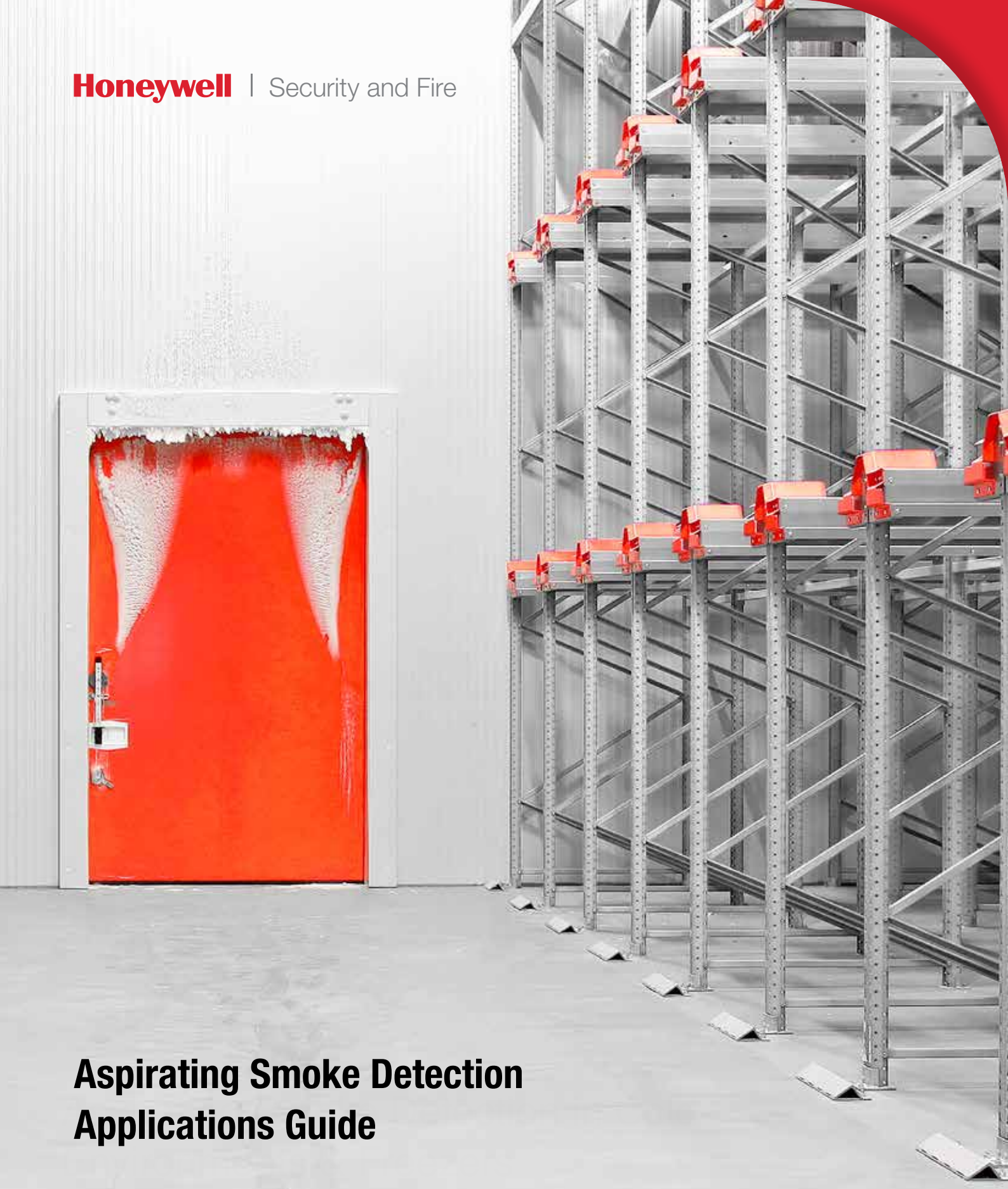
Honeywell | Security and Fire



Aspirating Smoke Detection Applications Guide

FAAST™

Cold storage & freezer application monitoring

Aspirating Smoke Detection (ASD) technology is ideal for installation in cold environments where traditional point or beam detection is unsuitable, due to high levels of moisture and ice particles in the atmosphere. FAAST LT™ combines the most advanced ASD technology and flexible pipe network design to deliver the earliest, most accurate smoke detection with false alarm immunity.
Typical cold storage and freezer applications include:

- Pharmaceutical & medical stores
- Food/drink produce stores
- Leasire centres e.g. ice rinks

Cold environment challenges and risks

There are a number of factors that make many traditional fire detection systems unsuitable for cold environments:

- Temperatures from -45°C to +8°C / -49°F to 46°F
- Heavy condensation
- Water vapour clouds
- High airflows diluting smoke
- Poor smoke transport due to low thermal conductivity
- Inaccessibility for installation, maintenance, testing and replacement

Fire risks in these applications are considerable and include:

- Electrical or mechanical faults in conveyors and transport equipment
- Electrical equipment and wiring (in the environment or housed in the roof space)
- Lighting systems
- Hot spots resulting from maintenance operations
- Discarded cigarette butts
- Arson

Typical areas where an ASD fire detection system provides an effective alternative to traditional detection methods include:

- Food processing plants
- Retail food distribution
- Ambient stores (pharmaceutical)

Pipework application

Sampling pipe network

Achieving optimum performance, accuracy and reliability depends upon correct installation of both the device and the sampling pipe network. It is essential to ensure the unit is protected from any contamination and the following recommendations should be considered in order to leverage the full performance capability of the system.

Pipe installation considerations

PipeIQ™ three-in-one design, configuration and monitoring software is provided as standard with FAAST LT™. During the planning stage, PipeIQ™ will provide an isometric design of the pipework system and may not take into consideration the following factors that may impact final correct design:

- Environment
- Feeder pipe run
- Offsets
- Obstructions

Environmental considerations

Environmental conditions can affect installation, operation and maintenance of the system, so please consider the following factors when designing the sampling pipe network:

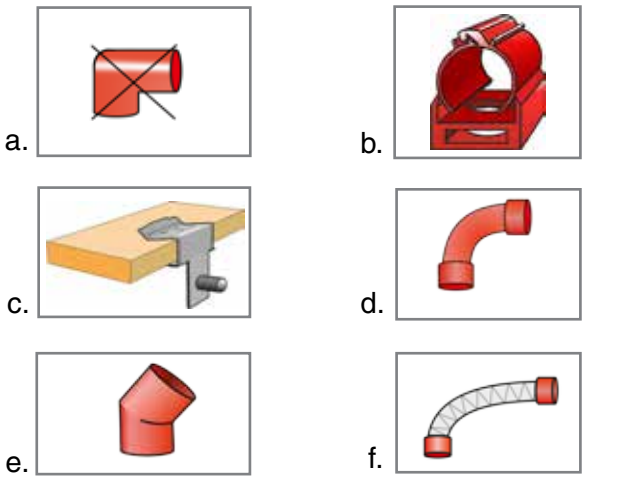
- **Temperature:** from ambient to operational temperature; large fluctuations occur when doors are open/closed during loading/unloading
- **Humidity:** High levels of humidity fog are prevalent during loading/unloading activities
- **External influence:** Internal traffic movement, lorries, forklifts, conveyors, mechanical shovels and accumulative dirt build-up

Installation of the sampling pipe network

Most installations will use ABS Red or White sampling pipe work; this is approved and tested for FAAST LT™. Optimum system design requires as much straight pipe work as possible. However, in reality bends and offsets will be required to create most application designs.

It is recommended to use the preferred fittings (shown in Figure 1 a-f below), designed for use with FAAST LT™. **Please note: 90° elbow bends (Figure 1a), should not be used.**

Figure 1.



Accessories image descriptions:

a. DO NOT USE a 90° elbow bend
b. Standard pipe clip
c. Girder clip for fitting standard pipe clip*
d. Sweep bend
e. 45° elbow bend
f. Flexible connector

* Please note: fixings and hangers are available from a variety of manufacturers.

Temperature impact on pipes

In all cases, the correct pipe clip should be used to accommodate for pipe slippage in the event of expansion and contraction from temperature fluctuations. Most pipes are affected by temperature fluctuations; the amount of expansion is generally 0.1mm / m for every 10°C / 50°F increase above installation temperature.

Using the appropriate clips allows expansion and contraction to occur naturally. However, positioning the pipe up against a wall or obstruction such as a girder (see Figure 2 below), can prevent expansion/contraction.

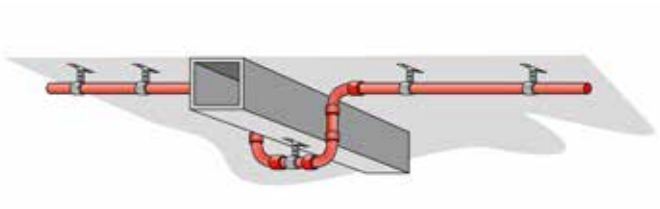
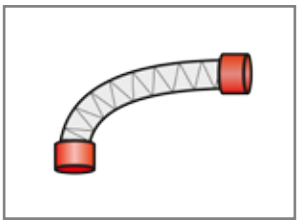


Figure 2.

Expansion clip



Flexible connector

Support clips need to be spaced as detailed in the table below.

Pipe Size	Bracket spacing in metres					
25mm	20°C / 68°F 1m	30°C / 86°F 0.95m	40°C / 104°F 0.85m	50°C / 122°F 0.75m	60°C / 140°F 0.70m	70°C / 158°F 0.60m

Preventing water and high humidity detection issues

In cold environments where high water/humidity are expected, additional ASD pipe network protection is required.

A water trap can be fitted to the pipe network to ensure that water droplets do not enter the ASD unit; moisture simply falls into the trap and can be flushed out of the system during routine maintenance checks (see Figure 3 below).

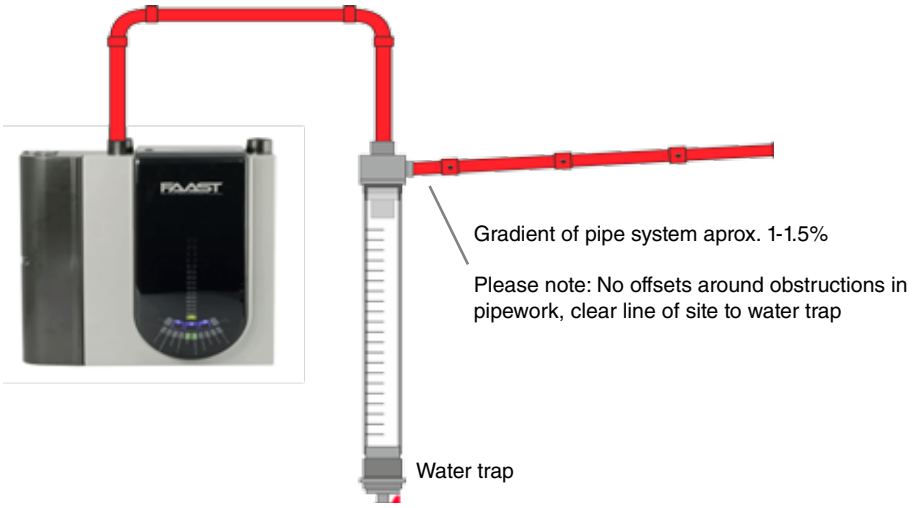
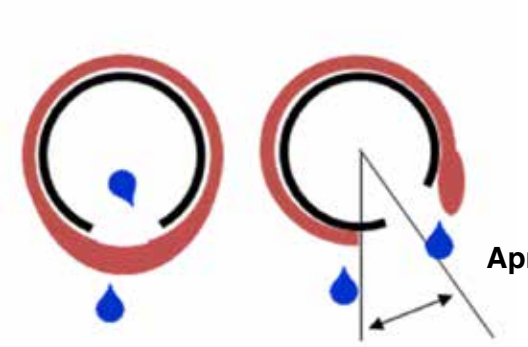


Figure 3.

For additional protection, the aspiration hole can be situated at a 30º angle (see Figure 4 below); this prevents water ingress into the pipe network, preventing the need for subsequent flushing during routine maintenance.

Pipe with hole in the bottom: risk of condensation blocking the aspiration hole and humidity is sucked in.



Pipe with hole at an angle: 30º angle allows condensation to drop down.

Figure 4.

Added system protection can be achieved by offsetting the sampling points. This prevents sample point blockages from large water droplets and also prevents airflow faults from occurring.

Installing pipework on a slight gradient towards the ASD detection unit also encourages any moisture build-up in the pipe network to flow towards the water trap. Please note: the offset must be towards the water trap.

Cold stores and freezer monitoring considerations

FAAST LT™ is ideal for cold stores and freezer room monitoring, because the unit can be mounted outside of the protected area. To ensure correct system operation and performance, please consider the following guidance:

Air return

It is important that the air sampled from the protected area is returned to prevent condensation build-up in and around the exhaust of the unit and to alleviate any flow monitoring issues that could arise from pressure differentials between the protected area and the unit position (see Figure 5 below).

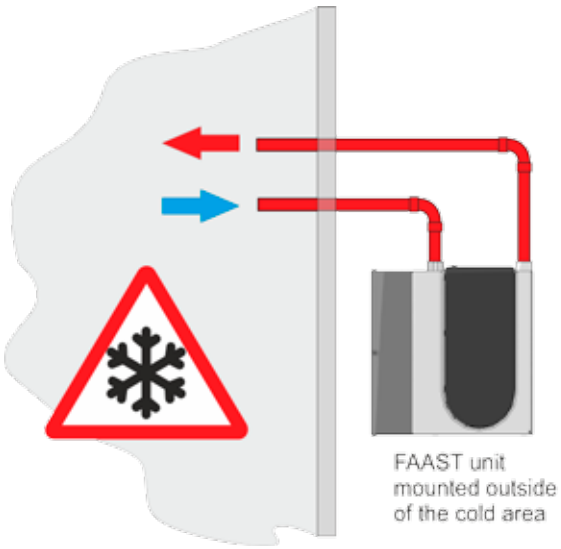


Figure 5.

Electronics protection

Protection of the ASD unit electronics is essential in the coldest environments. This can be achieved by installing a length of pipe between the FAAST LT™ device and the inlet to the protected area.

The pipe length allows cold air taken from the protected area to warm up, preventing damage to the FAAST LT unit (see Figure 6 below). The following pipe length specification is recommended:

- Down to -20°C / -4°F environment: 5 m pipe length minimum
- Below -20°C / -4°F environment: 15 m pipe length minimum

Please note: This guidance is based on a normal ambient temperature (~22°C / 71°F), outside of the protected cold area.

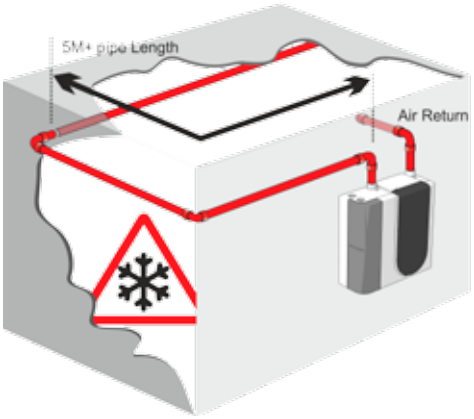


Figure 6.

Pipe lagging and insulation

Where build-up of condensation is an issue, lagging the inlet pipe from the protected area to the ASD unit should always be considered to avoid condensation or frosting of the pipe network. In extreme conditions, extensive insulation / lagging of the pipe network is recommended (see Figure 5 below).

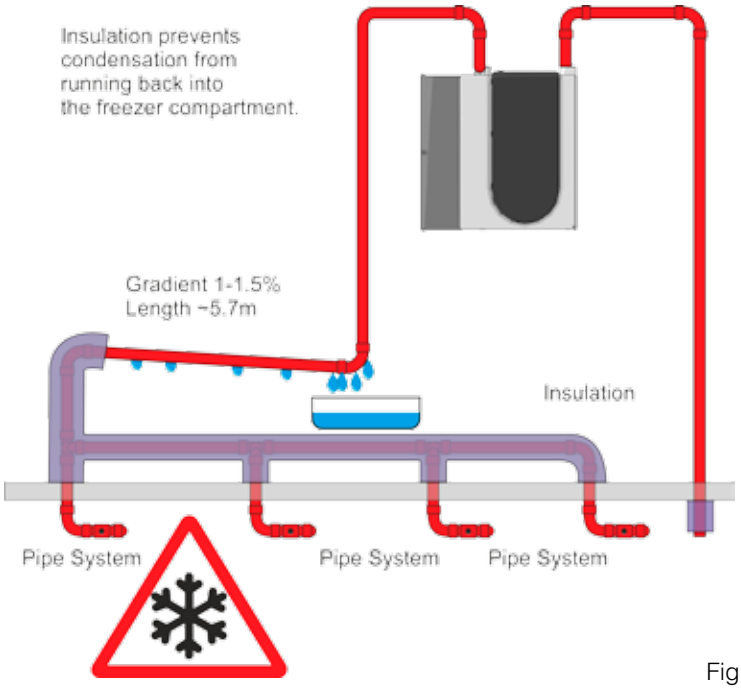


Figure 7.

Manual blow through

A manual blow through system is recommended in a cold store, and should be used with a closed end-cap, removing the pressure relief valve (see Figure 8 to the right).

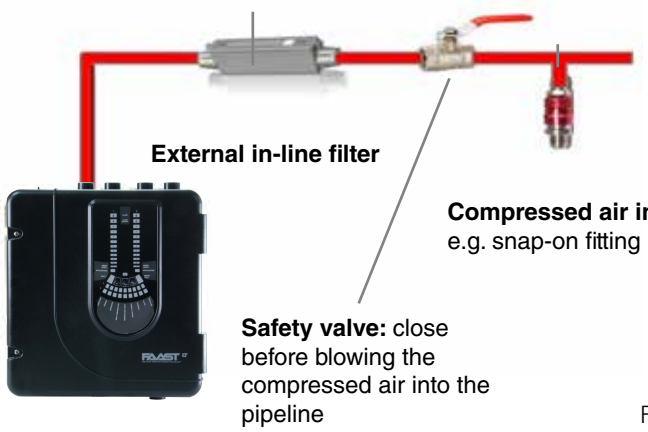


Figure 8.

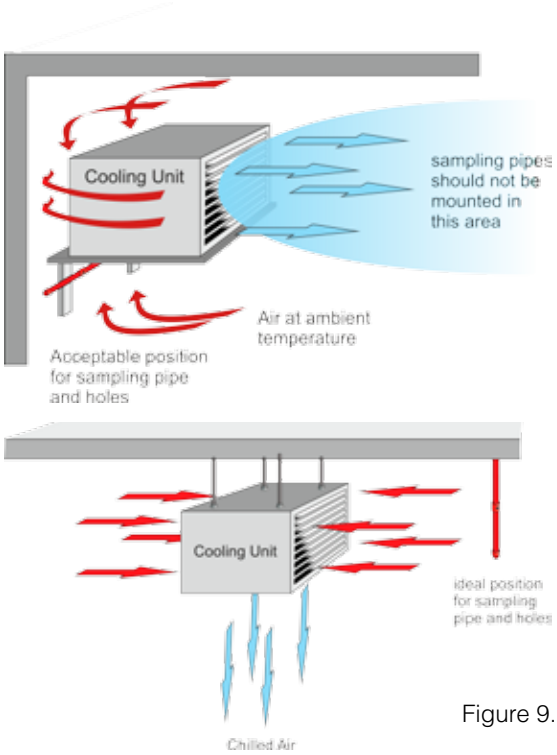


Figure 9.

Sampling points

It's important to ensure sampling points are not situated near entrance doors to the cold store, freezer or the blast chillers.

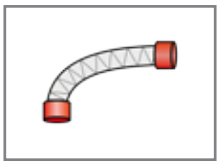
These locations are the most likely for high condensation and ice crystal formation on the sampling points (see Figure 9 to the left).

FAAST LT Accessories

Please find below information on the FAAST LT accessories discussed in this guide.

a. 

b. 

c. 

d. 

Accessories image descriptions:

a. Plastic clip for airflow reducers
b. Water/steam trap
c. 3-way ball valve
d. Manual blow through set

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