HoseGuard®

Installation, operation and maintenance instructions

ENGLISH (translation of the operating instructions)

HoseGuard®
Air Fuse for compressed air

Please read this manual thoroughly before using the product. It includes general information as well as

- **Installation instructions**
- **Operating instructions**
- **Maintenance instructions**

1. SAFETY INFORMATION

1.1 Machinery Directive (MD 2006/42/EC)
The "HoseGuard®" Air Fuse for compressed air is a safety component in accordance with MD Article 1, c) and can be considered as 5. "Valves with additional means for failure detection" intended for the control of dangerous movements on machinery" in accordance with MD Attachment V "Indicative list of the safety components referred to in Article 2(c)". The HoseGuard® Air Fuse may thus carry the CE mark of conformity.
Since air fuses are not listed in Attachment IV of the MD, the normal conformity evaluation process can be used by the manufacturer by means of internal production checks, risk analysis and technical documentation pursuant MD Attachments VII and VIII.

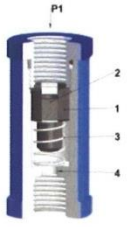
The HoseGuard® Air Fuse for compressed air fulfils the criteria of Machine Directive 2006/42/EC.
We provide a **Declaration of Conformity** according to the MD and **installation, operation and maintenance instructions** according to the MD for a machine. This document has been translated from the original German text.

1.2 Workplace safety
Employing a HoseGuard® helps in meeting requirements of legislation, directives and standards and in significantly increasing safety in the workplace.

1.3 Notes on use
We have only partial knowledge of how the HoseGuard® Air Fuse for compressed air is actually employed. The customer or the system planner responsible is obliged to implement the corresponding work instructions, risk analysis and safety instructions for use with their specific pneumatic system, when operating the HoseGuard® Air Fuse.
We recommend the system planner responsible for planning a pneumatic system to take all possible malfunctions into account (that may occur within pneumatic systems) and to take the appropriate safety precautions so that personal injury and material damage can be prevented.

1.4 Purpose of use
The HoseGuard® is intended to prevent pipes and hoses from being flung and whipped about in case they burst. This is to prevent persons from being injured or machines from being damaged.

1.5 Functional principle
The functional principle of the HoseGuard® Air Fuse for compressed air is:



General functional description

The air supply enters at P1.
The air flow passes by the plunger (1) and flows through the seat.
The flow is slowed down by the longitudinal grooves (2) on the top side of the plunger.
If the flow rate is too high, the air cannot pass through the plunger fast enough and presses it against the spring (3) towards the seat (4).
The closing points are indicated by the diagrams on the respective data sheet.
If the flow rate exceeds this value, the air supply is blocked automatically.

Note:
Attention should be paid to the closing point, which varies for different pressures.

1.6 Materials

• Housing:	EN AW-6061 (EN AW-ALMg1SiCu) blue powder-coated
• Plunger:	1/4" - 1/2" = Hostaform (POM) 3/4" - 2" = EN AW-6061 (EN AW ALMg1SiCu)
• Spring:	1.4310
• Seal:	Nitrile (NBR)
• Grease:	Molykote Longterm W2

1.7 Prohibited gases and liquids
Under no circumstances should the HoseGuard® be employed as an air fuse for dangerous, toxic or easily inflammable gases or any liquids such as:

- Explosive gases
- Highly inflammable gases
- Easily flammable gases
- Toxic or highly toxic gases
- Combustable gases
- All liquids no matter what danger level

The prohibited gases and liquids mentioned above include for instance: Acetylene, ammonia, butane, ethylene, methane, propane, propylene, oxygen, hydrogen, acetone, benzol, chlorobenzene, ethanol, methanol, propanol, petrol, engine oil, heating oil, diesel oil, hydraulic oil, water, etc. This list is not exhaustive.

1.8 Conditions of use
These products are intended solely for use in industrial compressed air systems. They may be used only in situations in which the specifications on the product label concerning upper and lower limit values for pressure and temperature are not exceeded. Please observe the technical data in the relevant product specification sheets.

- To prevent confusing various gases during use, pipes with compressed air have to be colour-coded (e.g. blue).
- Additionally the maximum and minimum temperature specifications need to be observed and maintained.
- The HoseGuard® may not be used in potentially explosive atmospheres.
- Any time work is to be done on the system, it must be reliably de-pressurised (and secured by a lock). A check must be made that there is no more pressure applied to the HoseGuard®. Suitable personal protective equipment must be worn (safety goggles, hearing protection, possibly gloves and protective clothing).
- The HoseGuard® may only be installed in a system that is depressurised.
- The HoseGuard® must not be removed. This is to prevent the HoseGuard® from being installed faultily preveting it from working effectively.
- A HoseGuard® without a product label should not be used or installed. If this is the case, please contact the manufacturer.
- The HoseGuard® should not be employed in applications which require 100% of the available airflow. These are for example sand blasters and container fillers (the HoseGuard® is flow-rate regulated and cannot determine the difference between the maximum flow rate and the rupture of a hose or pipe).

1.9 Selection of the HoseGuard®
Selecting the right size of HoseGuard® for your application is of prime importance. The flow rate has to be sufficient for normal operation and in case a hose or pipe ruptures, the HoseGuard® air fuse must trigger and close. If the flow rate is too low, the HoseGuard® will not close.
The most suitable HoseGuard® needs to be determined based on tests. Please follow the Function test for this (see 2.2).

The HoseGuard® closes if the corresponding flow rate is reached with a tolerance of +/- 10 %.

The following technical details are relevant for selecting the size (dimensions) of the appropriate HoseGuard®:
1. The pressure at the HoseGuard® (P1)
2. The air consumption of the tool, and pressure level required.
3. The inner diameter of the hose
4. The length of the hose lines
5. The size of the inlet valve and the quick coupling used in the system

To select the most suitable HoseGuard® for the hose or pipe you wish to protect, please refer to the corresponding data sheet, detailing closing points and specifications.

The following values should be taken into account, to select the minimum hose inner diameter to be used.
1/4" = 6mm / 3/8" = 10 mm / 1/2" = 13mm / 3/4" = 16mm / 1" = 19mm

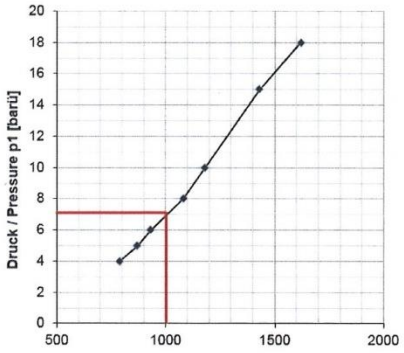
HoseGuard® also have different closing points at different pressures. Detailed specifications on that these can be found on the Internet pages listed.

Example for determining the right HoseGuard®

- The maximum air consumption of the tool and the required pressure are critical for determining the right HoseGuard®.
- If the air consumption of the tool is not known, it needs to be measured. Theoretical specifications are insufficient and may lead to malfunctions.
- With the flow rate value and the closing point table, the right HoseGuard® can then be determined.
- As a rule of thumb, the HoseGuard® should be able to handle at least 20 % more flow than a tool needs for normal operation.
- **It is to be ensured the provided volume flow rate is not reduced in the compressed air supply (for example through a contaminated filter) to prevent the HoseGuard® from achieving its closing point.**
- Note: There are some tools that have greater air consumption during start-up (or running idle) than during normal operation. Default specifications must always be checked.

Values for the example:
Air consumption of the tool = 800 Nl/min
Pressure P1 at the HoseGuard® = 7 bar

HoseGuard 3/8"
Airflow rate for closing (+/-10%)



Durchsatz für Schliessen
Flow rate for closing [Nl/min]

The table above is purely an example and the values indicated may deviate from actual values.

The HoseGuard® 3/8" allows for about 1000 Nl/min air at a pressure of 7 bar before it closes; therefore its closing point lies at 1000 Nl/min. In this example we have a reserve of 200 Nl/min, meaning the value of the closing point is higher than the consumption of the tool.
It is vital to test whether this reserve is sufficient (for example when there are long tubes installed).

If for example, an air consumption of 1800 Nl/min is needed, the 3/8" HoseGuard® cannot be used because the closing point of the HoseGuard® lies below the flow rate of the tool. The tool would not be operational.

It is important to remember:
Different tools may need a different HoseGuard®.
A HoseGuard® that has been configured for an air nailer gun with 500 Nl/min cannot be used for a blow gun that consumes 2000 Nl/min air.

After selecting a HoseGuard® with a diameter that adequately ensures safety, the parameters and functions of the system need to be checked, as described under Function test (see 2.2).

2. INSTALLATION INSTRUCTIONS
Installation and maintenance of the product have to be carried out by qualified personnel.
Products should never be mounted into areas that contain shock hazards. Dropping the HoseGuard® must be avoided, as this can damage it and lead to malfunctions later on.
The pipes should be free of rust and dirt particles. The air should be dry and conform to air quality ISO 8573 1 class 5. Otherwise the function of the HoseGuard® may be limited or the service life may be shortened.
Please check whether the HoseGuard® is suitable for the designated purpose before installing the air fuse. To determine this you should consider: the pressure applied to the HoseGuard®, the air consumption of the consumer as well as the hose's inner diameter and its length. A connection or quick coupling that has the wrong dimension may cause the sytem to malfunction.
Please see Selection of the HoseGuard® (1.9) for more details.

To avoid damage, the entire system needs to be depressurised when the HoseGuard® is installed.
The HoseGuard® Air Fuse must always connected to stationary, permanent piping for compressed air supply (pipes, connection pieces etc.).
If the HoseGuard® is installed upstream from a valve, a quick coupling or similar component, then the inner diameter of the valve or the quick coupling needs to be larger than or equal to the inner diameter of the hose.
It needs to be ensured that the HoseGuard® Air Fuse is installed in the correct direction of flow. This is indicated by arrows on the housing and the label.
HoseGuard® without a label or with an illegible label must not be installed.
A HoseGuard® which is incorrectly installed or with incorrect dimensions will not function properly. This could mean that pipes and hoses will flung and whipped about incase they burst.

Even if all specifications on the specification sheets, Internet pages and the graphics are observed, it is essential to conduct a function test with the actual configuration.

Observe the points Function test (see 2.2) and Prohibited gases and liquids (see 1.7) for that.

Instruction manual

Hose rupture valves »Hose Guard«
Article No. 105650 to 105658
Type No. 222.14 to 222.20

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Examples of use

2.1 Important notes on installation

The examples below showing improper installation X will always lead the system to develop faults or the complete failure of the HoseGuard®.

The HoseGuard® should not be installed at the end of flexible hoses.

The HoseGuard® has to be mounted to the end of a rigid line. Only the hose after the HoseGuard® is protected.

The flow direction must be observed; otherwise no closing function is possible.

The inner diameter at the inlet of the HoseGuard® has to equal at least that of the outlet diameter.

Only one tool may be protected per HoseGuard®.

An overdimensioned HoseGuard® does not protect a small pressure hose.
A HoseGuard® that is too small does not protect a high pressure hose.

A pneumatic tool or component which is mounted into the system which has a greater air consumption than the closing point of the HoseGuard® will make it impossible to regulate the airflow.

IMPORTANT
Each HoseGuard® can only secure one pneumatic device, one hose and be used to create a unit with the machine.

If a HoseGuard® is to be used in a different assembly, suitability checks must be made to ensure the air consumption required, is below the closing point of the HoseGuard®. Otherwise the HoseGuard® closes too quickly and operation is impossible.

Any time hoses (length/diameter) or couplings on the hose are changed, a renewed function test (see 2.2) is always necessary.

In any case, the provided volume flow rate in the compressed air supply has to be higher than the throughput for the closing of the HoseGuard®.

2.2 Function test
Before using for the first time the HoseGuard® needs to be generally tested according to the following specifications (in accordance to the function test). Only then, can we guarantee that the closing function of the HoseGuard® is ensured.

Procedure

1. Are the inlet and outlet threads as well as the plunger inside (where visible) clean and without any oxidation?
2. Can the plunger be moved easily from the inlet side with a firm tap and does it go back to its initial position without any problems?
3. Can any external damage or cracks be seen on the HoseGuard®?
4. Is the product label still legible and is the flow direction the same as indicated?
5. Was the HoseGuard® installed correctly according to the installation instructions?
6. Connect a pneumatic tool or other pneumatic device and switch on the compressed air supply.
7. If the system or the application functions normally, switch the compressed air supply off again.
8. Remove the pneumatic tool or pneumatic device again and exchange with a ball valve. The ball valve has to be closed and firmly affixed (e.g. in a vice).
9. Make sure that all connections have been properly attached and are secure.
10. Slowly switch the compressed air supply back on again.
11. The HoseGuard® opens after a while. Once the pressure in the hose has reached the maximum value, open the ball valve all the way.
12. The HoseGuard® closes and blocks the compressed air supply.
13. A minimal amount of compressed air will escape, to ensure the automatic reset function operates effectively.

If the HoseGuard® Air Fuse does not function properly or does not close, each function needs to be checked individually – as shown on the illustration under Important notes on the installation (see 2.1) – to ensure proper operation.
In case the desired results are not achieved, it needs to be checked whether the HoseGuard® is suited for the designated hose, consumer and the fixtures used. Precise air consumption specifications of the manufacturer are often not available, which is why flow rate tests must be carried out to determine how high the flow rate actually is.
Likewise the couplings used will have a critical impact on ensuring the system operates effectively.

3. OPERATING INSTRUCTIONS

The HoseGuard® should not be operated within areas that contain shock hazards.

Before being put to use the first time, the HoseGuard® needs to be tested according to the specifications of the Function test (see 2.2). Only then can it be guaranteed that the closing function of the HoseGuard® is ensured.
If filtered compressed air is used (acc. to ISO 8573-1 class 5), the system needs to be checked every six months in accordance with the procedure described in the Function test (see 2.2).

If the air is heavily soiled or saturated with water vapour and does not conform to class 5, then a premature wear of the components is very likely. The oxidation of the aluminium housing can jam the plunger and thus cause the HoseGuard® Air Fuse to fail. The first indication of this is a white, powdery or flaky surface on the aluminium. When such indications are detected, we urgently recommend exchanging the HoseGuard®.

Please note that after activating the HoseGuard®, a slight delay of the pressure increase occurs before the system becomes fully operational again. This reactivation time may differ depending on the size of the HoseGuard® and the hose dimensions and lengths used.

Likewise, when a quick coupling is reconnected or the ball valve / shut-off valve is opened again, the HoseGuard® closes again; it opens again automatically soon thereafter. It features a small opening that permits a minor amount of air to escape and reactivate the automatic reset. This bore hole must not be closed under any circumstance; otherwise, the HoseGuard® cannot function fully and will not open after closing.

The air fuse should be used exclusively for its intended purpose. It must never be misused as a safety, reducing regulating or stop valve. This list is not exhaustive.

3.1 Label
The specifications on the product label provide information on the conditions under which the HoseGuard® functions effectively.
For this reason, these values must be complied with; the upper and lower limits of the operational pressure and temperature in particular must not be exceeded.
The label below is for example only. Your actual product label may have specifications that deviate from those shown. Only the label on the respective product is authorised and these values must be observed.

Meaning of the label from top to bottom
Brand
Manufacturer website
Symbol / CE / Production date
Direction of flow (on label)
Max. operating pressure
Min. and max. temperature range
Item code

A arrow indicating the direction of flow is additionally placed on the product.

4. MAINTENANCE INSTRUCTIONS

The HoseGuard® is maintenance free and therefore only needs a regular function test according to the function test instructions (see 2.2). This has to be carried out every 6 months at the least and be documented. If compressed air is used, that does not at the least meet the standards of ISO 8573 1 class 5, the time between maintenance needs to be reduced accordingly.

Additionally, the HoseGuard® needs to be dismantled from the piping system, so that the inner surfaces and parts of the HoseGuard® can be viewed.

Under no circumstances may the HoseGuard® be disassembled. This ensures that the components are not inserted incorrectly into the housing, causing the HoseGuard® to malfunction.

If the aluminium parts show a white, powdery or flaky surface, this surface oxidation can result in the plunger becoming jammed and thus cause the protective component to fail. In this instance we recommend that the HoseGuard® must be replaced. You should also check the reason why the pneumatic lines are saturated with water or water vapour and ensure this issue is rectified.

Important
Can the plunger be moved easily from the inlet side with a firm tap and does it go back to its initial position without a problem? If not, the HoseGuard® definitely needs to be replaced.

Once the visual check has been completed without any indication of problems, the HoseGuard® may be reinstalled into the piping system.
Be sure that the correct direction of flow is complied with.

Conclude by carrying out the FUNCTION TEST according to the Function test (see 2.2).

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