS TOO SHORT
- 66 FILL LEVEL REJECT DETECTION IS TURNED OFF DURING INSPECTION
- 67 DIAMETER MISSING CAP ERROR-EXCEEDED CONSECUTIVE REJECT LIMIT
- 68 DIAMETER MISSING CAP ERROR-NO ENCODER PULSE
- 72 PRODUCTION LINE SPEED TOO HIGH
- 86 BBU RAM BATTERY IS LOW
- 87 BROKEN SLAT OR PIN
- 88 BROKEN SLAT SENSOR FAILURE
- 89 SLAT SENSOR IS OFF
- 90 BROKEN SLAT SENSOR ADJUSTMENT ERROR
- * 91 BROKEN SLAT PUSHPLATE
- 92 TOO MANY CONTAINERS IN DUD QUEUE
- 93 POSSIBLE SLIDING CONTAINER, MISSING LID, BULGED END, OR IMPROPER DUD SENSOR POSITION
- 94 CONTAINER DIAMETER IS SMALLER THAN DUD REFERENCE DIAMETER
- 95 DUD REFERENCE READINGS ARE TOO DISSIMILAR
- 96 CALCULATED DUD INSPECTION WINDOW IS TOO SMALL
- 97 DIFFERENCE BETWEEN GOOD AND BAD DUD IS LESS THAN 10
- 98 THE NUMBER OF DUD CONTAINERS IN THE SERIES ALARM WAS EXCEEDED
- 99 THE NUMBER OF DUD CONTAINERS IN THE SERIES ALARM WAS EXCEEDED
- 100 DUD SIGNAL WAS TOO SHORT FOR DUD REFERENCE DIAMETER
- 108 DUD SENSOR SIGNAL LATE OR CONTAINER EDGE NOT FOUND

109	DUD SENSOR SIGNAL EARLY OR CONTAINER EDGE NOT FOUND
111	DUD INSPECTION WINDOW LENGTH EXCEEDED
112	DUD REFERENCE DIAMETER CALIBRATED LARGER THAN INSPECTION WINDOW
113	POSSIBLE SLIDING CONTAINER OR BULGED END. MISSED LEADING REFERENCE
114	POSSIBLE SLIDING CONTAINER OR BULGED END. MISSED TRAILING REFERENCE
116	DUD REFERENCE POINT LESS THAN 3/4 CALIBRATED REFERENCE DIAMETER
117	MODBUS SERIAL INTERFACE FRAMING ERROR
118	MODBUS SERIAL RX OVERRUN ERROR
119	MODBUS SERIAL PARITY ERROR
120	MODBUS SERIAL RX RECEIVE RATE ERROR
121	MODBUS CTS LINE RATE ERROR

* An asterisk in the preceding table indicates that Filtec 3-G activates an alarm only when the **BEACON STATUS** function is set for **HIGH PRIORITY ONLY**.

Table 7-1. Diagnostic Error Codes

7.1.3 How to Display Error Codes

An amber warning beacon on top of the inspection head signals an alarm or error condition by blinking rapidly. To view the error code:

1. On the operator control panel, press key 6.

Result: Your Filtec 3-G displays the error.

2. Press the arrow key to scroll through the error description and to clear the error condition.

Result: When you clear an error, the message resets to zero.

7.2 Diagnostic Error Messages

7.2.1 Introduction

The amber warning beacon on top of the inspection head signals an alarm or error condition by blinking rapidly.

7.2.2 Descriptions of Diagnostic Error Messages

Error Number 2

An attempt was made to activate the rejector while the rejector status function is turned off.

To correct this error, turn on the rejector status function.

Error Number 5

The maximum limit of 32 containers between the trigger beam and the rejector has been exceeded.

Measure the container's width at the point where the inspection trigger contacts the container and verify that this value is the value in the **CAN WIDTH AT TRIG** function.

Error Number 6

A consecutive reject timing error that occurs when an encoder pulse is missed. One pulse per container is required, and starting and stopping the conveyor suddenly while a container is in the inspection trigger zone, or incorrect encoder calibration caused a missed pulse.

To correct this error, calibrate the encoder, or replace the encoder.

Error Number 8

The EEPROM cannot be erased. This error indicates that either switch S11 is not set to the Write Enabled position or that EEPROM chip U29 is faulty.

To correct this error, set switch S11 to the Write Enabled position (position A), or replace EEPROM chip U29.

Error Number 9

The write to EEPROM was not successful. This error indicates that either switch S11 is not set to the Write Enabled position or that EEPROM chip U29 is faulty.

To correct this error:

- Set switch S11 to the Write Enabled position (position A), execute the **SAVE DEFAULT CONSTANTS** function, and then set switch S11 to position C.
- Check EEPROM U29 by executing the **LOAD DEFAULT CONSTANTS** function. If an error occurs, replace U29 and then execute the **SAVE DEFAULTS** function.

Error Number 10

This error occurs when the number of consecutively rejected containers exceeds the limit set in the **CONSECUTIVE FILL LEVEL REJECT ALARM** function.

Error Number 11

This error occurs when the number of consecutively rejected containers exceeds the limit set in the **CONSECUTIVE MISSING CAP REJECT ALARM** function.

Error Number 12

This error occurs when the number of consecutively rejected containers exceeds the limit set in the **CONSECUTIVE HIGH CAP REJECT ALARM** function.

Error Number 13

This error indicates the gamma counts detected by the scintillation tube are 12 percent below the of the reject threshold level.

To correct this problem:

- Check the manual source shutter rod to be sure it is open. If your system has the autoshutter option, check that the shutter is in the full up position.
- Calibrate the scintillation tube.

Error Number 14

The gamma counts detected by the scintillation tube decreased rapidly to a value that is 75 percent below the average count for the last eight containers.

- Check the manual source shutter rod to be sure it is open. If your system has the autoshutter option, check that the shutter is in the full up position.
- Calibrate the scintillation tube.

Error Number 15

The missing cap sensor input state logic level remains high. This occurs when two or more consecutive signals are received from the trigger beam, which indicates containers are passing through the unit, and no signals are received from the missing cap sensor.

To correct this problem:

- Check light emitting diode (LED) 7 (dip switch S2-7 closed and S2-8 closed). If the LED is lit, the input level is high.
- Check the signal level on terminal block TB1-5 (if you are using a nonferrous sensor, check TB1-11). If no container is under the sensor, the voltage range should be 3 to 5 volts. If a container is under the sensor, the voltage range should be 13 to 15 volts. If the voltage is not within these ranges, replace the sensor.

Error Number 16

The trigger beam is not sensing containers. The gamma count pattern indicates containers are passing through the gamma beam, however no trigger signal is received.

To correct this problem:

- Check to see that the trigger amplifier sensitivity is correctly adjusted. The sensitivity may be set too low.
- Check to see if LED 8 is on when no container is present. If so it is blocked, clean the trigger lens.
- Check the signal at TB1-2. It should be less than 1 volt when the beam is blocked by a container, and 17 to 20 volts when the beam is clear.
- Check to see that the Gamma threshold is set correctly. It may be set slightly high. False errors can occur when the line is stopped and the gamma threshold is too high.

- Check to see that the source shutter is fully open (the handle shows red) and verify the auto shutter is fully open.

Error Number 22

This error occurs when an encoder pulse is missed. The encoder may be failing.

To correct this error:

Check light emitting diode (LED) 3 and the signal at TB1-23 while the conveyor is running. LED 3 should pulse regularly and the signal at TB1-23 should be smooth and regular. If LED 3 pulses irregularly or remains dark, encoder pulses are missing. Replace the encoder.

Error Number 23

This error occurs when an extra encoder pulse is detected. This error can occur when the conveyor stops or starts suddenly.

To correct this error:

- Check light emitting diode (LED) 3 and the signal at TB1-23 while the conveyor is running. LED 3 should pulse regularly and the signal at TB1-23 should be smooth and regular. If LED 3 pulses irregularly extra encoder pulses are occurring.
- Check the encoder wiring for water shorting problems.

Error Number 24

This error indicates the high resolution encoder is scaled lower than the minimum allowable distance. The minimum allowable distance between the scaled encoder pulses must be greater than 1mm (0.040 inch).

To correct this error:

Increase the encoder prescaler until this error no longer occurs. When decreasing the prescaler value, the calibrate encoder value is automatically increased to compensate for the higher resolution.

Error Number 25

This error indicates the high resolution encoder is scaled lower than the minimum allowable time. There must be a minimum of 1.0 millisecond between the encoder pulses at maximum speed.

To correct this error:

- Check the encoder cable and the connection at P6. This error can be caused by noise on the encoder cable which connects to P6.
- Increase the encoder prescaler value until this error no longer occurs at high speed.

Error Number 27

Containers are passing the inspection station, but the encoder is not sending pulses: at least five consecutive inspection triggers occurred without sensor transition.

To correct this error:

- Check the voltage at P6-2. The signal voltage should be between 0 and 12 volts.
- Check TB4-2 and light emitting diode (LED) 3 with dip switch S2-7 open.

Error Number 46

The number of containers in the consecutive external reject alarm was exceeded.

This is a high priority error condition and will cause the warning beacon to flash if **BEACON STATUS** is set to **HIGH PRIORITY ONLY**.

Error Number 47

The encoder resolution is too low. Replace the encoder with an encoder that has a higher resolution.

Error Number 48

The AC input voltage dropped below 90 volts on a 110 VAC system or below 185 volts on a 220 VAC system. During the time the voltage was low, no containers were inspected for any defect. When the power returns to normal, the system resets with no data being lost. This is a high priority error condition and will cause the warning beacon to flash if **BEACON STATUS** is set to **HIGH PRIORITY ONLY**.

Error Number 49

The User Defaults loaded for one or more settings are out of range. Check all settings to be sure they are correct.

This is a high priority error condition and will cause the warning beacon to flash if **BEACON STATUS** is set to **HIGH PRIORITY ONLY**.

Error Number 50

The System defaults loaded for one or more settings are out of range. A complete software setup must be performed.

This is a high priority error condition and will cause the warning beacon to flash if **BEACON STATUS** is set to **HIGH PRIORITY ONLY**.

Error Number 51

A container passed without any encoder pulses. This can be caused by:

- Blocking the trigger with the line stopped
- Encoder failure
- Trigger reflections
- Line jams

Check the gain on the trigger amplifier.

This error condition is low priority and will not cause the warning beacon to flash during **HIGH PRIORITY ONLY** operation.

Error Number 52

A container passed the trigger in less than 10 milliseconds. This can be caused by trigger reflections or line jams.

To correct this problem:

Adjust the gain on the trigger amplifier.

Error Number 53

The Reject Watchdog detected a queue error. If this error occurs repeatedly, call FILTEC Customer Support.

Error Number 54

This error displays the Reject Queue Count. If this error occurs repeatedly, call FILTEC Customer Support.

Error Number 58

An abnormally large container was detected. The reject delay encoder count exceeded the current encoder count. This condition is generally caused by line jams. If this error occurs continuously, the rejector may be installed to near the trigger.

Error Number 61

The reject delay position at the rejection queue output exceeded the current encoder count. If this error occurs repeatedly, call FILTEC Customer Support.

Error Number 66

A fill level reject was detected while the fill level status was turned off. Turn the fill level status on to correct this condition.

Error Number 67

The number of containers specified by the **CONSECUTIVE DIAMETER MISSING CAP REJECT ALARM** function was exceeded.

This is a high priority error condition and will cause the warning beacon to flash if **BEACON STATUS** is set to **HIGH PRIORITY ONLY**.

Error Number 68

No encoder pulses were received for the **DIAMETER MISSING CAP WIDTH** function.

Make sure switch S05 is in the "A" position and jumper S12 is in the "AB" position.

This error condition is low priority and will not cause the warning beacon to flash during **HIGH PRIORITY ONLY** operation.

Error Number 72

This error condition indicates the line speed is too high. You might need to calibrate the encoder or the gamma sample cutoff limit might be set too high. This error can also be caused by noise on the encoder cable which connects to TB4-2.

Error Number 86

This error condition indicates the BBU RAM Battery is low. Replace the smart socket for U27, or replace the nonvolatile SRAM at U27.

Error Number 117

This error condition indicates there is a host or Modbus serial interface framing error or reply timeout (timeout must be a minimum of 15 seconds.) Most communication errors are caused by excessive noise.

Check the termination of RX input.

Check the baud rate (S2-1)

- S2-1 Closed = 9600
- S2-1 Open = 1200

Check the character size (S2-5)

- S2-5 Closed = 8 bit, 1 stop.
- S2-5 Open = 7 bit, 2 stop

Check the RX with a voltmeter. Perform the check when the line is in a steady state (No transmission).

RS-485

- RX(-A) = GND
- RX(+B) = +5VDC

RS-232

- RX(-A) = -12VDC to -4VDC
- RX(+B) = GND

Error Number 118

This error indicates a host or Modbus serial RX overrun error. The baud rate may be set incorrectly.

To correct this error, check the baud rate setting which is controlled by dip switches S2-1 and S2-4:

- S2-1 closed = 9600 baud
- S2-2 open = 1200 baud

Error Number 119

This error indicates a host or Modbus serial parity error occurred. To correct this error, check the parity setting which is controlled by dip switches S2-3 and S2-4:

- S2-3 closed = no parity
- S2-4 closed = odd
- S2-4 open = even

Error Number 120

This error indicates there is a RX receive rate error. Too many characters have been received in one second. This error may be caused by line noise.

To correct this error:

- Check the termination of the RX input.
- Check the RX input with a voltmeter while the line is in a steady state (no transmission):

RS-485:	RX(-A) = GND
	RX(+B) = +5VDC
RS-232:	RX(-A) = -12VDC to -4VDC
	RX(+B) = GND

Error Number 121

This error indicates the Clear To Send (CTS) line is changing too rapidly for normal communication and therefore appears busy. This error is usually caused by excessive noise.

- Check the termination of the CTS input.

- Check the CTS input with a voltmeter while the line is in a steady state (no transmission):

CTS(-A) = GND

CTS(+B) = +5VDC



Note: For a quick solution you can connect TB1-5 and TB1-6 together.

7.2.3 How to View and Clear a Diagnostic Error Message

Complete these steps to view and clear a diagnostic error message.

1. On the operator control panel, press the question mark key

Result: Your Filtec 3-G displays the error number.

2. Press the arrow key to scroll through the error description and to clear the error condition.

Result: When you clear the error the message resets to zero.

7.3 Troubleshooting Procedures

7.3.1 Introduction

The troubleshooting procedures in this section are designed to help you isolate machine malfunctions and determine the corrective action. Once you determine the problem source, you will be directed to the appropriate corrective procedures that are contained in other sections of this guide.

7.3.2 Major Component Subsystems

System failures fall into one or more of the following subsystem categories:

Power Supply System

- Main power supply
- Power transformer

Processing System

- Main processor card
- Serial communications card
- Control panel

Sensor System

- Scintillation tube detector (STD)
- Optical sensors: inspection triggers, missing cap, high cap, smashed bottle
- Proximity sensors: missing cap, missing foil
- Encoder

Rejector Systems

- Proline rejector
- Servotec II rejector

7.3.3 Before You Begin

Before you attempt any diagnostic or troubleshooting procedure:

- Read and understand the procedures thoroughly
- Understand and comply with all safety precautions
- Have the correct diagnostic equipment on-hand

7.3.4 What You Should Do First

Before you begin detailed and time consuming troubleshooting methods check the following items first. These are simple things that are often overlooked, but can cause a wide range of system problems:

1. Is the power turned on?

Verify that both the main power switch on the I/O junction box and the internal power switch located on the power filter junction box are turned on.

2. Is the power filter circuit breaker tripped?

The internal power switch is an integrated switch/circuit breaker. When the breaker is tripped, the power switch turns off. Verify the power switch is turned on, if not turn it on to reset the breaker.

3. Is power reaching the Filtec 3-G?

Verify the power from the factory power system is reaching the Filtec 3-G and that the power selector switch is set to the correct voltage (110 volts or 220 volts).

The power selector switch is located on the power filter junction box.

4. Are all dip switches and jumpers configured correctly?

Verify the dip switches and jumpers on the processor circuit board are configured correctly. You can find the factory settings by looking at the Configuration Sheet that is included with each machine and is stored in the plastic sleeve attached to the inside of the Filtec 3-G inspection head cover.

7.4 Troubleshooting the Power Supply System

7.4.1 Introduction

Power supply instability and failures account for many malfunctions. We recommend testing the power supply voltages as a starting point when troubleshooting. You need a digital voltmeter with an impedance of at least 20,000 ohms per volt to perform these procedures.

7.4.2 Testing the Power Supply

Complete these steps to test the power supply.

1. Remove the Filtec 3-G's cover to access the power supply inside.
2. Using test point TP3 as ground, test all voltages at the appropriate test points.

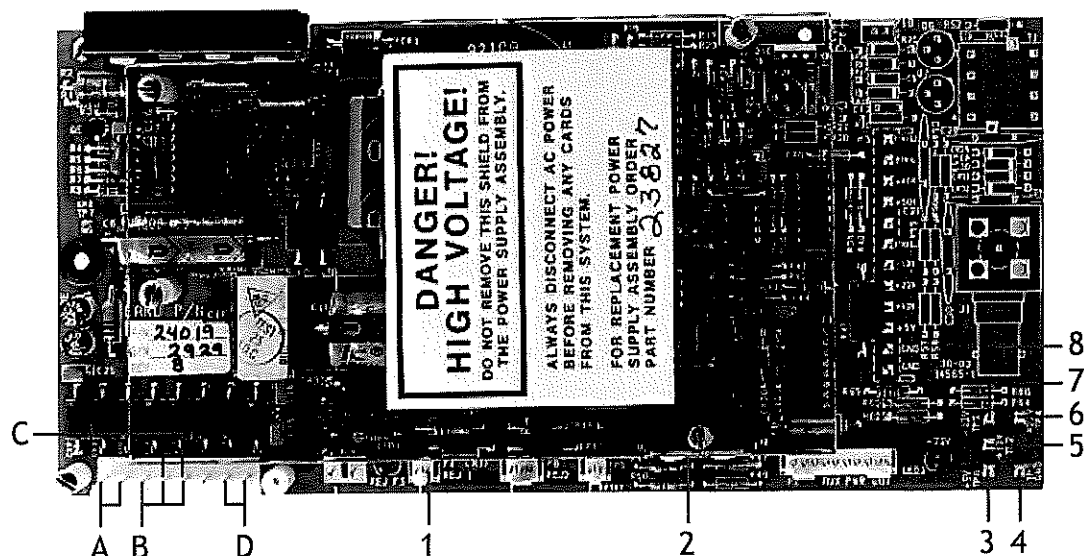


Figure 7-1. Power Supply Circuit Board Test Points

Reference	Test Point	Output VDC	Range VDC	Xfmr winding	Source supply	Description
1	P4-2	+60	50/60	36 VAC	Unreg	Rejector driver, rejector
2	Q8-3	-5	4.9/5.1	28 VAC	-12 VDC	RS232, RS422 drivers
3	TP-6	+5	5.0/5.2	28 VAC	+V	Processor logic, scintillation detector
4	TP-3					Ground

Reference	Test Point	Output VDC	Range VDC	Xfmr winding	Source supply	Description
5	TP-2	+12	11.5/12.5	28 VAC	+V	Scintillation tube pulse preamplifier, control panel, serial port drivers
6	TP-4	+22	18.0/22.0	28 VAC	+V	Sensor emitters/amplifiers, input comparators
7	TP-5	12	11.5/12.5	28 VAC	Unreg	Control panel, serial port drivers
8	J-1	+1000*	800/1200	28 VAC	+22 VDC	Scintillation detector

7.4.3 Testing the Power Transformer

If the power supply is not functioning, the failure may be caused by the loss of input power. If the input power is missing, test the power transformer.

1. Turn off all power to the Filtec 3-G.
2. Remove the Filtec 3-G's cover to access the power transformer inside.



Warning: Failure to turn off the power can result in severe electrical shock.

3. Disconnect plug P1 from the transformer and turn the power to the Filtec 3-G on.
4. Refer to Figure 8-1 and test the following pins in the P1 connector on the processor card.

Reference	Rated Voltage	Voltage Range	Connections
A	36 VAC	38 - 43 VAC	Pin 1 to Pin 2 (red to red)
B	14 VAC	15 - 17 VAC	Pin 3 to Pin 4 (yellow to blue) Pin 3 to Pin 5 (yellow to blue)
C	28 VAC	30 - 34 VAC	Pin 4 to Pin 5 (blue to blue)
D	24 VAC	25 - 29 VAC	Pin 7 to Pin 8 (brown to brown)

7.5.2 Serial Communications Card

Serial communications cease

Check to be certain serial communications has not been deactivated. If not, the terminal board is malfunctioning and you must replace it.

7.5.3 Control Panel

The display does not respond when you press keys

1. Turn the Filtec 3-G's power off and press the reset button and turn on the power to the machine. Wait for the three beeps before releasing the reset button.
2. Remove the Filtec 3-G's cover and verify the ribbon cable from the touchpad is undamaged and correctly connected to the terminal board.
3. Inspect the control panel display touchpad for water damage. If moisture is present, replace the control panel.

Filtec 3-G displays a blinking cursor on the two-line display and the warning beacon is on and solid

1. Check to be sure the reset switch is not stuck.
2. Check to be sure all PROMs on the processor card are seated correctly.
3. Replace the processor card.

Filtec 3-G displays nothing on the two-line display and the beacon is off

1. If you are using a remote control panel check that it is plugged into the connector on the inspection head correctly.
2. Reset the Filtec 3-G by pressing the reset button for three seconds while turning the machine off and on.
 - If the beacon does not flash, replace the beacon bulb and test again.
 - If the beacon is solid there is a problem with the processor card.

- If the beacon flashes once and stops, there is a problem with the terminal card.

The display is garbled or operates erratically

1. Replace the processor card.
2. Replace the terminal card.

7.6 Troubleshooting the Sensor System

7.6.1 Scintillation Tube Detector (STD)

Unable to calibrate the scintillation tube detector

If the calibration light emitting diode (LED) does not double peak during the calibration procedure, the detector is faulty and you must replace it.

Gamma counts decrease significantly within a short period of time

If the gamma counts suddenly decrease significantly and continues to decrease, the STD is worn out and must be replaced. You can view the active gamma counts by using the **GAMMA COUNTS** function.

High or erratic gamma counts

If the gamma counts suddenly increase significantly or become erratic, check to be certain the STD is grounded correctly:

1. Remove the STD and wipe it with a clean cloth.
2. Wipe the mounting clamp and chassis also.
3. Check to be sure the grounding wire is secure at both ends.
4. Replace the STD making sure the mounting clamp contacts the STD firmly and cleanly.

7.6.2 Optical Sensors

False triggers suddenly increase, or reject timing malfunctions occur.

1. Inspect and clean the lenses. Use a cotton swab and isopropyl alcohol to clean the lens. If the lens is scratched, chipped, cracked, or discolored, replace it.
2. Fiber optic strands in the cable may be broken. Remove the cable from the sensor amplifier and shine a flashlight into the lens. Looking at the cable end you removed, the light should be solid and round. If there are any dark spots, the cable contains fiber optic strands. Replace the cable.

3. If the rejector timing is erratic and you are certain that all settings are configured correctly, the encoder might not be installed correctly, or the encoder coupling might be slipping. The encoder has a built in diagnostic that displays error 22 when the encoder has failed and must be replaced.
4. Pass a reject test container through the inspector and observe the time delay synchronization. The rejector pad's center line should contact the container's center line at the point of impact. If not, contact your service department.

7.6.3 Proximity Sensors

No triggering occurs.

- Check light emitting diode (LED) 7 on the processor board. If the LED blinks when a container passes under the sensor, the sensor is working. Check to be sure the sensor height is set correctly.
- The height of the sensor has been changed. Check to see that the Filtec 3-G head height has not been altered.

7.6.4 Encoder

Your encoder fails or works erratically.

- The encoder has a built in diagnostic that displays error 22 when the encoder has failed and must be replaced.
- If the rejector timing is erratic and you are certain all settings are configured correctly, the encoder may not be installed correctly, or the encoder coupling may be slipping.

7.7 Troubleshooting Problems With Rejectors

7.7.1 Troubleshooting the Proline Rejector

The rejector is operating erratically

1. The air supply may be erratic. Verify the air pressure is in the correct operational range for the rejector.
2. Check to see if the cylinder is binding by shutting off the air pressure to the rejector and moving the rejector in and out by hand. If it is binding, rebuild the rejector with a rebuild kit.
3. The rejector Pulse Width function may need adjustment. Contact FILTEC Customer Support for assistance.

The rejector arm remains extended

1. Turn the Filtec 3-G's power off. If the rejector remains extended, repair or replace the Rejector Assembly.
2. Close dip switch S2-8 on the Filtec 3-G processor card and then turn cycle the power.
 - If LED 2 remains on, replace the processor card.
 - If the warning beacon is on and LED 2 is off, replace the power supply.

Rejected container trajectory is sloppy or inconsistent

1. Fatigued or worn pads cause the rejected container's trajectory to change.
2. Replace the rejector pad.

The rejector does not function

1. Is the rejector activated? Turn the rejector status function on.
2. If you hear a clicking sound, but the rejector does not activate, the air pressure is not turned on. Turn on air pressure to the rejector.

3. The rejector pulse width function may need adjustment. Contact FILTEC Customer Support for assistance.
4. Disconnect the wire at TB1-26 and use a digital voltmeter to measure the resistance between the wire and TB1-25. The resistance should be 165 ohms (± 10 percent).
5. Turn the Filtec 3-G on and off and then use the Fire Rejector On Demand function to fire the rejector. LED 2 on the processor card should flash for each reject pulse.
 - If the LED flashes, but the rejector does not fire; replace the power supply.
 - If the LED does not flash, replace the processor card.

7.7.2 Troubleshooting the Servotec II Rejector

The rejector is operating erratically

1. Check all circuit breakers and fuses that power the AC branch circuit to the Servotec II rejector. Replace or reset any blown fuses or breakers.
2. Check all electrical and/or electronic fuses located in the inspection unit the Servotec II is linked to, and in the Servotec II rejector. Replace or reset any blown fuses.
3. Verify the AC input voltage range to both the inspection unit and to the rejector unit are within the specified tolerances for your unit. Refer to your Filtec 3-G manual for specifications.
4. Check the cable between the rejector and the inspection units for broken or frayed wires. If damaged, repair or replace it.
5. Check the continuity between the rejector and inspection units using the inspection unit's wiring diagram. Refer to your Filtec 3-G manual.

Unstable main power

Surges, sags, and transients in the AC mains can cause the inspection system to falsely reject good containers. If this occurs, try the following procedures.

1. Check the AC power mains powering the inspection unit using line voltage measuring equipment to detect surges, sags, and transients.

2. Check the AC power mains neutral and ground lines for common-mode voltages and currents.

Terminal and conductor damage

Terminal and conductor damage can cause intermittent open circuits. If this occurs, try the following procedures.

1. Check all the cable connections for terminal and conductor damage. If damaged, replace the cable.
2. Check all inspection unit and valve terminals for signs of moisture or water deposits. If moisture is found, use filtered, dry compressed air to dry the unit.



Note: If intermittent or erratic rejector operation continues, contact FILTEC Customer Support for assistance.

Containers are not rejected

Possible Cause	Corrective Action
Rejector is not being energized by inspection unit.	Is the inspector detecting any rejects? Pass a reject test container through the Inspection System. With the reject switch set to ON, the rejector should fire and the Reject LED on the should flash.
Rejector assembly has malfunctioned.	Inspect the rejector arm as described in the Routine Preventative Maintenance procedures
Containers incorrectly positioned on the conveyor.	Review the Installation section for correct installation.

All containers are rejected

The fill level calibration is incorrect and all containers are registering as rejects.

Containers are rejected erratically

Possible Cause	Corrective Action
Time Delay is incorrectly set.	Pass reject test container through the inspector and observe the time delay synchronization. The rejector pad's center line should contact the container's center line at the point of impact. If not, adjust the reject timing settings in the inspection unit.
Rejector is not in the correct position.	Verify the Rejector Pad, when completely retracted, is 1/8 inch from the containers as they move down the conveyor line. If not adjust the Stroke Offset.
Rejector Pad fatigue or failure.	Fatigued or worn pads cause the rejected container's trajectory to change. Replace Rejector Pad.
Rejector sticking or binding.	Check the rejector piston for smooth movement. If it is binding, you must replace the Servo unit. See your Servotec II documentation for parts information.



Note: If intermittent or erratic rejector operation continues, contact FILTEC Customer Support for assistance.



8. Using a PLC With Your Filtec 3-G

Programmable Logic Control (PLC) signals are provided by AC or DC optically isolated solid-state Relays. The Filtec 3-G has separate PLC signals with a programmable pulse width (1 to 120 milliseconds) that transmits one pulse for each event. The signals are available in the I/O junction box for your Filtec 3-G.

8.1 Using a PLC With Your Filtec 3-G

8.1.1 List of Signals That the Filtec 3-G Can Report to a PLC

The Filtec 3-G can report the following signals to a PLC:

- Sensor/gamma failure alarm
- Latched consecutive alarms
- Rejector/fill level status OFF
- Total rejects
- Total throughput
- Fill level rejects
- High cap rejects
- Missing cap rejects

And the following remote alarms:

- Rejector/fill level status OFF
- Fill level series alarm
- Missing lid series alarm
- High cap series alarm
- Gamma failure alarm
- Sensor failure alarm

8.2 PLC Series Alarms

8.2.1 How to Activate the PLC Series Alarms

To configure your Filtec 3-G for operation with a PLC you must activate the PLC series alarms functions in the Filtec 3-G software.

To activate the PLC series alarms:

1. On the operator control panel, press key 5 until your Filtec 3-G displays **SYSTEM DISPLAY**.
2. Press the arrow key to select **CALIBRATE**.
3. Open dip switch S1-5.
4. **Result:** You enter the system configuration.
5. Press key 5 until your Filtec 3-G displays **PLC SERIES ALARMS**.
6. Press the arrow key to select **PRESENT**.
7. Close dip switch S1-5.

Result: The **PLC SERIES ALARM** functions are now activated in the system software. The following options now appear in the function menus.

- **PLC PIN ASSIGNMENTS**
- **PLC OUTPUT PULSE WIDTH**
- **ALARM SERIES UNDERFILLS**
- **ALARM SERIES OVERFILLS**
- **ALARM SERIES MISSING CAP**
- **ALARM SERIES HIGH CAP**
- **ALARM SERIES SMASHED BOTTLE**
- **ALARM SERIES DIA. MISSING CAP**
- **ALARM SERIES ANY OTHER INSPECTIONS**

8.2.2 How to Determine the Signal Output Wiring

The **VIEW PLC PIN ASSIGNMENTS** function lists the configuration of the PLC outputs for your Filtec 3-G. It also lists the normal voltage levels associated with the signals.

To view the PLC pin assignments:

1. On the operator control panel, press key 5 until your Filtec 3-G displays **SYSTEM DISPLAY**.
2. Press the arrow key to select **CALIBRATE**.
3. Press key 5 until your Filtec 3-G displays **VIEW PLC PIN ASSIGNMENTS**.
4. Press the arrow key to scroll through the list.
 - The top line of the displays the output function and its assigned terminal pin.
 - The bottom line lists the voltage level and triggered action.For example, **NORMAL >>2V, PULSE<2V** means that the normal state signal voltage is greater than 2 volts, and the pulsed state signal voltage is less than 2 volts.

When you reach the end of the list the **COMPLETED** message appears.

8.2.3 Adjusting the PLC Output Signal Pulse Width

To adjust the PLC output signal pulse width:

1. On the operator control panel, press key 5 until your Filtec 3-G displays **SYSTEM DISPLAY**.
2. Press the arrow key to select **CALIBRATE**.
3. Press key 5 until your Filtec 3-G displays **PLC OUTPUT PULSE WIDTH**.
4. Press the arrow key until you display the value that you want.

8.2.4 Relay Types for Output Signals

The Filtec 3-G does not supply power to the PLC unit. The Filtec 3-G signal output is a solid-state relay that closes on each event occurrence.

Description	Relay type
Sensor/Gamma Failure Alarm	Reed
Latched Consecutive Alarms	Reed
Rejector/Fill Level Status Off	Reed
Total Rejects	Solid State

Description	Relay type
Total Throughput	Solid State
Fill Level Rejects	Solid State
High Cap Rejects	Solid State
Missing Cap Rejects	Solid State

A resistor of the appropriate value may be needed across the load attached to the relay. The resistor absorbs the 2 ma leakage and meets the minimum current load requirement.

The following illustrations show the resistor required for your specific voltage.

No.	Description
1	Field
2	Diode must be used on inductive loads
3	Screw Terminals
4	Plug-in Module
5	Equivalent Circuit Only
6	Amplifier
7	Pins
8	Sockets in Mounting Rack
9	Pull-up Resistor
10	Edge Connector
11	Logic
12	Input
13	Ground (Common)
14	Mounting Rack
15	Fuse (Plug-in)
16	Load (Connected to either the positive or negative side of the source)

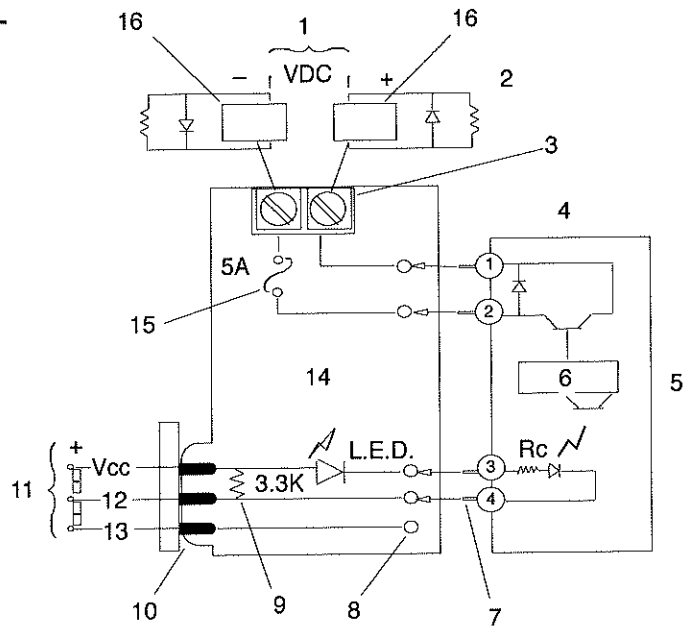


Figure 8-1. 0-60 Volts DC, 1 Amp Maximum, 2 ma Leakage, 10 ma min. Load

No.	Description
-----	-------------

- | | |
|----|--|
| 1 | Field |
| 2 | Diode must be used on inductive loads |
| 3 | Screw Terminals |
| 4 | Plug-in Module |
| 5 | Equivalent Circuit Only |
| 6 | Zero Voltage Check |
| 7 | Pins |
| 8 | Sockets in Mounting Rack |
| 9 | Pull-up Resistor |
| 10 | Edge Connector |
| 11 | Logic |
| 12 | Input |
| 13 | Ground (Common) |
| 14 | Mounting Rack |
| 15 | Fuse (Plug-in) |
| 16 | Load (Connected to either the positive or negative side of the source) |

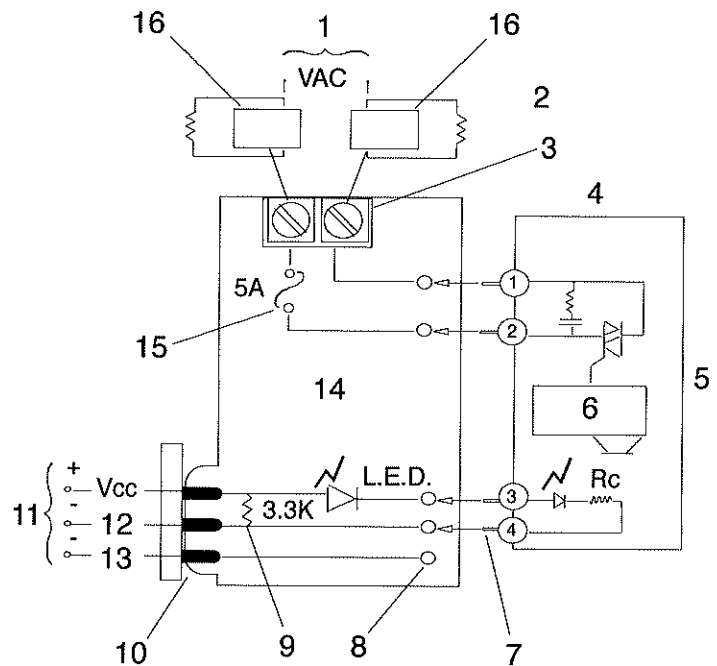


Figure 8-2. 0-120 Volts AC, 1 Amp Max., 2 ma Leakage, 50 ma Min. Load

8.3 Remote Alarm

The Filtec 3-G remote alarm option uses the diagnostic error signals to latch (hold LOW or SINK) the appropriate PLC output lines. Each remote alarm is initiated by a diagnostic error number (or group of error numbers) and remains latched until you or an operator clears the diagnostic error number.

You can use the remote alarm option and the PLC interface option in the Filtec 3-G simultaneously. However, they cannot occupy the same signal output lines.

8.3.1 How to Clear a Remote Alarm

A remote alarm is cleared when it is overwritten by another alarm, or when you manually clear the alarm.

To clear the alarm manually:

1. On the operator control panel, press key 6.

Result: Your Filtec 3-G displays the error.

2. Press the arrow key.

Result: You clear the error.

8.3.2 Remote Alarm Error Number Designations

Error Number	Remote Alarm Designation
2, 66	Rejector/Fill Level Status Off
10	Fill Level Series Alarm
11	Missing Lid Series Alarm
12	High Cap Series Alarm
13, 14	Gamma Failure
15, 16, 17, 32	Sensor Failure



9. Controller Board Dip Switches and LEDs

This chapter tells you all about dip switches on the controller board and light emitting diodes (LEDs) inside your Filttec 3-G.

9.1 Controller Board Switch Locations

The Filtec 3-G's controller board contains two dip switch packs (S1 and S2) which contain eight switches each. The controller board also contains three slide switches (S3, S11, S13).

No.	Description
1	S3
2	S11
3	S13
4	S1
5	S2

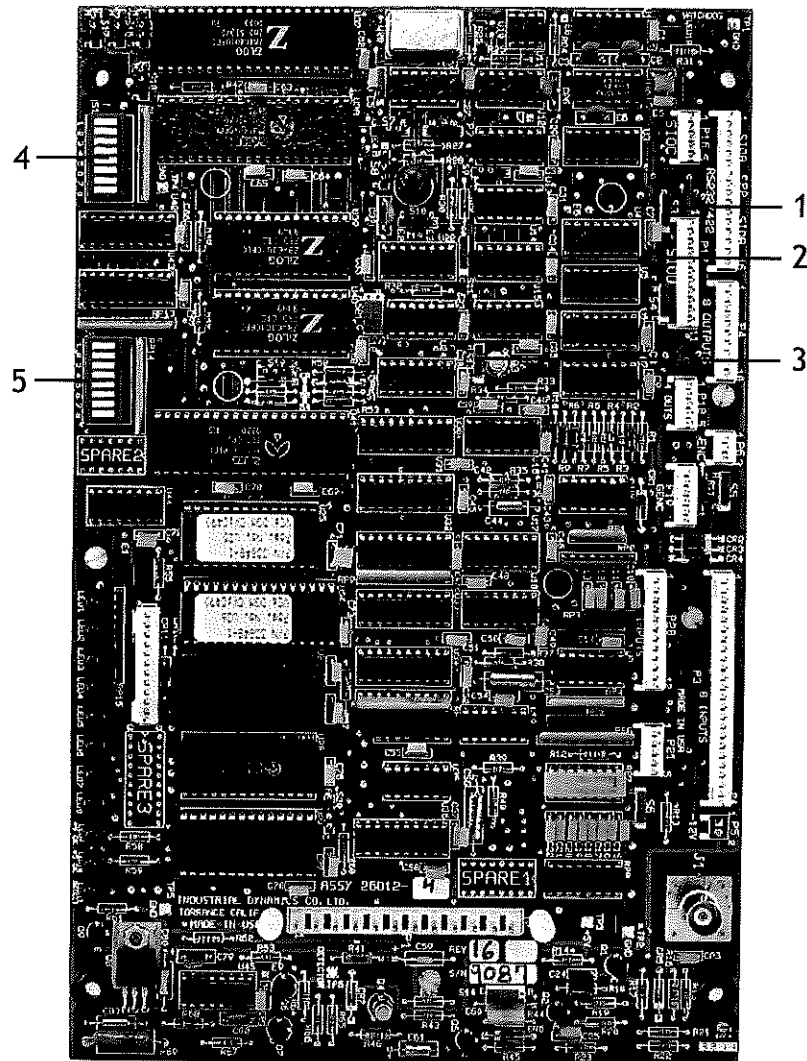


Figure 9-1. Locations of Switches on the Controller Board

9.2 Switch Function Configurations

9.2.1 Table

The default configuration for each option is indicated in bold. The following table represents the standard Filtec 3-G configuration. Depending upon the options installed in your Filtec 3-G the default configuration may be different. Refer to the System Configuration Sheet located inside the cover of your Filtec 3-G for you specific factory configuration.

Switch	Function	Open = 1	Closed = 0
Switch Pack S1			
S1-1	Inspection Logic	Overfill	Underfill
S1-2	Software Protect	On	Off
S1-3	Speed Tracking	Variable	Fixed
S1-4	Languages	Second	English
S1-5	System Configuration	On	Off
S1-6	Not Used	NA	NA
S1-7	Not Used	NA	NA
S1-8	Password	Required	Not Required
Switch Pack S2			
S2-1	Baud Rate	1200	9600
S2-2	Handshake Flags	On	Off
S2-3	Parity On/Off	On	Off
S2-4	Parity Odd/Even	Even	Odd
S2-5	Character Size	7 Bit	8 Bit
S2-6	Multi-Serial	RS-485	RS-232/422
S2-7	Led Section Selector	Section 2	Section 1
S2-8	Led Bank Selector	Bank 2	Bank 1
Slide Switches		Position A	Position C
S3	RS-232/RS422	RS-232	RS-422/485
S11	Save Setup	Enable	Disable
S13	Auto Reset	Disabled	Enabled

9.3 Switch Function Definitions

9.3.1 Dip Switch Pack S1

S1-1: Inspection Logic

Switches the fill level inspection logic between underfill and overfill. All fill level text is changed to reflect the current logic. The default is underfill.

S1-2: Software Write Protect

Enables or disables the write protect function. When disabled the Save Default Constants function removed from the function menu. The default is enable.

S1-3: Speed Tracking

Switches between variable and fixed speed tracking. Variable speed tracking is used with encoders on lines that run at more than one speed. Fixed speed tracking is used on single speed lines that do not use an encoder. The default is variable.

S1-4: Model

Switches between particular models of FILTEC products, that is, between the FT-50 and Filtec 3-G models. Note that the software for the FT and Filtec 3 models is incompatible.

S1-5: System Configuration

Switches the system between configuration mode and standard mode. When active this mode activates various options throughout the software option menus. The default is off.

S1-6: Not Used

S1-7: Not Used

S1-8: Password

Enables or disables the password protect function. The default is disabled.

9.3.2 Dip Switch Pack S2

S2-1: Baud Rate

Defines the baud rate (bit per seconds) for the user serial port (RS-422/423). The default is 1200.

S2-2: Handshake Flags

Enables the use of the Serial Hardware Handshake lines. The default is off.

S2-3: Parity On/Off

Enables the parity bit in the Serial Data transmission. The default is off.

S2-4: Parity Odd/Even

Allows selection of odd or even parity when S2-3 is open. The default is odd.

S2-5: Character Size

Allows selection of 7 or 8 bit characters. The default is 8 bit.

S2-6: Multi-Serial

Enables the Filtec 3-G for a multiple unit serial network and switches the serial port from active open to tri-state, RS-485. The default is RS-485

S2-7: Led Section Selector

Defines current LED section. The default is section 1.

S2-8: Led Bank Selector

Defines current logical LED bank. The default is bank 1.

9.3.3 Slide Switches

SW3

Selects either RS-232 or RS-422/485 network communications. The default is RS-232.

SW11

Enables or disables the ability to write setup values to protected memory. The default is enable.

SW13

Enables or disables the Auto-Reset function. The default is disable.

9.4 Locations of Controller Board LEDs

The Filtec 3-G's controller board contains 1 bank of 11 light emitting diodes (LEDs). The LEDs are divided into logical sections and banks which are configured by dip switches S2-7 and S2-8.

No.	Description
1	LED 1
2	LED 2
3	LED 3
4	LED 4
5	LED 5
6	LED 6
7	LED 7
8	LED 8
9	LED 9
10	LED 10
11	LED 11

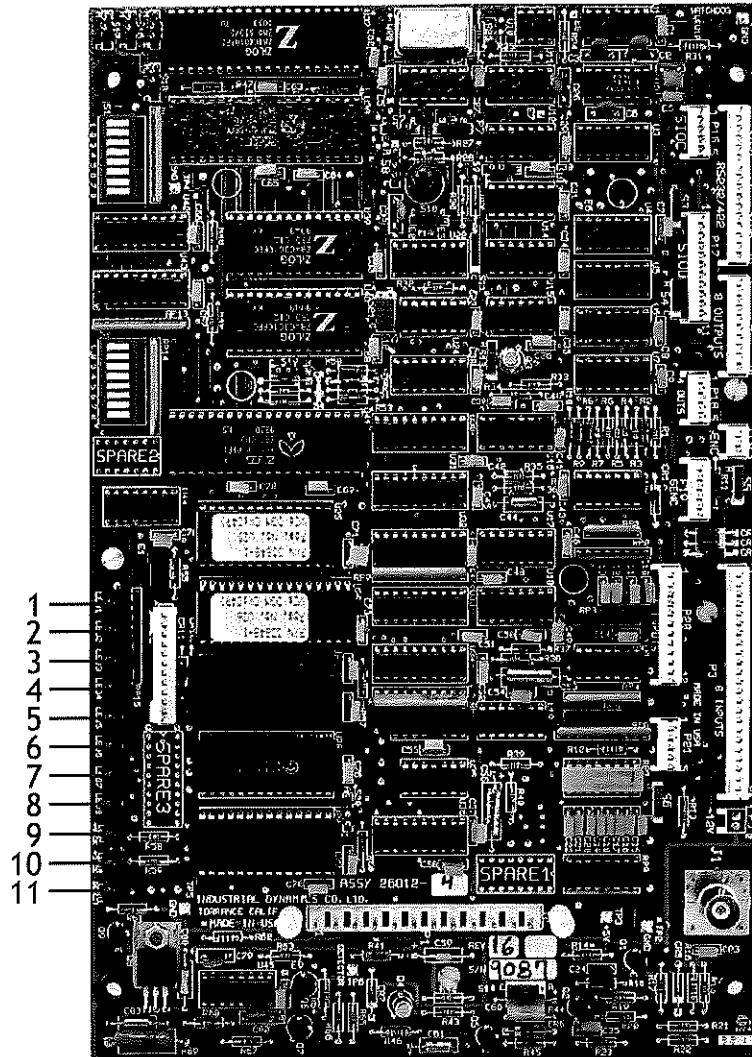


Figure 9-2. Locating the LEDs on the Controller Board

9.5 LED Configurations

9.5.1 Table

The light emitting diode (LED) assignments below are listed by the section and bank.

Selecting a section and bank is controlled by dip switches S2- 7 and S2-8. The multiple banks are necessary to handle the various options available for the Filtec 3-G.

LED	Section 1, Bank 1	Section 1, Bank 2	Section 2, Bank 1	Section 2, Bank 2
1	Diag Error	Label 1	Remote Clr	Inlabeler 1
2	Reject Pulse	Label 2	Broken Slat or Batch Rej	Inlabeler 2
3	Hi Res Encoder	Label 3	Lw Res Encoder	Inlabeler 3
4	Low Foam	Label 4	X-ray Enable or Optical FL	Inlabeler 4
5	Down can/Smashed bottle	Label 5	X-ray Failure or FSRC 2 Input	Inlabeler 5
6	Bulged Can/High Cap	Label 6	Extrn or FSR 1	Cntr Present
7	Missing Cap/Missing Lid	Label 7	Slat Backup or Reject Verify	System Timing
8	Trigger	Label 8	Trigger	Trigger

9.5.2 LED Logic

The standard detection logic for the LEDs is on when the sensor is blocked and off when a sensor is clear. Some options, such as high cap detection, use reverse detection logic. When reverse detection logic is used the LED is off when the sensor is blocked and on when the sensor is clear.

Refer to the system configuration sheet, which is usually located inside the cover of your Filtec 3-G for you specific configuration.

9.6 LED Definitions

9.6.1 Table

Section 1, Bank 1: S2-7 = Closed/S2-8 = Closed

LED 1	Fault error present: The light emitting diode (LED) is on when there is a fault alarm or other error in the system.
LED 2	Reject pulse: Flashes one time for each container rejected.
LED 3	Low res encoder pulse: Flashes once for each pulse.
LED 4	Not used in this configuration.
LED 5	Slat backup sensor: Indicator lights when the sensor is activated or when sensor is blocked.
LED 6	High cap: Indicator lights when the high cap sensor is activated or when the sensor is blocked.
LED 7	Missing cap trigger: Indicator lights when the missing cap sensor is activated or when lid is present.
LED 8	Inspect trigger: Indicator lights when the inspection trigger sensor is activated or when the sensor is blocked.
LED 9	AC power low: Indicator lights when the input AC power to the Filtec 3-G is too low to operate satisfactorily (below 70 VAC).
LED 10	+5 VDC power low: Indicator lights when the +5 VDC power supply is too low to operate satisfactorily (below 4.85 VDC). Indicator is also on when you press the reset button.
LED 11	Detector: Used to get a coarse calibration setting for the scintillation detector.

Section 1, Bank 2: S2-7 = Closed/S2-8 = Open

This section is used when the label inspection option is installed in your Filtec 3-G. For More information refer to your label inspection documentation.

Section 2, Bank 1: S2-7 = Open/S2-8 = Closed

LED 1	Fault error present: The Indicator lights when there is a fault alarm or other error in the system.
LED 2	Reject pulse: Flashes one time for each container rejected.
LED 3	High resolution encoder pulse: Flashes once for each pulse.
LED 4	Not used in this configuration.
LED 5	Not used in this configuration.
LED 6	External reject: Flashes one time for each input received from an external source requesting the next container to be rejected.
LED 7	Not used in this configuration.
LED 8	Inspect trigger: Indicator lights when the inspection trigger sensor is activated or when the sensor is blocked.
LED 9	AC power low: Indicator lights when the input AC power to the Filtec 3-G is too low to operate satisfactorily (below 70 VAC).
LED 10	+5 VDC power low: Indicator lights when the +5 VDC power supply is too low to operate satisfactorily (below 4.85 VDC). Indicator is also on when you press the reset button.
LED 11	Detector: Used to get a coarse calibration setting for the scintillation detector.

Section 2, Bank 2: S2-7 = Open/S2-8 = Open

LED 1	Fault error present: The indicator lights when there is a fault alarm or other error in the system.
LED 2	Reject pulse: Flashes one time for each container rejected.
LED 3	High resolution encoder pulse: Flashes once for each pulse.
LED 4	Not used in this configuration.
LED 5	Smashed bottle: Flashes when sensor is blocked.
LED 6	Not used in this configuration.
LED 7	Not used in this configuration.
LED 8	Inspect trigger: Indicator lights when the inspection trigger sensor is activated or when the sensor is blocked.
LED 9	AC power low: Indicator lights when the input AC power to the Filtec 3-G is too low to operate satisfactorily (below 70 VAC).
LED 10	+5 VDC power low: Indicator lights when the +5 VDC power supply is too low to operate satisfactorily (below 4.85 VDC). Indicator is also on when you press the reset button.
LED 11	Detector: Used to get a coarse calibration setting for the scintillation detector.

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