



CARBON DIOXIDE FIRE SUPPRESSION —

Machining Centers

Part 2: Fire "Snuffer" Systems

In the machining of castings and the like where a mineral oil coolant is utilized, fires can occur within the machining enclosure. A fast attack, while the fire is small, by a quick application of CO₂ can provide rapid extinguishment with no fire spread and no mess or clean-up.

If the fire is likely to extend beyond the enclosure, or the facility is made up of a number of machines that are "inter-exposing," then a major protection problem exists requiring a more extensive protection system (see CO₂ Application Bulletin #0755: Machining Centers, Part 1: Production Lines).

Since these enclosures are often quite small, a limited supply of CO₂, often a single CO₂ cylinder, will suffice to control a fire inside the housing.

The protection consists of a local application of CO₂ inside the enclosure, applying CO₂ to the work area. Since the enclosure is not a total enclosure, calculation of the CO₂ discharge is done using the Rate by Volume method, taking into account the partial enclosure of the machine housing. This will determine the CO₂ discharge rate that is to be applied for at least 30 seconds.

Additionally, total flood protection of the exhaust duct and mist eliminator is provided, in case the fire is drawn into these units. (See attached sketch.)

Many of these systems have been installed with manual only operation when an operator is always handy. NFPA Standard No. 12, Carbon Dioxide Extinguishing Systems, states:

Paragraph 1-7.1.1: Automatic detection and actuation shall be used.

Exception No. 1: Manual-only actuation may be used if acceptable to the authority having jurisdiction where automatic release could result in an increased risk.

Exception No. 2: This does not apply to hoseline and standpipe systems

Automatic operation is, therefore, obviously the preferred method of operation. Since the enclosures are often relatively small, a single detector at the vapor exhaust could suffice to actuate the systems. Rate compensated thermal detectors work best.

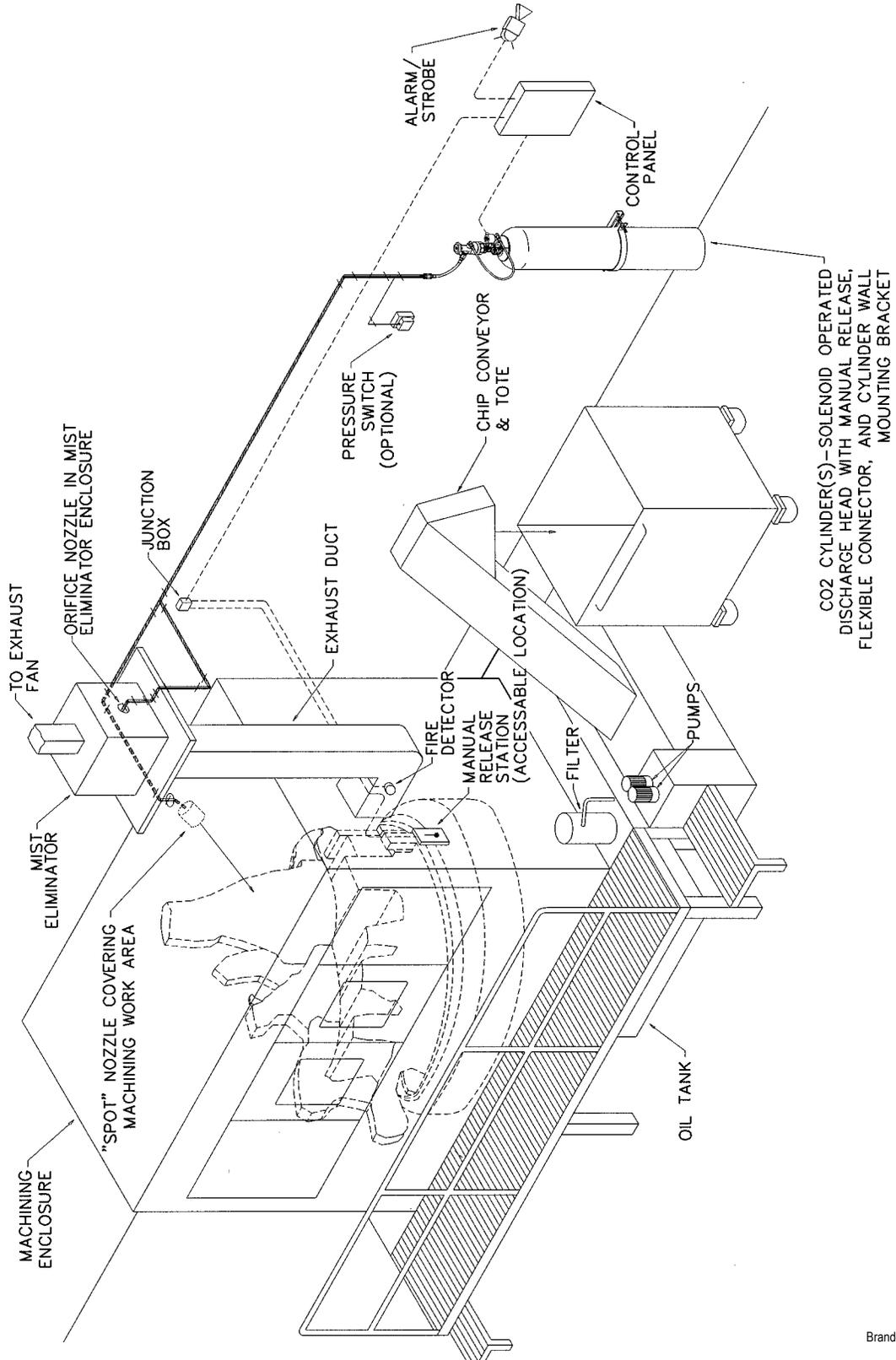
The manual release should be at the machine, handy to the operator(s). The required alarms, with pre-discharge alarm capability (both audible and visual), should be at or near the unit. A pressure switch can be used to give a positive indication of CO₂ discharge by sounding the alarms; to prevent spread of the fire, it can also be used to shut down the exhaust fan, coolant pumps, etc.

The CO₂ system control panel, with its back-up power supply, provides system control as well as vital electrical supervision of control, power and alarm circuits, ensuring a system with a high degree of reliability.

System Lock-out

It may be appropriate to lock out the CO₂ system if personnel can be working in the enclosure. A supervised lock-out valve (not shown in the sketch) can easily be added. This will provide compliance with confined space regulations and still ensure that the protection is in service when the machine is in use.

**High Pressure CO₂ "Snuffer" System
for Machining Enclosure**



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