

Supplementary Guidance Notes for Citizen Machines

Fitted with Firetrace 9kg indirect low pressure class “D” fire suppression dry powder systems

The Firetrace system protecting your Citizen machine is designed to contain a fire caused by cutting oil flash over and the ignition of the combustible metal. The system incorporates a Firetrace indirect high pressure CO₂ system and a Firetrace indirect low pressure Class D dry powder system.

The Firetrace automatic fire detection tube installed within the machine is connected to the Firetrace IHP CO₂ system, in a fire condition the detection tube will be burst resulting in the discharge of the CO₂ system, the system can also be discharged via the Firetrace manual activation device sited on the side of the machine.

The Firetrace automatic fire detection tube is installed within the machine working chamber passing across the extraction spigot en route to the cutting head; the tube is installed above the cutting head and also connects onto the manual activation device.

The first suppressant discharge of CO₂ is intended to suppress a flash over fire associated with the cutting oil used within the machine process. Due to the possibility of combustible metal causing a follow on risk, the Class D dry powder system is designed to discharge once the CO₂ discharge is complete. This allows for the targeted deployment of the Class D dry powder in pre-agreed areas, such as the swarf catchment area immediately below the cutting head: an additional diffuser is aimed directly at the cutting head from above.

The high pressure CO₂ system is fitted with a FTDDV (Firetrace Discharge Delay Valve) that ensures the CO₂ discharge is complete prior to the dry powder being discharged, this allows the system to deploy the Class D powder in the targeted areas so as to fully envelop any risk material.

The Firetrace twin output monitoring pressure switch is installed into the CO₂ system to signal immediately upon discharge of the CO₂. The switch is connected to both a sounder strobe and the machine. The switch utilises a normally closed circuit to initiate shutdown of the machine process upon discharge of the first system, thus ensuring that cutting oil and extraction processes are also shutdown. The machine will not operate until the system has been reinstated.

As the fire suppression system uses CO₂ as one of the extinguishants it is important that the machine is not operated in a restricted space or a basement without adequate ventilation. High concentrations of CO₂ can cause respiratory distress and asphyxiation and care needs to be taken to make sure that in the event of activation of the fire suppression system that the machine operator door is left closed, that the area is cleared immediately of all personnel and that personnel do not return to the area until it has been ventilated to reduce the level of CO₂ to a safe level. Work should not be undertaken with the machine door open (for example inspecting the damage) until the machine enclosure has also been ventilated. This is no different from discharging a portable CO₂ fire extinguisher in a restricted space. Staff training should always take account of the procedure to be taken in the event of fire and the importance of ventilating the area of extinguishant discharge.

Factories incorporating large workshop floor areas should not be an issue, but for example, a CO₂ cylinder of 2kg needs a volumetric area of 100 cubic metres (m³) to prevent danger and, because carbon dioxide is heavier than air, when calculating this area only the volume of the room within two metres of the floor should be taken into account. For a 2Kg cylinder, This equates to a floor area of just over 7 metres by 7 metres with a ceiling height of at least 2 metres. Information about this is given below, please check with us if you are unsure about this.

For use as guidance only

2kg cylinder	100m ³ or equivalent floor space of 7m x 7m with a height of at least 2 metres
5kg cylinder	250m ³ or equivalent floor space of 10m x 12.5m with a height of at least 2 metres
9Kg cylinder	450m ³ or equivalent floor space of 15m x 15m with a height of at least 2 metres

When undertaking the calculations above you should not take account of any room height above 2 metres.

Following any discharge the area should always be well ventilated and care taken to ensure that any low lying areas are also ventilated such as pits or basements where carbon dioxide can accumulate. In the event of activation, the fire suppression system will need to be repaired before the machine can be reused. This will require both cylinders to be exchanged, the heat sensitive tube and pressurisation of the system. This work can be carried out by Firetrace Ltd.

In the event of no activation the CO₂ gas cylinder has a recommended service life of 10 years before needing to be exchanged. The powder system has a recommended shelf life of 5 years.

Service & Maintenance

To comply with British Standard BS 5306 Part 3 2017 the following maintenance tasks should be carried out periodically.

The British standard recommends that each system is visually inspected every 3 months and then fully serviced at maximum intervals of 12 Months by a competent engineer. **It is the customer's responsibility to ensure the fire suppression system is fully maintained and serviced. We strongly recommend this system check is conducted by Firetrace Ltd.**

The Class D fire suppression system is designed to contain a combustible metal fire within the machine. No fire suppression system is 100% guaranteed to extinguish the fire and in the case of a Class D system the aim is to contain the fire to prevent the rapid spread. Alternative fire precautions may need to be considered and may be a requirement of your insurance, especially in an unattended mode of operation. Please satisfy yourself that your fire protection precautions are adequate for your need and risk, and seek independent advice where necessary. This is particularly the case when machining materials with a high content of magnesium or titanium or any machining of sodium or lithium, where highly specialised precautions may be needed to prevent fire or explosion. Precautions are also needed in the storage of combustible metal swarf and chips.

Make sure that your staff are fully versed in safe firefighting methods and have additional free standing suitable Class D fire extinguishers and staff trained in their use in the vicinity. Water or water based extinguishers should never be used on a combustible metal fire as this can cause an explosion. A detailed risk assessment should always be undertaken by a competent person before machining combustible metals and the premises fire risk assessment will also need to be reviewed.

If there is any doubt or you need further advice then please contact Citizen Machinery UK Ltd, Firetrace Ltd, or a specialised fire protection company.

This guidance should be read in conjunction with, and be considered to be in addition to, Guidance Notes for Citizen Machines fitted with Firetrace CO₂ Fire Suppression Systems.

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