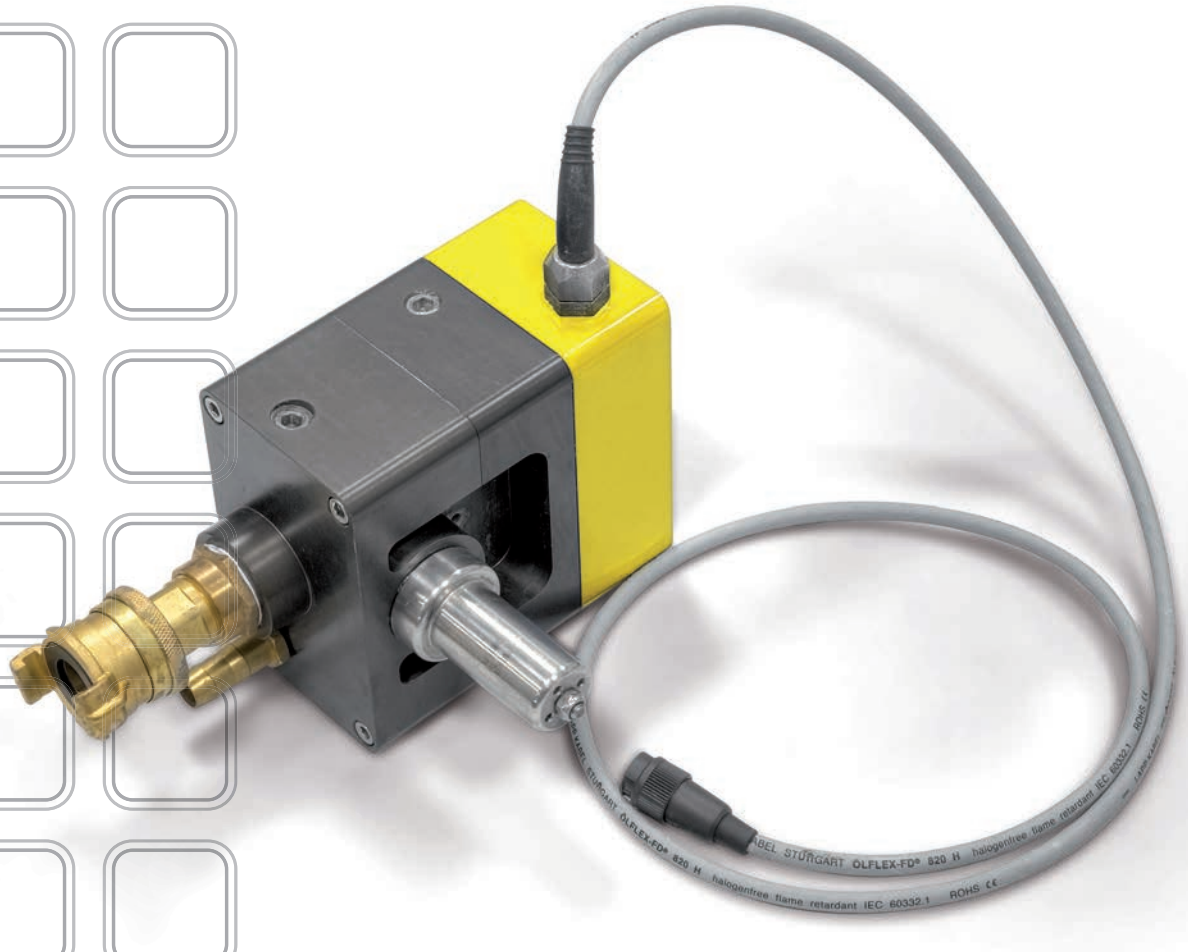
TROTEC®

Operating Instructions

LD PULSE
pulse wave generator



How it works

The LD Pulse is an electronically operated valve made of high-quality light metal designed to detect pipes made of different types of material. By opening the pipe quickly, the device generates a compression surge in the pipe. The pressure difference which is created when the LD Pulse is put into operation generates a sound impulse that can be heard at the surface of the ground.

The sound impulses can be heard in higher frequencies and more audibly through the pipe than next to the pipe. The impulse strength, i.e. the pressure impulse on the pipe which the LD Pulse generates, can be varied with the help of different-sized adapters.

The LD Pulse's mechanics are built for pressures up to 8 bar.
Do not operate with higher pressures.

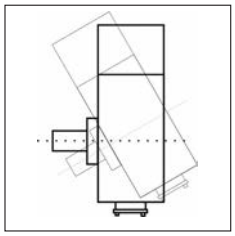
Adapter:

short adapter:
low energy

long adapter:
high energy

Information regarding installation:

1. the pipe must be flushed thoroughly prior to the installation.
2. The adapter must be mounted at the top *(see diagram)*.



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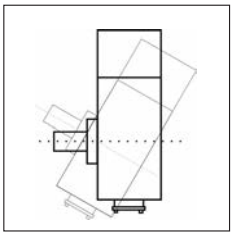


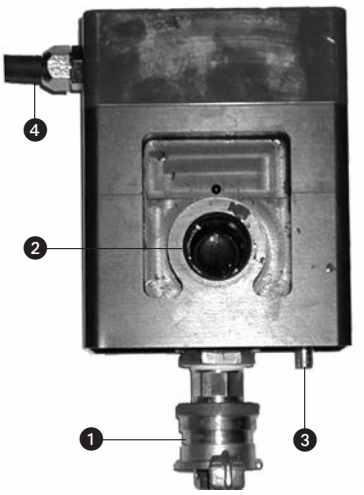
correct

Operating the LD Pulse

Description

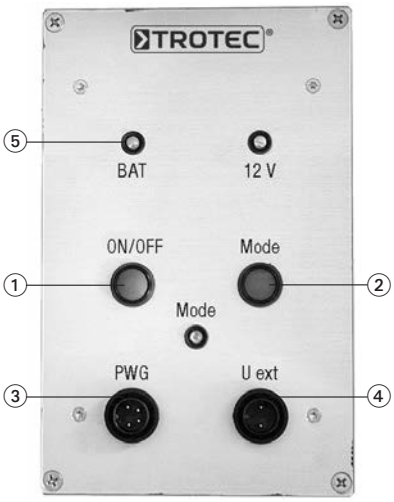
1.	Only use standpipes without valves when connecting to a standpipe.
2.	Place the LD Pulse so that the outlet does not point upwards.
3.	Check the GEKA connector and replace if necessary before installing. The GEKA connectors safety straps must be pulled tightly.
4.	Connect the LD Pulse's connector cable with the power supply of the case unit. **Make sure that the case unit is placed away from where any flooding could occur!**
5.	**Selecting an adapter:** The adapter you use depends on the type of pipe material, the diameter of the pipe and length of the pipe which is being inspected.
6.	Apply the water pressure to the LD Pulse. Make sure that the valve has been opened completely.
7.	Press key ① (fig. b) to power on the LD Pulse.
8.	Press "Mode" ② (fig. b) to select an operating mode: Impulse: slow / fast
9.	A geophone can now be used to measure the pipe. You can achieve the best possible results by assessing either the maximum sound or the highest sound frequency.
10.	The LD Pulse must be emptied completely before it is returned to the case unit. If you fail to ensure that there is no water left in the device, then you may find that water will run out of the case unit

Overview of the LD Pulse



a) Description

❶ *Screw GK connector*
❷ *Connector for adapter pieces (limiting the pressure energy)*
❸ *Exit point*
❹ *Connection to the power supply*



b) Electric connections

① *On-/off key*
② *Controlling the operating mode (Impulse: slow/fast)*
③ *LD Pulse power supply output*
④ *Connecting external power supplies*
⑤ *LED battery*

charge:
- *Blinks during charging Steady light as soon as the battery is fully charged.*

measuring:
- *Steady light during the measurement*

Stress caused by the LD Pulse

At maximum impact strength pressures of approx. … are created:

material	note	Distance sensor from LD Pulse [m]	Static pressure [bar]	Pressure LD Pulse MIN / MAX [bar]
Synthetic material	DN 40, house pipe; LD Pulse in the house	0	3.7	0.2 / 5.4
Synthetic material	DN 100, main pipe; LD Pulse on hydrant	55	4.4	3.9 / 5.0
Cast iron	DN 125, main pipe; LD Pulse on hydrant	0	3.7	0.8 / 6.0
Cast iron	DN 125, main pipe; LD Pulse on hydrant	55	3.7	3.0 / 4.5

These measurements were recorded with a pressure logger that can measure up to 100 pressure values per second

The diagrams are combined in the adjacents diagrams.

The pipe that is being inspected has to be able to withstand these pressures with each stroke of the LD Pulse! We cannot accept liability for any damage to the pipes including any damage which may arise as a consequence thereof.

Error messages

The LD Pulse is equipped with a microcontroller which emits both an acoustic and an LED signal when one of the following errors occurs.

Power supply error during measuring		
Display:	*Possible cause:*	*Possible solution:*
External LED blinks	External voltage too high or low.	- Use a more powerful mains adapter. - Replace mains adapter.
LED battery blinks	Internal battery voltage too low.	- Operate the case unit via an external power supply. - Charge battery.
3 LEDs blink	DCDC converter defective.	- Operate LD Pulse via external power supply. *Needs to be repaired!*
Error while loading		
LED battery blinks fast	Ext. voltage too high/low; Timeout.	- Use a more powerful mains adapter. - Replace mains adapter.

Explanatory note concerning the mains power unit

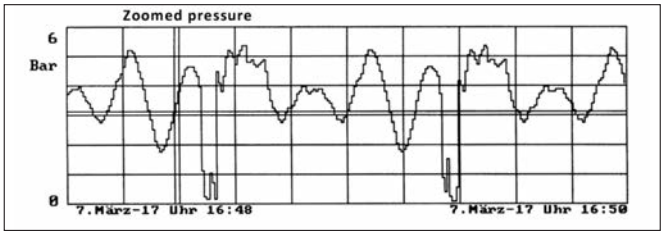
If the internal battery is fully discharged (e.g. when the device was switched off when the battery was almost empty and was then used for a longer period without first having been recharged), then the switching power supply will turn itself off automatically because it is overloaded.

You can use the car battery charger lead (or another external power source which can deliver approximately 10 A at 12 V DC) **for a few seconds** to remedy this problem.

The mains power unit can be used again as soon as the LED battery starts to blink.

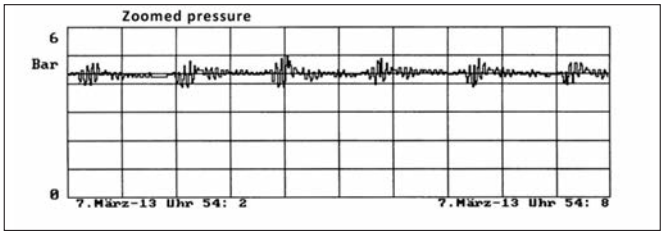
Pressure measurements with LD Pulse/1

Figure 1:



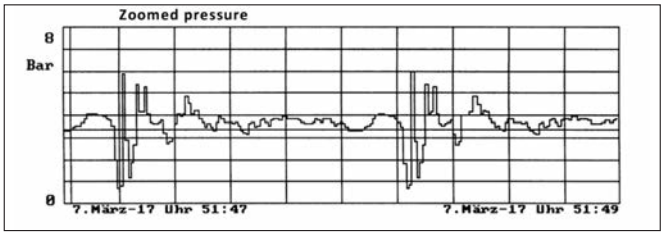
Synthetic material; DN 40 house pipe; LD Pulse in the house; sensor on the LD-Pulse

Figure 2:



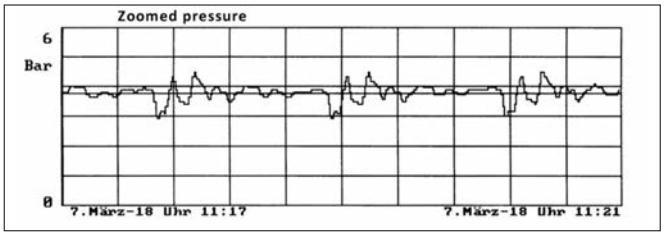
Synthetic material; DN 100 main pipe; LD Pulse on hydrant; sensor in 55 m

Figure 3



Cast iron; DN 125 main pipe; LD Pulse on hydrant; sensor on the LD-Pulse

Figure 4:



Cast iron; DN 125 main pipe; LD Pulse on hydrant; sensor in 55 m

Information regarding maintenance:

Because the LD Pulse is subjected to high levels of stress it must be checked by us every 300 operating hours.

During this inspection important seals and springs are replaced.
This is necessary to ensure that the device continues to work reliably.

Technical Data	LD Pulse
Minimum pressure	2 bar (minimum pressure of the service pipe)
Operating time	approx. 12 hours
Pulse sequence	approx. 60x per minute
Connection	1 inch GEKA high pressure connector
Power supply	battery (rechargeable) or 230 V AC
Weight	4.2 kg

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