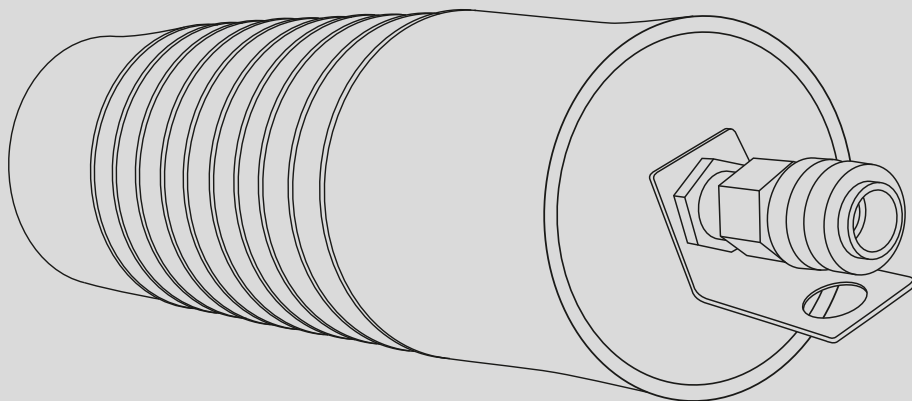


Inflatable pipe plugs and bypass pipe plugs

RV type / RVD type

» OPERATING INSTRUCTIONS



Inflatable pipe plugs and bypass pipe plugs

RV type / RVD type



NOTE!

To facilitate shipment, the air is completely removed out of some pipe sealing plugs.
However, the plug shall NOT be stored in this condition.

When you unpack the plug, insert the breathing nipples into the coupling, to allow air entry. This way, the plug will recover its normal, cylindric shape. If necessary, the plug may be filled with compressed air, but only in so far as it recovers its normal shape again.



Read and observe the operating and safety instructions before use.

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1. Definitions

The following symbols are used in this operating manual:



Caution.

Safety information: Non-observance may result in damages of the product or property close to it.



Warning.

Identifies a dangerous situation. If not respected, it may cause serious injuries or death.



Note

Additional information about the operation of the device.



2.2. Hazards identification

- Neither modifications nor alterations of plugs, charging units, and filling hoses are admitted. Use pipe, test and bypass pads only in combination with original filling fittings and filling hoses. If you use accessories of unknown origin, the technical safety may be affected.
- Pipe and test sealing plugs are made of a highly elastic material. If they are expanded beyond their maximum limit, they may burst. No people are allowed to stay within the working area during the pressure test.
- During a hydrostatic test, the pipe to be tested must not be directly connected to a pipe under overpressure (e. g. a fire hydrant).
- Place the pipe or test sealing plug, and make sure that nobody is in the manhole or in front of the pipe during the filling, testing and emptying procedures.
- Before you remove the packer, make sure that the pipe is depressurized and completely drained.



2.3. Warning!

- Check the perfect condition of pipe, test sealing plugs, and accessories before and after each use.
- If not inserted into pipes, the pipe sealing plugs shall only be charged with a maximum of 0.2 bar for visual inspection.
- All control valves are combined with a safety valve to limit the pipe or test sealing plugs maximum operating pressure. If the maximum operating pressure exceeds 1.5 or 2.5 bars, the safety valve opens. The opening and closing tolerance of the safety valves shall not exceed $\pm 10\%$. Do not modify the pressure adjusted.
- If the admissible operating pressure is exceeded, the sealing plug may burst and cause serious injury.
- The pipe sealing plugs must be protected from temperatures above $+80^{\circ}\text{C}$; If necessary, appropriate cooling must be provided.

2. Safety instructions

2.1. General Information

We assume that all relevant occupational safety and safety regulations, accident prevention regulations (e. g. the German TBG safety regulations) as well as the generally accepted rules of technology are observed.

- Before you insert the pipe sealing plugs, check the pipe for damage.
- The working area around the pipe shall be free of deposits, foreign objects, and contamination, e. g. pieces of glass, and sharp-edged objects. Wear the personal protection equipment specified for the operation - workwear, gloves, helmet, face protection and/or goggles.
- Pipe sealing plugs must have full contact with the sealing surface of the inner pipe wall over the full length of the pipe.
- The pipe sealing plug inside the pipe must be permanently secured against undesired movements caused by counterpressure.

3. Intended Use

These operating instructions apply for the following inflatable pipe plugs and pipe test units:

- Pipe test and sealing plugs - RVD / RV type
- Short version Pipe test and sealing plugs - RVD-K / RVK
- High pressure pipe sealing plug - RV-HD
- Pipe plug, semi-circular
- Bypass pipe sealing plugs

Pipe plugs and pipe test units are inflatable packers to seal, check, and bypass sewer lines and sewer ducts. Characteristics are a highly positive fit, robust design, easy and safe handling, and long service life. They consist of high-quality rubber reinforced with a polyamide or Kevlar inlay. All metal parts are corrosion resistant.

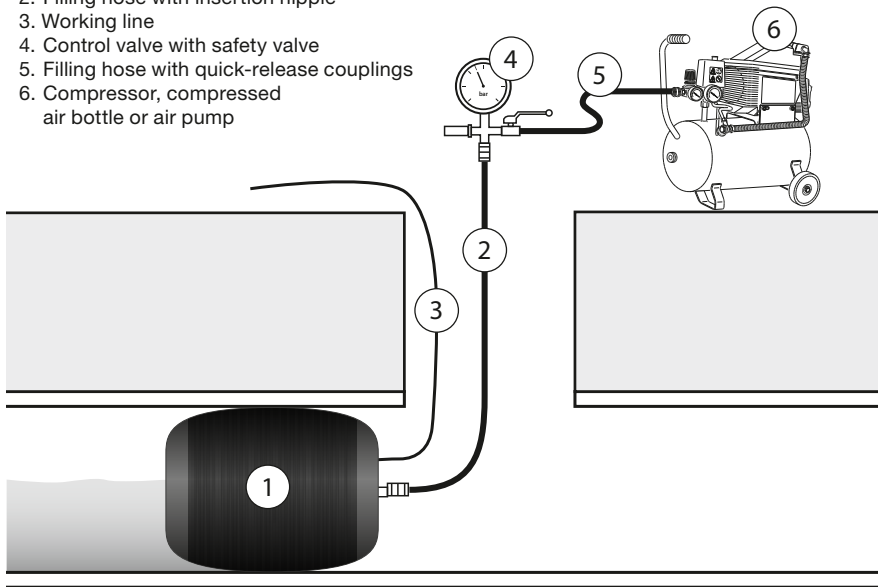
Any other or additional use is considered as not intended. The following uses of our pipe sealing plugs are considered as not intended:

- Improper operation, use, or maintenance of the pipe and test sealing plugs
- Use of pipe or test sealing plugs with defective safety valves or charging units not correctly installed or inoperable.
- Non-observance of the instructions in the operating manual related to storage, operation, and maintenance of the pipe sealing and test plugs.
- Insufficient maintenance of accessories which may wear out.
- Unprofessional maintenance

4. Basic design

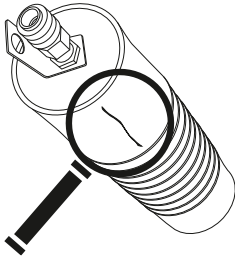
Components

1. Pipe sealing plugs
2. Filling hose with insertion nipple
3. Working line
4. Control valve with safety valve
5. Filling hose with quick-release couplings
6. Compressor, compressed air bottle or air pump



5. Necessary preparations before use

1



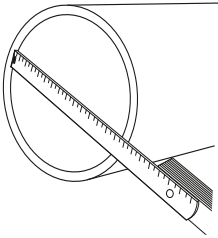
Before each use, check the pipe sealing plugs and accessories

- The plug skin shall not show any signs of mechanical damage and/or chemical attack: no cracks, bubbles, delamination of fabric lining
- The quick-release coupling must be in perfect condition.
- Control valve and connecting hoses shall not show any damage.
- Clean the pipe sealing plug with detergent and water after each use. Never use solvents and aggressive cleaning agents.



CAUTION! In outdoor areas, the maximum pressure of the pipe sealing plug is limited to max. 0.2 bar.

2



Make sure that the pipe sealing plug is of the correct size!

- Each pipe plug is only intended for a certain diameter range. (see labelling of the pipe sealing plug)
- Before use, measure the clear pipe width and check if it is within the specified range of the pipe plug.



WARNING!

Do not use the sealing plug in the pipe with a larger diameter than specified on the sealing plug.

3



Wear protective clothing, use personal protective equipment.

- Wear workwear, helmet, protective goggles, and gloves while working on Pipe sealing plugs.
- Important! Observe strictly all regulations and instructions stipulating the sewer manhole access.

4



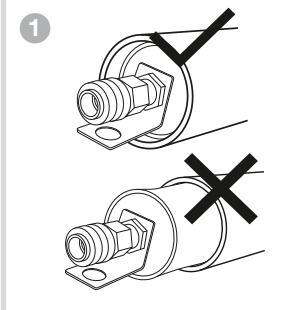
Clean the pipe before use.

- Remove mud, sand, stones, and sharp objects before you push the sealing plug into the pipe.
- Pressurized water will be required in most cases.

i Note!

Check also the physical properties of the pipes to be sealed. They have to be sturdy enough to withstand the operating pressure of the pipe plugs and test units.

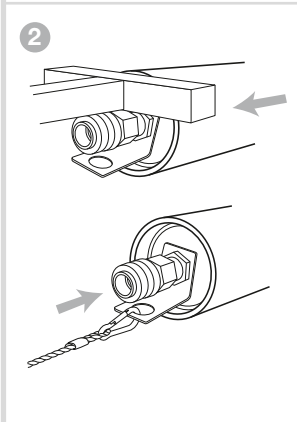
6. Instructions for use or operation



How to install the pipe sealing plug correctly

- Insert the pipe plug into the pipe or the sewer section to be sealed until the pipe end or sewer end slightly projects the sealing plug inserted.
- Use sealing plugs only in properly cleaned pipes.

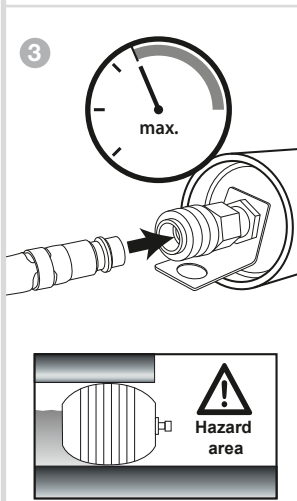
Note!
i The entire sealing surface must have an even contact with the pipe wall.



How to secure the pipe sealing plug against undesired movement

- Always block the sealing plug in the pipe to prevent undesired movement.
- All pipe plugs and test systems must be installed in axial direction with positive fit.
- The type of safer installation required depends on the structure inside the pipe, the pipe itself and the expected back pressure.
- The regulations of the employers' liability insurance association (BG) and the applicable accident prevention regulations (UVV) specify that a packer or packer system must be installed to prevent that the pipe sealing plug or pipe test plug are suddenly pushed out or slip out because of the back pressure built up.

The options of the safe fixation in the scheme may only serve as a typical example and do not cover all aspects of use.

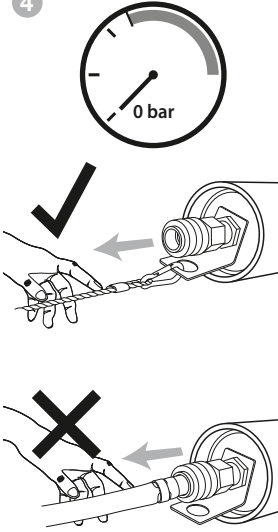


Do not exceed the permissible operating pressure!

- Fill the sealing plug from a safe position with the maximum operating pressure permitted. (See specification on the pipe sealing plug)
- Use a control unit with safety valve!
- For longer use, we recommend to check the pressure at least once per hour.
- If the pipe plug has to stand a temperature increase of more than 50°C during use, the pipe plug must stay connected with the safety valve.
- Dust, oil, condensed water, or antifreeze must not be present in the compressed air. If necessary, use an appropriate separator.

WARNING! People are not allowed to stay in the hazard area. Risk of injury and death!

4

**How to empty and remove the pipe plugs**

- A reduction of the back pressure, i.e. by depressurizing the fluid behind the pipe sealing plug, prevents the undesired ejection of the pipe sealing plug from the pipe and subsequent damage.
- Open the control valve to depressurize and stay always outside of the hazard area.
- No people are allowed to stay close to or in the manhole while depressurizing (hazard area).
- Remove the packer (i.e. the device holding the sealing plug) afterwards only.
- Use the rope to pull out the pipe sealing plug, do not use the filling hose.

**WARNING!**

Reduce the back pressure to a minimum before releasing the operating pressure!

7. How to care, maintain, and store the pipe sealing plugs**1 Maintenance:**

This chapter explains how to maintain the pipe sealing plugs and pipe testing devices and the maintenance intervals to observe.

- Clean the sealing plug equipment after each use.
Clean with lukewarm water and soap.
- Dry at room temperature.



NOTE See also the following German regulations:

- BGR 126
- BGI 802
- ArbSchG
- BGR 117
- BetrSichV



CAUTION! Never clean with chemical agents and/or so-called high pressure jet guns.

2 Maintenance:

- Check the safe operation of the safety valves only without pipe sealing or test plug connected. Overpressure hazard area!
- Do not test the operation of the safety valves with connected pipe or test sealing plugs if they are not inserted in a pipe or a testing pipe since they may burst.
- Test the operation of the pipe and test sealing plugs with full operating pressure only inside a sturdy pipe of admissible maximum diameter. If the pipe is not strong enough, it will burst when the pressure plug is charged with full operating pressure!

| When? | What? | Do what? |
|-----------------------------|---|---|
| After each use | Pipe sealing plugs, control valves and filling hoses (safety devices) | <p>Check for completeness, perfect condition and function and clean if necessary.</p> <ul style="list-style-type: none"> • Visual inspection: Check the pipe sealing plugs and safety devices (e. g. on changes in shape, cracks, fabric damage, porous surfaces, etc.) • Perform an operational test of the safety devices • Cleaning: Clean pipe plugs and pipe testing devices with warm water, a neutral cleaner and a washing brush, if necessary. Dry tube sealing plugs at room temperature. |
| At least once a year | Control valves | <p>Visual and operational checks*</p> <ul style="list-style-type: none"> • Check the operation of couplings, nipples, pressure gauges, and safety valves. |
| | Filling hoses | <p>Visual and operational checks*</p> <ul style="list-style-type: none"> • Check the operation and tightness of the connection nipples and couplings. |
| | Sealing plugs | <p>Visual and operational checks*</p> <ul style="list-style-type: none"> • Check the operation of the connection couplings. • Check for cracks and / or cuts, abrasions, and surface deteriorations due to chemical effects • If you still have safety concerns after the visual inspection of the pipe and test sealing plugs, return the plugs to the manufacturer for further operational tests. |

* Visual and operational checks should be carried out by a competent person. A competent person is someone who, due to his professional training and experience, has sufficient knowledge in the field of pipe plugs and is familiar with the relevant official occupational health and safety regulations, accident prevention regulations and generally recognized state of the art (e.g. the German BG regulations, DIN or EN standards, technical regulations valid in other EU member states or other states where the Agreement on the European Economic Area applies) so that he is able to assess the safe working condition of the pipe plugs. (Source: BGI 802)

3 Storage:

The properties of rubber products remain rather unchanged for a long time if stored and treated properly. However, their physical properties may change and/or their service life may be reduced in case of improper handling and unfavourable storage conditions. The following storage conditions must be ensured:

- First check carefully the condition of the pipe plugs and accessories, then them in a clean, cool, dry way, away from sunlight and under moderate ventilation. The relative air humidity should be below 65%.
- Protect rubber products against light (direct sunlight and artificial light with a high UV component). The windows in the storage room must be darkened accordingly.
- The storage room temperature should be approx. 15°C but shall in no case exceed 25°C. The temperature should also not lower than -10°C.
- The storage room shall be free of solvents, fuels, lubricants, chemicals, acids, chlorides, iodides etc.

8. Repair Shop

For more information about repair shops in your area, please call our service hotline:
Phone: +49 (0) 34 292 / 654 20 or contact us via e-mail to : service@ehle-hd.com

9. List of chemical resistances

| Chemical agent | Concentration in % | Pipe sealing plugs | Pipe sealing plugs- Oil resistant | Universal pipe sealing plugs |
|---------------------|--------------------|--------------------|--------------------------------------|---------------------------------|
| Acetone | | ! | - | ✓ |
| Acetylene - Alcohol | | ✓ | ✓ | ✓ |
| Anilin | | ! | - | - |
| Benzine | | - | ✓ | ✓ |
| Benzene | | - | - | - |
| Boric acid | 10 | ✓ | ✓ | ✓ |
| Brake system fluid | | ✓ | - | ✓ |
| Butanol | | ✓ | ✓ | ✓ |
| Butyric acid | | - | ! | - |
| Calcium hydroxide | | ✓ | ! | ✓ |
| Calcium chloride | 15 | ✓ | - | ✓ |
| Diesel oil | | - | ✓ | ✓ |
| Ethanol | | ✓ | ✓ | ✓ |
| Formaldehyde | 40 | ✓ | ✓ | ✓ |
| Glycerine | | ✓ | ✓ | ✓ |
| Kerosene | | - | ✓ | ! |
| Methanol | 50 | ✓ | ✓ | ✓ |
| Mineral oil | | - | ✓ | ✓ |
| Methylene chloride | | - | - | - |
| Natural gas | | - | ✓ | ✓ |
| Nitric acid | 50 | ! | ! | - |
| Ozone | | - | - | ✓ |
| Phenol | | - | - | - |
| Phosphoric acid | 60 | ! | - | ✓ |
| Propanol | | ✓ | ! | ✓ |
| Sodium hydroxide | 20 | ✓ | ✓ | ✓ |
| Sodium chloride | 10 | ! | - | ✓ |
| Sulfuric acid | 20 | ✓ | ✓ | ✓ |
| Sulfuric acid | 50 | ✓ | ! | ✓ |
| Sulfuric acid | 60 | - | - | ! |
| Toluen / Toluene | | - | - | - |
| Ammonium chloride | | ! | - | ✓ |
| Ethanol acid | | ✓ | ! | ! |
| Iron chloride | | ✓ | ✓ | ✓ |
| Sea water | | ✓ | ✓ | ✓ |

✓ resistant ! limited resistance - no resistance

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