FAAST FLEX™ Product Guide



FLX-010

FLX-020

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The following typographic conventions are used in this document:

Convention	Description
Bold	**Used to denote:** emphasis. Used for names of menus, menu options, toolbar buttons
Italics	**Used to denote:** references to other parts of this document or other documents. Used for the result of an action.

The following icons are used in this document:

Convention	Description
	**Caution:** This icon is used to indicate that there is a danger to equipment. The danger could be loss of data, physical damage, or permanent corruption of configuration details.
	**Precaution:** Electrostatic precautions must be followed to prevent damage to the detector.

Contact Us

www.xtralis.com

Codes and Standards Information for Air Sampling Smoke Detection

We strongly recommend that this document is read in conjunction with the appropriate local codes and standards for smoke detection and electrical connections. This document contains generic product information and some sections may not comply with all local codes and standards. In these cases, the local codes and standards must take precedence. The information below was correct at time of printing but may now be out of date, check with your local codes, standards and listings for the current restrictions.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures; re-orientate or relocate the receiving antenna, increase the separation between the equipment and receiver, connect the equipment to a power outlet which is on a different power circuit to the receiver or consult the dealer or an experienced radio/television technician for help.

Honeywell International
12 Clintonville Rd,
Northford CT 06472
Tel +1 203-484-7161

Regional Regulatory Requirements and Notices

European Installations

CE **0786 21**
Honeywell Products and Solutions Sàrl Zone d'activités La Piece 16 CH-1180 ROLLE Switzerland **CE DoP: DOP-ASP038**
EN 54-20: 2006 Aspirating smoke detectors for fire detection and fire alarm systems for buildings Classes: A, B and C

Product Listings

- VdS
- EN 54-20, ISO 7240:20
- CE
- ActivFire

Honeywell Products & Solutions Sarl
Z.A. La Pièce 16
1180 ROLLE (SWITZERLAND)

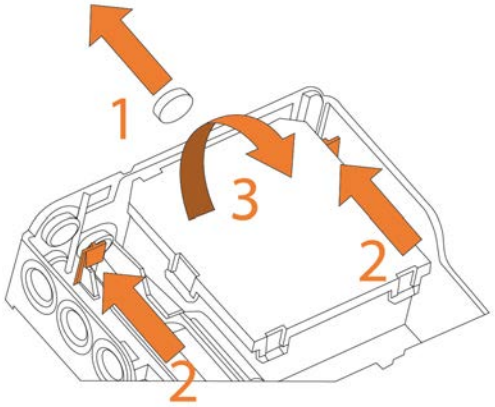
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Battery Removal for Recycling

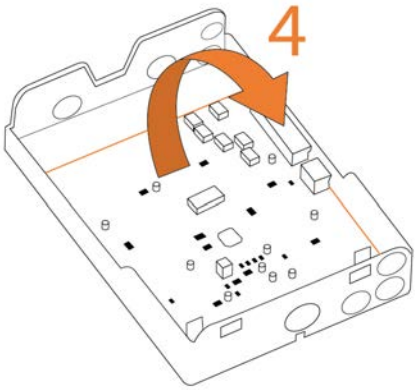
Caution: Do not ingest battery. Chemical Burn Hazard. This product contains a coin cell battery. If the battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.

Note: Battery Removal Recycling should be done when the detector life expires. If done before, the warranty becomes void.

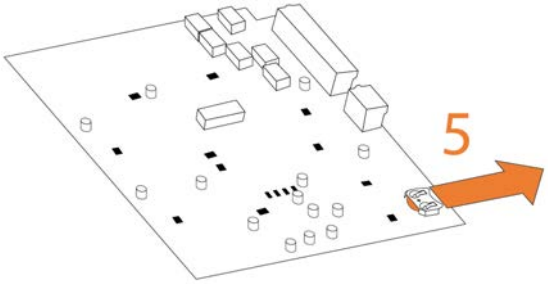
1. Remove the plug.
2. Remove the manifold by detaching the two clips.
3. Rotate the manifold and the sensing head to access the detector circuit.



4. Remove the PCB from the plastic base.



5. Remove the battery using a small screwdriver and following the direction of the arrow.



6. Recycle the CR2032 Lithium battery in accordance with your local regulations.

Note: Battery supplies the internal clock in the detector and can't be replaced in the field.

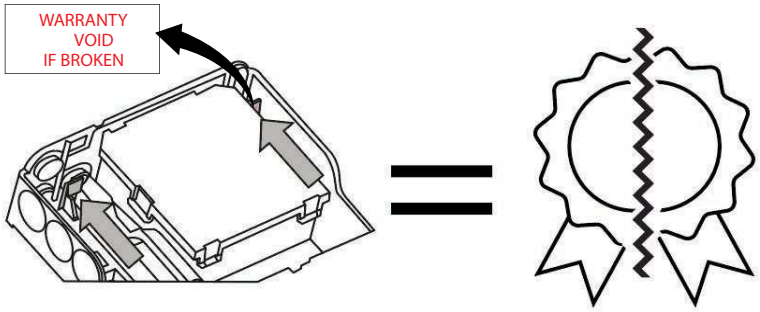
Warranty

Xtralis warrants the FAAST FLEX aspirating detector against defective parts and workmanship.

This warranty does not cover consumable, batteries, fuses, normal wear and tear, or damage caused by accident, abuse, improper installation, unauthorized use, modification or repair, ambient environment, poisons, contaminants or abnormal operating conditions.

This warranty does not apply to sensors or components that are covered under separate warranties, or to any 3rd-party cables and components. In no event shall Xtralis be liable for any damages or injury of any nature or kind, no matter how caused, that arise from incorrect handling or use of this equipment.

This warranty will be void if the sealing label is broken and the plastic block is removed from the PCB.



In no event shall Xtralis be liable for any equipment malfunction or damages whatsoever, including (without limitation) incidental, direct, indirect, special, and consequential damages, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss, resulting from the incorrect installation or use of this equipment.

Any claim under the Xtralis Product Warranty must be made within the warranty period and as soon as reasonably practicable after a defect is discovered.

Please contact your local Xtralis Service representative to register your claim.

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1 Introduction

The FLEX Series is part of the Fire Alarm Aspiration Sensing Technology® (FAAST) family. FAAST is an advanced fire detection system for use where configurability, sensitivity and very early warning are a requirement. The system continuously draws air from the monitored environment through a series of sampling holes to monitor the environment for smoke particulate.

The FLEX has two channel capability with two high sensitivity smoke sensors in separate chambers (one sensor for each channel).

Note: Aspirating Smoke Detectors supplied and installed within the EU must conform to the EU Construction Products Regulation (CPR) 305/2011 and the related European Product Standard EN 54-20. FAAST has been tested and certified to ensure that it conforms to the necessary Standards, but strict adherence to this instruction guide is advised to ensure that the installation meets the requirements of the CPR.

This equipment and all associated pipe work must be installed in accordance with all relevant codes and regulations.

1.1 Unit Description

The FAAST FLEX is an aspirating smoke detector that provides early warning detection using a dedicated high sensitivity smoke sensor. The FAAST FLEX is available as a one channel or two channel detector, Each sensing channel consists of an inlet, a metallic filter, a sensing element and a flow monitoring system. The product has a single aspirator and a single exhaust outlet. The FAAST FLEX is powered by an external 24 VDC power supply. Front panel LEDs indicate power, fault, and alarm status, and fault relays are activated in normal operation, and open in the event of a fault to notify monitoring systems. One General Purpose Input (GPI) is also provided.

Configuration of the device is typically via DIP switches on the circuit board. The circuit board also has a USB port that can be used by maintenance technicians to download event logs.

Components subject to periodic maintenance are designed to be easily reachable in any cabling situation. An in-line filter (Xtralis: VSP-850, System Sensor: F-INF-25) can be installed on the pipeing close to the inlet in order to improve protection to the sensing elements in particularly harsh (e.g. dusty) environments. The product is designed to protect an area up to 1600m² for 1 channel models and 2000 m² for two channel models.The product is designed to be compliant with EN54-20 Class A, B, and C sensitivity requirements.

1.2 Storage and Shipping

The FAAST FLEX detectors are shipped in specifically designed cartons. If the detectors must be stored, store the devices in the original shipping cartons. The product should be stored in an environmentally controlled, clean, dry, well ventilated area free from any corrosive agents. Do not store the devices for more than one year.

The detectors can be damaged by rough handling. During transportation, avoid violent vibration, heavy shock loads, and exposure to excessive heat or moisture.

1.3 Ordering Information

Ordering Code	Description
FLX-010	FAAST FLEX 1-pipe Stand-alone
FLX-020	FAAST FLEX 2-pipe Stand-alone
FLX-SP-01	FAAST FLEX Sensing Module
FLX-SP-02	FAAST FLEX Metal Filter (pack of 6)
FLX-SP-03-EN	FAAST FLEX Front Cover (EN)
FLX-SP-03-CH	FAAST FLEX Front Cover (CH)
FLX-SP-04	FAAST FLEX Aspirator
FLX-SP-05-EN	FAAST FLEX Internal Covers Set (EN)
FLX-SP-05-CH	FAAST FLEX Internal Covers Set (CH)
FLX-SP-06	FAAST FLEX Adaptor Set

2 Product Information

2.1 Detector Components

Figure 2-1 shows the major components of the FAAST FLEX. The FAAST FLEX is available in 1 Channel and 2 Channel models. For simplicity, the double Channel version is shown in illustrations in this manual unless there is an important difference between the two models.

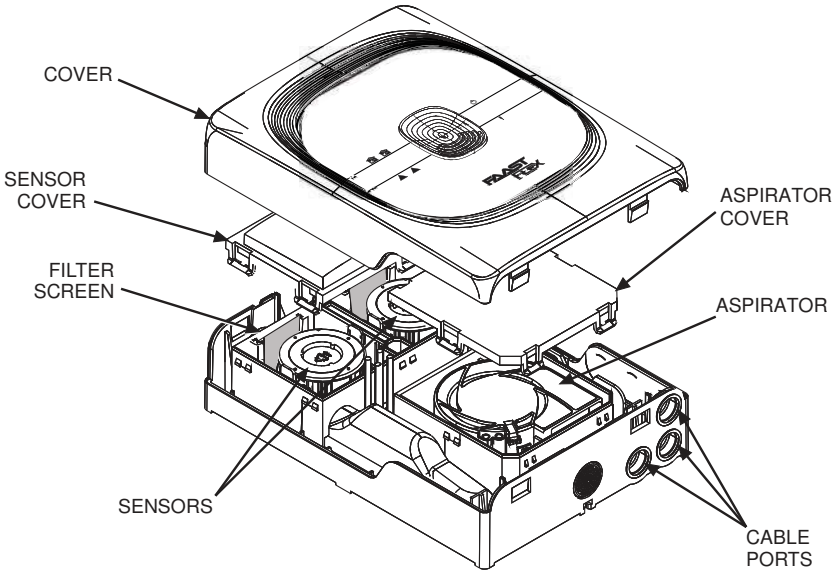


Figure 2-1: Detector Components

2.2 General Information

Figure 2-2 shows the information label on the FAAST FLEX. There is a QR code that can be scanned to access the online manual, and a barcode that can be scanned to access the model and serial number.

Power Requirements

The device requires an external 24 VDC power supply. In order to meet EN54-20 standard, the aspirating detector shall be supplied by a power supply complying with European Standard EN54-4. Operational Power Supply range is 18-30V. The device monitors the power supply and when supply voltage drops below 21V the device gives a LOW POWER alert (POWER LED shows steady RED). Moreover, the device has a brown-out circuit, which operates nominally at 17V. In this condition the device switches to POWER OUT OF RANGE state and activates fault relays. When the device is turned off by brown-out hardware circuit, the fault relays remains activated.

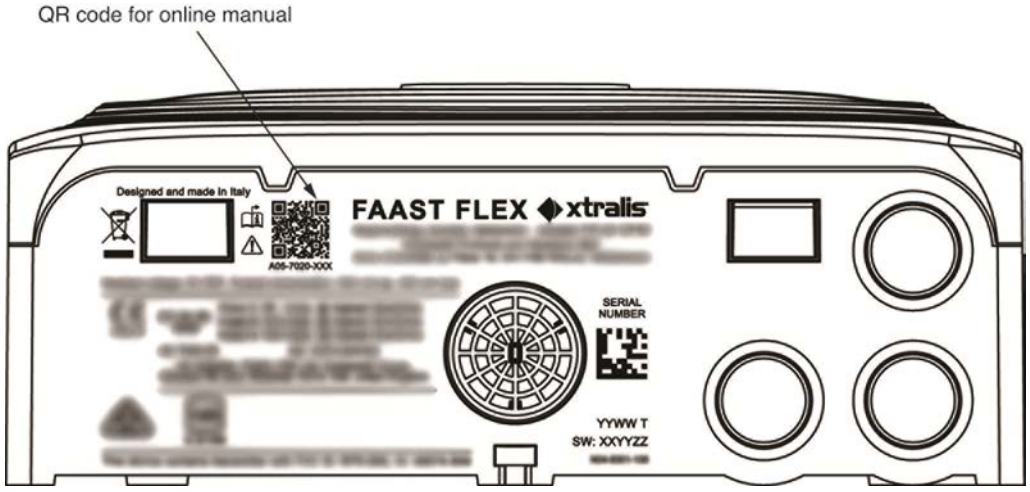


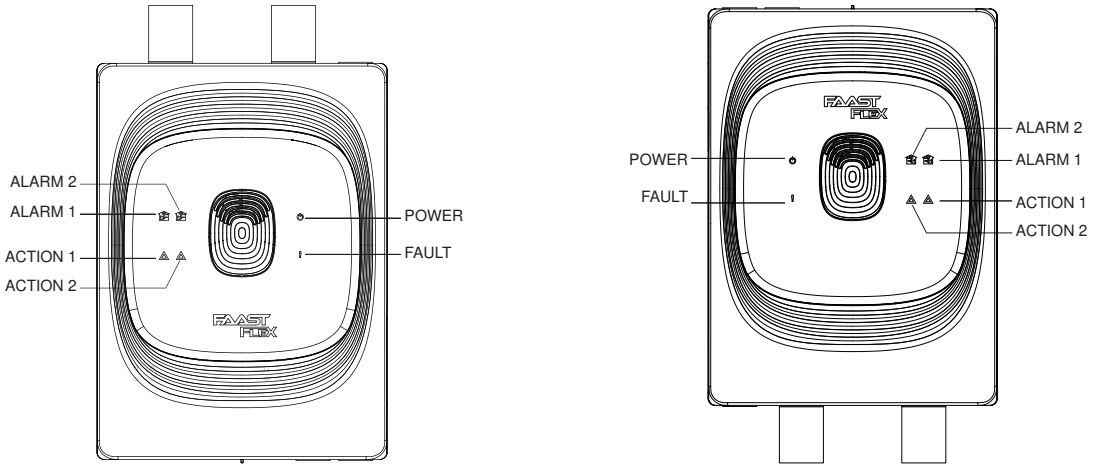
Figure 2-2: FAAST FLEX Product Information

2.3 Front Panel Indicators

The FAAST FLEX front panel has six indicator LEDs the communicate status information to the operator (see Figure 2-3).

Table 2-1: LED Indicators

LED	Indications	Meaning	Detector Cover
ALARM 1	Yellow, Steady	Delay timer activated on Channel 1	Open/Close
	Yellow, Slow Blink	Wait for authentication	Open
	Red, Steady	Alarm condition on Channel 1	Open/Close
ALARM 2	Yellow, Steady	Delay timer activated on Channel 2	Open/Close
	Red, Steady	Alarm condition on Channel 2	Open/Close
ACTION 1 ACTION 2	Yellow, Steady	Delay timer activated on Channel 1/2	Open/Close
	Red, Steady	Action condition on Channel 1/2	Open/Close
POWER	Green, Steady	Power on, normal operation	Close
	Green, Slow Blink	Change configuration	Open
	Yellow, Steady	Power on, system initializing	Open/Close
	Yellow, Fast Blink	Wait for USB stick	Open
	Yellow, Slow Blink	Wait , Normalize procedure in progress	Open
	Red, Steady	Protection mode - under or over voltage condition exists	Open/Close
	Red, Fast Blink	Service mode	Open
FAULT	Green, on for 3 seconds	Operation successful	Open
	Green, fast blink	Following initialization, indicates extended configuration is being loaded	Open/Close
	Yellow, Steady	One or more faults detected	Open/Close
	Yellow, Fast Blink	Wait for cover open to confirm unauthorized change configuration	Close
	Yellow, Slow Blink	One or more alerts detected	Open/Close
	Red, ON for 3 seconds	Operation result failed	Open
	Red, Fast Blink	Normalize procedure in process	Open
All LEDs	Yellow, Every 10 seconds	Disable	Open/Close
	Green, Steady	Identification device in BT connection	Open/Close



Standard Mounting **Inverted Mounting**

Figure 2-3: FAAST FLEX Indicator LEDs

2.4 Audible Alarms

The FAAST FLEX has a buzzer that provides the following audible feedback:

- Buzzer will sound whenever the user presses a button. This is the default configuration and it can be disabled with the Silence button (See section 6.3 WAIT Mode).
- Buzzer will sound for 0.5 seconds when the NORMALIZE procedure is completed (See section 6.3.4 Normalize).
- Buzzer will sound for 0.5 seconds when a data log file or a DIAGTEST.txt has been written to the USB drive (See section 6.3.8 Test Mode).
- Buzzer will sound for 0.5 seconds when the cover is opened or closed and there is a conflict between the DIP switch settings and the current device configuration (for example, if a DIP switch has been accidentally changed).
- Buzzer will sound for 0.5 when the detector is connected / disconnected to SMARTCONFIG (Bluetooth App).
- Buzzer will sound for 0.5 when the passcode recovery procedure is done.

2.5 Specifications

Table 2-2: FAAST FLEX Detector Specifications

Specification	Value
Electrical Characteristics	
Voltage Range	18-30 VDC (24 V Nominal)
Supply Current (@24 VDC 25°C)	Single Channel Model: 200 mA (typical) 400 mA (max) @ 24V
	Dual Channel Model: 220 mA (typical) 450 mA (max) @ 24V
General Purpose Input (GPI)	Activation Time 2s (min)
Relay Contact Ratings	2.0 A @ 30 VDC, 0.5 A @ 30 VAC
Environmental Ratings	
Operating Conditions	**Temperature:** • **Ambient:** -40 °C to 55 °C (-40°F to 131°F) • **Sampled Air:** -40 °C to 55 °C (-40°F to 131°F) **Humidity:** • 10-93% RH, non-condensing

Table 2-2: FAAST FLEX Detector Specifications (continued...)

Specification	Value
Flow Fault	± 20% of the reference flow (according to EN54-20)
IP Rating	IP40
Mechanical	
Exterior Dimensions	204 mm x 280 mm x 80.5 mm
Wiring	0.5 mm² to 2.5 mm² maximum
Pipe Network Layout	**Single Channel Model** • Linear pipe length: 1 X 105m (344 ft) • Branched pipe length: 2 X 105m (344 ft) or 4 X 68m (223 ft) **Dual Channel Model** • Linear pipe length: 2 X 105m (344 ft) • Branched pipe length: 4 X 105m (344 ft) or 8 X 49m (161 ft) **Note:** Results can be achieved using CAD.
Maximum Number of Holes	Refer to section "9 Piping Design Guidelines" for more information.
Pipe Spec (EN54-20 Compliance)	EN 61386 (Crush 1, Impact 1, Temp 31)
Outside Pipe Diameter	27 mm (nom) or 25 mm (nom) with plug/adapter
Shipping Weight	1.7 kg (including sensors)

3 Installation

3.1 Instruction Sheet

Refer to the graphical instruction sheet in the box for installation instructions. This instruction sheet (37328) is available online at www.xtralis.com.

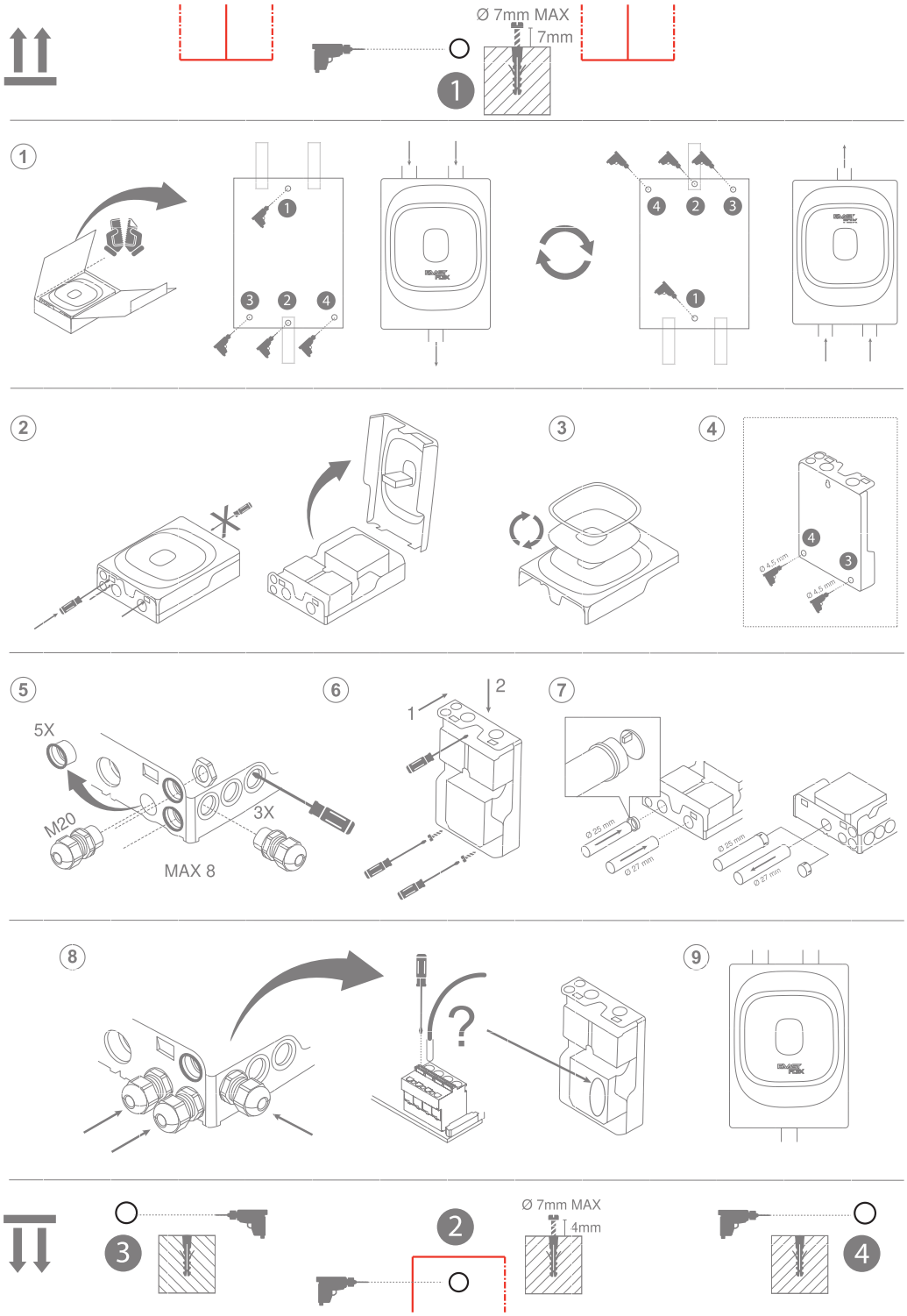


Figure 3-1: Graphical Installation Instructions

3.2 Mounting the Unit

The FAAST FLEX is mounted on any wall or flat surface that is conveniently located for access to the piping and electrical connections. It can be mounted in the standard orientation or inverted 180°. Once the proper location has been determined, mount the device as follows:

Note: The FAAST FLEX can be mounted with either two or four screws, depending on your specific requirements.

1. The cover of the box FAAST FLEX, a template for the mounting holes is provided (see Figure 3-2).
2. Use the template to mark the locations for the mounting holes, ensuring that all piping and electrical connections are located properly.

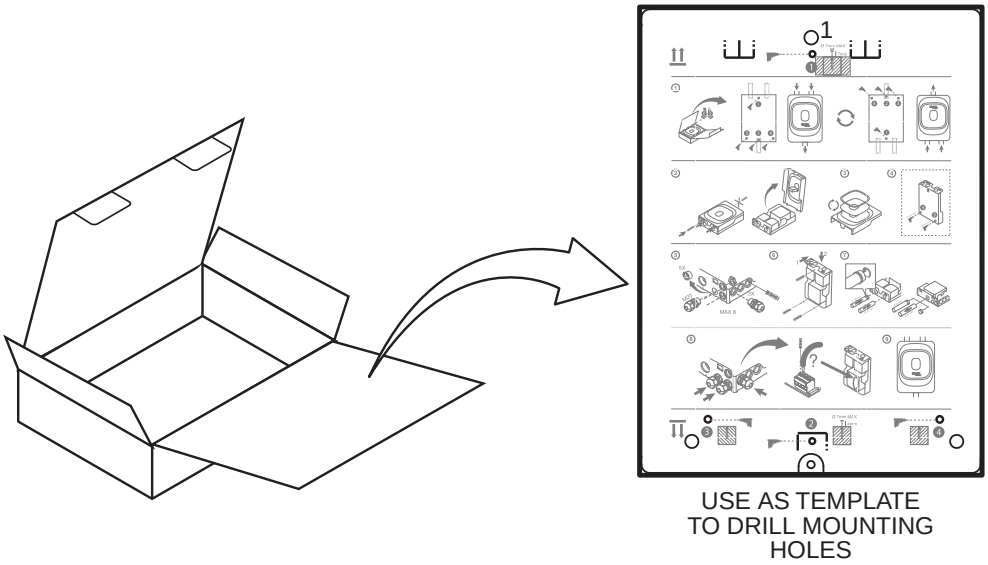


Figure 3-2: Mounting Template

3. Drill appropriate pilot mounting holes for M4 screws in the locations designated by the template.
4. Loosely install a screw in the Hole 1 location.
5. Position the FAAST FLEX in place over the mounting screw in Hole 1 (Figure 3-3) , and slide it down into place.
6. Install a mounting screw in Hole 2.
7. Tighten the two mounting screws, taking care not to overtighten. Over tightening the screws can damage the device.
8. Optionally, install mounting screws in Holes 3 and 4.

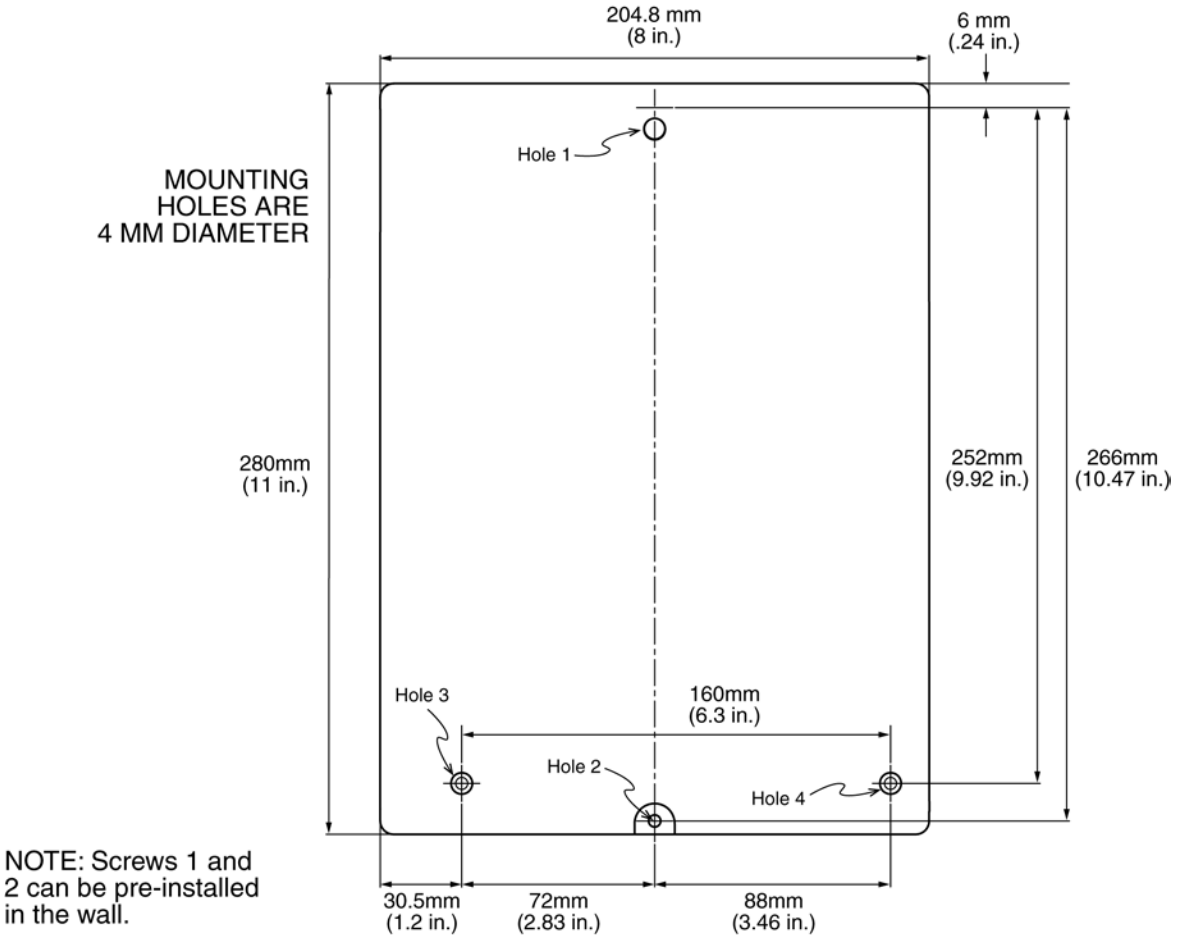


Figure 3-3: Mounting Hole Dimensions

3.3 Removing the Cover

1. Using a small screwdriver or other suitable tool, press in the two tabs **on the inlet side** of the FAAST FLEX (see Figure 3-4).
2. Rotate the cover up as shown and remove it.

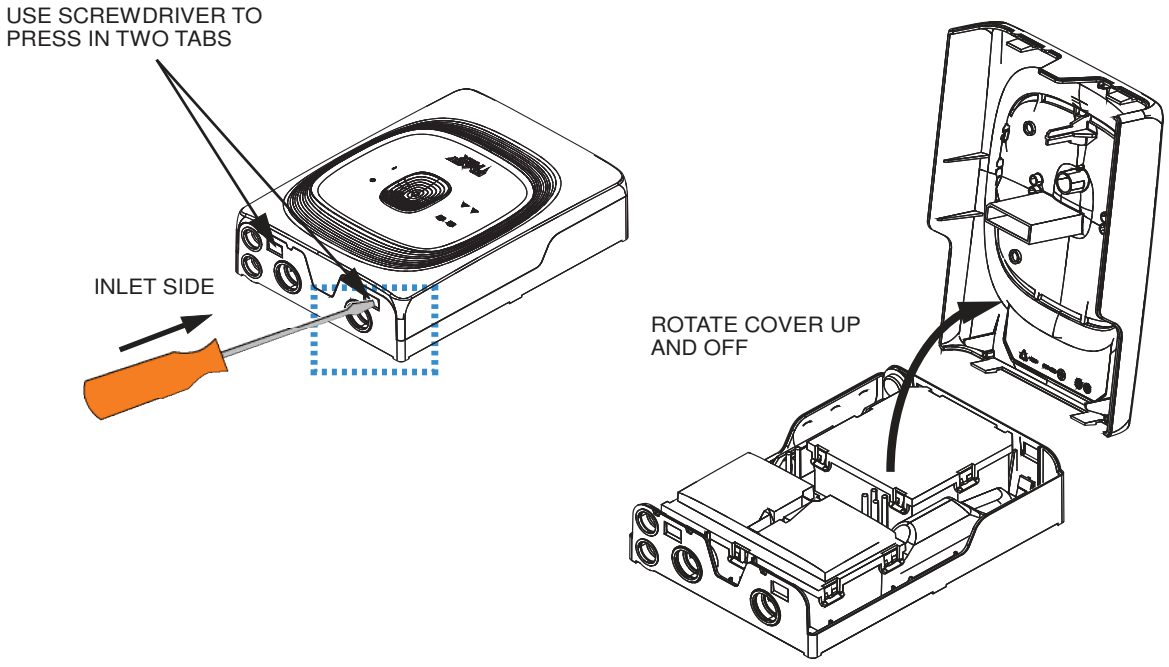


Figure 3-4: Removing the Cover

3.4 Orientation

The FAAST FLEX can be mounted either in standard orientation or inverted (see Figure 3-5). The access and location of the inlet and outlet pipes is usually the determining factor in selecting the orientation.

Note: Inverted installation must be set using dip-switch 9.

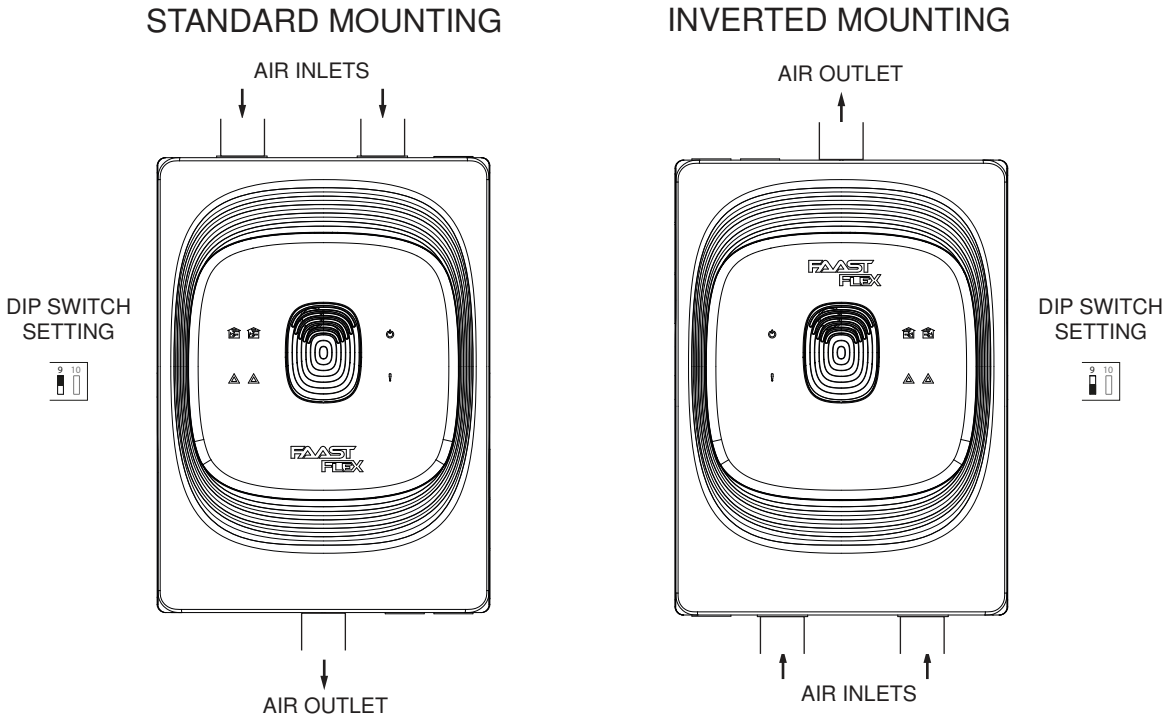


Figure 3-5: Mounting Orientation

3.5 Front Label

The device is shipped with the front panel labels installed for standard mounting. The labels are double-sided; one side is printed for standard mounting, and the reverse side is printed for inverted mounting (see Figure 3-6). The label should be installed to match the mounting orientation. To place the label, detach the 4 gray clips from inside the cover and snap the retainers off the device. Position the label as desired, then snap the retainer back in place.

Note: Inverted installation must be set using dip-switch 9.

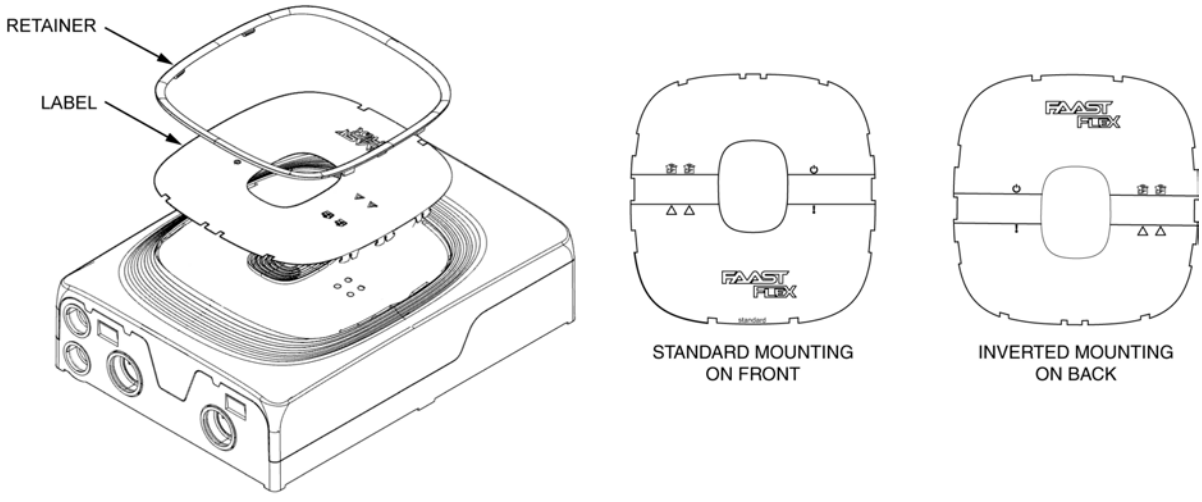


Figure 3-6: Front Label Installation

3.6 Piping Considerations

1. Inlet ports that are not used should remain sealed.

Caution: DO NOT glue piping into the inlet and exhaust ports. Pipes that are glued in will be deemed out of warranty, since they cannot be tested.

2. To avoid contamination by dust, debris, insects, or spiders, It is recommended that inlet and exhaust ports remain plugged before use. Seal up inlet and exhaust ports if the device is turned off during maintenance periods.
3. Whenever the FAAST FLEX is installed outside the risk area, it is recommended that the exhaust air from the device be returned to the risk area. This will reduce flow faults caused by pressure differences (see Figure 3-7).

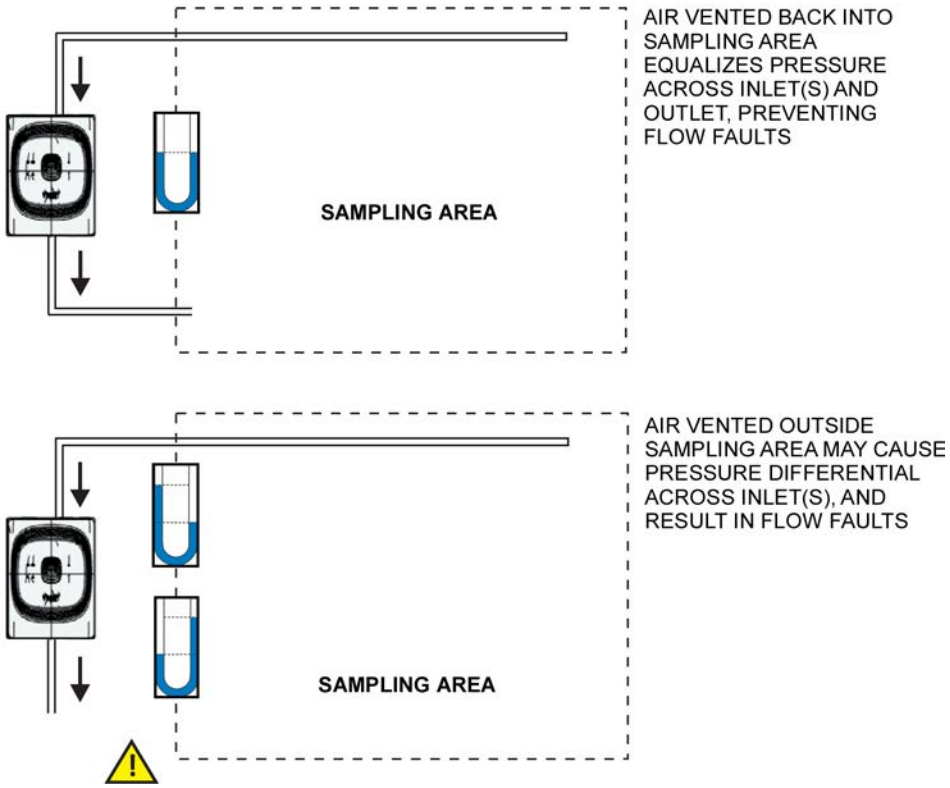


Figure 3-7: Piping Considerations

4. DO NOT USE GLUE OR ADHESIVE. The FAAST FLEX ports are designed to provide a complete seal without the use of any adhesives, glues, or other substances.
5. The FAAST FLEX is designed to accommodate either 27mm or 25mm pipe. If 25mm piping is used, an adapter is required. On the inlets, the pipe plugs can be used as an adapter by removing the center of the plug to open it up (see Figure 3-8). On outlet piping, the screen can be used as an adapter with 25mm piping (see Figure 3-9).

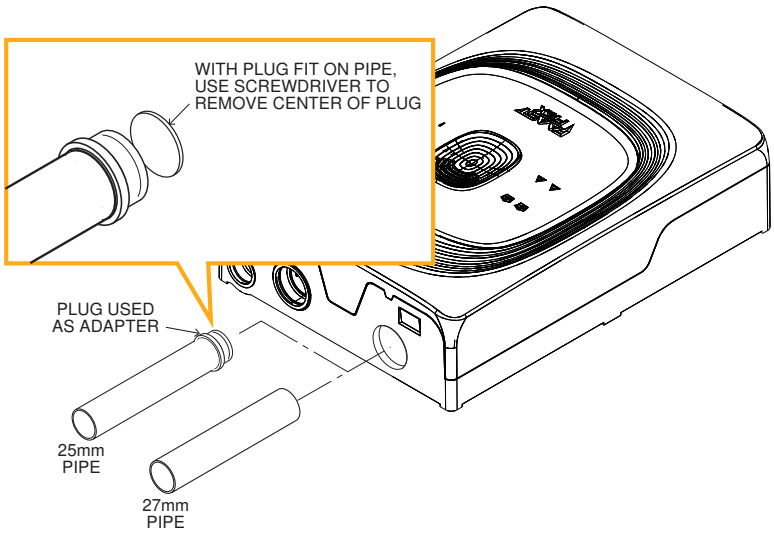


Figure 3-8: Inlet Piping Connections

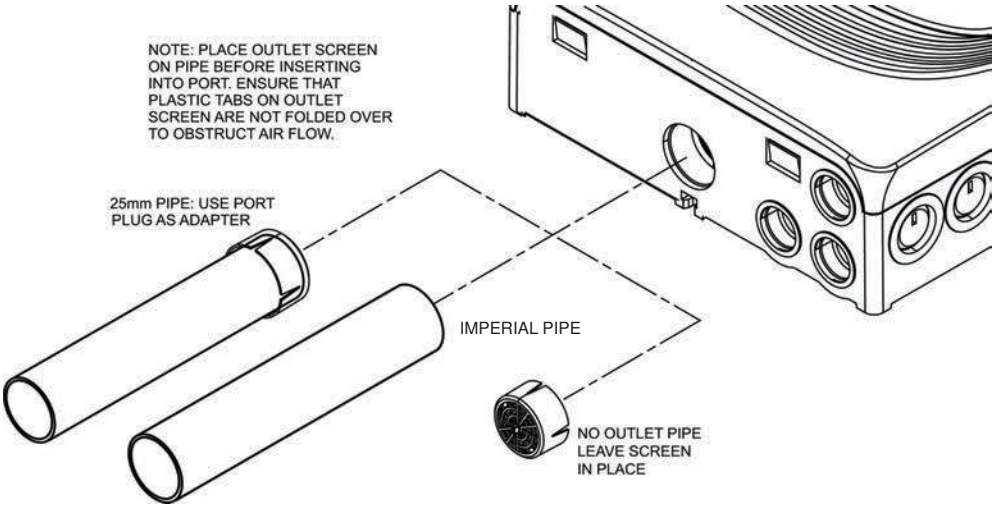


Figure 3-9: Outlet Piping Connections

3.7 Cable Access

Determine the cable gland holes that will be used for your installation. The specific holes used will be different depending on the specifics of your installation. The top and bottom cable ports use a 20mm gland. For the side ports, you must use an appropriate punch tool (such as a screwdriver) to gently tap the covers out of the selected holes. Figure 3-10 shows the locations of the available cable ports.

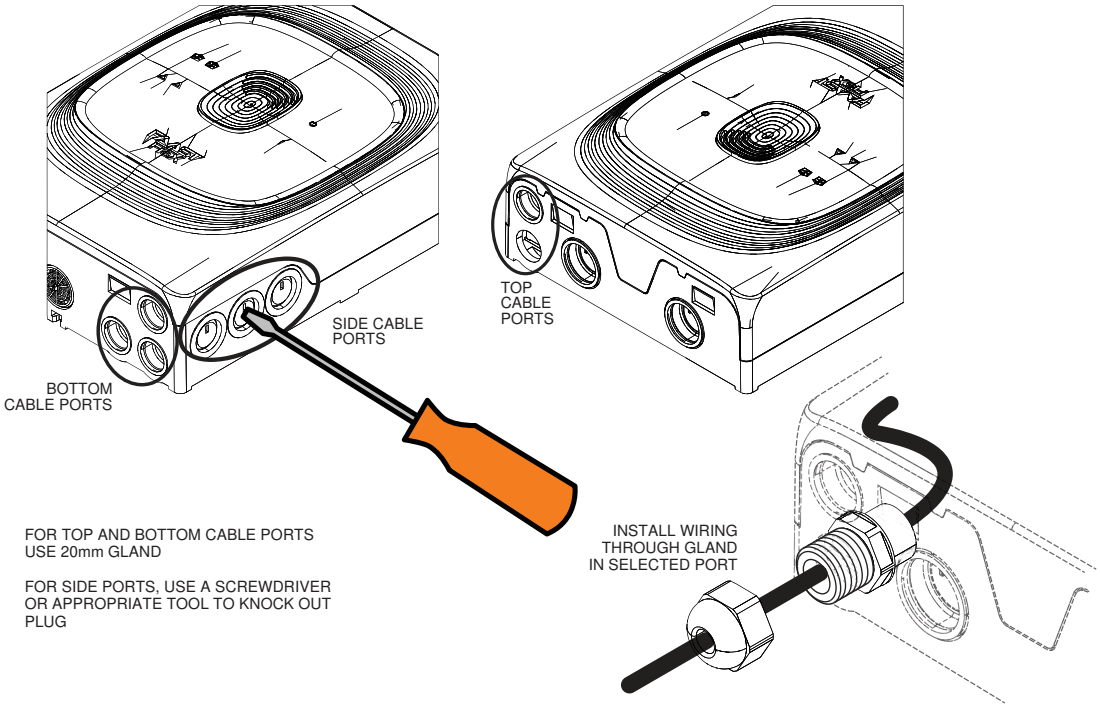


Figure 3-10: Cable Ports

4 Wiring Installation

4.1 Wiring Considerations

1. All wiring must comply with local requirements and regulations.
2. Panel wiring must comply with the recommendations of the panel manufacturer.
3. Always use appropriate gauge wire. Inspect all connections to ensure they are tight and secure.
4. Remove the cover as shown in Figure 3-4.
5. Electrical connections are made to the terminal blocks as shown in 4.2. Wire insulation should be stripped approximately 5mm from the end. Using a small screwdriver, push down on the small tab on the terminal block, and then insert the wire into the corresponding hole.

Note: Wiring diagrams are printed on the internal covers of the detector.

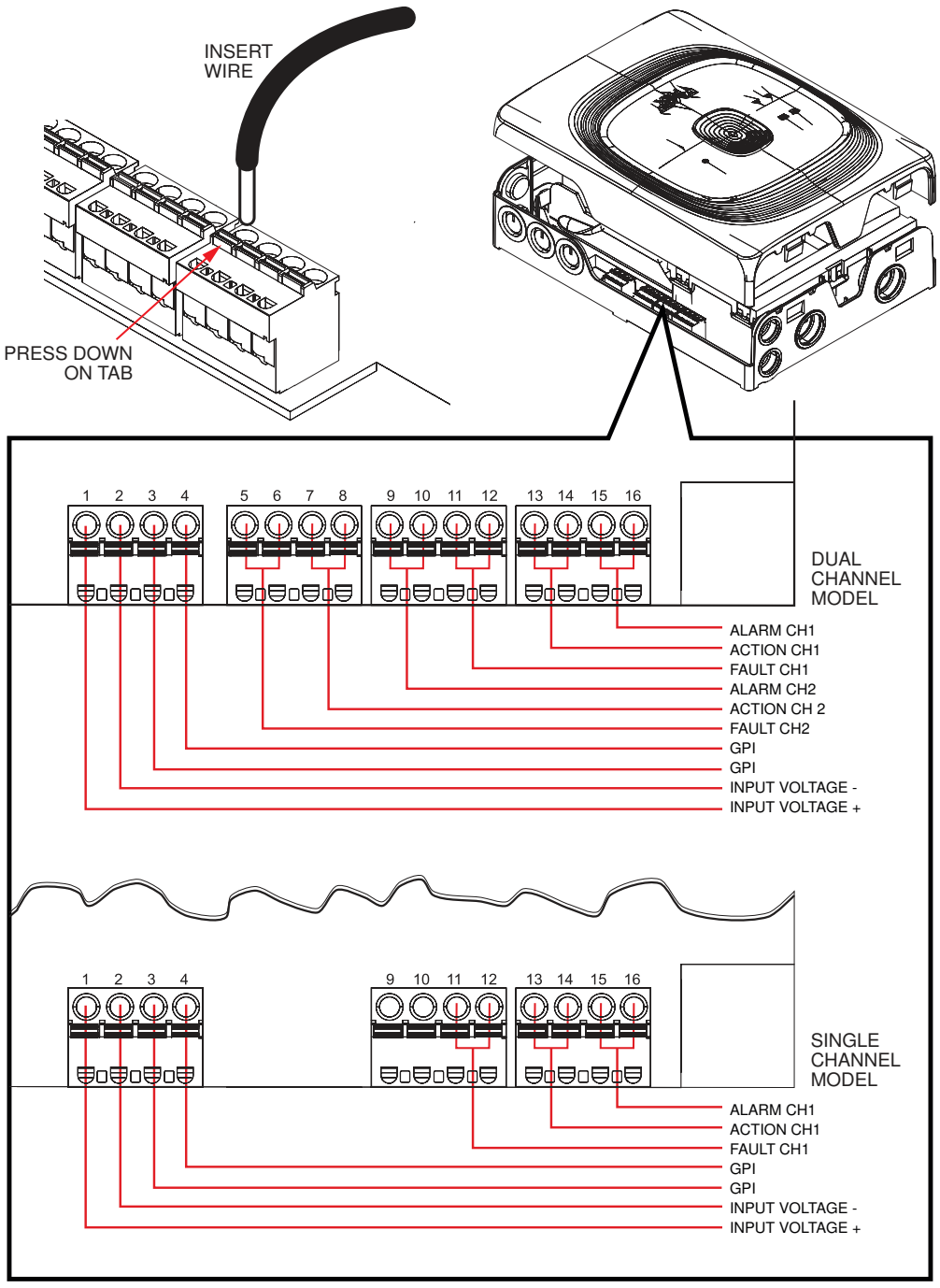


Figure 4-1: Wiring Connections

4.2 Relay Outputs

For all the versions of the FAAST FLEX single pole, changeover, unsupervised contacts for Fault, Alarm and Action are provided for each channel. Alarm and Action relays are normally de-energized. They are switched on by the unit command. See table below for more details.

Note: In case of power down, Faults are activated. On 2 Channel models, generic fault conditions activate both channels relays.



Caution: Output channel status should be checked before powering any circuit served by the output channel itself to avoid any position change due to either shipment or installation handling.

Table 4-1: Relay Outputs

LED	Set Condition	Indications	Meaning
ALARM 1 / 2	Alarm condition reached	LATCHED: Alarm reset sequence from user	
		UNLATCHED: Alarm condition ended	
ACTION 1 / 2	Action condition reached	LATCHED: Action reset sequence from user	
		UNLATCHED: Action condition ended	
FAULT 1 / 2	One or more Fault condition(s) involving one or both channels are recognized	LATCHED: Fault reset sequence from user	i.e. Flow or sensor communication faults involve the corresponding channel; aspirator fault involves both channels
		UNLATCHED: Fault condition ended	

4.3 GPI (General Purpose Input)

One GPI is provided.

4.3.1 OUT OF BOX configuration

In OUT OF BOX configuration, when a transition between normal state (open) and active state (short) is detected, the device will perform a single device RESET. In OUT OF BOX configuration, only unbalanced configuration is available.

5 User Interface

There are four buttons located under the cover that are used to configure various operating parameters and perform additional setup, data logging, and test functions (see Figure 5-1 and Figure 5-2).

Notes:
- *: Enter the passcode to start the procedure.
- **Underlined**: Press and hold the button for 5 seconds to start the procedure.

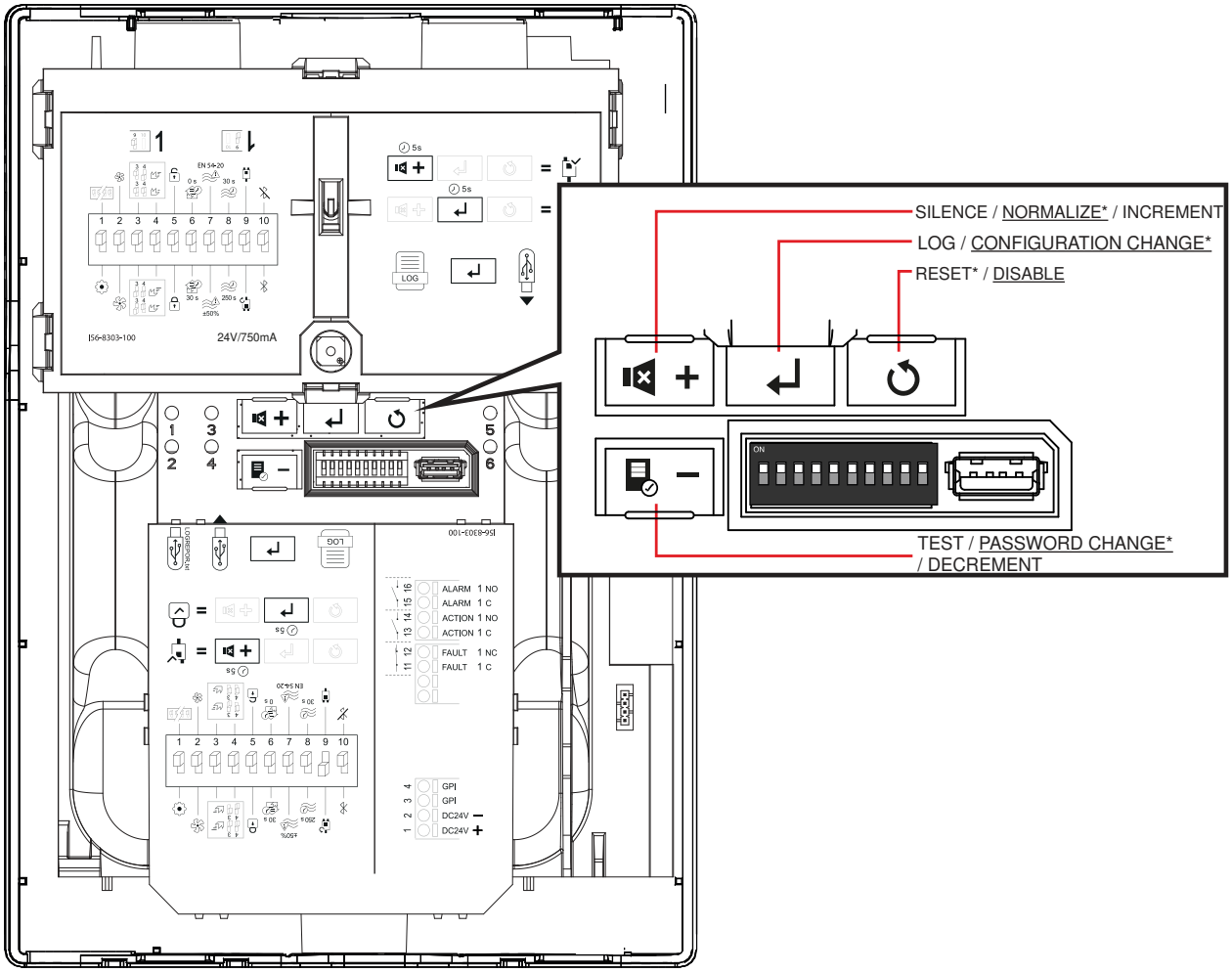


Figure 5-1: User Buttons (Single Channel)

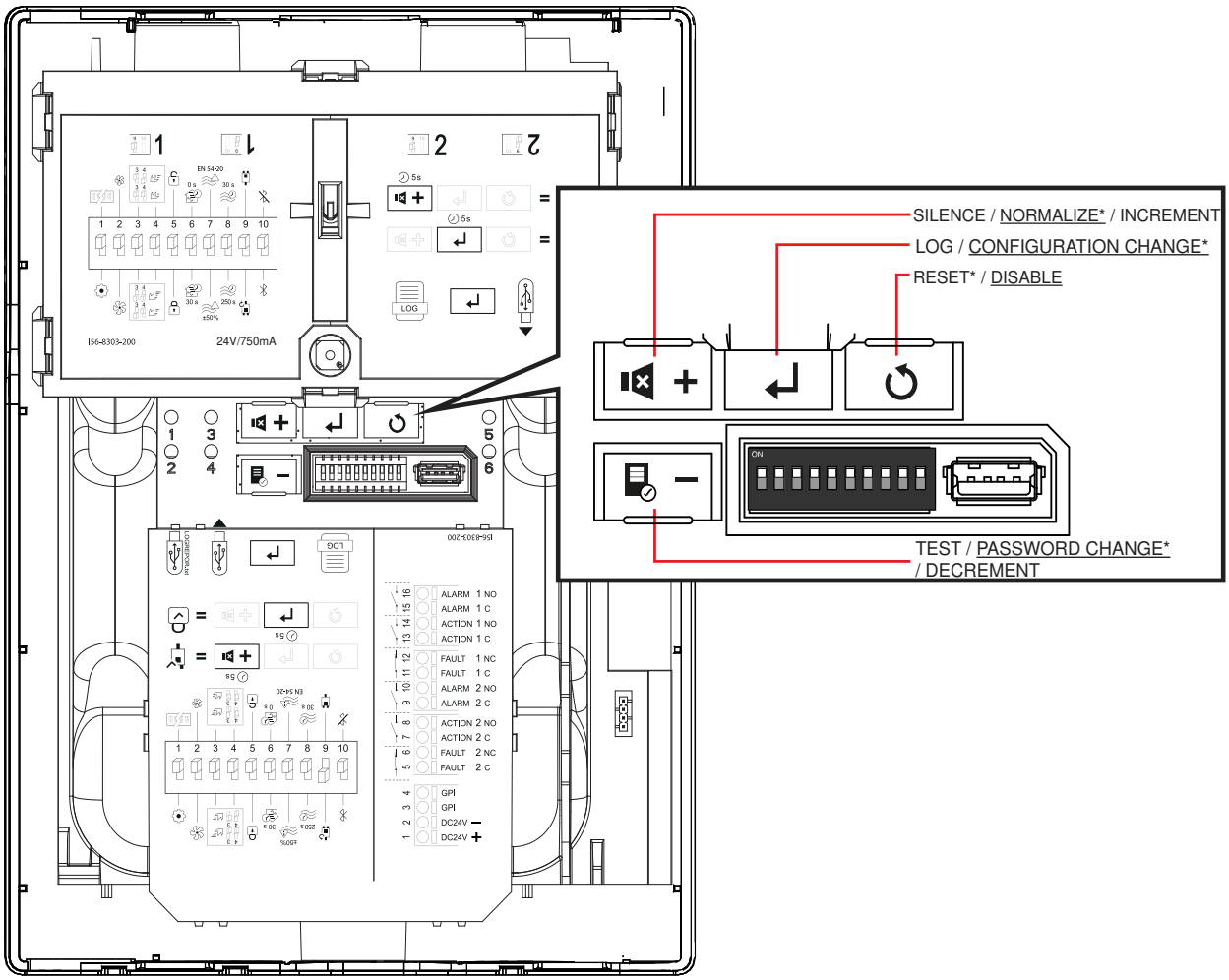


Figure 5-2: User Buttons (Dual Channel)

6 Working Modes

In normal operation when the device is powered on, it will initialize for 30 seconds and then it will enter NORMAL mode. If the device is in NORMAL mode and the cover is opened the device will enter WAIT mode, after a 60 seconds timeout without any action from the user the device enters SERVICE Mode.

Closing the cover while the device is in Service mode causes the device to enter INITIALIZATION Mode and after 30 seconds it will enter NORMAL mode. Closing the cover while the device is in WAIT mode will return the device to NORMAL mode. The device enters PROTECTION mode in certain situations, refer to section 6.4 PROTECTION Mode for more information. Figure 6 illustrates the working modes of the device.

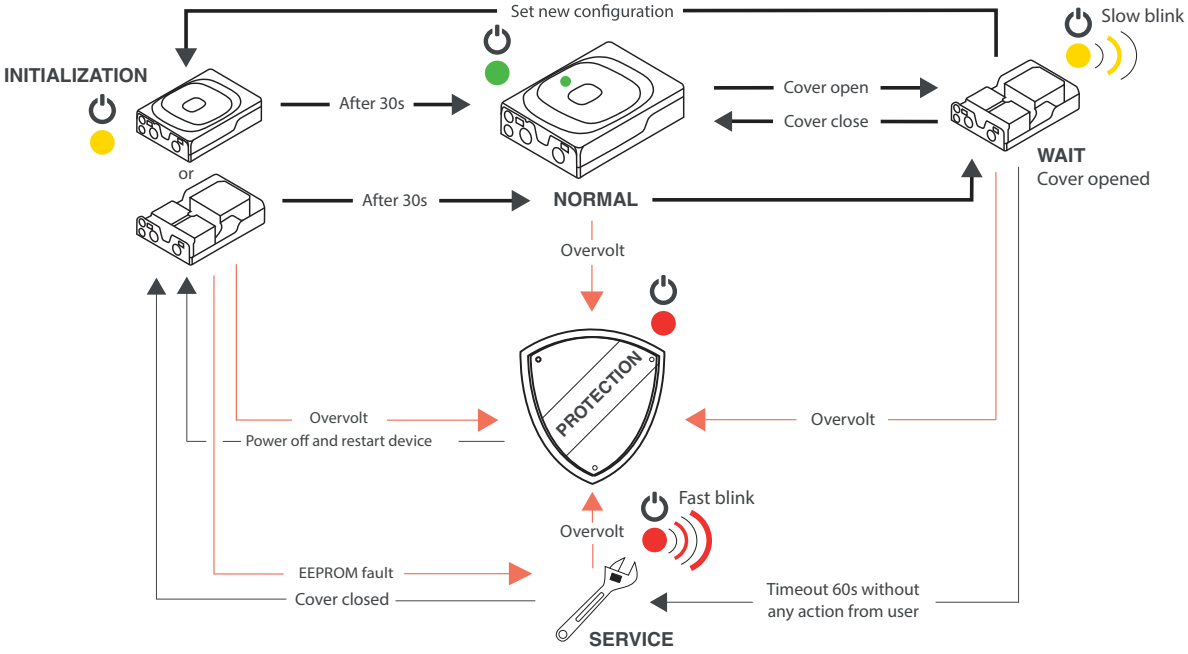


Figure 6-1: Working Modes

6.1 INITIALIZATION Mode

After the power up, the device performs an initialization sequence with the following actions, during which the POWER LED is on steady yellow.

- Checks power supply.
- Tests peripheral equipment connected to the device.
- Reads the EEPROM and DIP switch positions for configuration.

If there is a conflict between the DIP switch positions and the EEPROM values, the next step depends on whether the cover is open or closed.

1. If the cover is open, the device will prompt the user to enter the password in order to accept the new DIP switch position changes.
2. If the cover is closed The device enters the “waiting for cover” mode where, for 60 seconds, FAULT LED will blink fast yellow. If the cover is opened within this 60 second period, the device will prompt the user for password and will accept changes that have been made.
   If the cover is not opened within the 60 second window, the device will signal a configuration fault and will turn on the buzzer for 0.5 every time the cover is opened or closed

If the device has been configured to use the extended mode, at the end of initialization the FAULT LED blinks fast green for 3 seconds before changing - either to WAIT mode if the cover is open, or to NORMAL mode if the cover is closed.

6.2 NORMAL Mode

This is normal working mode. The device monitors the power supply voltage, aspirator speed, smoke levels, air flows, cover status, and signals and logs faults, actions, alarms.

6.3 WAIT Mode

The WAIT mode is a sub-mode of the NORMAL mode. There are two ways to enter into the WAIT mode:

1. If the cover is open the device enters WAIT mode after power-on and initialization.
2. If the cover is opened while the device is in NORMAL mode.

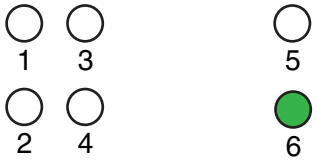
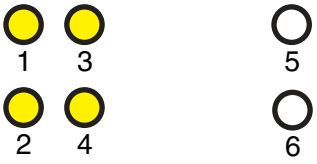
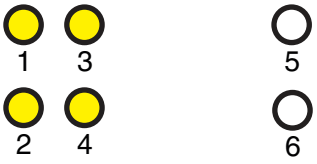
On entering WAIT Mode the POWER LED blinks yellow (slow blink). At this point the device is waiting for a button press.

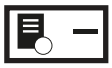
After 60 seconds of no activity in WAIT mode the device will automatically go into the SERVICE mode. Every time an action (button or BLT) is performed in WAIT mode the timeout timer restarts. If a non-protected action (no passcode required) is requested, the command is executed and then the device comes back to WAIT mode. If a protected action (passcode required) is requested, user is prompted to enter the passcode. If the passcode is correct the device will perform the requested action.

WAIT Mode Actions

Note: For a long press of a button, press and hold it for 5 seconds.

Table 6-1: WAIT Mode Actions

Action	Button	LED Display	Description
Toggle button beeps ON/OFF	Short Press 		LED 6 will show green ON for 3 seconds as feedback. Default beeps ON.
Initiate NORMALIZE procedure ***(Passcode Authentication Required - if not authenticated, you must enter the passcode to start procedure.)***	Long Press 		LEDs 1 through 4 will show yellow to indicate that the NORMALIZE procedure has started. See section 6.3.4 Normalize.
Copy LOGREPOR.TXT to USB drive	Short Press 		USB drive must be inserted. See section 6.3.6 Event Logs for more information.
Enter CHANGE CONFIGURATION MODE ***(Passcode Authentication Required)***	Long Press 		LEDs 1 through 4 will show yellow to indicate change configuration procedure has started. See section 6.3.3 Changing Configuration Mode.
Reset active Alarms or Faults ***(Passcode Authentication Required)***	Short Press 		Resets the latched alarm and faults status.
Toggles DISABLE Mode ON/OFF ***(This option is NOT AVAILABLE if GPI is disabled in extended mode)***	Long Press 		LEDs 1 through 4 will show yellow to indicate disable mode has turned ON/OFF.

Action	Button	LED Display	Description
Place unit in TEST Mode	Short Press 		See section 6.3.8 Test Mode for more information
Initiate CHANGE PASSWORD procedure ***(Passcode Authentication Required - if not authenticated, you must enter the passcode to start procedure.)***	Long Press 		LEDs 1 through 4 will show yellow to indicate that the CHANGE PASSWORD procedure has started. See section 6.3.2 Changing the Passcode for more information.

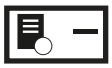
6.3.1 Authenticating - Entering Passcode



Caution: THE DEFAULT PASSCODE IS 000000 AND IT MUST BE CHANGED DURING DEVICE COMMISSIONING! BE SURE TO RECORD THE NEW PASSCODE IN ACCORDANCE WITH YOUR LOCAL POLICIES.

Overview

Certain actions related to operation and configuration of the FAAST FLEX are protected by use of a six digits passcode. To enter the passcode, the user must press the SILENCE/+ or TEST/- buttons to enter the six digits of the passcode. Once the digit has been entered, press the ENTER button to confirm the digit. For example, to enter a 3 you would press the SILENCE/+ button three times. If you pressed the SILENCE/+ button four times, and then pressed the TEST/- button once, that would also register as a 3. Once all six digits have been entered, press the ENTER button again to confirm entry.

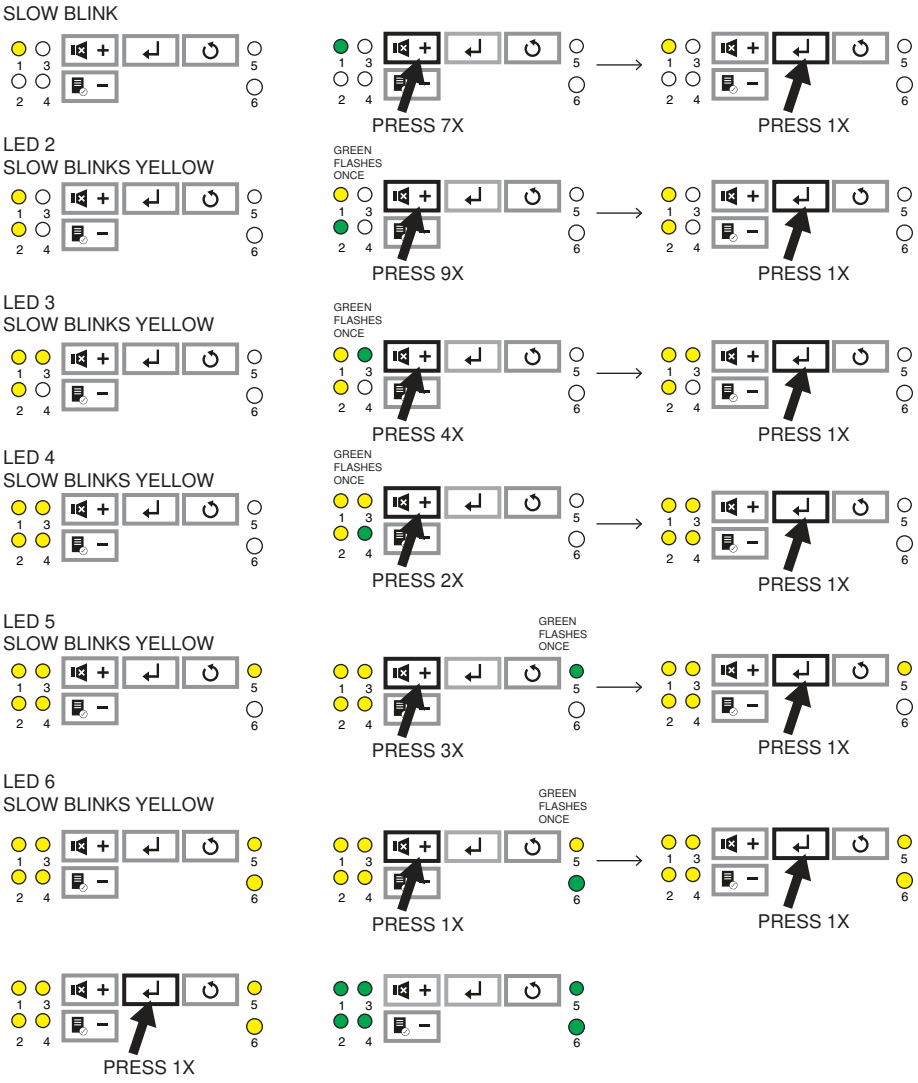
Button		Action(s)
SILENCE/+		Increments the current digit (if smaller than 9).
TEST/-		Decrements the current digit (if greater than 0).
RESET		Cancels changes to the current digit entry and prompts for the user to re-enter the digit.
ENTER		Confirms the current digit and the corresponding LED shows yellow. If all six digits have been confirmed and are correct, all LEDs will show green. If incorrect, all LEDs will show red for 3 seconds.

Access to some functions requires a passcode. Follow these steps to enter the passcode (see Figure 6-2):

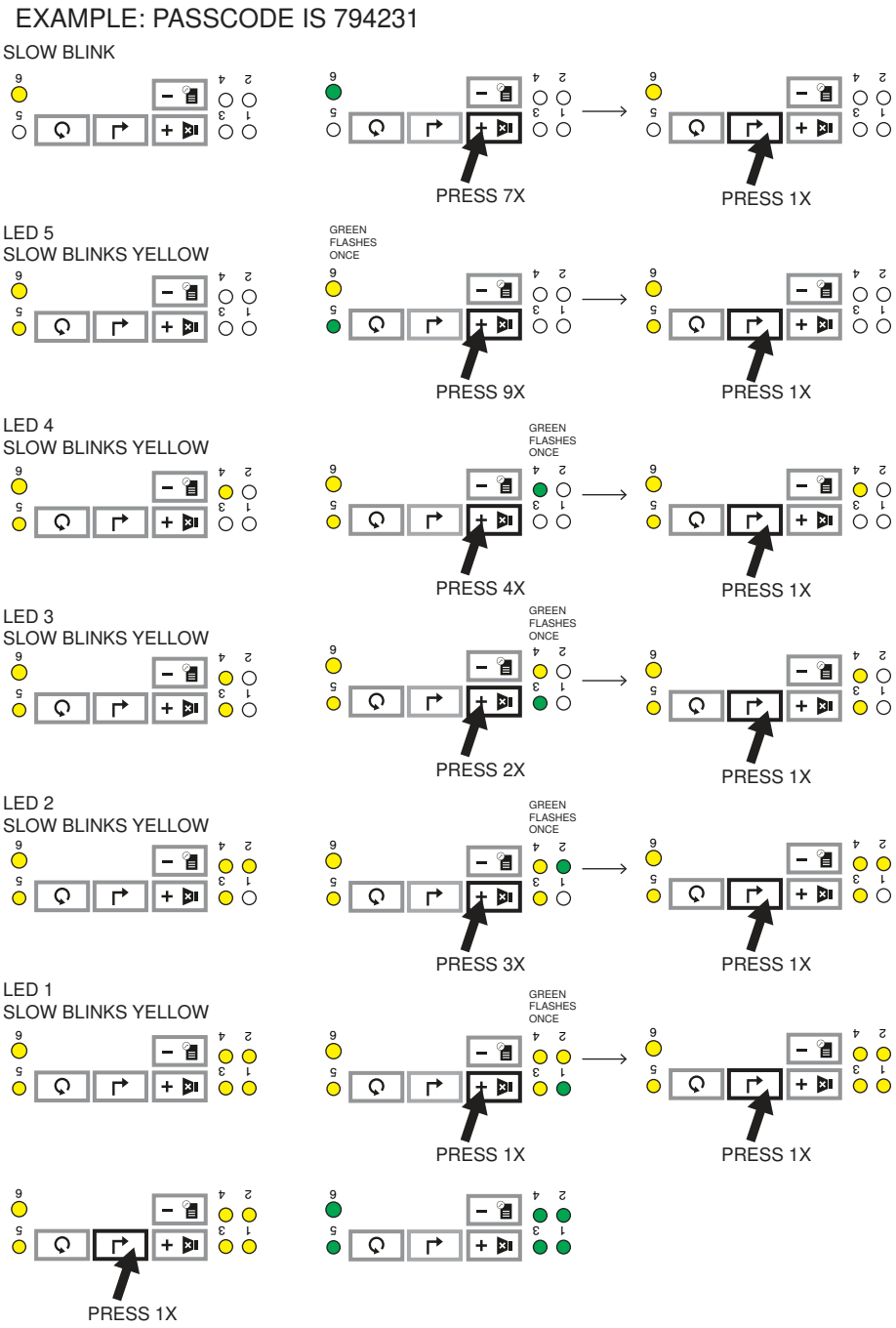
Note: Passcodes are 6 digits long and digits from 0 to 9 are valid.

1. When you access a function that requires authentication, LED 1 will blink yellow waiting for the first digit (60 seconds timeout to cancel operation).
2. Using the SILENCE/+ or TEST/- buttons, enter the first digit of the passcode.
3. Press the ENTER button to confirm the first digit. LED 1 will be steady yellow and LED 2 will blink slow yellow. If not preceded with SILENCE/+ or TEST/- buttons, the digit will be 0.
4. Repeat the process until all six digits of the passcode have been entered.
5. After the sixth digit has been entered press enter to confirm and if the passcode is correct all six LEDs will show steady green for 3 seconds. If the passcode is incorrect, all six LEDs will show steady red for 3 seconds and the process must be restarted.

EXAMPLE: PASSCODE IS 794231



Standard Mounting



Inverted mounting

Figure 6-2: Entering Passcode Example

6.3.2 Changing the Passcode

Example - Changing Passcode from 000000 to 123456

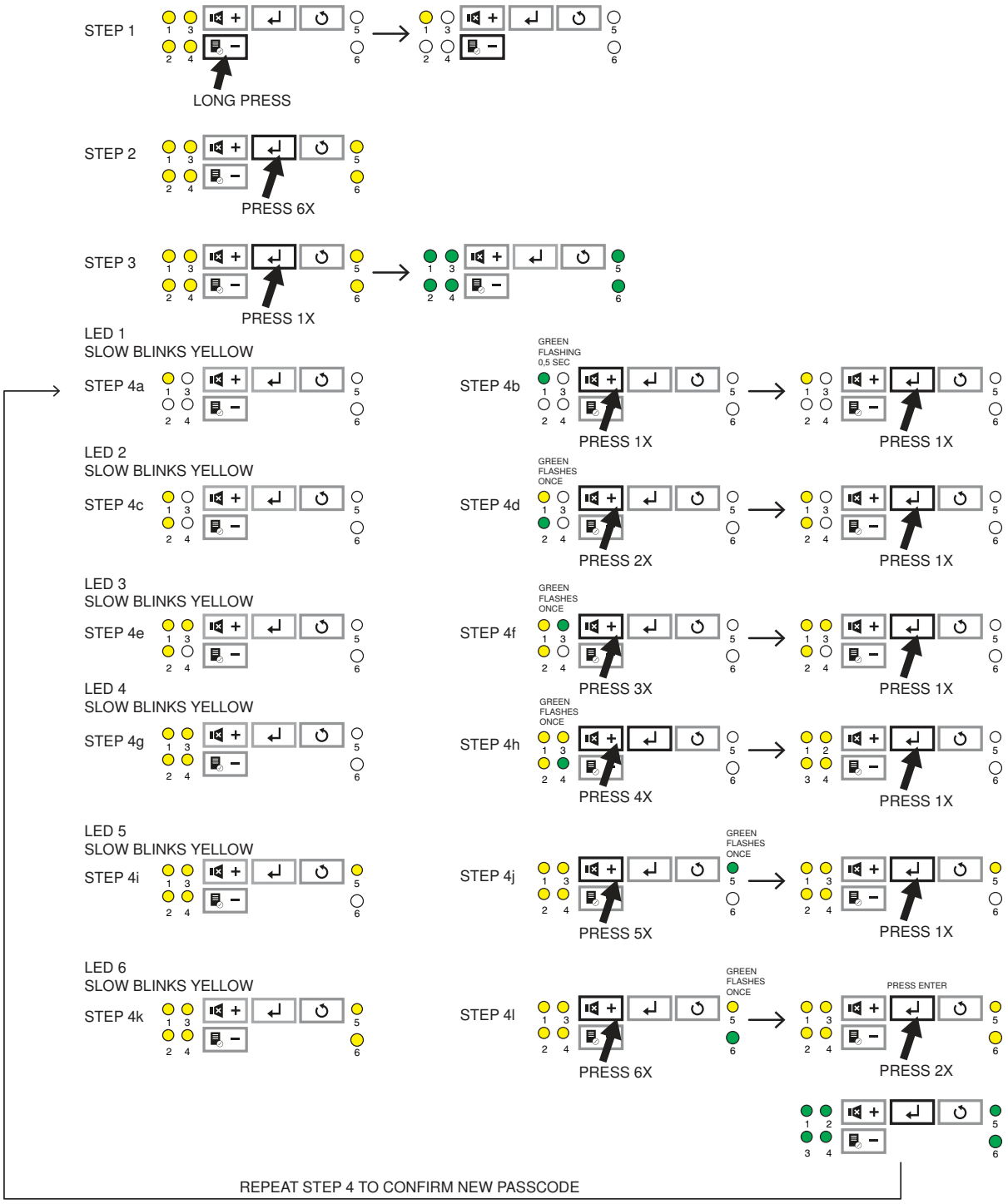
To change the passcode you must first enter the current passcode. Then you must enter the new passcode, and then re-enter the new passcode a second time to confirm that it is correct. The following procedure demonstrates changing the passcode from 000000 to 123456.

1. Long-press the TEST button to enter the CHANGE PASSCODE mode. LEDs 1, 2, 3 and 4 will flash yellow, and then LED 1 will slow blink yellow indicating that the device is waiting for entry of the first digit.

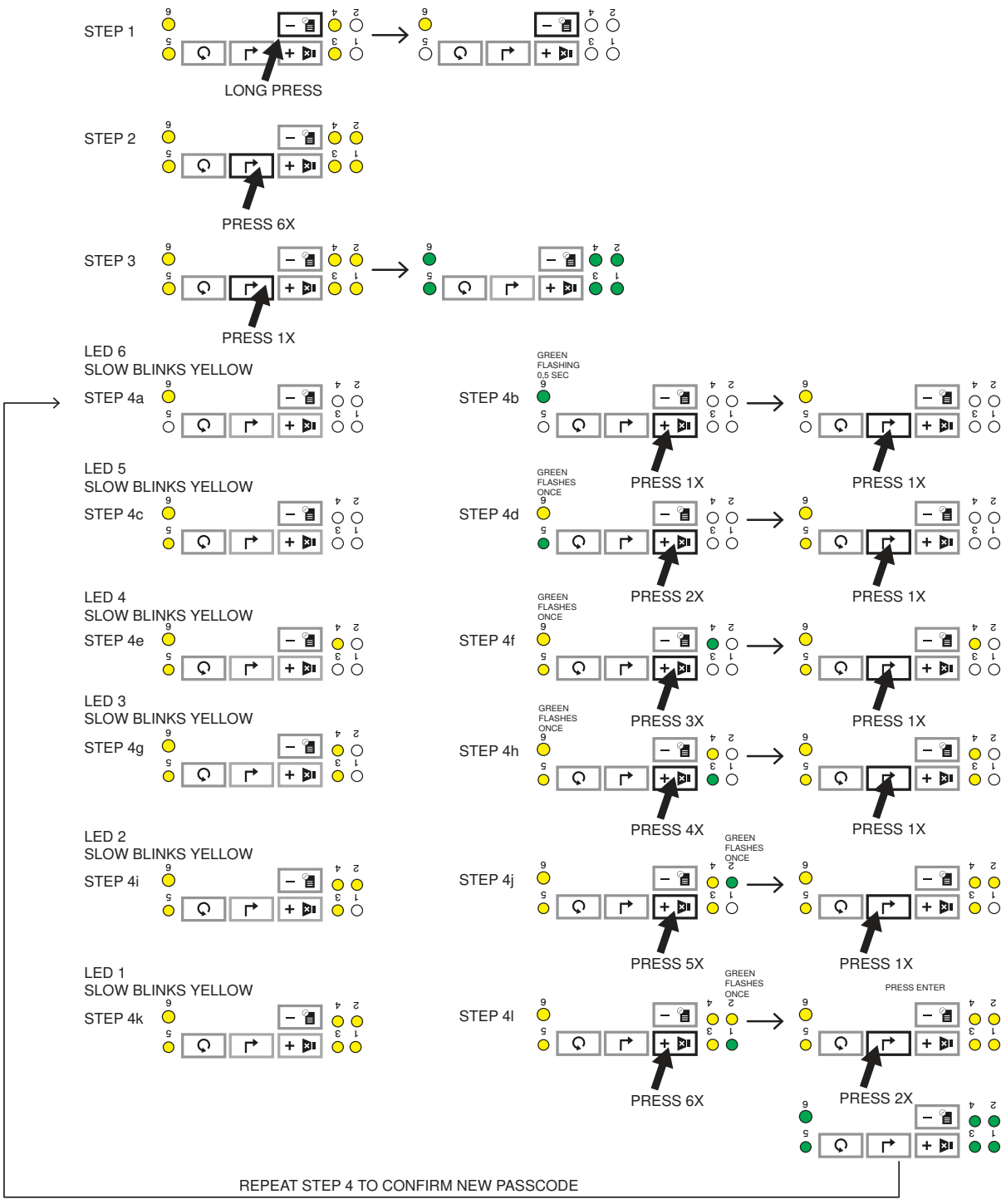
Note: The digit counter starts at 0, so pressing the ENTER button will record 0 as the current digit. The following table summarizes the actions of button presses during the procedure.

2. Press the ENTER button six times to enter the default passcode (000000). Each time you press the ENTER button, the LED corresponding to that digit will show steady yellow indicating the digit has been entered. Once the sixth digit is entered, all six LEDs will show steady yellow.
3. Press the ENTER button again to confirm the passcode entry. The LEDs will all show green for five seconds, then will go out.
4. LED 1 will show steady yellow, prompting you for the first digit of the new passcode. Enter the new passcode as follows:
   a. Press the SILENCE/+ button one time to enter 1 as the first digit. LED 1 will flash green as you press the SILENCE/+ button.
   b. Press the ENTER button to enter the first digit. LED 1 will show steady yellow.
   c. Press the SILENCE/+ button twice to enter 2 as the second digit. LED 2 will flash green as you press the SILENCE/+ button.
   d. Press the ENTER button to enter the second digit. LED 1 and LED 2 will show steady yellow.
   e. Press the SILENCE/+ button three times to enter 3 as the third digit. LED 3 will flash green as you press the SILENCE/+ button.
   f. Press the ENTER button to enter the third digit. LEDs 1, 2, and 3 will show steady yellow.
   g. Press the SILENCE/+ button four times to enter 4 as the fourth digit. LED 4 will flash green as you press the SILENCE/+ button.
   h. Press the ENTER button to enter the fourth digit. LEDs 1, 2, 3 and 4 will show steady yellow.
   i. Press the SILENCE/+ button five times to enter 5 as the fifth digit. LED 5 will flash green as you press the SILENCE/+ button.
   j. Press the ENTER button to enter the fifth digit. LEDs 1, 2, 3, 4, and 5 will show steady yellow.
   k. Press the SILENCE/+ button six times to enter 6 as the last digit. LED 6 will flash green as you press the SILENCE/+ button.
   l. Press the ENTER button to enter the last digit. All LEDs will show green for 5 seconds, and then will go out.
5. Repeat the procedure in step 4 to re-enter and confirm the new passcode.

Note: After three failed attempts to enter the passcode, the unit will return to WAIT mode. The user must wait 20 seconds before attempting to re-enter the passcode. Each subsequent attempt will increase the wait time by an additional 20 seconds.



Standard Mounting



Inverted Mounting

Figure 6-3: Changing Passcode

6. Exit with a new passcode.

6.3.3 Changing Configuration Mode

The device can be configured using two ways:

1. Buttons, dip-switches and LEDs
2. Setting dip-switches 1 and 10 through the Bluetooth app connected to the detector.

Follow these steps to change device configuration:

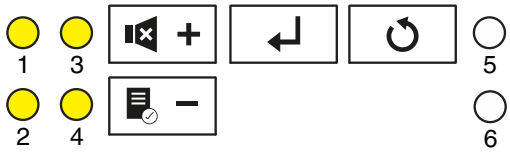
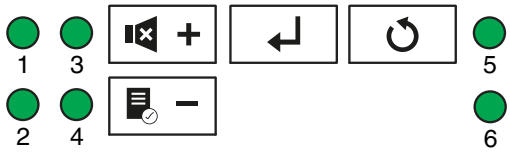
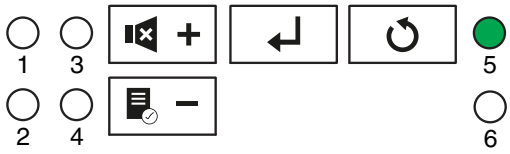
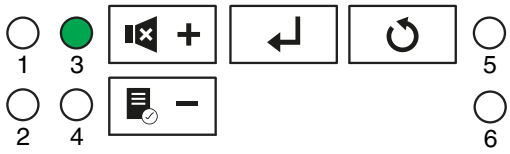
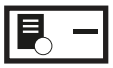
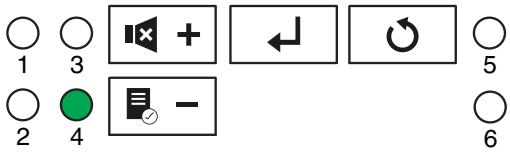
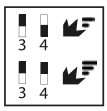
Action	Button	LED Display	Description
While the unit is in WAIT mode, long press the ENTER button.	Long Press 		LEDs 1-4 will flash yellow and then go out.
Enter the current passcode.			After passcode is entered correctly, all LEDs will show green. See section 6.3.1 Authenticating - Entering Passcode.
Change DIP switch settings as desired.			LED 5 will slow blink green.
Increment current hour by 30 minuets (for a max of +14 hours)	Short Press 		LED 3 blinks green every time user presses the button.
Decrement current hour by 30 minuets (for a max of -14 hours).	Short Press 		LED 4 blinks green every time user presses the button.
Press the ENTER button. The new configuration is saved and the device exits configuration mode.	Short Press 		The device will restart with the new configuration active.

Table 6-2: DIP Switch Configuration

Switch	Icon	Setting	Position	Description
1		Configuration Mode	ON	Enables configuration using DIP switches
			OFF	Disables configuration using DIP switches Enables extended configutration using the SMARTCONFIG app
2		Aspirator Speed	ON	LOW aspirator speed
			OFF	HIGH aspirator speed
3 and 4		Alarm Level (See Table 6-3 for more information on Alarm Levels)	ON, ON	HIGH: Alarm = Level 0, Action = Level 0
			ON, OFF	MEDIUM: Alarm = Level 2, Action = Level 1
			OFF, ON	MEDIUM: Alarm = Level 2, Action = Level 1
			OFF, OFF	LOW: Alarm = Level 4, Action = Level 3
5		Alarm/Action/Fault	ON	Unlatched
			OFF	Latched
6		Alarm Mode	ON	Instant Fire
			OFF	Cumulative, Action delay 30 seconds and Alarm delay 30 seconds
7		Flow Fault Threshold	ON	Apply EN-54-20 flow fault criteria policy for reference flow
			OFF	± 50% (not EN-54-20 compliant)[1]
8		Flow Fault Delay	ON	30 seconds
			OFF	250 seconds
9		Detector Orientation	ON	Standard
			OFF	Inverted
10		Bluetooth	ON	Disabled
			OFF	Enables access to SMARTCONFIG app. If DIP Switch 1 if ON, you can monitor settings, to change the settings switch SW1 ON (Extended Mode)

[1] Used on customer responsibility

Table 6-3: Smoke Levels Description

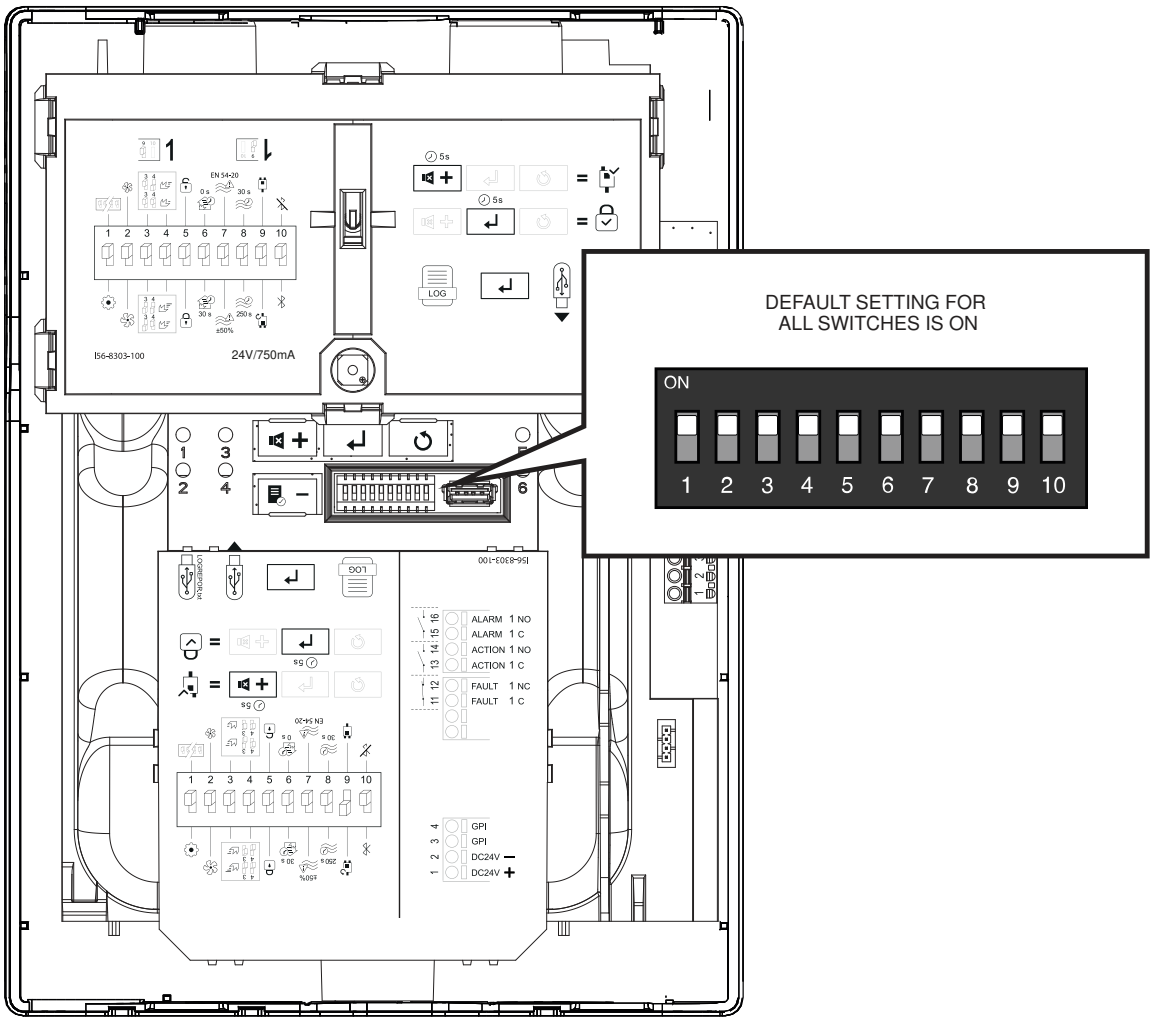
Alarm Level	Obscuration Detected	
	Imperial Units	Metric Units
Alarm level 0	0.014% obs/ft	0.046% obs/m
Alarm level 1	0.02% obs/ft	0.066% obs/m
Alarm level 2	0.03% obs/ft	0.098% obs/m
Alarm level 3	0.05% obs/ft	0.164% obs/m
Alarm level 4	0.10% obs/ft	0.328% obs/m

About Faults, Alerts, and Alarms

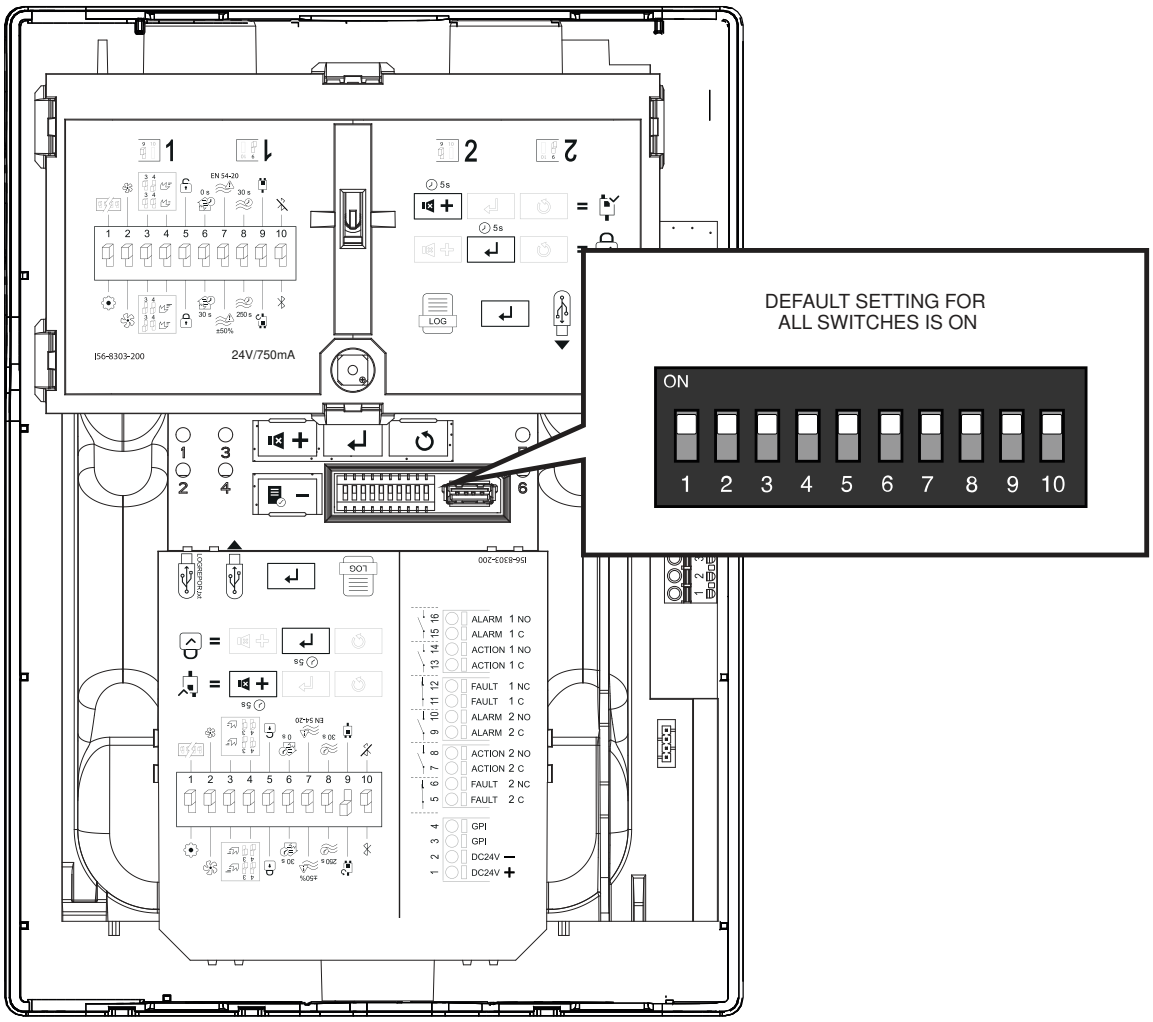
The unit can signal two types of abnormal conditions: alerts (minor issues) and faults (major issues). Faults are indicated by the FAULT LED showing yellow, either blinking or steady ON. Some alerts or faults are common to both channels (e.g. aspirator fault), whilst others are only related to channel 1 or channel 2 for 2-channel devices (e.g. sensing head fault). If one or more faults occur, the FAULT LED indicates the most important fault, and the fault relays are activated accordingly.

Faults can be either latched or unlatched , based on configuration. If latched, the user must manually clear the fault by pressing the RESET button. User can configure a delay between flow fault condition and fault relay activation (default is 30 seconds) during which activation is aborted if the fault condition terminates.

In dual channel models, if a fault is related to both channels both relays are activated. The device logs all alerts and faults as well as the exit from fault or alert conditions. Alarms are raised when smoke levels exceed the limits established by the device configuration. Alerts and faults are visible in the log file (Refer to section 6.3.6 Event Logs).



Single Channel



Dual Channel

Figure 6-4: Configuration DIP Switches

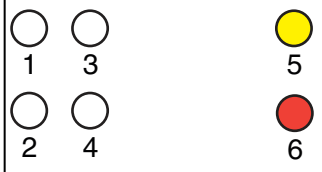
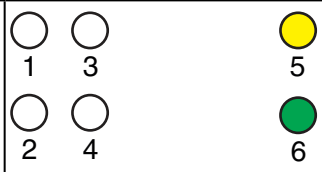
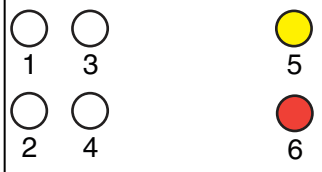
6.3.4 Normalize

Normalize procedure is used to set a new nominal flow reference based on the pipe network connected to device, with this procedure the two thresholds for maximum and minimum flow are re-calculated and changed according to the chosen tolerance.

Normalize procedure must be done during commissioning, when pipes are installed and drilled, to be sure that the flow obtained is considered similar to the reference by FAAST FLEX that will update the flow tolerance range accordingly with this value.

- If the flow is not normalized, the detector can report flow faults.
- If there is a change in the flow, we suggest checking if the are filters clean and pipeline's integrity before starting the normalization procedure.

Note: Before starting the NORMALIZE procedure, the pipe system should be connected and checked. There can be no blockages, open pipes, dirty filters, dust, or other obstructions. The device should be working for a minimum of 2 minutes and air flow must be stable.

Action	Button	LED Display	Description
While the device is in WAIT mode, long press the SILENCE/+ button. ***(Enter the current passcode.)***	Long Press 		LED 6 will flash red until the procedure is complete.
Once the NORMALIZE procedure is complete, the buzzer will sound for 0.5 seconds. LED 6 will indicate the result.			LED 6 will show green if the NORMALIZE procedure completed successfully.
			LED 6 will show red if the NORMALIZE procedure was unsuccessful.
Unit will return to WAIT mode.			

Note: If the cover is closed during the NORMALIZE procedure, then the procedure is aborted and the device will return to NORMAL mode.

6.3.5 Resetting Alarms and Faults

To reset any alarm and/or fault conditions press the RESET button. You will be prompted to enter the passcode. Once the passcode has been successfully entered,all latched alarms and faults are reset (both LEDs and relays) and the device returns to WAIT mode.

6.3.6 Event Logs

Follow these steps to download event log files to a USB drive:

Note: The USB drive must be formatted in FAT32 format (quick formatting isn't available), and must be completely empty, and the volume name must be no more than seven characters.

1. While the device is in WAIT mode, press the ENTER button and insert the USB drive. The device will sound a buzzer once the LOGREPOR.TXT file is downloaded.
2. Once the log file is written, the FAULT LED will show green. Remove the USB drive. The USB drive will contain a new log file, named LOGREPOR.TXT.

Data Log Header

Figure 6-5 shows the structure of the LOGREPOR.TXT log file. The table below describes the information contained the log.

```
-----------------------------------------------
FAAST FLEX Diagnostic   22-08-24 15:21
-----------------------------------------------

--INFO-----------------------------------------
Model type          :   Stand alone
Number of channels  :          2
Standard            :   EN 54-20
Model               :         020
Serial number       :   22 04 25 15 39 22 020
FW version          :      2.4.8
FW release version  :          1
FW major version    :          0
FW minor version    :          0
FW build version    :          5
HW version          :          1
Mech version        :          1

--Manufacturing date GMT----------------------
DAY    :    25
MONTH  :     4
YEAR   :    22
HOUR   :    15
MINUTE :    39
SECOND :    22

--SETTINGS-------------------------------------
Configuration       :   Extended
Last good DipSW conf:    0111111110
Detector orientation:    Upright
Alarm level         :          0       110
Action level        :          0       110
Reference flow 1    :         24 l/min
Minimum flow 1      :         12 l/min
Maximum flow 1      :         36 l/min
Reference flow 2    :         24 l/min
Minimum flow 2      :         12 l/min
Maximum flow 2      :         36 l/min
GPI mode            :          UNBALANCED
GPI normal state    :        0
GPI change state action:     1
Blower speed        :        Low
Blower correction   :        -2   22-04-25

--STATE----------------------------------------
Device in fault     :         NO
Power supply        :       23.4 V
Disabled            :         NO
GPI                 :       OPEN
Relay ALARM 1       :      reset
Relay ALARM 2       :      reset
Relay ACTION 1      :      reset
Relay ACTION 2      :      reset
Relay FAULT 1       :        set
Relay FAULT 2       :        set

Progres | Day-Month | Hour:Minute:Second | Event |               Event description                | Temperature 1 | Temperature 2 | Flow 1 | Flow 2 | Sensor 1 | Sensor 2 | RPM blower
  50630 |   12-08   |          10:38:28 |     5 |                          Password modified |         +  17 |         +  20 |     47 |     58 |       50 |       50 |       3600
```

Figure 6-5: Data Log Structure

Table 6-4: LOGREPOR.TXT File Structure

Event Codes	Description	Event Codes	Description
0	None		
1	Power on		
2	Cover opened		
3	Cover closed		
4	Password entry		
5	Password modified		
6	Password correct		

Event Codes	Description	Event Codes	Description
7	Password incorrect		
8	To Disable		
9	Exit from Disable		
10	Test started		
11	Test completed		
12	Test log written		
18	Normalize start		
19	Normalize successfully completed		
20	Normalize failed, flow not stable		
21	Normalize failed, flow out of range		
22	Reset started		
23	Change configuration request		
24	Downloading Logs		
25	Download Complete		
27	Disable Buzzer Button		
28	Open cover to confirm change configuration		
29	Protection (overvolt)		
30	Normal		
31	Wait		
32	Service		
33	Pairing tentative		
34	Pairing successfully completed		
36	Factory restore failed		
37	Password recovery		
38	Flow adjustment started		
39	Flow adjusted		
40	Change configuration completed		
41	Exit from Configuration after timeout		
42	Exit from Password entering for timeout		
43	Exit from Password change for timeout		
44	Time changed		
46	Password change requested		
47	Exit from test EN for BT request		
48	Trend log		
49	Clear log		
50	Test failed EN		
51	Password by BT app is incorrect		
102	EEPROM not readable[1]		

[1] Switch into PROTECTION mode

Event Codes	Description	Event Codes	Description
103	Bluetooth module error	1103	Exit from bluetooth module error
106	CH1 sensing head communication fault	1106	Exit from CH1 sensing head communication fault
107	Aspirator failure	1107	Exit from Aspirator fault
109	CH1 flow is below the min limit	1109	Exit from CH1 Low flow fault
110	CH1 flow is above the max limit	1110	Exit from CH1 High flow fault
112	CH2 sensing head communication fault	1112	Exit from CH2 sensing head communication fault
114	CH2 flow is below the min limit	1114	Exit from CH2 Low flow fault
115	CH2 flow is above the max limit	1115	Exit from CH2 High flow fault
116	Overvoltage error[1]		
117	Unauthorised configuration change	1117	Not used
118	Data Flash fault[1]		
119	Memory Fault[2]		
120	CH1 Dust Contamination[3]	1120	Exit from CH1 dirt fault
121	CH2 Dust Contamination[3]	1121	Exit from CH2 dirt fault
127	Enable buzzer for buttons over		
128	EEPROM byte writing failure		
201	Clock cannot be read or set	1201	Exit from clock alert
202	Clock data is not consistent	1202	Exit from Invalid time base alert
203	CH1 High Temperature Alert	1203	Exit from CH1 High temperature alert
204	CH1 Low Temperature Alert	1204	Exit from CH1 Low temperature alert
205	CH2 High Temperature Alert	1205	Exit from CH2 High temperature alert
206	CH2 Low Temperature Alert	1206	Exit from CH2 Low temperature alert
207	Low power alert	1207	Exit from Low power alert
208	CH1 Sensing Head Dust Contamination Level 1[4]	1208	Exit from CH1 Sensing Head Dust Contamination Level 1
209	CH1 Sensing Head Dust Contamination Level 2[5]	1209	Exit from CH1 Sensing Head Dust Contamination Level 2
210	CH2 Sensing Head Dust Contamination Level 1[4]	1210	Exit from CH2 Sensing Head Dust Contamination Level 1
211	CH2 Sensing Head Dust Contamination Level 2[5]	1211	Exit from CH2 Sensing Head Dust Contamination Level 2
212	Low power alert, possible loss of events	1212	Exit from Low power alert, events will not be written
251	Service fault[1]		
252	Initialization fault[1]		

[1]Switch into PROTECTION mode
[2]Switch into SERVICE mode
[3]Drift level 100%
[4]Drift level 40%
[5]Drift level 70%

Event Codes	Description	Event Codes	Description
253	Wait fault[1]		
254	Normal fault[1]		
255	State machine default handler		
256	RAM consistency failure		
301	Action ch1	1301	Exit from Action ch1
302	Alarm ch1	1302	Exit from Alarm ch1
303	Action ch2	1303	Exit from Action ch2
304	Alarm ch2	1304	Exit from Alarm ch2
1400	Config Changed, password needed		
1401	Ch1 Alarm relay set to unlatched		
1402	Ch1 Alarm relay set to latched		
1403	Ch2 Alarm relay set to unlatched		
1404	Ch2 Alarm relay set to latched		
1405	Ch1 Action relay set to unlatched		
1406	Ch1 Action relay set to latched		
1407	Ch2 Action relay set to unlatched		
1408	Ch2 Action relay set to latched		
1409	Ch1 Flow fault relay set to unlatched		
1410	Ch1 Flow fault relay set to latched		
1411	Ch2 Flow fault relay set to unlatched		
1412	Ch2 Flow fault relay set to latched		
1413	Alarm mode set to cumulative		
1414	Alarm mode set to instantaneous		
1415	Relay for temperature is unset		
1416	Relay for temperature is set		
1417	Relay for low power is unset		
1418	Relay for low power is set		
1419	Fan speed set to level 0		
1420	Fan speed set to level 1		
1421	Fan speed set to level 2		
1422	Fan speed set to level 3		
1423	Fan speed set to level 4		
1424	Fan speed set to level 5		
1425	Fan speed set to level 6		
1426	Fan speed set to level 7		
1427	Fan speed set to level 8		
1428	Fan speed set to level 9		
1429	Fan speed set to level 10		

[1] Switch into PROTECTION mode

Event Codes	Description	Event Codes	Description
1430	Ch1 Alarm set to level 0		
1431	Ch1 Alarm set to level 1		
1432	Ch1 Alarm set to level 2		
1433	Ch1 Alarm set to level 3		
1434	Ch1 Alarm set to level 4		
1435	Ch1 Alarm set to level 5		
1436	Ch1 Alarm set to level 6		
1437	Ch1 Alarm set to level 7		
1438	Ch1 Alarm set to level 8		
1439	Ch1 Alarm set to level 9		
1440	Ch2 Alarm set to level 0		
1441	Ch2 Alarm set to level 1		
1442	Ch2 Alarm set to level 2		
1443	Ch2 Alarm set to level 3		
1444	Ch2 Alarm set to level 4		
1445	Ch2 Alarm set to level 5		
1446	Ch2 Alarm set to level 6		
1447	Ch2 Alarm set to level 7		
1448	Ch2 Alarm set to level 8		
1449	Ch2 Alarm set to level 9		
1450	Ch1 Action set to level 0		
1451	Ch1 Action set to level 1		
1452	Ch1 Action set to level 2		
1453	Ch1 Action set to level 3		
1454	Ch1 Action set to level 4		
1455	Ch1 Action set to level 5		
1456	Ch1 Action set to level 6		
1457	Ch1 Action set to level 7		
1458	Ch1 Action set to level 8		
1459	Ch1 Action set to level 9		
1460	Ch2 Action set to level 0		
1461	Ch2 Action set to level 1		
1462	Ch2 Action set to level 2		
1463	Ch2 Action set to level 3		
1464	Ch2 Action set to level 4		
1465	Ch2 Action set to level 5		
1466	Ch2 Action set to level 6		
1467	Ch2 Action set to level 7		
1468	Ch2 Action set to level 8		
1469	Ch2 Action set to level 9		

Event Codes	Description	Event Codes	Description
1488	Ch1 Flow Fault Threshold set to 1-15 perc		
1489	Ch1 Flow Fault Threshold set to 16-80 perc		
1490	Ch2 Flow Fault Threshold set to 1-15 perc		
1491	Ch2 Flow Fault Threshold set to 16-80 perc		
1492	Alarm delay set to 0 seconds		
1493	Alarm delay set to a value greater than 0 seconds		
1494	Action delay set to 0 seconds		
1495	Action delay set to a value greater than 0 seconds		
1496	Flow Fault delay set to a value smaller than or equal to 30 seconds		
1497	Flow Fault delay set to a value greater than 30 seconds		
1498	Reset Alarms and Fault		
1499	Disable Timeout not enabled		
1500	Disable Timeout enabled		

Log example and interpretation

The log header is an important part of the log file as it gives general details about the detector model, manufacturing date, configuration mode and relay status, below is the list of sections in the log header:

- **INFO:** this section gives general details about the model, the firmware version serial number, etc.
- **Manufacturing date GMT:** this section shows the manufacturing date in the GMT timezone.
- **SETTINGS:** this section shows details about the configuration mode, alarm and action levels, GPI state, aspiartor speed, etc.
- **STATE:** this section records the instantaneous status of the detector.

HEADER reading for salient data: document downloaded from device in date Aug. 24 2022, is a single channel manufactured in date April, 25 2022 following EN54-20 standard, DIP switches configuration is 0111111110, reference flow 24 l/min, GPI unbalanced.

```
-----------------------------------------------
FAAST FLEX Diagnostic   22-08-24 15:21
-----------------------------------------------

--INFO----------------------------------------
Model type          :   Stand alone
Number of channels  :          2
Standard            :   EN 54-20
Model               :        020
Serial number       :   22 04 25 15 39 22 020
FW version          :      2.4.8
FW release version  :          1
FW major version    :          0
FW minor version    :          0
FW build version    :          5
HW version          :          1
Mech version        :          1

--Manufacturing date GMT----------------------
DAY    :    25
MONTH  :     4
YEAR   :    22
HOUR   :    15
MINUTE :    39
SECOND :    22

--SETTINGS-------------------------------------
Configuration       :   Extended
Last good DipSW conf:    0111111110
Detector orientation:    Upright
Alarm level         :          0       110
Action level        :          0       110
Reference flow 1    :         24 l/min
Minimum flow 1      :         12 l/min
Maximum flow 1      :         36 l/min
Reference flow 2    :         24 l/min
Minimum flow 2      :         12 l/min
Maximum flow 2      :         36 l/min
GPI mode            :          UNBALANCED
GPI normal state    :         0
GPI change state action:      1
Blower speed        :         Low
Blower correction   :         -2   22-04-25

--STATE---------------------------------------
Device in fault     :          NO
Power supply        :       23.4 V
Disabled            :          NO
GPI                 :        OPEN
Relay ALARM 1       :       reset
Relay ALARM 2       :       reset
Relay ACTION 1      :       reset
Relay ACTION 2      :       reset
Relay FAULT 1       :         set
Relay FAULT 2       :         set
```

Progres	Day-Month	Hour:Minute:Second	Event	Event description	Temperature 1	Temperature 2	Flow 1	Flow 2	Sensor 1	Sensor 2	RPM blower
50630	12-08	10:38:28	5	Password modified	+ 17	+ 20	47	58	50	50	3600
50631	12-08	10:39:27	2	Cover opened	+	+ 20	47	56	50	50	3600
50632	12-08	10:39:28	31	To Wait	+ 17	+ 20	48	58	50	50	3600
50633	12-08	10:39:37	24	Log requested	+ 17	+ 20	48	60	50	50	3600
50634	12-08	10:39:59	25	Log downloaded	+ 17	+ 20	48	60	50	50	3600
50635	12-08	10:40:04	4	Password entry	+ 19	+ 20	44	58	50	50	3600
50636	12-08	10:40:35	6	Password correct	+ 17	+ 20	44	58	50	50	3600
50637	-08	10:40:35	23	Change configuration request	+ 17	+ 20	44	58	50	50	3600
50638	12-08	10:40:42	40	Change configuration completed	+ 17	+ 20	44	58	50	50	3600

Figure 6-6: Sample Event Log

LOG Desc

Row 1) device power ON
Row 2) Alarm CH1 smoke level passed from 50 to 200,
Row 3) Exit from alarm CH1
Row 4) Front cover opened by operator
Row 5) Log requested -pushed button enter-
Row 6) Log downloaded on USB stick.

Sensing Status

Figure 6-7: Smoke Levels Description

Sensing Status	Description	Obscuration Detected		Note(s)
		Imperial Units	Metric Units	
0 ... 9	Fault			
40 ... 50	Normal			Drift Level: 50 =clean, 40 =100% drift
110	Alarm level 0	0.014% obs/ft	0.046% obs/m	Action and Alarm if Alarm level confiigured as HIGH in Out of Box Mode
120	Alarm level 1	0.02% obs/ft	0.066% obs/m	Action if Alarm level configured as MEDIUM in Out of Box Mode
130	Alarm level 2	0.03% obs/ft	0.098% obs/m	Alarm if Alarm level configured as MEDIUM in Out of Box Mode
140	Alarm level 3	0.05% obs/ft	0.164% obs/m	Action if Alarm level configured as LOW in Out of Box Mode
150	Alarm level 4	0.10% obs/ft	0.328% obs/m	Alarm if Alarm level configured as LOW in Out of Box Mode
160	Alarm level 5	0.20% obs/ft	0.656% obs/m	Not approved under EN54-20 regulatory
170	Alarm level 6	0.50% obs/ft	1.640% obs/m	Not approved under EN54-20 regulatory
180	Alarm level 7	1.00% obs/ft	3.281% obs/m	Not approved under EN54-20 regulatory
190	Alarm level 8	1.50% obs/ft	4.921% obs/m	Not approved under EN54-20 regulatory
200	Alarm level 9	2.00% obs/ft	6.562 % obs/m	Not approved under EN54-20 regulatory

6.3.7 DISABLE Procedure

When the device is DISABLED, it will not report any alarm or fault conditions via the relays and LED functions will remain active. To indicate that the device is DISABLED, all the LEDs will slow flash yellow (once every 10 seconds). To disable the device, long press (5 seconds) the RESET button. LEDs 1, 2, 3, and 4 will show steady yellow to confirm the command. Repeating this procedure will return the device to normal operation. **Powering off the device will NOT exit the DISABLE procedure.**

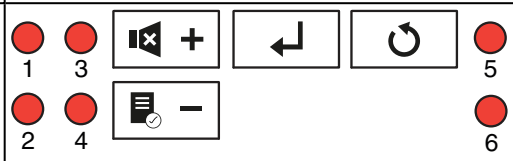
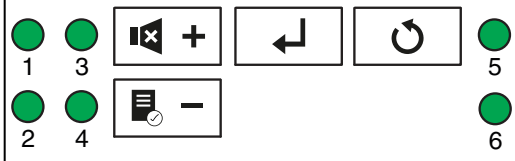
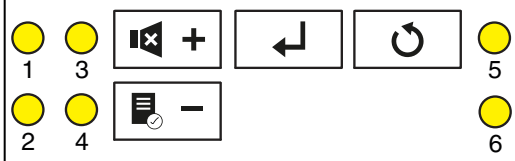
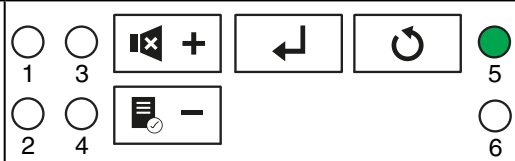
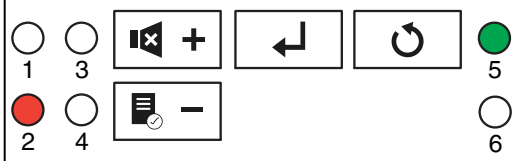
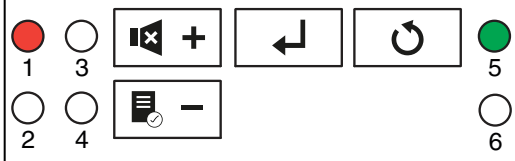
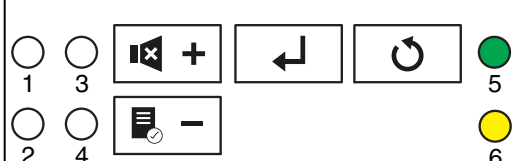
This command will not be available through a long press on RESET button if the GPI is configured to enter and exit the DISABLE procedure.

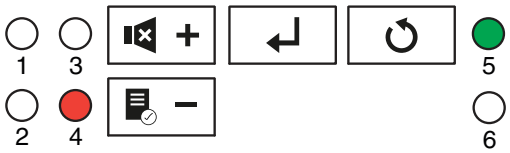
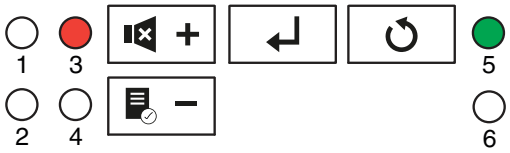
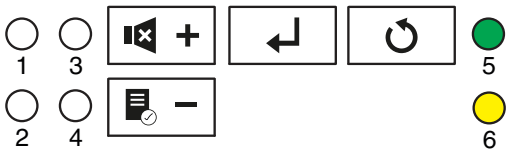
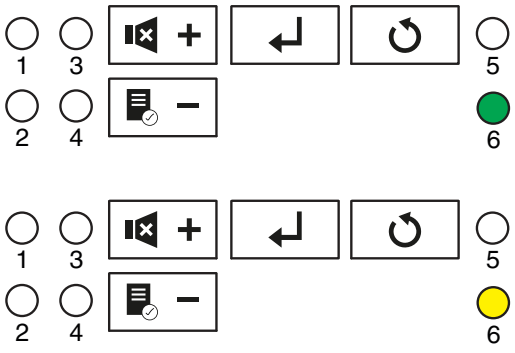
6.3.8 Test Mode

In TEST mode, the device will perform a self-test. As tests are executed the user must confirm each step of the test before it continues.

Follow these steps to enter TEST mode execute the self-test.

Note: If any of these steps do NOT complete correctly, press the SILENCE/+ button to indicate FAIL condition for the test step. If 30 seconds pass without pressing TEST, the test fails.

Action	Button	Action(s)	Description
Short press the TEST button. /+	Short Press		All LEDs will show red in the following sequence: 1, 3, 5, 6, 4, 2.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		All LEDs will show green in the following sequence: 1, 3, 5, 6, 4, 2.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		Buzzer will sound for 1 second and all LEDs will show yellow in the following sequence: 1, 3, 5, 6, 4, 2.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 5 shows green, indicating normal condition (no action/alarms or faults).
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 2 shows red and LED 5 shows green to indicate Action condition on Channel 1. Relay activation can be checked.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 1 shows red and LED 5 shows green to indicate Alarm condition on Channel 1. Relay activation can be checked.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 5 shows green and LED 6 shows yellow to indicate Fault condition on Channel 1. Relay activation can be checked.

Action	Button	Action(s)	Description
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 4 shows red and LED 5 shows green to indicate Action condition on Channel 2. (Test step must be completed even on Single Channel units). Relay activation can be checked, however in case of single channel unit the relay is not available.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 3 shows red and LED 5 shows green to indicate Alarm condition on Channel 2. (Test step must be completed even on Single Channel units). Relay activation can be checked.
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 5 shows green and LED 6 shows yellow to indicate Fault condition on Channel 2. (Test step must be completed even on Single Channel units.)
Press the TEST button to confirm test PASS or press Silence to enter test FAIL.	Short Press		LED 6 shows green if all tests PASS. LED 6 shows yellow if any step FAILs.
Press the RESET button to exit TEST mode or Insert a USB drive and press the ENTER button to download test results.	Short Press Short Press		The results of the test will be written to the USB drive in the file DIAGTEST.txt and the device will beep to provide an audible confirmation that the process is complete.

DIAGTEST.TXT File Format

The DIAGTEST.TXT file will contain the result of the test in the format shown below.

1CH	2CH
SELF_TEST_RED_LIGHT_PASSED | SELF_TEST_GRE_LIGHT_PASSED | SELF_TEST_YEL_LIGHT_PASSED | SELF_TEST_NORMALSTA_PASSED | SELF_TEST_ACTIO_CH1_PASSED | SELF_TEST_ALARM_CH1_PASSED | SELF_TEST_FAULT_CH1_PASSED | SELF_TEST_ACTIO_CH2_NOTAVA | SELF_TEST_ALARM_CH2_NOTAVA | SELF_TEST_FAULT_CH2_NOTAVA |	SELF_TEST_RED_LIGHT_PASSED | SELF_TEST_GRE_LIGHT_PASSED | SELF_TEST_YEL_LIGHT_PASSED | SELF_TEST_NORMALSTA_PASSED | SELF_TEST_ACTIO_CH1_PASSED | SELF_TEST_ALARM_CH1_PASSED | SELF_TEST_FAULT_CH1_PASSED | SELF_TEST_ACTIO_CH2_PASSED | SELF_TEST_ALARM_CH2_PASSED | SELF_TEST_FAULT_CH2_PASSED |

6.4 PROTECTION Mode

The device goes in PROTECTION in the following situations:

- Dataflash fault
- Power supply overvoltage

In PROTECTION mode, the POWER LED is steady red. The device switches off all peripherals and communications and reports fault by activating fault relays (the unit reports fault through relays only). The only way to exit PROTECTION mode is to completely power off the device and then power it back up.

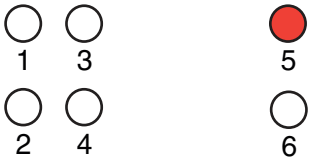
6.5 SERVICE (or STANDBY) Mode

If the cover is left open for more than 60 seconds the device enters SERVICE Mode and the POWER LED blinks red (fast blink). This mode is typically used during hardware maintenance, for example changing or cleaning a filter screen in the field. During this working mode (also referred to as STANDBY Mode), the device switches off the aspirator, stops monitoring flows and sensing elements. No alarms will be shown on the LEDs, relays (fault relays activated), or buzzer.

Additionally, USB and buttons sensing are turned off while Bluetooth is enabled to report SERVICE mode only. From the SERVICE mode, users can initiate the password recovery process during the EEPROM factory reset and aspirator spare part replacement.

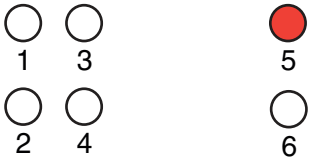
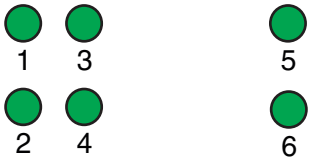
6.5.1 Passcode Recovery

In the event the passcode has been lost, perfom the following steps to recover the passcode .

Action	Button	LED Display	Description
Open cover and allow device to enter SERVICE Mode (60 second wait).			LED 5 will fast blink red when the device enters SERVICE Mode.
Plug a formatted USB drive into the port.			
Long press the ENTER button.	Long Press 		LED 5 will go out and LEDs 1, 2, 3, and 4 will flash yellow, and the buzzer will sound to indicate that the reset file has been written to the USB drive.
Email the file from the USB drive to your device supplier. The passcode will be recovered by Xtralis Customer Support and will be communicated by the vendor back to you via email or telephone.			

6.5.2 EEPROM Factory Reset

To perform a reset to the default EEPROM configuration, perform the following steps.

Action	Button	LED Display	Description
Open cover and allow device to enter SERVICE Mode (60 second wait).			LED 5 will fast blink red when the device enters SERVICE Mode.
Set all DIP Switches to ON position.			
Long press the RESET button.	Long Press 		LED 5 will go out and LEDs 1, 2, 3, and 4 will flash yellow, and the buzzer will sound to indicate that the reset procedure has been started.
Enter the passcode.			Once the passcode is entered, the device will be reset to the EEPROM factory settings. **Note:** The passcode is NOT changed.
			All LEDs will show green for 2 seconds to indicate the reset was successful.

If the LEDs show red, repeat the process by long pressing the RESET button again. This can happen in an undervoltage situation.

Note: If the reset procedure fails a second time the device is corrupted and must be replaced with a new unit.

7 FAAST FLEX Bluetooth App (Honeywell SmartConfig)

To connect to the detector via the Bluetooth App, refer to the FAAST FLEX Bluetooth App User Guide (37163).

8 Maintenance

8.1 Sensing Module Replacement (FLX-SP-01)

1. Remove cover (see Figure 3-4).

Note: The sensor cover and the rubber gasket may stick together when removing the sensor cover. Some effort may be required to pull the sensor cover off.

2. Using a small screwdriver, release six locking tabs, and remove Sensing Module Cover (see Figure 8-1).
3. Press two latches inward to release sensor, and remove Sensing Module.
4. Install the replacement Sensing Module.
5. While pressing down on Sensing Module, push two latches outward to lock it in place.
6. Replace Sensing Module Cover and press down to engage locking tabs.
7. Check and ensure that all six tabs are secured.
8. Replace cover.

Note: Follow local codes and standards to recycle the old sensing module.

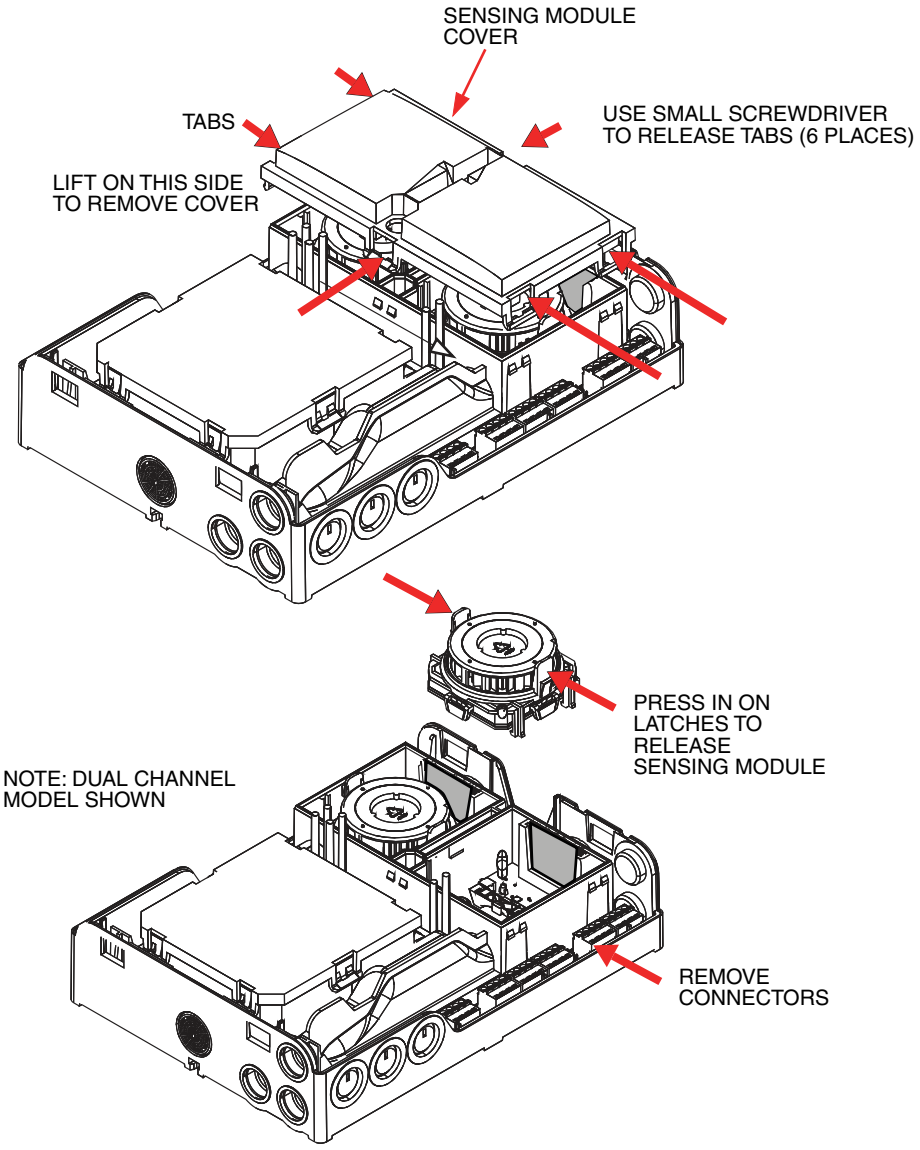


Figure 8-1: Sensing Module Replacement

8.2 Filters Replacement (FLX-SP-02)

The FAAST FLEX has two filters to prevent dirt and debris from entering the Sensors, and a third filter on the air outlet. Filters should be replaced annually to ensure proper operation.

Note: In harsh operating environments (excessive dust, insects, exposure to chemicals) the filter screens may need to be replaced more frequently.

During maintenance, the sensors should be protected whenever the filters are removed. The shipping box is designed with four cardboard protection tabs that can be removed and inserted in place of the filters to provide protection. See Figure 8-2.

1. Remove cover (see Figure 3-4).
2. Using a small screwdriver, release six locking tabs, and remove Sensor Cover (see Figure 8-2). The filters cover and the rubber gasket may stick together when removing the cover. Apply pressure to pull the sensor cover off.
3. Using a small screwdriver, release six locking tabs, and remove Aspirator Cover.
4. Insert the two cardboard tabs to protect the detector from dust.
5. Remove Channel 1 Filter, Channel 2 Filter, and Outlet Filter.

Note: The filters can be cleaned using compressed air in case of grease water. Soap can be used to degrease it or replace with new filters.

6. Replace Aspirator Cover and press down to engage locking tabs.
7. Replace Sensor Cover and press down to engage locking tabs.
8. Replace the cover.

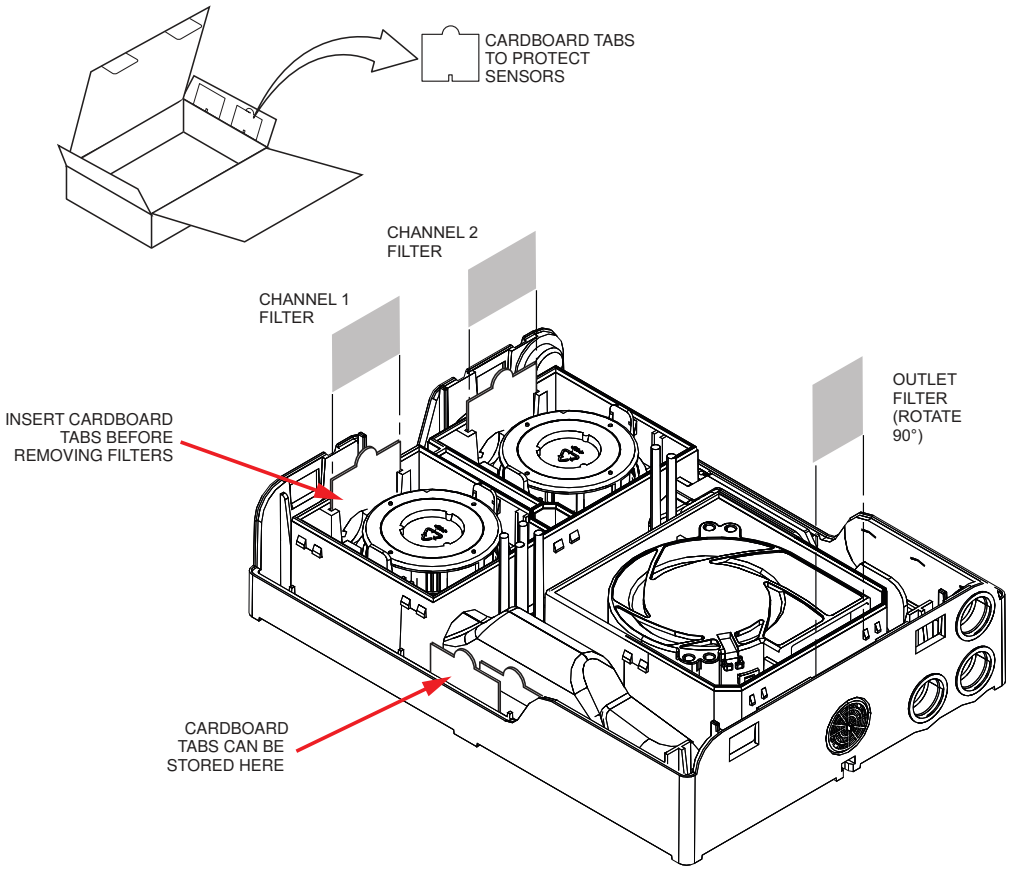


Figure 8-2: Filter Replacement

9 Piping Design Guidelines

Proper operation of the FAAST FLEX is highly dependent on proper design and installation of the inlet piping. For the detector to perform at maximum efficiency the inlet piping must collect ambient air from the protected space and deliver it to the detector with unobstructed airflow. The factors that impact this process include the following:

- Length and diameter of inlet piping
- Angle and location of bends in inlet piping
- Length of exhaust piping
- Location, diameter and spacing of air collection holes
- Aspirator speed
- Alarm Levels
- Presence/absence of filter

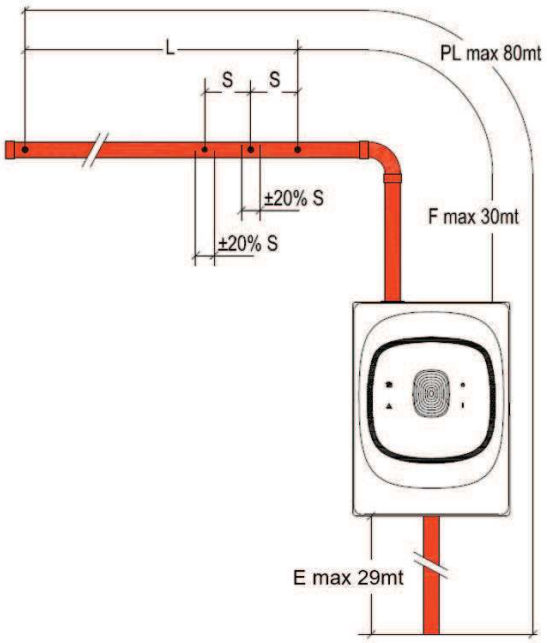
The tables in this section are created to give installers an idea on the maximum level of flexibility for a generic application, thus balance and sensitivity can be affected by the type of installation and the quality of the drilled holes. The end hole has a greater diameter than all other holes to accelerate the flow and meet the transport time requirements needed to generate the tables.

The following figures illustrate the various parameters used in the calculations provided in the Piping Tables in the following pages, taking into consideration the transport time for classes A, B and C is as below:

Classes	Transport Time
Class A	50 seconds
Class B	70 seconds
Class C	90 seconds

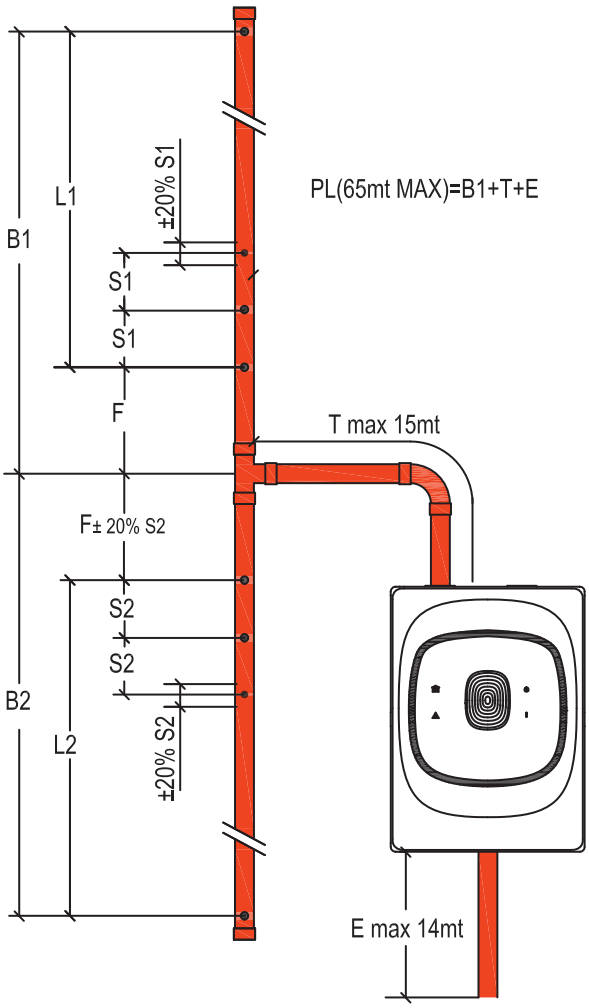
Note: For installations not covered in the pre-engineered tables use ASPIRE software to achieve an optimum design of pipe networks.

Single Channel:



Rules		
Pipe **L**ength **with low aspirator speed** **with high aspirator speed**	**PL**	max 50m max 80m
Exhaust	**E**	max 29m
First hole position	**F**	30m - E min 1m
Last hole position	**L**	PL - E - F
Step between holes	**S**	L / (Number of holes-1) min 2.5m
Hole position deviation from nominal position		S ± 20%
45° or 90° Bend corresponds to a straight pipe length of		0.3m
T junction corresponds to a straight pipe length of		1.2m
Clips distance		max 1.5m
TT		max 90s

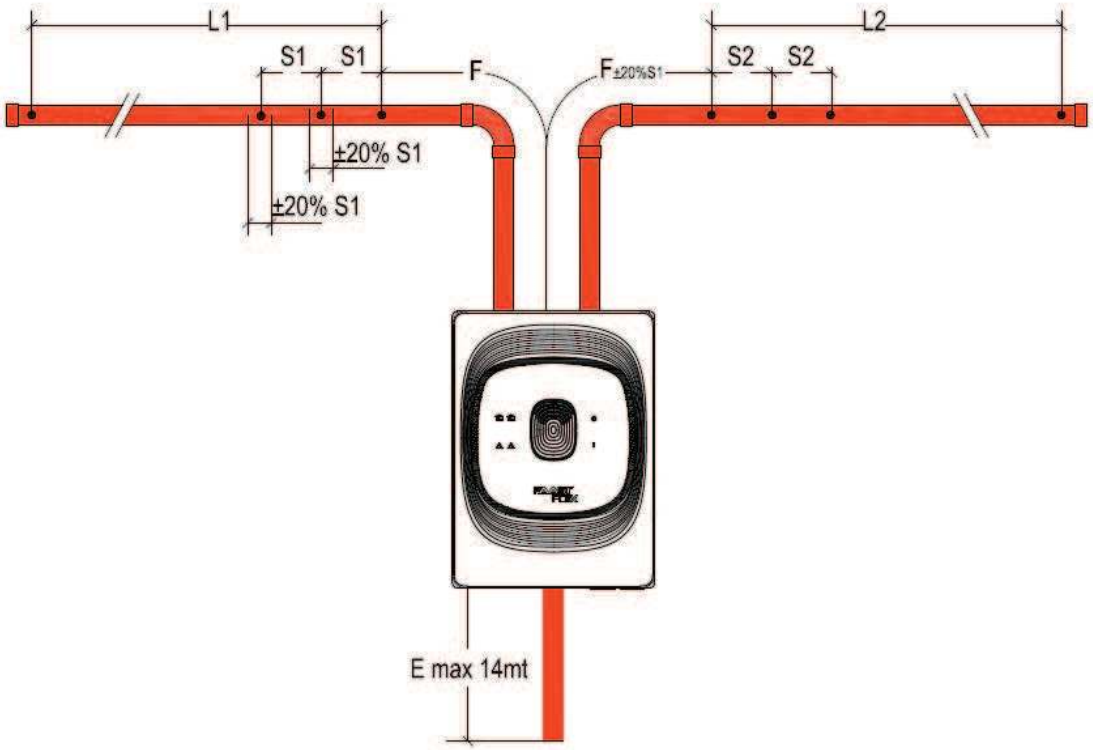
Figure 9-1: Piping Design Parameters - I Pipe



Rules		
Pipe **L**ength **with low aspirator speed** **with high aspirator speed**	**PL (E+T+B1)**	max 45m max 65m
Exhaust	**E**	max 14m
T-junction position	**T**	max 15m - E
Branch 1 **L**ength	**B1**	PL-T-E
Branch 2 **L**ength	**B2**	B1-10%÷B1
First hole position, Branch 1	**F**	max 30m - E min 1.25m
First hole position, Branch 2	**F2**	F ± 20%*S2 min 1.25m
Last hole position	**L1, L2**	PL - E - F - Fx
Step between holes	**S1, S2**	Lx / (Number of branch holes-1) min 2.5m
Hole position deviation from nominal position		Sx ± 20%
45° or 90° Bend corresponds to a straight pipe length of		0.3m
T junction corresponds to a straight pipe length of 1.2m on the common branch		
Clips distance		max 1.5m
TT		max 90s

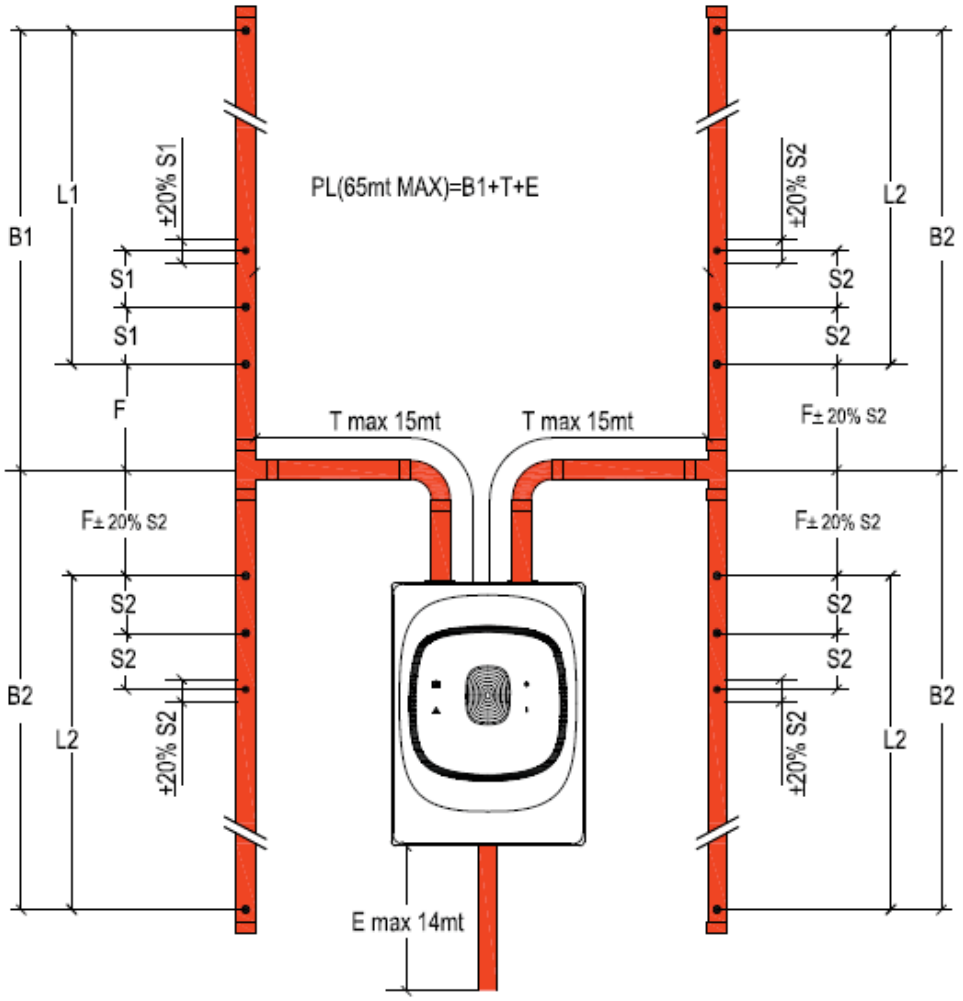
Figure 9-2: Piping Design Parameters - U Pipe

Dual Channel:



Rules		
Pipe **L**ength **with low aspirator speed** **with high aspirator speed**	**PL**	max 50m max 80m
Exhaust	**E**	see table row B
First hole position, Chamber 1	**F**	max (see table row A) -E min 1m
Last hole position, Chamber 1	**L1**	PL - T - F
Last hole position, Chamber 2	**L2**	L1-10%÷L1
First hole position, Chamber 2	**F2**	F ± 20%*S2
Step between holes	**S1, S2**	Lx / (Number of branch holes-1)
Hole position deviation from nominal position		Sx ± 20%
45° or 90° Bend corresponds to a straight pipe length of		0.3m
T junction corresponds to a straight pipe length of 1.2m on the common branch		
Clips distance		max 1.5m
TT		max 90s

Figure 9-3: Piping Design Parameters - I Pipe



Rules		
Pipe **L**ength **with low aspirator speed** **with high aspirator speed**	**PL (E+T+B1)**	max 45m max 65m
Exhaust	**E**	see table row C
T-junction position	**T**	max (see table row A) -E
Branch 1 **L**ength	**B1**	PL-T-E
Branch 2 **L**ength	**B2**	B1-10%÷B1
First hole position, Branch 1	**F**	max (see Table row B) - E - T min 1.25m
First hole position, Branch 2	**F2**	F ± 20%*S2 min 1.25m
Last hole position	**L1, L2**	PL - E - F - Fx
Step between holes	**S1, S2**	Lx / (Number of branch holes-1) min 2.5m
Hole position deviation from nominal position		Sx ± 20%
45° or 90° Bend corresponds to a straight pipe length of		0.3m
T junction corresponds to a straight pipe length of 1.2m on the common branch		
Clips distance		max 1.5m
TT		max 90s

Figure 9-4: Piping Design Parameters - U Pipe

Piping Design "I" pipe - Single Channel (FLX-010):

Example:

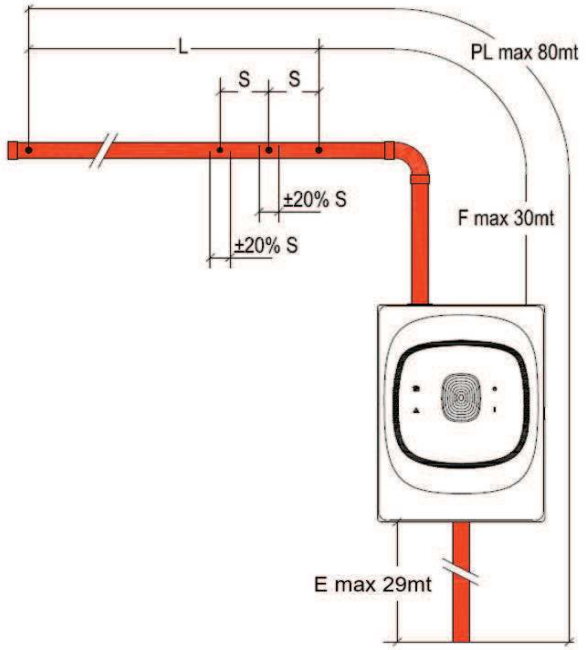
I-pipe network, Class C with In-line filter

Exhaust pipe of 10m (E), First hole at 20m (F), Last hole at 40m from the first hole (L), 9 holes

1. Verification of project constraints and determination of aspirator speed

		Required	Rules
E	Exhaust pipe	10m	≤ 29 m ✓
F	First hole	20m	1 ÷ 30m-E ✓
L	Last hole	40m	
PL	Pipe length with low speed with **high aspirator speed**	10+20+40=70m	≤ 50 m ✗ ≤ 80 m ✓
N	Number of holes	9	See Table ✓

1



2. Calculate nominal step between holes and hole position deviation form nominal

S = L / (Number of holes – 1) = 40 / 8 = **5 m (≥2.5m)** ✓

± 0.2*5m = **±1m**

3. Determination of necessary Sensitivity Level and the hole diameters

2 3

Number of Holes	2	3	4	5	6	7	8	9
Aspirator speed, max 80m for H and 50m for L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L
Alarm Level Class C with/without filter	Low	Low	Low	Medium	Medium	Medium	Medium	Medium
Alarm Level Class B with/without filter	High	High	High	High	High	High	High	High
Alarm Level Class A without filter only	High	High	High	-	-	-	-	

1 2 3

Number of Holes	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Aspirator speed, max 80m for H and 50m for L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H	H	H	H	H	H	H
Alarm Level Class C with/without filter	Low	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	High	High	High	High	High	High	High	High	High	High	High	High
Alarm Level Class B with/without filter	High	High	High	High	High	High	High	High	High	High	High	-	-	-	-	-	-	-	-	-	-
Alarm Level Class A without filter only	High	High	High	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled hole diameter (mm)	H1 6.5	H1 5.5	H1 4.5	H1 4	H1 3.5	H1 3.5	H1 3	H1 3	H1 2.5	H1 2.5	H1 2.5	H1 2.5	H1 2.5	H1 2	H1 2	H1 2	H1 2	H1 2	H1 2	H1 2	H1 2
	H2 6.5	H2 5.5	H2 4.5	H2 4	H2 3.5	H2 3.5	H2 3	H2 3	H2 2.5	H2 2.5	H2 2.5	H2 2.5	H2 2.5	H2 2	H2 2	H2 2	H2 2	H2 2	H2 2	H2 2	H2 2
		H3 5.5	H3 4.5	H3 4	H3 3.5	H3 3.5	H3 3.5	H3 3	H3 2.5	H3 2.5	H3 2.5	H3 2.5	H3 2.5	H3 2.5	H3 2	H3 2	H3 2	H3 2	H3 2	H3 2	H3 2
			H4 4.5	H4 4	H4 3.5	H4 3.5	H4 3.5	H4 3.5	H4 2.5	H4 2.5	H4 2.5	H4 3	H4 2.5	H4 2.5	H4 2	H4 2	H4 2	H4 2	H4 2	H4 2	H4 2
				H5 4.5	H5 3.5	H5 3.5	H5 3.5	H5 3.5	H5 3	H5 2.5	H5 2.5	H5 3	H5 2.5	H5 2.5	H5 2.5	H5 2	H5 2	H5 2	H5 2	H5 2	H5 2
					H6 4	H6 3.5	H6 3.5	H6 3.5	H6 3	H6 3	H6 2.5	H6 3	H6 2.5	H6 2.5	H6 2.5	H6 2.5	H6 2.5	H6 2.5	H6 2	H6 2	H6 2
						H7 4	H7 3.5	H7 3.5	H7 3	H7 3	H7 2.5	H7 3	H7 3	H7 2.5	H7 2.5	H7 2.5	H7 2.5	H7 2.5	H7 2.5	H7 2.5	H7 2.5
							H8 4	H8 3.5	H8 3	H8 3	H8 3	H8 3	H8 3	H8 2.5	H8 2.5	H8 2.5	H8 2.5	H8 2.5	H8 2.5	H8 2.5	H8 2.5
								H9 4	H9 3	H9 3	H9 3	H9 3	H9 3	H9 2.5	H9 2.5	H9 2.5	H9 2.5	H9 2.5	H9 2.5	H9 2.5	H9 2.5
									H10 3.5	H10 3	H10 3	H10 3.5	H10 3	H10 2.5	H10 2.5	H10 2.5	H10 2.5	H10 2.5	H10 2.5	H10 2.5	H10 2.5
										H11 3.5	H11 3	H11 3.5	H11 3	H11 2.5	H11 2.5	H11 2.5	H11 2.5	H11 2.5	H11 2.5	H11 2.5	H11 2.5
											H12 3.5	H12 3.5	H12 3	H12 3	H12 2.5	H12 2.5	H12 2.5	H12 2.5	H12 2.5	H12 2.5	H12 2.5
												H13 4	H13 3	H13 3	H13 2.5	H13 2.5	H13 2.5	H13 3	H13 3	H13 2.5	H13 2.5
													H14 4	H14 3	H14 2.5	H14 2.5	H14 2.5	H14 3	H14 3	H14 2.5	H14 3
														H15 3.5	H15 2.5	H15 2.5	H15 3	H15 3	H15 3	H15 2.5	H15 3
															H16 3.5	H16 3	H16 3	H16 3	H16 3	H16 3	H16 3
																H17 3.5	H17 3	H17 3	H17 3	H17 3	H17 3
																	H18 3.5	H18 3	H18 3	H18 3	H18 3
																		H19 4	H19 3	H19 3	H19 3.5
																			H20 4	H20 3	H20 3.5
																				H21 4	H21 3.5
																					H22 4.5

Piping Design "U" Pipe - Single Channel (FLX-010):

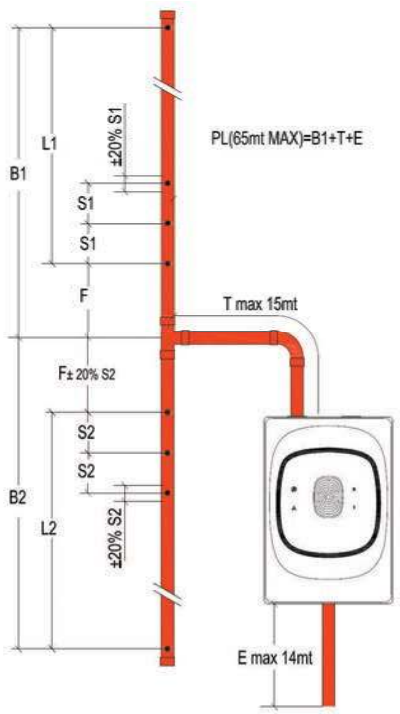
Example:

U-pipe network, Class C with In-line filter

Exhaust pipe of 5m (E), T-junction 10m (T), Branch of 30m (B1), First hole at 5m (F), 6 holes …

1. Verification of project constraints and determination of aspirator speed

		Required	Rules
E	Exhaust pipe	5m	≤ 14 m ✓
T	T-junction position	10	≤ 10 m (15m-E) ✓
B1	Branch length	30m	
F	First hole, Branch 1	5m	1.25 ÷ 25m ✓
PL	Pipe length with low speed with **high aspirator speed**	5+10+30=45m	≤ 45 m ✓ ≤ 65 m ✓
L1	Last hole position, Branch 1	45-5-10-5=25m	
N	Number of holes	6	See Table ✓ 1



2. Calculate nominal step between holes and hole position deviation form nominal

S1 = L1 / (Number of holes – 1) = 25 / 5 = **5 m (≥2.5m)** ✓

± 0.2*5m = **±1m**

3. Determination of necessary Sensitivity Level 2
and the hole diameters 3

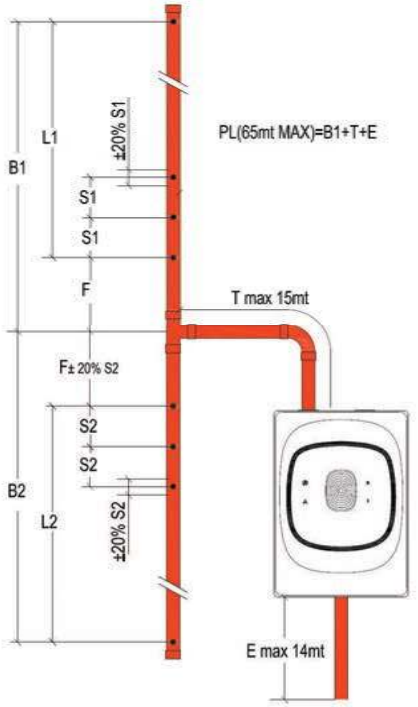
Number of Branch Holes	1	2	3	4	5	6
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L
Alarm Level Class C with/without filter	Low	Low	Medium	Medium	Medium	High
Alarm Level Class B with/without filter	High	High	High	High	High	High
Alarm Level Class A without filter only	High	High	-	-	-	-
Drilled hole diameter (mm)	H1 6.5	H1 5.5	H1 4.5	H1 3.5	H1 3.5	

1 2 3

Example:

U-pipe network, Class C with In-line filter
Exhaust pipe of 5m (E), T-junction 10m (T), Branch of 30m (B1), First hole at 5m (F), 6 holes **and Branch 2 of 28m (B2)**

		Required	Rules
E	Exhaust pipe	5m	≤ 14 m ✓
T	T-junction position	10	≤ 10 m (15m-E) ✓
B1	Branch length	30m	
F	First hole, Branch 1	5m	1.25 ÷ 25m ✓
PL	Pipe length with low speed with **high aspirator speed**	5+10+30=45m	≤ 45 m ✓ ≤ 65 m ✓
L1	Last hole position, Branch 1	45-5-10-5=25m	
N	Number of holes	6	See Table ✓
B2	Branch 2 length	28m	27 ÷ 30m ✓
L2	Last hole, Branch 2	28-5=23m	



4. For Branch 2, calculate nominal step between holes and hole position deviation from nominal

   S2 = L2 / (Number of holes – 1) = 23 / 5 = **4.6 m (≥2,5m)** ✓

   ± 0.2*4.6m = **±0.9m**

5. For Branch 2, first hole position can be **5±0.9m**

Number of Branch Holes	1	2	3	4	5	6	7	8	9	10	11
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H
Alarm Level Class C with/without filter	Low	Low	Medium	Medium	Medium	High	High	High	High	High	High
Alarm Level Class B with/without filter	High	High	High	High	High	High	-	-	-	-	-
Alarm Level Class A without filter only	High	High	-	-	-	-	-	-	-	-	-
Drilled hole diameter (mm)	H1 **6.5**	H1 **5.5**	H1 **4.5**	H1 **3.5**	H1 **3.5**	H1 **3**	H1 **3**	H1 **3**	H1 **2.5**	H1 **2**	H1 **2**
		H2 **5.5**	H2 **4.5**	H2 **4**	H2 **3.5**	H2 **3.5**	H2 **3**	H2 **3**	H2 **2.5**	H2 **2**	H2 **2**
			H3 **5**	H3 **4**	H3 **3.5**	H3 **3.5**	H3 **3.5**	H3 **3**	H3 **2.5**	H3 **2**	H3 **2**
				H4 **4.5**	H4 **4**	H4 **4**	H4 **3.5**	H4 **3**	H4 **3**	H4 **2**	H4 **2**
					H5 **4.5**	H5 **4**	H5 **4**	H5 **3.5**	H5 **3**	H5 **2.5**	H5 **2**
						H6 **4.5**	H6 **4**	H6 **3.5**	H6 **3**	H6 **2.5**	H6 **2**
							H7 **4.5**	H7 **4**	H7 **3**	H7 **2.5**	H7 **2**
								H8 **4.5**	H8 **3.5**	H8 **2.5**	H8 **2**
									H9 **4**	H9 **3**	H9 **2.5**
										H10 **3.5**	H10 **2.5**
											H11 **3**

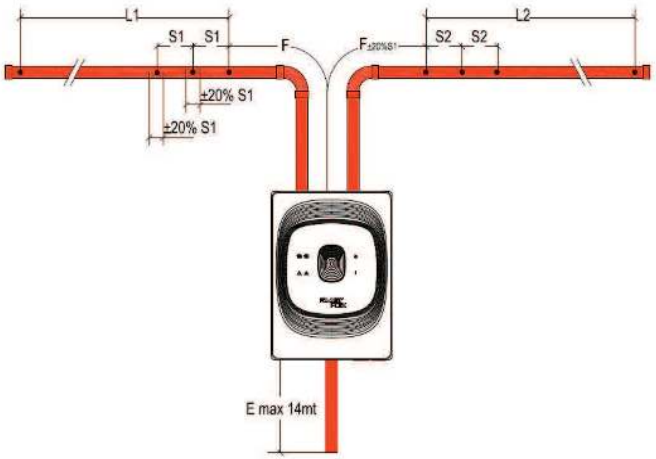
Piping Design "I" pipe - Dual Channel (FLX-020):

Example:

FLX-020 I-pipe network, Class C without In-line filter
Exhaust pipe of 10m (E), First hole at 5m (F), Last hole at 35m from the first hole (L1), 6 holes
…

1. Verification of project constraints and determination of aspirator speed

		Required	Rules
N	Number of holes	6	See Table ✓ (1)
E	Exhaust pipe	10m	max 14 (See Table row B) ✓
F	First hole with low speed with **high aspirator speed**	5m	1 ÷ (26-10) ✓ 1 ÷ (30-10) (2)
L1	Last hole	35m	
PL	Pipe length with low speed with **high aspirator speed**	10+5+35=50m	≤ 50 m ✓ ≤ 80 m ✓



2. Calculate nominal step between holes and hole position deviation form nominal

S1 = L1 / (Number of holes – 1) = 35 / 5 = **7 m (≥2.5m)** ✓

± 0.2*7m = **±1.4m**

3. Determination of necessary Sensitivity Level (3) and the hole diameters (4)

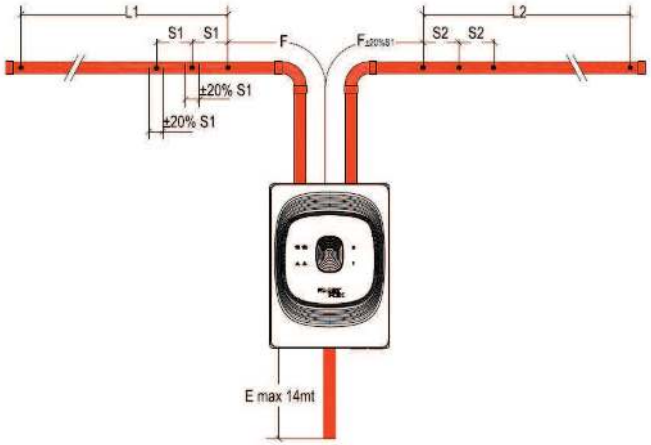
(1)

Number of Branch Holes	1	2	3	4	5	6
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L
A - Maximum First Hole Distance (meters)	NN	30/30	30/30	30/30	30/30	30/26 (2)
B - Maximum Exhaust Pipe Length (meters)	~~14/14~~	~~14/14~~	~~14/14~~	~~14/14~~	~~14/14~~	14/14
Alarm Level Class C with/without filter	Low	Low	Low	Medium	Medium	Medium (3)
Alarm Level Class B with/without filter	High	High	High	High	High	High
Alarm Level Class A without filter only	High	High	High	-	-	
Drilled hole diameter (mm)	H1 6.5	H1 6	H1 5	H1 4	H1 4	(4)

Example:

FLX-020 I-pipe network, Class C without In-line filter
Exhaust pipe of 10m (E), First hole at 5m (F), Last hole at 35m from the first hole (L1), 6 holes chamber 2: first hole at 4m (F2), Last hole at 33m from the first hole (L2)

		Required	Rules
N	Number of holes	6	See Table ✓
E	Exhaust pipe	10m	max 14 (See Table row B) ✓
F	First hole with low speed with **high aspirator speed**	5m	1 ÷ (26-10) ✓ 1 ÷ (30-10)
L1	Last hole	35m	
PL	Pipe length with low speed with **high aspirator speed**	10+5+35=50m	≤ 50 m ✓ ≤ 80 m ✓
L1	Last hole, chamber 2	33m	



4. Verify that branch 2 first hole position (4m) satisfies rules

   F2min = F – 0.2*S1 = 5m – 0.2*7 = **3.6 m** ✓

5. Calculate nominal step between holes and hole position deviation from nominal for branch 2

   S2 = L2 / (Number of holes – 1) = 33 / 5 = **6.6 m (≥2.5m)**

   ± 0.2*6.6m = **±1.3m**

Number of Branch Holes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H	H	H	H	H	H	H
A - Maximum First Hole Distance (meters)	NN	30/30	30/30	30/30	30/30	30/26	30/22	30/17	30/13	30/8	30/3	28	24	19	15	10	6	1
B - Maximum Exhaust Pipe Length (meters)	14/14	14/14	14/14	14/14	14/14	14/14	14/14	14/14	14/12	14/7	14/2	14	14	14	14	9	5	0
Alarm Level Class C with/without filter	Low	Low	Low	Medium	Medium	Medium	Medium	Medium	High	High	High	High	High	High	High	High	High	High
Alarm Level Class B with/without filter	High	High	High	High	High	High	High	High	-	-	-	-	-	-	-	-	-	-
Alarm Level Class A without filter only	High	High	High	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled hole diameter (mm)	H1 6.5	H1 6	H1 5	H1 4	H1 4	H1 3	H1 3	H1 3	H1 2.5	H1 2.5	H1 2.5	H1 2.5	H1 2	H1 2	H1 2	H1 2	H1 2	H1 2
		H2 6	H2 5	H2 4	H2 4	H2 4	H2 3.5	H2 3	H2 2.5	H2 2.5	H2 2.5	H2 2.5	H2 2	H2 2	H2 2	H2 2	H2 2	H2 2
			H3 6	H3 5	H3 4	H3 4	H3 3.5	H3 3	H3 3	H3 3	H3 2.5	H3 2.5	H3 2	H3 2	H3 2	H3 2	H3 2	H3 2
				H4 6	H4 5	H4 4	H4 4	H4 3.5	H4 3	H4 3	H4 2.5	H4 2.5	H4 2	H4 2.5	H4 2	H4 2	H4 2	H4 2
					H5 6	H5 5	H5 4	H5 4	H5 3.5	H5 3	H5 3	H5 2.5	H5 2.5	H5 2.5	H5 2.5	H5 2	H5 2	H5 2
						H6 6	H6 4.5	H6 4	H6 4	H6 3.5	H6 3	H6 3	H6 3	H6 2.5	H6 2.5	H6 2.5	H6 2	H6 2
							H7 6	H7 5	H7 4.5	H7 4	H7 3.5	H7 3	H7 3	H7 2.5	H7 2.5	H7 2.5	H7 2	H7 2
								H8 6	H8 5	H8 4	H8 4	H8 3.5	H8 3.5	H8 2.5	H8 2.5	H8 2.5	H8 2	H8 2
									H9 6	H9 4.5	H9 4	H9 3.5	H9 3.5	H9 3	H9 2.5	H9 2.5	H9 2	H9 2
										H10 6	H10 4.5	H10 4	H10 4	H10 3	H10 3	H10 2.5	H10 2.5	H10 2
											H11 6	H11 4	H11 4	H11 3	H11 3	H11 2.5	H11 2.5	H11 2.5
												H12 6	H12 5	H12 3	H12 3	H12 2.5	H12 2.5	H12 2.5
													H13 6	H13 3.5	H13 3	H13 2.5	H13 2.5	H13 2.5
														H14 5	H14 3.5	H14 3	H14 2.5	H14 2.5
															H15 5	H15 3.5	H15 3	H15 3
																H16 5	H16 3.5	H16 3
																	H17 5	H17 3.5
																		H18 5

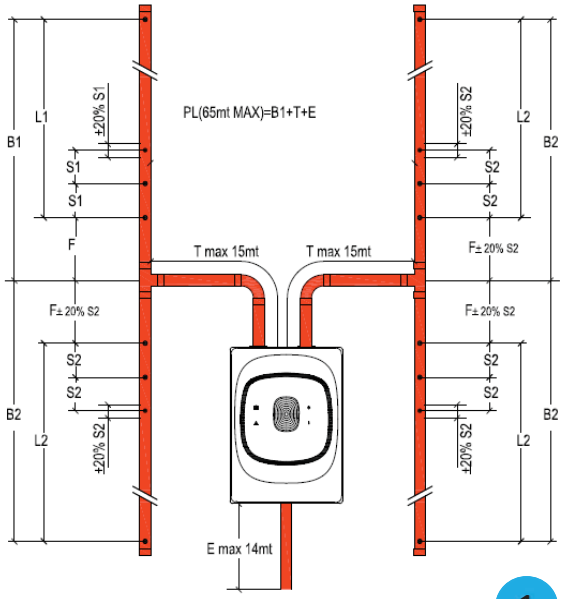
Piping Design "U" pipe - Dual Channel (FLX-020):

Example:

FLX-020 U-pipe network, Class C with In-line filter
Without Exhaust pipe (E), T-junction 1m (T), Branch of 40m (B1), First hole at 20m (F), 6 holes

1. Verification of project constraints and determination of aspirator speed

		Required	Rules
N	Number of holes	6	See Table ✓
E	Exhaust pipe	0m	See Table row C ✓
T	T-junction position	1m	See Table row A ✓
B1	Branch length	10m	
F	First hole Branch 1 with low speed with **high aspirator speed**	20m	1.25 ÷ 18m (19-1) ✗ 1.25 ÷ 29m (30-1) ✓
PL	Pipe length with **high aspirator speed**	40+1+0=41m	≤ 65 m ✓
L1	Last hole position, Branch 1	41-1-20=20m	



2. Calculate nominal step between holes and hole position deviation form nominal

S1 = L1 / (Number of holes – 1) = 20 / 5 = **4 m (≥2.5m)** ✓

± 0.2*4m = **±0.8m**

3. Determination of necessary Sensitivity Level and the hole diameters

1

Number of Branch Holes	1	2	3	4	5	6
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L
A - Maximum T-Junction Distance (meters)	~~15~~/15	~~15~~/15	~~15~~/15	~~15~~/15	~~15~~/15	15/15
B - Maximum First Hole Distance (meters)	30/30	30/30	30/30	30/27	30/23	30/19
C - Maximum Exhaust Pipe Length (meters)	~~14~~/14	~~14~~/14	~~14~~/14	~~14~~/14	~~14~~/14	14/14
Alarm Level Class C with/without filter	Low	Medium	Medium	High	High	High
Alarm Level Class B with/without filter	High	High	High	High	-	
Alarm Level Class A without filter only	High	-	-	-	-	

2

3

4

Number of Branch Holes	1	2	3	4	5	6	7	8	9
Aspirator speed, max 65m for H and 45m for L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H	H
A - Maximum T-Junction Distance (meters)	15/15	15/15	15/15	15/15	15/15	15/15	15/13	15	6
B - Maximum First Hole Distance (meters)	30/30	30/30	30/30	30/27	30/23	30/19	30/15	15.25	7.25
C - Maximum Exhaust Pipe Length (meters)	14/14	14/14	14/14	14/14	14/14	14/14	14/13	14	6
Alarm Level Class C with/without filter	Low	Medium	Medium	High	High	High	High	High	High
Alarm Level Class B with/without filter	High	High	High	High	-	-	-	-	-
Alarm Level Class A without filter only	High	-	-	-	-	-	-	-	-
Drilled hole diameter (mm)	H1 6	H1 4	H1 3	H1 3	H1 2.5	H1 2.5	H1 2	H1 2	H1 2
		H2 6	H2 4	H2 3	H2 3	H2 2.5	H2 2.5	H2 2	H2 2
			H3 6	H3 3	H3 3	H3 2.5	H3 2.5	H3 2.5	H3 2
				H4 6	H4 3	H4 3	H4 2.5	H4 2.5	H4 2
					H5 6	H5 3	H5 2.5	H5 2.5	H5 2.5
						H6 6	H6 3	H6 2.5	H6 2.5
							H7 6	H7 3	H7 2.5
								H8 6	H8 2.5
									H9 5.5

10 Troubleshooting

10.1 Bluetooth Connectivity

Bluetooth connectivity issues may appear depending on the installation location and distance of the detector you are trying to connect with. To ensure Bluetooth connectivity is correct, confirm that the detector's dipswitch is enabled correctly by going through the dipswitch configuration process again, as captured in section 6.3.3 Changing Configuration Mode. Once the FAAST FLEX detector has enabled Bluetooth connectivity through the correct procedure of changing the dipswitch, the detector ID code should appear on the FAAST FLEX Bluetooth App (Honeywell SmartConfig) as a nearby unit.

If the FAAST FLEX detector still does not appear on the list of connected devices, or the Bluetooth functionalities can't be performed, restart the detector via power cycle and try again; this will ensure the configuration has been activated.

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