

DECOPRESSED AIR DOOR

USE & FUNCTION



Usage • Advantages • frame size • design principle



Wettertechnik GmbH

Adlerstr. 16
45307 Essen
Germany

Telephon: +49 (0) 201 855 14-14

Fax: +49 (0) 201 855 14-46

Mail: info@wettertechnik.de

www.wettertechnik.de

DECOPRESSED AIR DOOR

USE & FUNCTION



Index

Introduction.....	1
Frame sizes	2
Advantages.....	3
Description	4
Design Principle.....	4
Ventilation locks	5
Overview of a decompressed air door	9

DECOPRESSED AIR DOOR

USE & FUNCTION



Introduction

A decompressed air door by the Company Wettertechnik is designed and built:

- for completely sealing its cross section
- to provide a scheduled climate control
- to operate in harsh conditions as found in underground mining
- to be opened and closed mechanically
- to constitute a ventilation lock

For example they are used in the following businesses and places:

- Kali und Salz-mining
- Recycling - processing
- Tunneling
- Mineral mining
- Coal mining
- Final nuclear storages



DECOPRESSED AIR DOOR

USE & FUNCTION



Frame sizes

Decompressed air doors by the Company Wettertechnik are available at any frame size.

Tunneling

ARGE Tulfes-Pfons	LW 2500 X LH 3000
Trastec Gotthard	LW 3100 X LH 4500
ARGE Transco Sedrun	LW 3600 X LH 4000
ARGE Tunnel Alabastieg	LW3600 X LH 4200
Murer AG Amsteg	LW 4500 X LH 4200
ARGE Haupttunnel Eyholz	LW 4500 X LH 4500

Salt mine

DBE Morsleben	LW 3000 X LH 2400
SSW Heilbronn	LW 4200 X LH 3650
DBE Schacht Konrad	LW 4400 X LH 3000
Asse GmbH	LW 4500 X LH 3500
K+S Zielitz	LW 5000 X LH 3200
Esco GmbH Bernburg	LW 5400 X LH 4200
K+S Unterbreitzbach	LW 6000 X LH 2800
K+S Neuhof Ellers	LW 6000 X LH 2500
GESES Sondershausen	LW 6000 X LH 3500
Esco GmbH Borth	LW 7000 X LH 5000

Recycling - processing

NDH Bleicherode	LW 5000 X LH 2800
-----------------	-------------------

Coal mining

RAG Prosper	LW 1800 X LH 2000
Samca Spanien	LW 2000 X LH 2000
RAG Anthrazit Ibbenbüren	LW 2000 X LH 2400
RAG AV 3/7	LW 2200 X LH 2500
TTK Türkei	LW 2330 X LH 2320

*(LW = clear width; LH = clear Height)

A decompressed man air door can be incorporated in every decompressed air door.

DECOPRESSED AIR DOOR

USE & FUNCTION



Advantages

Decompressed air doors by the Company Wettertechnik are characterized by:

- An easy assembly
- An universal applicability
- Safe opening and closing even under a high pressure difference

Furthermore is a decompressed air door designed to be installed in operations with:

- Free-steered-machines
- Monorails
- Light railway
- No tracks

DECOPRESSED AIR DOOR

USE & FUNCTION



Description

The decompressed air door has two equally sized door leafs, which can be opened or closed as well with an electro hydraulic actuator as a pneumatic cylinder.

The drive mechanism of the decompressed air door is designed in a way both door leafs will move in opposite direction at any time. As a consequence, if one door leaf moves in the same direction as the air flow does, the other moves against it. As a result of the decompression design principle, the pressure that acts on one door leaf is almost completely compensated. Through this design the air door becomes safer and significantly lighter in weight.

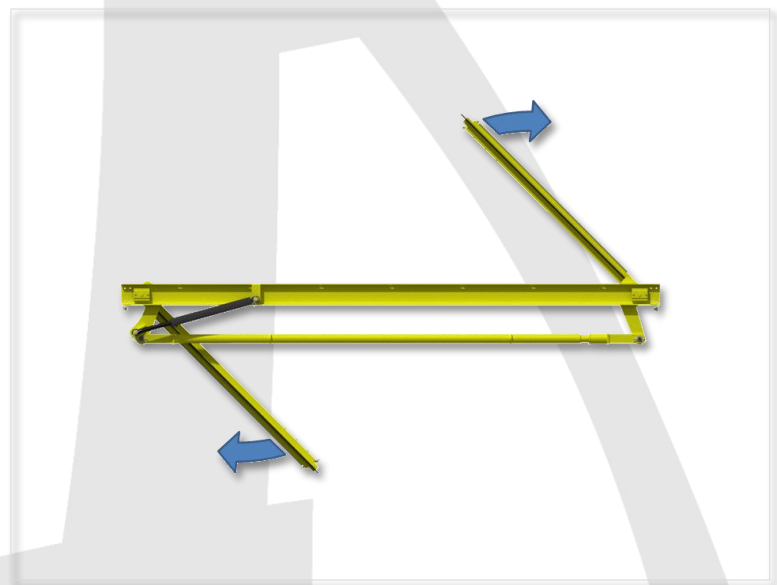


Illustration 1: Opening of a decompressed air door

Design Principle

DECOPRESSED AIR DOOR

USE & FUNCTION



The system can be operated by a variety of control mechanisms such as:

- Approach contact
- Activation- or manual stop contact
- Pull or push contact
- Chain hoist switch
- Remote control

A decompressed air door has equipped the following special features:

- A viewing window in both door leafs
- Elastic rubber gaskets, which have two tasks. On the one hand provide an airtight seal and on the other hand prevent injuries, which could occur in case of human error
- Kill switches at both door leaves
- A mechanism to adjust the speed of movement to reduces the endangering of persons, if the door is controlled over distance. In addition to that it preserves the mechanical components
- In addition there is an option to install a decompressed man air door or an escape hatch in one doorleaf as shown in the second illustration



Illustration 2: decompressed air door with escape hatch

Ventilation locks

DECOPRESSED AIR DOOR

USE & FUNCTION



Purpose:

A ventilation lock has the purpose to ensure the scheduled climate control and air distribution in the mine workings, by throttling the air flow, without interfering with the conveyance of material and personnel within the air course.

Description:

It is a control device to adjust the air flow and pressure distribution in the mine workings.

A ventilation lock consists of at least two covering frames with a decompressed air door each to enable the conveyance of material and personnel. Depending on the condition of use, additional passages in each covering frame can be provided, as shown through example in Illustration 3.

DECOPRESSED AIR DOOR

USE & FUNCTION

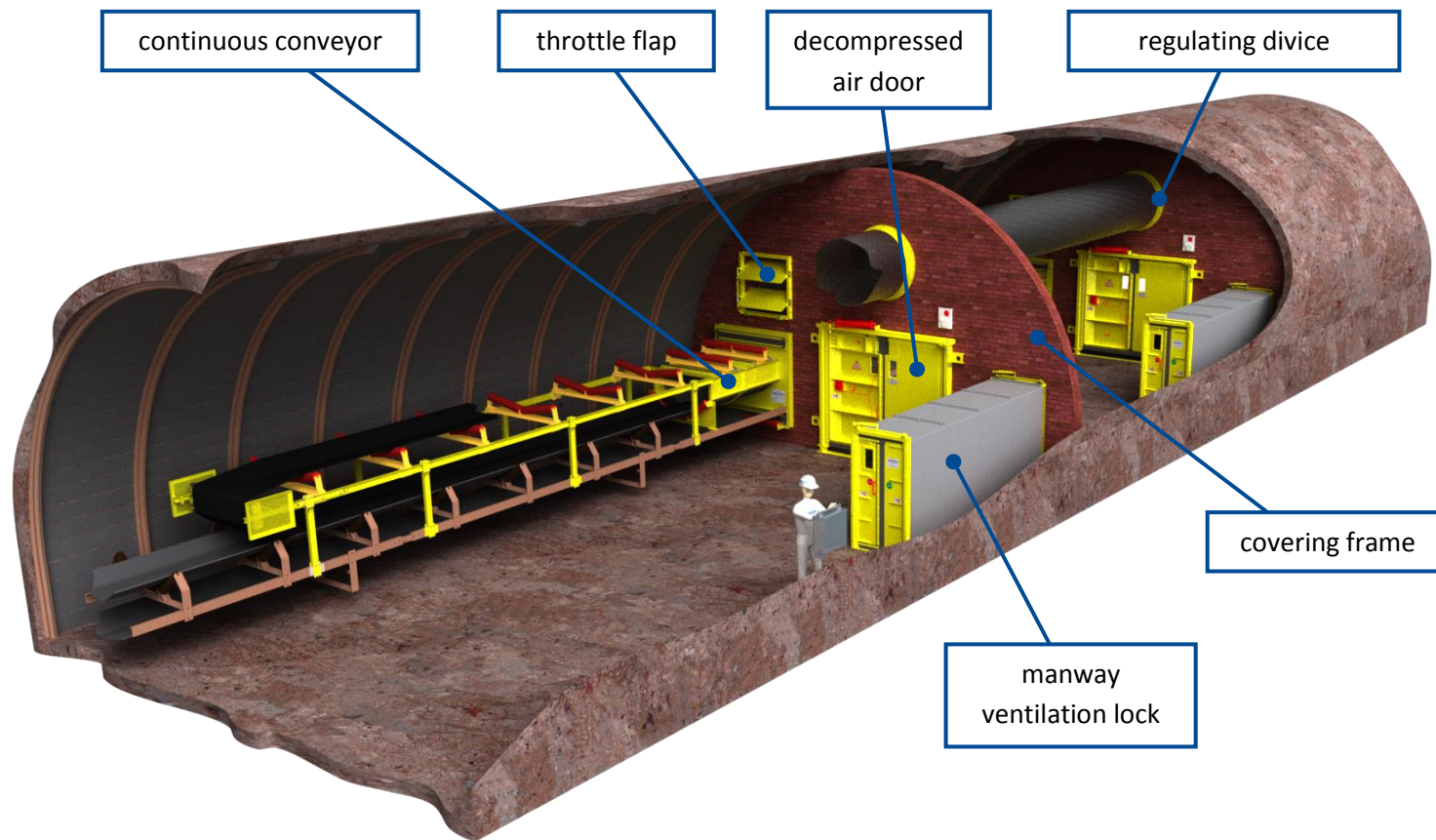


Illustration 3: Overview ventilation lock

DECOPRESSED AIR DOOR

USE & FUNCTION



Installation Options

- **Air door**
 - A Door to seal the aperture in a covering frame, which enables the conveyance of material and personnel
 - **Not decompressed**
 - An air door, which is opened and closed, through a mechanical device, usually against the air flow.
 - **Decompressed**
 - An air door with equally sized door leafs which opens and closes in opposite directions
Note: Through constructive measures like for example a coupling rod or a revolving chain the forces on the door leafs, which point in opposite directions, are balanced. As a consequence, only the friction and the restoring force of the opening and closing mechanism, must be overcome.
 - **Haulage road door**
 - An air door to seal the aperture, which enables the conveyance of material.
 - **Decompressed man air door**
 - An air door to seal the aperture, which enables the conveyance of personnel.
- **Manway ventilation lock**
 - A lock chamber closed on all sides including at least two decompressed man air doors.
- **Continuous conveyor ventilation lock**
 - A lock chamber closed on all sides with two openings for the conveyor. The sealing can be achieved through different methods, for example through movable shields transverse to the conveying direction.