



Operation Manual

Seismic pulse source PIKE-12

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Description and operation

Designation

Seismic pulse source PIKE-12 is designed for shallow high-resolution seismic. For exciting oscillations in the device, the powder gases energy is used. It is released during the combustion of a smoke or smokeless hunting powder in a closed volume formed between a device chamber and a bottom of a hole drilled in the ground.

Basic technical data and specifications

Table 1 Technical data, parameters and dimensions

Parameter	Value
Weight of a set with a protective disk	≤7.5 kg
Overall dimensions in the assembled condition, with a protective disk	1320*370*165 mm
Charge type	special blank cartridges fitted in a transparent (semitransparent) plastic shell or marked as "SEISGUN"
Actuation	manually, with a rubber or plastic hammer
Diameter of a pit: - working - permissible (with additional seals) - bearable (with additional consolidators)	60 mm up to 100 mm
Depth of a pit*	350÷1000 mm

* For operation in pits with depths of more than 1 m, the device can be equipped with a rod extension (optional).

Contents of delivery

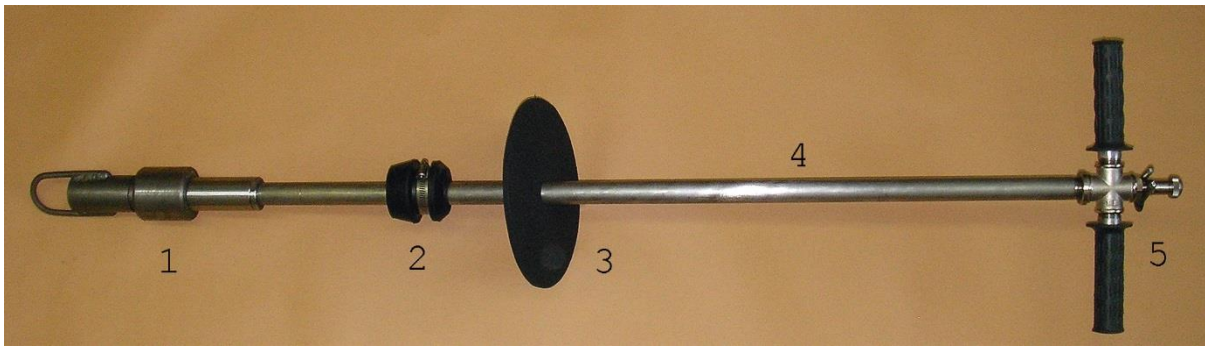


Figure 1 Seismic pulse source

- 1 – head
- 2 – consolidator
- 3 – protective disk
- 4 – ram
- 5 – cross-piece

Parts of the device and changes in contents of delivery

The source head (1) consists of a receiver, cartridge chamber with a protective bracket, an adapter coupling and a striker's tube. A striking pin, counterrecoil spring, thrust washers and fluoroplastic guide tube are located inside the receiver, and the striker's tube.

Consolidator (2) is designed to seal the pit. It prevents the release of gases and soil from the pit and increases pulse power.

Protective disk (3): rubber or plastic. The protective disk moves freely on the ram (4).

The ram (4) is designed to put the device in the pit. Plunger of the striking mechanism is inside the ram.

The cross-piece (5) with two rubber handles ensures comfortable holding of the device during operation.

For transportation the device can be disassembled into 5 parts and compactly packed in transport case. Assembly of device takes no more than 5 minutes.



Figure 2 Disassembled device for transportation

Safety requirements

It is allowed to use only specially equipped 12-gauge special blank cartridges fitted in a transparent (semitransparent) plastic shell with a charge of up to 5.2 grams of smokeless gunpowder of the marks "Sunar-32", "Sunar-35" or similar.

TO USE SHOTGUN CARTRIDGE CONTAINING BUCKSHOT, DUST-SHOT OR BULLETS, AND ANY CARTRIDGES OF UNKNOWN ORIGIN ARE ABSOLUTELY FORBIDDEN!

Before loading the device make sure that the striking pin has returned to its initial position after the previous shot or assembling the head and doesn't stick out the hole in the receiver. Jamming of the striking pin in the receiver hole is a source malfunction, in which case the further use of device is strongly prohibited until the problem is fixed.

Before charging the device make sure that the firing pin has returned to its initial position after the previous shot or assembling the head and doesn't stick out the hole in the receiver. Jamming of the firing pin in the receiver hole is a source malfunction, in which case the further use of device is strongly prohibited until the problem is fixed.

While working with the seismic pulse source the operator and his/her assistant should use an eye protection - protective goggles or masks, the footwear should be made of thick material and cover feet entirely.

The structure of the device totally prevents any chance of powder gases breaking out through the ram, however some bursts of soil, dirt and water alongside the edges of the borehole and under the protective disk are possible.

Bystanders **are not allowed** in the working area within 10 meters from the pit.

While operating outside the borehole aiming the device at people closer than 10 meters away **is not allowed**.

It's necessary to use a safety-lock when moving with the loaded device. Put the source into the borehole only with a set up safety-lock to prevent any chance of accidental triggering the device in case of it hitting the pit's bottom. Set the safety-lock up immediately after a shot, without pulling out the device out of the borehole. Remove the safety-lock only just before the next shot. Working with the safety-lock is demonstrated on the figure 3a and 3b.



Figure 3 a) Safety-lock set up



b) Safety-lock remove

While the device is triggered the operator should hold the cross-piece by the grip with one hand and stand on the protective disk with one leg. Don't bend over the device putted in the pit. During the shot, powder gases tend to push the source out of the pit. If it is not held firmly enough, you may be injured.

Operation with the equipment

Preparation of pit

The receiver size provides making of pit of 60-70 mm diameter. The depth of the pit should be more than 350 mm to ensure that the protective disc fits snugly to the ground. The maximum depth of the pit without use of an extension is 1000 mm.

The device can be used without restrictions in any soil, as well as in flooded and contaminated pits.

Loading

Make sure that the striking pin after previous shot has returned to its original position and does not protrude from the hole in the receiver. In case of striker pin's jamming, separate the receiver from the striker tube, remove the striker pin (Figure 5) and eliminate the nature of a failure (impurity or soot).

Insert a blank cartridge in cartridge chamber.

Locking the cartridge chamber is carried out on four-way threads. For complete locking it is required to wrap the cartridge chamber through 1.5 turns. Always tighten the cartridge chamber until it stops. Otherwise, a shot may cause a misfire or breakthrough of the liner bottom, what may cause difficulty in removing it.

In the process of loading, draw up the cartridge chamber by hand, without using a tool. Do not use any accessories for tightening cartridge chamber with a loaded cartridge. If rotation of the cartridge chamber is difficult, clean and lubricate four-way threads.

Protective bracket can be used as a support for tommy bar in case of difficulty in unscrewing the cartridge chamber and **ONLY AFTER THE SHOT**.

Shot

Lower the charged device into pit until the bracket stops in the bottom.

Lower the protective disk (3 in Figure 1) onto ground in order to block the top of a pit.

Place one foot on the protective disc.

Remove a safety-lock.

Hold the handle of the cross-piece with one hand.

By command of seismic station operator, deliver a light blow with a hammer on the end cup. (Figure 4)

Set a safety-lock.

Remove the device from a pit. When removing the device do not rotate it counterclockwise, as this will lead to unscrewing the cartridge chamber.

Unscrew the cartridge chamber. In case of difficulty, use a tommy bar and pipe wrench.

Push out used-on shell with a 250–300 mm long ramrod.

If necessary, clean the threads of chamber cartridge with a stiff brush and lubricate it with liquid mineral oil or silicone grease.



Figure 4 Shot in a contaminated pit

Maintenance and care

At the end of the work, make an incomplete disassembly of the device. Separate the source head from the plunger. Remove the plunger from the ram. Wash the parts with water, dry and lubricate with liquid mineral oil or silicone grease.

After working in flooded or contaminated wells completely disassemble the source head for cleaning and lubrication. The appearance of source head and the installation procedure of device parts are shown in Figure 5.

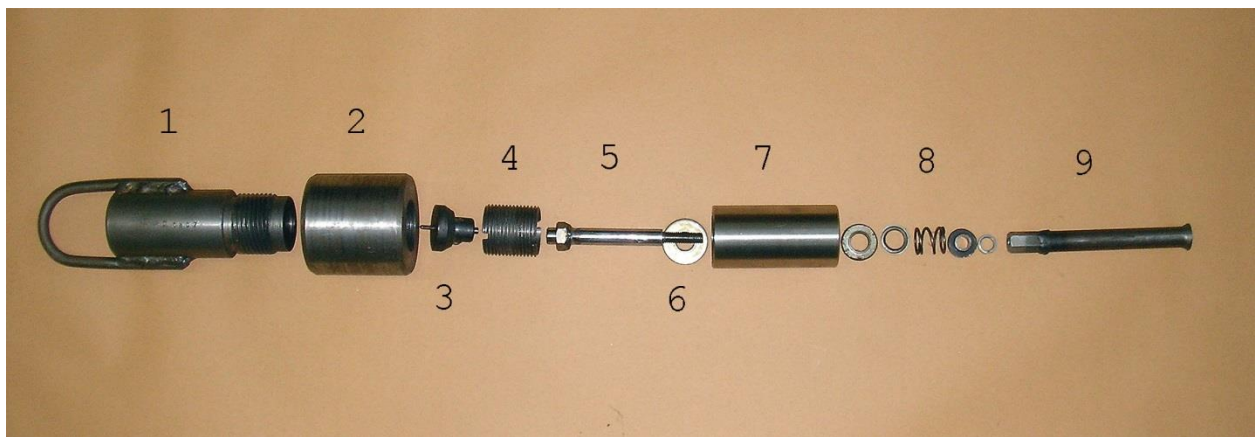


Figure 5 The appearance of source head and the installation procedure of device parts

1. Cartridge chamber
2. Receiver
3. Striking pin assembly (Figures 6 and 7)
4. Clutch
5. Striker
6. Washer
7. Striker's tube
8. Striker's counterrecoil spring with centering washer
9. Guide tube

The assembly sequence of individual units is shown in Figures 6 - 11.

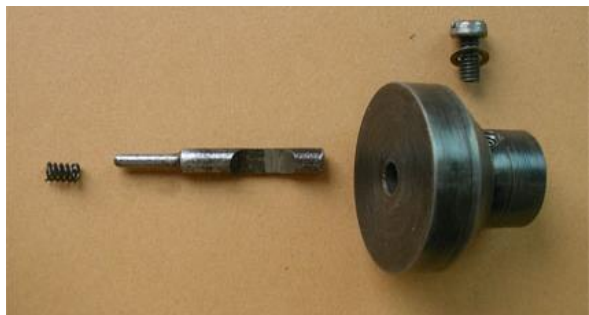


Figure 6 Striking pin. Detail



Figure 7 Striking pin assembly



Figure 8 Receiver with striking pin and clutch



Figure 9 Striker's tube and striker with guide tube



Figure 10 Source head with the cartridge chamber

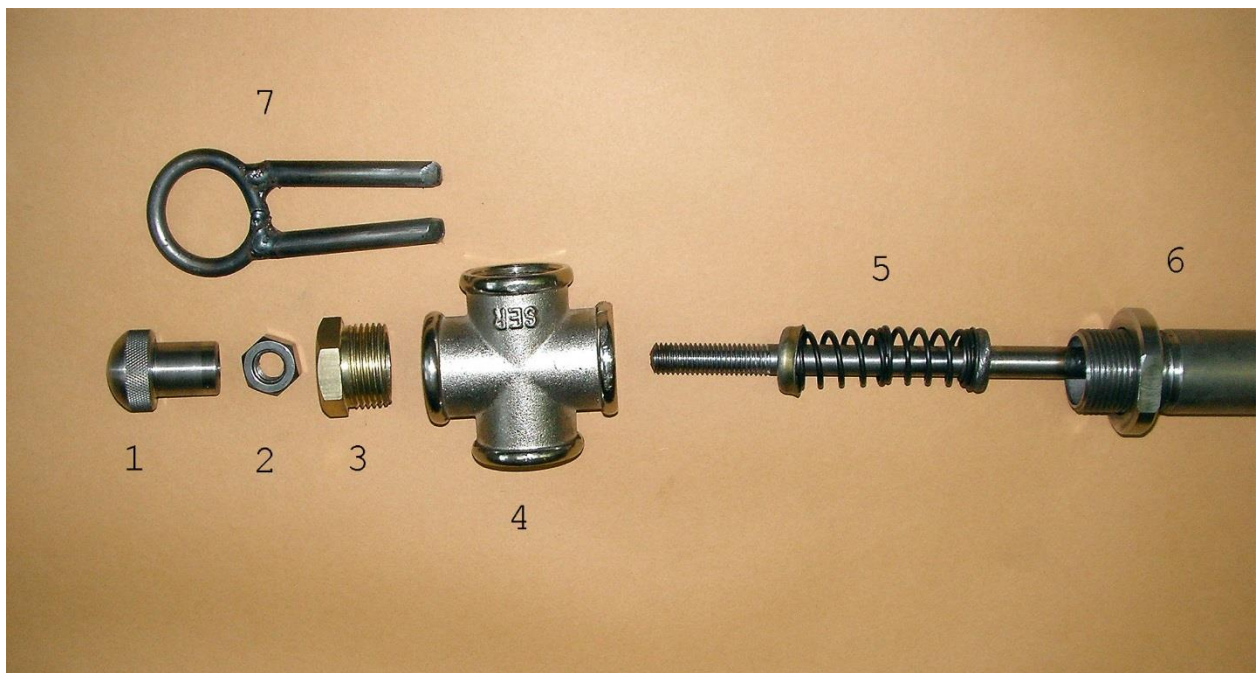


Figure 11 Cross-piece mounting scheme

1. End cap
2. Keeper
3. Blanking element with plunger canal
4. Cross-piece
5. Plunger with restraining spring and centering rim
6. Ram with the keeper
7. Safety-lock (It is fixed using the spring 5).

Cartridges for the seismic pulse source

Only special blank cartridges are allowed for the Seismic pulse source PIKE-12. The cartridges must have either transparent (semi-transparent) plastic case or they should be marked with "SEISGUN" label. Either intentional or occasional using of pellet/bullet-equipped shot-gun cartridges are strongly prohibited and may cause the damage of the pulse source.



Figure 12 Cartridges

Repair service

ATTENTION: REPAIR SERVICE CAN BE CONDUCTED ONLY BY THE MANUFACTURER (GEODEVICE LLC) AND ITS PARTNERS WHICH HAVE SPECIAL MAINTENANCE CERTIFICATES ISSUED BY THE MANUFACTURER.

IT IS STRONGLY PROHIBITED TO PROVIDE REPAIR SERVICE BY UNAUTHORIZED PERSONNEL.

In case of unauthorized repair of the equipment – all warranty obligations are cancelled.

Utilization

The Buyer (Owner) is responsible for the utilization of the equipment after the end of its lifecycle.

IT IS STRONGLY PROHIBITED TO DISCARD THE EQUIPMENT TOGETHER WITH DOMESTIC GARBAGE

It is recommended to separate the equipment onto different parts (metal, plastic, rubber etc.) and utilize them according to corresponding regulations of local authorities.



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