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High Pressure Mine Door

American Mine Door® Co. works with and assists every customer to help determine the best solution for your specific application.

We take into consideration the width, height, water gauge, service requirements, budget, and application to offer the most economical and effective solution for your ventilation door needs, including two different door actuation designs. (See Door Actuation Options later in this document.)

Operation and Design of the AMD Mine Ventilation Door

Our door wings open in opposite directions. This unique design feature allows our mine doors to withstand many inches of water gauge pressure. The same air pressure that assists the door in opening also assists it in closing. Consequently, air pressure is equalized.

Ramp slope effects are cancelled as one door wing operating downhill aids the other wing uphill. Due to the equal force principal, our mine doors can be installed in almost any slope application.

To assure maximum lifetime value, our mine doors are reusable, and can be easily moved from one location to another.

Safety Features

Safety is everyone's top priority at American Mine Door Co. We have incorporated safety into the design of our doors by risk assessments during design, engineering and controls. Below are some benefits of using our mine doors:

- Doors were designed to cancel the effects of static pressure by incorporating our "opposing wing" design. Making the pressure on the door system equal out significantly reduces potential stored energy concerns.
- Optional Traffic control using lighting systems, alarms, surface control, remote control systems, sonic sensors/ photo sensors (identify objects within the path of the door wing closure) and bump panels are all examples of available safety options to our customers.
- Custom controls packages designed to fit your specific needs. We can design a system to control almost any situation unique to your situation.
- Door packages are painted (powder coated) high visibility safety yellow. Reflective striping as an available option.
- Optional man-door escape ways installed within the door wing.
- Optional air regulators installed into door wing.
- In the event of a power failure, our door packages can still open and close with stored energy (limited cycles).

Door Benefits/ Overview of Options

ITEM	DESCRIPTION
Operational Design and Features	• Opposing wing design cancels out the effects of static air pressure • Top and Bottom connecting bar actuation (standard), or top connecting bar and two cylinders on bottom of wing panels – (optional) actuation. • Allows traffic into neutral airways where a permanent stopping is impossible to construct. • Door remain closed if air currents are reversed. • Reduce icing conditions by installing an American Mine Door at the portal. • Used in all types of mines: uranium, salt, potash, gypsum, clay, gold, coal, titanium, molybdenum.
Door sizes	8’ wide to 24’ wide 8’ height to 20’ height
Operational water gauge pressure	Up to 1,000,000 IN/LB./Torque
Operational Service	365 days a year for many years without failures.
Installation	12/6 pitch, reduces the distance to open and close the wings. Door packages are easy to install, drawings are included with every package.
Economics	The most effective and economic door system available.
Door Activation	Pull cord, push button, remote control, proximity sensor, manual
Safety	Available - light packages, reflective stripping, buzzers, proximity sensors, sonic sensors, high visibility safety yellow paint, cap lamp sensors and bump panels.
Options-custom design	We are capable of designing almost any custom door systems to fit your requirements. We will custom manufacturer the steel fabrication (add man door, regulator, etc.), controls (custom PLC programs to run auxiliary options) and safety systems (able to include your mines specified devises).
Actuation Power Systems	Pneumatic, hydraulic and manual 100% all electric operation – “electric cylinder

Door Control and Actuation Features

The American Mine Door Co. has the ability to design controls to operate your mine door package. After initial review of your specific needs, we will offer the customer a written description of exactly how the control system we design will operate. At that time, the customer will review the system operation overview and make any final alterations that they want included. American Mine Door Co. will build the controls in-house, complete a thorough testing of the system, and then complete wiring schematics and installation instructions for the customer.

Control Features:

- NEMA 12/13 enclosure
- Allen Bradley Micrologix 1000 PLC
- Line conditioner in each system
- All Allen Bradley components (relays, terminal blocks, switches, fuse holders etc.)

Available options and programmable logic control packages:

- Door interlock logic – lock out 1 door in airlock to maintain neutral airways.
- Logic for “T’s” and “cross” traffic patterns.
- Lighting systems (green, red and yellow shows traffic conditions).
- Buzzer/ horns for audible alerts.
- Proximity switches to detect vehicles entering doorways, obstructions in pathway.
- Remote control systems via remote transmitters.
- Cap lamp sensors to activate door systems.
- Other custom features requested by customers for unique situations.

Available control activation options:

- Our standard package includes air control system (control box, valve, air cylinders, 17 gallon storage tank, flow control valves.
- Optional hydraulic package includes 1 or 2 or 3 door systems, 20 gallon tank, 3 or 5 HP motor, 1 qt. accumulator, 4 way directional valve, pressure relief valve, 700 PSI, tank heater, pressure switch.
- Manual operation with door close- manual lock.
- 100% electric operation uses an “electric cylinder” to replace a pneumatic or hydraulic cylinder

Specifications

AMD Mine Ventilation Door Specifications – High Pressure

AMD MINE DOOR COMPONENTS - STRUCTURAL		
Item	**Description**	
FRAME POSTS	6" @ 15.3# CHANNEL	Standard
FRAME - CAP AND SILL	6" @ 15.3# CHANNEL	Standard
DOOR WINGS	6" @10.5# CHANNEL W/ 10 GA. SKIN	Standard
HINGES PIN AND SOCKET	ADJUSTABLE	Standard
CONNECTING BARS	1 1/2" PIPE W/ CLEVIS	Standard
TRAFFIC WINDOW	LEXAN - BOTH WINGS	Standard
PAINT	SAFETY YELLOW POWER COAT	Standard
INSTALLATION	DRAWINGS ALONG WITH TEXT DESCRIPTION	Standard
PERIMETER SEALENT	MSHA APPROVED RUBBER BRATTICING	Standard
DOUBLE SKINNED WINGS	10 GA.SHEET	Optional
ESCAPE HATCH/ REGULATOR	10 GA. SHEET	Optional

AMD MINE DOOR COMPONENTS - ELECTRICAL AND MECHANICAL		
Item	**Description**	
AIR OPERATION	CYLINDER/ RESERVOIR TANK	Standard
AIR OPERATION	CONTROL CABINET(VALVES/ FILTER, LUBRICATOR)	Standard
AIR OPERATION	ALL FITTINGS AND 50' HOSE	Standard
ELECTRO-HYDRAULIC OPERATION	CYLINDER AND CONTROLS 120 VAC	Optional
PLC CONTROLS	ALLEN BRADLEY OR CUSTOMER DESIGNATED	Optional
ACTUATION DEVICES	PULL SWITCHES	Optional
ACTUATION DEVICES	REMOTE CONTROL - INFRARED	Optional
ACTUATION DEVICES	MOTION SENSOR	Optional
VISUAL/ AUDIO	RED/ AMBER/ GREEN LIGHTS	Optional
VISUAL/ AUDIO	WARNING HORNS	Optional
VISUAL/ AUDIO	REFLECTIVE STRIPPING	

Additional Features and Options

Door Actuation Options

To offer an additional option to our door packages, we also offer two different door actuation designs to better fit our customers needs.

Top and Bottom Connecting Bar Design – This design consists of each door using a “connecting bar” on the top, and on the bottom of each door assembly. The bottom connecting bar rests in a trough under the road way and covered by a steel plate. This design requires a cement sill foundation with space provisions to allow the connecting bar to travel with the door wings.

Two Cylinder Design. We also offer a design that incorporates two cylinders, placed 15” above the sill foundation, one cylinder attached to each wing panel. These cylinders take the place of the bottom connecting bar, while still utilizing the top connecting bar to keep the door in time and equalizing the stress forces upon the door system. (See Bottom Cylinder Design Illustration attached at the end of this document.)

Steel Frames and Steel Panels

Our mine doors come equipped with steel frames and steel panels, double-acting cushioned air cylinder, 17 gallon air storage tank, and control cabinet. Your choice of **PNEUMATIC, HYDRAULIC OR MANUAL** operation. Optional signal lights show position of door at all times. Air compressor with air storage tank available for those mines that do not have ready access to compressed air.

Air Cylinder

Double-acting cushioned cylinder is equipped with control valves for adjusting the opening and closing speed of the door wings. Optional rope pull contactor, slap type contactor or photo-electric operation located in-by, and out-by each door provide for a positive opening and positive closing each time. Eliminates waiting time by mine personnel and maintains constant speed through haulage ways.

Control Cabinet

Manual override on valve allows for operation of door several times in event of power failure. A shut-off cock, check valve (to maintain pressure in the air reservoir receiver should line pressure fall), filter, lubricator and solenoid valve are all mounted in a heavy sheet metal enclosure.

See Example Door Installation Next Page: