FIRETRACE® LTD

AUTOMATIC FIRE SUPPRESSION SYSTEMS

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# Firetrace® "**Indirect**" Low Pressure Automatic Fixed Fire Suppression Systems For Large Plant and Machinery Applications

**Please read instructions carefully prior to starting installation**

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Stops fires where they start

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## System Overview.

The Fixed Firetrace® system is a simple self-actuating device that is designed to suppress fires within an identified risk area.

The system works by using pressurised Firetrace® linear detection tubing that is installed throughout the risk area. This tubing is heat sensitive and when subjected to a temperature above 120 Degrees centigrade, or when touched by flame, the Firetrace® tubing will burst.

Tube burst

The extinguishant is then deployed via discharge pipe work and diffusers onto the fire.

The Firetrace® system requires no external power source or separate detectors and owing to its simple design ensures that all of the extinguishant is always deployed in the risk area.

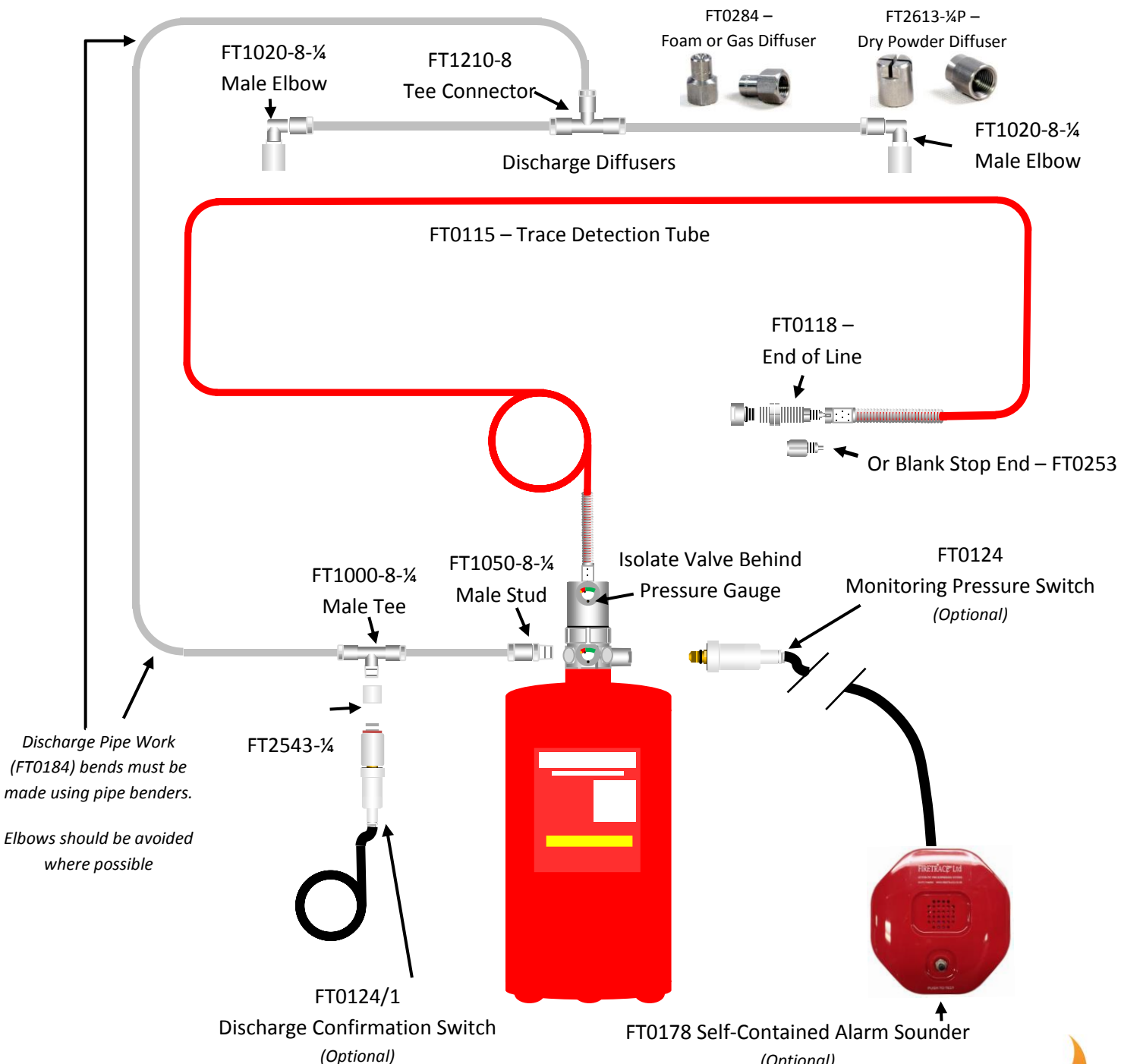
The Firetrace® system can be fitted with a volt free single pressure switch (FT0124) or volt free twin pressure switch (FT0124/T75) which, when connected to the cylinder, not only provides constant monitoring of the system but can also send a signal to indicate a discharge via a Self-contained Alarm Sounder (FT0178) or building alarm.

It is important that the cylinder, Firetrace® detection tubing and discharge pipe work are correctly installed and that the system is subjected to a regular maintenance regime in line with BS5306-3 by a competent engineer.

FT0178 – Self-Contained Alarm Sounder

FT0178/SS – Self-Contained Alarm Strobe Sounder

## System Layout



# Firetrace® Installation Instructions.

## Cylinder

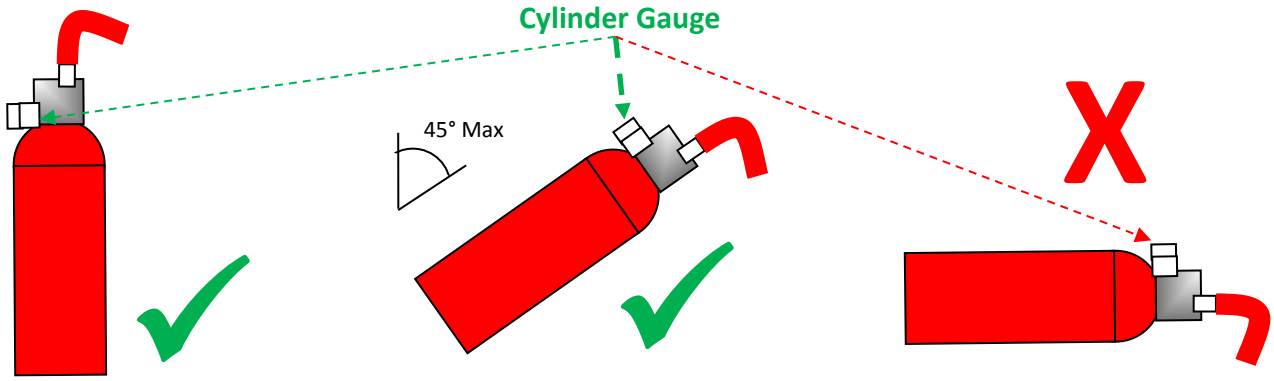
When installing the Firetrace® system it is important that a suitable cylinder location is selected and that the cylinder is orientated correctly.

The cylinder location shall be in a clean area away from direct heat. The cylinder must not be placed in a location where the ambient temperature is above 80 Degrees centigrade.

The cylinder shall be readily accessible to allow future servicing / inspections and as close as practicable to the risk area.

The cylinder shall be adequately fixed to a suitable load bearing surface.

Wherever possible the cylinder shall be **mounted vertically** and in no circumstances must the cylinder be positioned at an angle of more than 45 Degrees from vertical.




**It is recommended wherever possible that Firetrace® cylinders be mounted vertically. Where vertical locating is not possible the systems can be mounted within 45° of vertical.**

**As indicated in the above drawing when cylinders are fitted at an angle the gauge must face uppermost.**

**MOST FIRETRACE® SYSTEMS ARE NOT SUITABLE FOR HORIZONTAL MOUNTING.**

## Firetrace® Automatic Detection Tubing

The Firetrace® Automatic Detection tubing is the key part of the system and acts as the detector to activate the valve.

The correct installation of the tubing is important to achieve optimum performance from the system.

The tubing must be mechanically protected outside the identified risk area and shall remain accessible to allow future servicing.

As heat rises, the Firetrace® tubing is most efficient when mounted directly above the risk. The tubing will activate at approximately 120 Degrees Centigrade and care must be taken to avoid attaching the tubing where temperatures above this are achieved during normal operation.

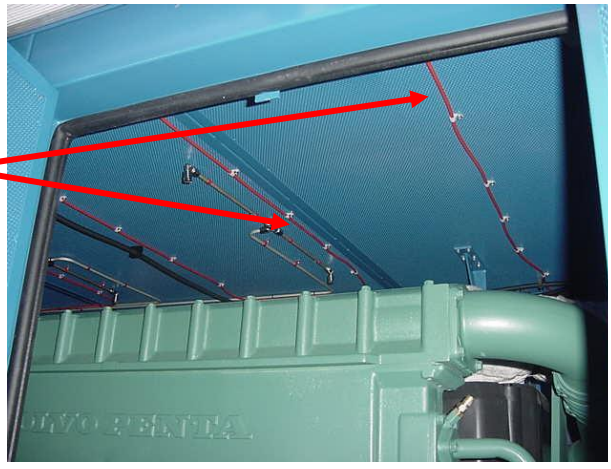
It is recommended that the tube is a minimum of 150mm away from exceptionally hot surfaces or fitted with additional sleeving to avoid false activation.

## Firetrace® Detection Tube and Discharge Pipe Work Routing

As the Firetrace® detection tube is flexible the exact tube route can vary from machine to machine. The basis of the system design is to circumnavigate the protected area so that any potential risks are covered.

The discharge pipe work shall be installed so an unimpeded flow is allowed. Bending of the discharge tube must be done using pipe benders to avoid kinks. The discharge diffusers shall be located for maximum effectiveness on the fire.

**Trace detection tube and discharge pipe work located above the risk area.**



**Typical pipe work bend**

## Tube Fixings

The Firetrace® Automatic Detection tubing is the key part of the system and acts not only as the detector but in some cases as the delivery method for the extinguishant.

The correct installation of the tubing is important to achieve optimum performance from the system.

**The tubing must be physically protected outside the identified risk area using Kopex or another flexible conduit and shall remain accessible to allow future servicing.**

The detection tubing must to be adequately fixed to retain its position and withstand the vibration.

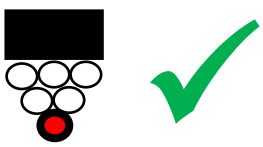
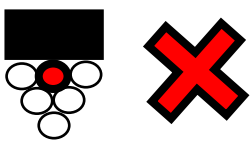
The tubing is a soft polymer and is susceptible to wear / chaffing when repeatedly rubbed against a hard or sharp surface. The tubing shall be protected using nylon Kopex at all fixing points and where it passes through holes.

The following photographs show both “Tyrap” and “P clip” fixings all of which are acceptable.

The Detection tubing shall be supported at maximum intervals of 150mm.

Always leave a small loop of tubing adjacent to the cylinder. Whilst this shall also be secured it must be releasable to allow future servicing of the cylinder.

Where the tubing is installed with a group of other cables/pipes it must be positioned on the underside of the loom and must never be located within the center of the loom.

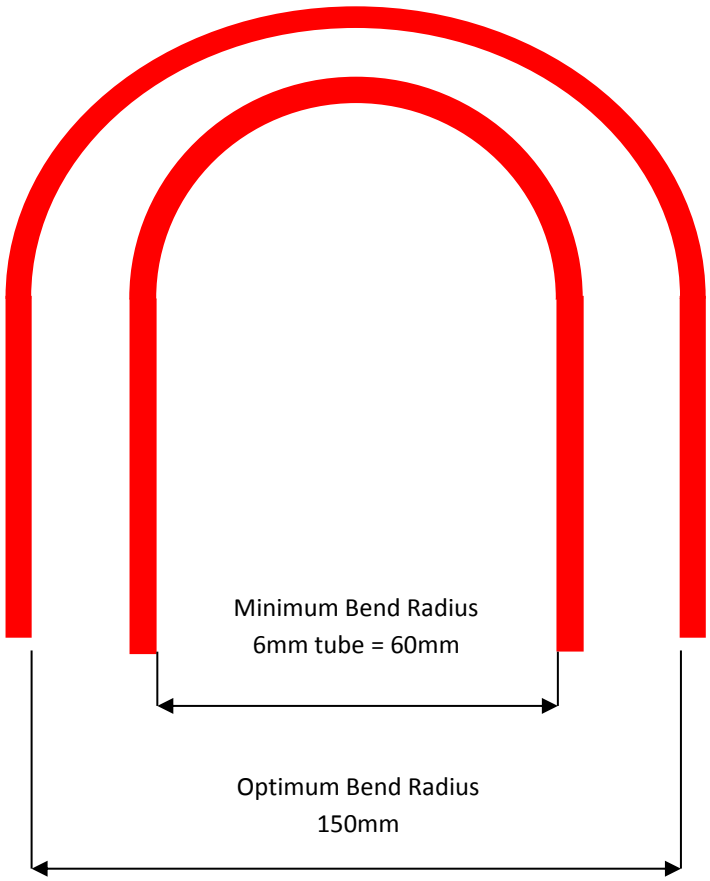



## Tube bending radius

The Firetrace® tubing acts as the detector. It is imperative that the tubing is not kinked or crushed and the following minimum bending radius must be adhered to.

If the tubing is kinked or damaged in anyway then the Firetrace® tubing in that section must be replaced:

**FT0115 Firetrace® tubing 6mm:** **Minimum bending radius 60mm**



## 6mm Trace Detection Tube Components

FT 1511-6/4-1/8
1/8 Male Stud
(Shown with FT0113 Bonded Seal)

FT1540-6/4
Tee

FT1723-6/4
Anti-Kink Spring Nut

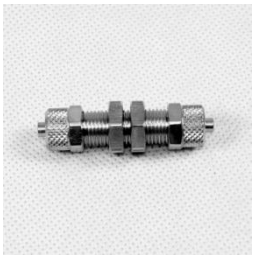
FT0269/1/M
INT Banjo

FT0253
Stop End

FT1580-6/4
Straight Connector

FT0268
Single Banjo

FT1590-6/4
Bulkhead Fitting



FT0269
Double Banjo

FT0254/1
In-Line Commissioning Adapter

All compression fittings must be secured in the following manner:

a) Cut the tube end ensuring the cut is clean and free from burrs. Check that no debris/ swarf is left in the tube.

b) Place the nut over the end of the tube with its threaded section towards the end of the tube.

c) Push the tube fully home into the body.

d) The nut shall be tightened finger tight and then using a 12mm Spanner pinched up to firm hand tightness

e) Slacken off the assembly and inspect end to ensure flange has formed correctly then reconnect and tighten down to ensure an effective seal.

**Method of Assembly**

1. Tubing must be cut off square.

2. Insert tubing into tubing nut.

3. Offer the tubing to the fitting so that the tubing bottoms on the tubing stop. (*this requires a firm push if cold*)

4. Hold the tubing in contact with the tubing stop and screw the tubing nut down to the recommended torque. *(torque = 5.7 Nm)*

5. Slacken off the assembly and inspect end to ensure flange has formed correctly then reconnect to fitting and tighten down to ensure an effective seal.

## Commissioning Instructions

**Warning** Firetrace® Low Pressure cylinders are pressurised to 12bar. Proceed with caution.

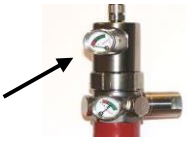
This procedure shall be read in conjunction with design layout for Indirect Low Pressure systems with Integrated Isolate Valve earlier in this booklet.

**Do not** turn integrated isolate valve until system is fully commissioned. *(Pressurised)*

Locate cylinder and firmly secure with bracket provided

Remove black safety cap from the top of the cylinder. Connect Trace detection tube, tighten silver nuts and secure with appropriate clips

Remove gauge FT0107 from the top section of the valve.



Fit Schrader adapter FT0172 and pressurise to **12 Bar / 175 psi using a Nitrogen Cylinder or air pump**
Remove Schrader adapter FT0172 and refit gauge FT0107

Using tape, mark the location of the needle on the pressure gauge *(Mid Green)* and **leave system for a minimum of ten minutes per metre of Trace detection tube to check for any leaks on the Detection tube.**

Install FT0184 8mm diffuser pipework, connect to cylinder using FT1050-8-1/4 stud. When installation is complete, disconnect FT0184 from cylinder and fit blank plug.

When satisfied pressure is good and no leaks have occurred, remove the gauge and open the isolate valve slowly using the key provided and refit the gauge hand tight.
Remove blank plug and reconnect FT0184 8mm discharge pipework.

**System is now live**

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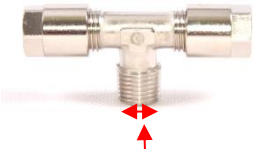
## Discharge Pipe Work Fittings

FT1050-8-1/4
1/4 Male Stud

FT1250-8
Bulkhead

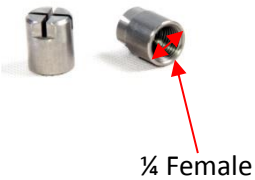
FT1000-8-1/4
Male Tee




FT1020-8-1/4
¼ Male Elbow

FT1210-8
Tee

FT2613-1/4P
Powder Diffuser




FT1220-8
Elbow

FT0284
AFFF Foam Diffuser

FT1230-8
Straight Connector

FT0184
8mm Anodised steel
discharge tube
Supplied in 3m lengths

## Pressure Switches

### Firetrace® Pressure switch (FT0124 & FT0124/T75) Optional

The optional Firetrace® pressure switch is used to monitor the system pressure and will activate in the event of a pressure drop.

The switch can be introduced and removed from the cylinder whilst it is under pressure. This allows its operation to be proven both during commissioning and future servicing.

The Pressure switch is fitted with a black rubber “o ring” which provides the air tight seal. This ‘O` ring must be lubricated with silicone grease and free of any dirt or debris. Failure to ensure the ‘O` ring is clean can lead to a leak which will require the system needing replacement.

**The switch shall be screwed into the cylinder hand tight ONLY.**

The switch contains both normally open & normally closed contacts.

**Always leave a small loop of spare cable adjacent to the pressure switch to allow future removal.**

***FT0124/T75 Twin Monitoring Switch.***

***Switch 1 Set at 5 bar falling.***
***Switch 2 Set at 7 bar falling.***

Common - Brown
Normally open - Grey
Normally closed - Black
Earth - Green/yellow

## Single Pressure Switches

Switching is effected by means of a micro-switch rated at 5A 250v AC

**(Not suitable for use on 440v AC)**
**Tighten HAND TIGHT ONLY**

| | |
|---|---|
| Range | 5 - 35 bar |
| Hysteresis | 2.5 bar |
| Temperature | -10°C to +80°C |
| Thread | M10 x 1.0 x 12.5 with O ring |

**FT0124** — **Monitoring Pressure Switch set at 5 bar falling**

| | |
|---|---|
| Common | Brown |
| Normally Open | Grey |
| Normally Closed | Black |
| Earth | Green / Yellow |

**FT0124/1** — **Discharge Confirmation Pressure Switch Set at 3.5 bar rising**

| | |
|---|---|
| Common | Brown |
| Normally Open | Black |
| Normally Closed | Grey |
| Earth | Green / Yellow |

***(Please note this switch is non-latching)***

## Service and Maintenance (Foam Systems)

**Firetrace® Limited recommends a visual inspection of a Firetrace® system at least every three months and fully serviced annually by a competent engineer.**

**The following checks shall be carried out on a 3 monthly inspection.**

- Check the pressure gauge is reading mid-green.
- Carry out a visual check of the trace detection tube.
- Ensure physical changes of protected areas haven't affected cylinder suitability.
- Check external surface of the cylinder for evidence of rust or corrosion.
- Report any potential problems immediately.

**The following checks shall be carried out on an annual inspection of a Firetrace® Low Pressure Foam System.**

**Remove discharge pipe work and fit blanking caps before starting maintenance**

- Check maintenance record on cylinder to ensure "new date" is less than 5 years old. Foam cylinders require discharge testing every 5 years.
- Check external surface of cylinder for rust, corrosion and damage.
  (If damage or corrosion is identified, replace cylinder)
- Check cylinder bracket and fixings for security.
- Ensure physical changes of protected area haven't affected cylinder suitability.
- Check pressure gauge is reading mid green.
  (If system pressure has dropped close to or in the red area, replace cylinder).
- Remove cylinder removable gauge test operation. Check the cylinder isolate valve is in the correct position. (Horizontal – System isolated, vertical – system live)
- Clean and re grease gauge thread and 'O` ring and refit gauge.
- Carry out visual check of trace detection tubing for damage, deterioration and security of fixings.
- Carry out visual check of discharge pipe work for damage, deterioration and ensure fittings are tight.
- Where fitted, remove and test operation of pressure switches. Ensure pressure switch thread and o ring are cleaned and re greased and refit pressure switch.
- Remove blanking plugs and refit discharge pipe work.
- Record details and service date on cylinder service label.

# Service and Maintenance (Dry Powder Systems)

**Firetrace® Limited recommends a visual inspection of a Firetrace® system at least every three months and fully serviced annually by a competent engineer.**

**The following checks shall be carried out on a 3 monthly inspection.**

- Check the pressure gauge is reading mid-green.
- Carry out a visual check of the trace detection tube.
- Ensure physical changes of protected areas haven't affected cylinder suitability.
- Check external surface of the cylinder for evidence of rust or corrosion.
- Report any potential problems immediately.

**The following checks shall be carried out on an annual inspection of a Firetrace® Low Pressure Dry Powder System.**

**Remove discharge pipe work and fit blanking caps before starting maintenance**

- Check maintenance record on cylinder to ensure "new date" is less than 5 years old. Dry Powder cylinders require discharge testing every 5 years.
- Check external surface of cylinder for rust, corrosion and damage.
  (If damage or corrosion is identified, replace cylinder)
- Check cylinder bracket and fixings for security.
- Ensure physical changes of protected area haven't affected cylinder suitability.
- Check pressure gauge is reading mid green.
  (If system pressure has dropped close to or in the red area, replace cylinder).
- Remove cylinder removable gauge to test operation. Check the cylinder isolate valve is in the correct position. (Horizontal – System isolated, vertical – system live)
- Clean and re grease gauge thread and 'O` ring and refit gauge.
- Carry out visual check of trace detection tubing for damage, deterioration and security of fixings.
- Cut the cable ties around the loop of trace detection tube adjacent to the cylinder. Remove the cylinder from the bracket and invert 2 – 3 times to agitate powder contents. Refit cylinder into bracket and re-instate the loop and affix with cable ties.
- Where fitted, remove and test operation of pressure switches. Ensure pressure switch thread and 'O` ring are cleaned and re greased and refit pressure switch.
- Remove banking caps and refit discharge pipe work.
- Record details and service date on cylinder service label.

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