

ACTUATION

OVERVIEW

In an automatic system, the closing of any one of the normally open heat detection devices will cause the Control Unit or Circuit Monitor Panel to discharge the electric actuator. The pressure generated from the discharge of the electric actuator forces the piston through the seal of the actuating nitrogen gas cartridge, the gas then moves through the actuation lines to the slave actuator where a piston punctures the seal of the pressurizing cartridge. The released gas flows to the agent tank and distributes the fire suppression agent into the protected areas of the machine.

If the automatic detection feature of the system has been disabled, or was not installed, the system will not discharge unless manually actuated. Manual actuation is accomplished by pulling a safety pin and striking down forcefully on the push knob on a mechanical actuator assembly. This action also forces the piercing rod through the seal of the compressed nitrogen gas cartridge.

FEATURES

- FM 5970 Approved
- Australian Standards AS 5062
- Automatic and manual actuation uses
- Purpose built for heavy equipment
- Tested for -40° to 140°



APPLICATIONS

The AFEX fire suppression system is a pre-engineered dry chemical, liquid agent, or dual agent system. It is designed to suppress fires that occur on heavy duty mobile equipment. Typical applications are found on machines used in surface mining, logging, landfill, agriculture, resource recovery, oil and gas, slag operations, buses and transportation applications, and special uses such as conveyor belts, compressors and generators.

The fire system described is a suppression system only and is not designed or intended to suppress all fires.

DESCRIPTIONS

A116000 FIRING MECHANISM

The firing mechanism is used with systems featuring automatic detection and actuation. It houses the electric actuator and a nitrogen cartridge. The electric actuator is mounted in the upper port and a nitrogen discharge port is located in the lower portion of the firing mechanism. Discharge of the electric actuator, or depressing the knob on the top of the firing mechanism, forces the piercing rod through the seal in the nitrogen cartridge, allowing the release of the compressed gas.



A709500 ELECTRIC ACTUATOR

The electric actuator is used with systems featuring automatic detection and actuation. It produces gas pressure upon discharge. This gas pressure drives the piercing rod in the firing mechanism down through the seal in the nitrogen cartridge, releasing the compressed nitrogen gas. One end of the electric actuator is threaded into the upper part of the firing mechanism and a wiring harness is integrated into the other end.



Note: Legacy electric actuators shipped prior to 2019 included a separate harness.

A905000 CHECK VALVE

The check valve is a spring loaded ball valve that controls the direction of the flow of the nitrogen gas from the actuating nitrogen cartridges. If more than one manual actuator is installed, one check valve is required per actuator. An arrow is inscribed on the check valve to indicate the direction of flow. The check valve is finished with 1/4" male NPT threads.



MANUAL ACTUATORS

A manual actuator serves as a point of manual actuation for both manual and automatic systems. When the knob on the top of the actuator is driven down forcefully, the piercing rod is forced through the seal in the actuating nitrogen cartridge, releasing the compressed gas, which is then directed to the top of the slave actuator.

Manual actuators satisfy:

NFPA 17 9.9.8 An additional manual actuator or operating device shall be located so that it is in the path of egress and operable from ground level.

NFPA 122 7.4 (3) Depending on the size of the equipment, additional ground-level manual actuators could be needed to provide quick access for manual activation of the system.

A981450 REMOTE W/U-BRACKET



A981550 REMOTE W/S-BRACKET



AUTOMATIC ACTUATOR

A981750 SLAVE ACTUATOR

The slave actuator is primarily used to actuate the pressurizing cartridges for the agent tanks. The gas released from the actuation cartridge enters the top of the slave actuator and drives the piston downwards, puncturing the seal of the nitrogen cartridge, and releasing the gas into the agent tank.



NITROGEN CARTIDGES

The nitrogen cartridge assemblies consist of a DOT approved cylinder, threaded adapter, seal and shipping cap. They are used to either pressurize or actuate the fire suppression system, depending on their application. The nitrogen used in the AFEX fire suppression system is 99.99% nitrogen with a dew point of -100°F (-73°C).



ACTUATION HOSE FITTINGS

Approved flexible hydraulic hose with 1/4" (6.35mm) nominal inside diameter must be used for system actuation and agent tank pressurization lines. Female hose fittings must be used with corresponding appropriate adapters.



SPECIFICATION CHART

ACTUATION COMPONENTS

COMPONENTS & PART NUMBERS	DIMENSIONS	DESCRIPTION	SHIPPING WEIGHT
MANUAL ACTUATORS			
A981350 REMOTE W/2 OZ. BRACKET	3.25"x3.75"x12.25" (8x10x31cm)	REMOTE ACTUATOR WITH 2OZ. NITROGEN CARTRIDGE BRACKET	1.2247 kg (2.7 lb)
A981450 REMOTE W/U-BRACKET	2.5"x3"x6" (6x8x15cm)	REMOTE ACTUATOR WITH U-BRACKET	0.5579kg (1.23 lb)
A981550 REMOTE W/S-BRACKET	3"x3.5"x14.25" (8x9x36cm)	REMOTE ACTUATOR WITH S-BRACKET	1.4628 kg (3.22 lb)
AUTOMATIC ACTUATORS			
A981750 SLAVE ACTUATOR	7.5"x5"x18.75" (19x13x47cm)	AUTOMATIC SLAVE ACTUATOR	3.4111kg (7.5202 lb)
A116000 FIRING MECHANISM	2.5"x2.5"x7.5" (6x6x19cm)	FIRING MECHANISM FOR AUTOMATIC ACTUATORS	0.787 kg (1.735 lb)
A709500 ELECTRIC ACTUATOR	1"x1"x1.25" (25x25x32mm)	ELECTRIC ACTUATOR	0.1429 kg (0.315 lb)

COMPONENTS & PART NUMBERS	DIMENSIONS	NOMINAL CAPACITY	FILLED TO	SHIPPING WEIGHT
NITROGEN CARTRIDGES				
A310000 10oz REFILL A315000 NITROGEN GAS	3.5"x15" (9x38cm)	10 oz. (383.5g)	1800 psi	2.3474 kg (5.1751 lb) 3.7 kg (8.1571 lb)
A320000 1oz ASSM NITROGEN GAS	2"x7.5" (5x19cm)	1 oz. (28.4g)	1800 psi	0.6532 kg (1.44 lb)
A330000 25OZ ASSM NITROGEN GAS	4"x28" (10x71cm)	25 oz. (708.7g)	2015 psi	6.8198 kg (15.035 lb)
A350000 15oz REFILL A350005 NITROGEN GAS A355000	4.25"x18" (11x46cm)	15 oz. (425.2g)	2015 psi	4.6 kg (10.1413 lb) 4.5 kg (9.9208 lb) 4.6258 kg (10.1981 lb)
A360000 2oz ASSM NITROGEN GAS	2"x10.5" (5x27cm)	2 oz. (56.7g)	1800 psi	0.9095 kg (2.0051 lb)
A380000 55oz ASSM NITROGEN GAS	6.75"x23.5" (17x57cm)	55 oz. (1.56kg)	2015 psi	19.0511 kg (42.001 lb)

SPECIFICATION CHART

ACTUATION COMPONENTS

COMPONENTS	DIMENSIONS	DESCRIPTION	SHIPPING WEIGHT
ACTUATION HOSE AND FITTINGS			
A601000P HOSE-1/4IN	1/4" (6.35mm)	1/4' ACTUATION HOSE	0.0726 kg (0.16006 lb)
A604400P FTG-1/4 HOSE X 1/4 FJIC	1/4" (6.35mm)	1/4' HOSE x 1/4" FEMALE JIC FITTING	0.0975 kg (0.21495 lb)
A604600P ADAPTER-1/4 MPT X 1/4 MJIC STRAIGHT	1/4" (6.35mm)	1/4' MALE NPT x 1/4" MALE JIC STRAIGHT ADAPTER	0.0295 kg (0.0650 lb)
A604800P ELBOW-1/4 MPT X 1/4 MJIC X 90	1/4" (6.35mm)	1/4' MALE NPT x 1/4" MALE JIC x 90 ADAPTER	0.0408 kg (0.0899 lb)
A604850P FTG-BULKHEAD 1/4 MJIC	1/4" (6.35mm)	1/4' MALE JIC BULKHEAD FITTING	0.0431 kg (0.0950 lb)
A905000 CHECK VALVE	1.75"x0.75"x1" (44x19x25mm)	CHECK VALVE 1/4" MALE NPT THREADS	0.0816 kg (0.1799 lb)

MAINTENANCE INTERVALS

ELECTRIC ACTUATOR

INTERVALS NOT TO EXCEED 5 YEARS

- Replace the electric actuator (A709500), if equipped.

NITROGEN CARTRIDGES

INTERVALS NOT TO EXCEED 10 YEARS

- Replace all 1 oz. (A20000), 2 oz. (A360000), and non-refillable (A31000 and A35005) nitrogen cartridges.
- Hydrostatic testing of all nitrogen cartridges greater than 2" (5cm) outside diameter (all cartridges larger than 2 oz.) shall be performed to the test pressure as defined by DOT specification. For DOT 3A cartridges this equals 5/3 times the service pressure.

ACTUATION HOSE AND FITTINGS

INTERVALS NOT TO EXCEED 5 YEARS

- Hydrotest or replace hoses.

INTERVALS NOT TO EXCEED 12 YEARS

- Pressure test:
 - A601000P 1/4" hose 1250 psi
 - A602000P 1/2" hose 565 psi
 - A603000P 3/4" hose 565 psi

SYSTEM TYPES

MANUAL SYSTEMS

These systems do not have heat detection circuits and require human action to identify a fire condition and take appropriate actions to initiate the system's discharge sequence.

MAIN INDUSTRY USES

These types of actuation systems are primarily used in steel & slag industries due to the high ambient temperature of the environment in which they operate

AUTOMATIC SYSTEMS

Automatic systems feature a detection circuit that senses heat in the protected areas of the machine and then automatically initiate the discharge sequence. All automatic systems are required to have a manual override method of initiating the discharge sequence.

MAIN INDUSTRY USES

These types of actuation systems are primarily used in mining, forestry, oil, gas & energy, coal, waste handling, and agriculture industries

APPROVAL

AFEX fire suppression systems have been tested by Factory Mutual in accordance with FM Standard 5970, "Heavy Duty Mobile Equipment Protection" and Australian Standards AS 5062 "Fire protection for mobile and transportable equipment," and have been found to comply with all applicable requirements.

ADVANTAGES OF CHOOSING AFEX

- You will be working with a company that is committed to top-notch, personable customer service. When you call us, you speak to a real person who cares.
- You will be supporting an American manufacturer and American workers.
- You will benefit from working with a forward-thinking, innovative company that keeps current with heavy equipment trends
- You will receive timely and professional shipping of your order.

ORDERING INFORMATION

We appreciate our customers and are committed to providing the industry's best service and support. That's part of what makes AFEX the #1 manufacturer of vehicle fire suppression systems in the Americas.

Order all system components through your local distributors.

Corporate office:
6031 Oak Forest Drive
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