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DIMENSIONING OF SPARK DETECTOR SYSTEM

The elements to be considered for dimensioning the system are the following:
- Ducting: diameter, length and air speed.
- Safety level required: with or without monitoring station.
- Water: pressure.

The duct diameter determines the choice between single detector and pair.
Up to 500 mm diameter, the duct is considered small and a single detector is sufficient (small systems type “A” and “E1”).
Over 500 mm diameter the duct is considered large and a pair of detectors is required (large systems type “B” and “E”).

The safety level required determines the choice between systems that perform only detection and extinguishing operations (simple systems type “A” and “B”) and those that also provide monitoring (complete systems type “E1” and “E”).

Four systems are then available:
- **SYS-A**
  Small simple system. Extinguishing only. Single detector.
- **SYS-B**
  Large simple system. Extinguishing only. Double detector.
- **SYS-E1**
  Small complete system. Extinguishing and monitoring. Single detector.
- **SYS-E**
  Large complete system. Extinguishing and monitoring. Double detector.

The duct length must be sufficient to allow positioning of the spray nozzles, and of monitoring detectors if required.
Normally 15 m are required for the nozzles plus another 4 m for the monitoring detectors. In all, 15 or 20 m are required.
If the required length is not available, consult page MASP 13, which shows the minimum distance for the spray nozzle as a function of air speed.

The air speed is an important factor for the duct length required. The usual air speed in wood-processing factories is 20-30 m/s. In textile and other factories air speed is lower, 15 to 20 m/s.

The system must be powered by an external 24Vdc power supply.

The water pressure is very important to a proper functioning of the extinguishing system. At least 1 bar must reach the nozzle for a continuous hollow cone jet. Account must be taken of the pressure drop in the solenoid valve ($^1/_2$ to 1 bar), and of pressure drop due to the elevation of the nozzles (1 bar every 10 m of elevation).

In general a pressure of 3-4 bar on the nozzle is recommended. When the water pressure is not sufficient or unstable, it is recommended to mount a small (10-20 liter) pressurized storage tank. Water consumption is moderate.
A nozzle sprays about 1-2 liters of water in each 3 sec spray, the flow rate through the nozzles is about 30 liters per minute at 4 bar.

Naturally, account must also be taken of the water piping length before the solenoid valve. 50 meters of 3/4" pipe with a flow rate of 60 liters per minute (2 nozzles) create a pressure drop of 4 bar, whereas for a 1 $^1/_2$" pipe with the same flow rate the pressure drop would only be 1/4 bar.

To compensate for the pressure drop it is advisable to mount a 10-20 liter pressurized tank with a non-return valve.
It is also advisable to mount a manometer before the solenoid valve and beyond the tank.
A strainer and a manual shutoff valve are accessories that a good plumber will fit on his own initiative.