MONARCH Dry Chemical
Open Face Paint Spray Booth
Fire Suppression System

General
Paint spray booths/rooms are areas designed to confine or limit
the escape of spray, vapor, and residue. A power ventilation
system dedicated to these areas helps ensure the appropri-
ate exhaust of residual material. PYRO-CHEM dry chemical
suppressing agents are appropriate for Class A, B, or C fires. A
careful hazard survey should be conducted to properly define
the type of fire to be suppressed. In addition to flammable/
combustible liquids, the material composition of the object to be
painted must be considered as well as resident material in the
protected area. Total flooding and screening application tech-
niques as defined by NFPA 17 are utilized by the MONARCH fire
suppression systems to protect the entire hazard which includes
the work area, exhaust plenum area, exhaust ducts, and the
screening of the opening.

The National Fire Protection Association Standard No. 33 “Spray
Application Using Flammable and Combustible Materials” and
No. 17 “Dry Chemical Extinguishing Systems” are primary
reference sources and provide guidelines for the proper applica-
tion and design of the MONARCH Industrial Fire Suppression
Systems in the specialized protection of paint spray booths
and rooms. Underwriters Laboratories testing provides pre-
engineered system application parameters allowing the flex-
ibility to protect a variety of paint spray booth/room layouts to
Underwriter’s Standard UL 1254, effective September 1998, with
confidence.

System Operation
Paint spray booth fire protection is a special application of
the MONARCH Industrial Fire Suppression System. It provides
a highly reliable response with the versatility of automatic or
manual activation.

A modular concept of protection is used. A nozzle, with a
prescribed area of protection positioned according to pre-
engineered placement parameters, protects a modular area of
hazard. Sets of nozzles supplied by a dedicated cylinder contain-
ing dry chemical suppressing agent and piped in an approved
pattern consistent with the application coverage are utilized.
Mechanical or electrical fixed temperature detectors are posi-
tioned strategically within the protected area to monitor ambient
temperature and initiate an output should the rated temperature
be exceeded. The detector input is “sensed” at the control head.
The control head responds by discharging the system by pneu-
matically depressing the stored agent cylinder valve. A manual
means of activating the system is also provided.

Expanded capability is available to provide remote manual acti-
vation, auxiliary electrical outputs and/or audible alarms. This
optional equipment will enhance the basic system functions and
be applicable when designing custom configurations to suit a
particular customer’s needs and/or comply with local codes.

Suggested Architect’s Specifications
1. General
   1.1 – The fire suppression system shall be the stored pres-
sure dry chemical pre-engineered fixed nozzle type manu-
factured by Johnson Controls. The system shall provide
for the protection of the paint spray area(s) described in
drawing __________________. (Note drawing number and
revision.)
   1.2 – The system shall be capable of automatic and manual
actuation. It shall be U.L. Listed and installed in confor-
mance with National Fire Protection Association Standard
No. 17, “Dry Chemical Extinguishing Systems” and No.
33, “Spray Application using Flammable and Combustible
Materials,” and comply with all local and/or state Codes
and Standards.
   1.3 – The system shall be designed for operation at ambient
temperatures from 32 °F to 120 °F (0 °C to 49 °C).

2. Cylinder and Agent
   2.1 – Agent. The system shall use PYRO-CHEM monoam-
monium phosphate-based dry chemical agent.
   2.2 – Cylinders. Steel cylinders manufactured, tested, and
marked in accordance with DOT 4B 350 or DOT 4B 500 shall
be used to store the suppressing agent. Cylinder Models

1. Model PCI-Series Agent Storage Cylinders
2. Model MCH Control Head
3. Suppressing Agent Discharge Nozzles
4. Fixed Agent Distribution Piping
5. Fixed Temperature Fusible Link Detector
6. Electrical Conduit Protecting Stainless Steel Cable
7. Alarm Bell
8. Remote Mechanical Pull Station
2. Cylinder and Agent (Continued)

PCI-15ABC shall be used with suppressing agent fill weight of 12.5 lb (5.6 kg). Cylinder Models PCI-25sABC shall be used with suppressing agent fill weight of 25 lb (11.3 kg). Cylinder Models PCI-35ABC shall be used with suppressing agent fill weight of 35 lb (15.8 kg). Cylinder Models PCI-50sABC shall be used with suppressing agent fill weight of 50 lb (22.6 kg). Cylinder Models PCI-70ABC shall be used with suppressing agent fill weight of 70 lb (31.7 kg). All models are charged with dry nitrogen to 350 psig (24.1 bar) at 70 °F (21 °C).

3. Actuation Controls

3.1 – Control Head. The system control head shall include a Model MCH, NMCH or ECH-Series Control Head. The control head shall be mounted directly on the valve of the agent cylinder (for single cylinder systems), in a Model MB-P2 control head mounting bracket (for actuating up to five centrally located agent cylinders) or directly on the valve of a pneumatic actuating cylinder. A carbon dioxide pilot cartridge that complies with MIL-C0601G shall be used as an integral component of the control head. Control head status shall be visually indicated by a SET/FIRED indicator.

3.2 – Detection. The ambient temperature of the hazard area shall be monitored by fixed temperature mechanical or electrical thermal detectors. When the temperature of the hazard area exceeds the rating of any detector, the detector shall a) release tension in a cable connected to the control head, causing control head activation (for mechanical detectors), or b) close a normally open switch element within the detector, sending a signal to the control head which energizes a solenoid in the control head, exercising the control head (for electrical detectors).

3.3 – Pneumatic actuation. For systems requiring more than five agent cylinders, the system shall have a PAC-Series Pneumatic Actuating Cylinder whose valve opens upon activation of the control head. The valve shall release nitrogen from the PAC cylinder into the pneumatic pipe and tubing network. This nitrogen shall depress a piston above the valve stem in each agent cylinder, opening each agent cylinder valve and releasing the pressurized agent.

3.4 – Manual actuation. The system shall have mechanical manual actuation capability requiring no electrical power. This is accomplished locally by twisting the handle on the cover of the MCH or ECH Control Head, or remotely by means of a Model RPS-M remote mechanical pull station.

3.5 – Auxiliary output. The system shall provide for the shut off of power to equipment within the hazard and to ventilation systems in the event of system actuation. This is accomplished by means of dry contacts on a Model MS-SPDT or MS-DPDT miniature switch installed in the control head. The miniature switch may also be used for auxiliary functions such as audible alarms or alarm signaling.

3.6 – Supervision. A Model SM Series Solenoid Monitor shall be used to supervise the integrity of all electrical actuation circuits, whether automatic or manual.

3.7 – Manual electrical actuation (optional). The system shall have electrical manual actuation capability. This is accomplished by the use of a Model RPS-E2 Remote Electrical Pull Station installed in the automatic detection circuit.

4. Distribution Nozzles

4.1 – Nozzles. The system shall utilize PYRO-CHEM discharge nozzles to distribute agent throughout the hazard area. The model, quantity, location, and orientation of nozzles shall be in accordance with MONARCH Industrial Fire Suppression System Technical Manual (Part No. 550387, latest revision) for Open Face Paint Booth Protection.

4.2 – Nozzle covers. All nozzles shall be installed with nozzle covers to prevent foreign matter from clogging the discharge nozzles.

5. Pipe and Fittings

5.1 – Pipe. All pipe shall be Schedule 40 black, galvanized, chrome plated or stainless steel pipe in compliance with NFPA 17. All pipe ends shall be thoroughly reamed after cutting, and all oil, chips, and debris shall be removed prior to nozzle installation.

5.2 – Fittings. Standard weight malleable, galvanized, chrome plated or stainless steel fittings shall be used.

5.3 – Size. All system pipe and fittings will be sized in accordance with the system Technical Manual. No substitutions are allowed.

5.4 – Joints. No joint sealant shall be used in the discharge piping. Exception: Teflon tape may be used to help ensure a snug fit.

5.5 – Straps. All system discharge pipe shall be securely fastened by means of pipe hangers and/or pipe straps. UL Listed pipe hangers shall be used.

5.6 – Union. A union shall be installed in the discharge piping conveniently close to the cylinder valve to permit disconnection for inspection and service.

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### Suggested Architect’s Specifications (Continued)

#### Cylinder and Agent (Continued)

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<th>Model No.</th>
<th>A (in.)</th>
<th>B (in.)</th>
<th>C (in.)</th>
<th>D (in.)</th>
<th>Weight (lb)</th>
<th>Mounting Bracket</th>
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Note: The converted values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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