

VOD 812

DETONATING VELOCITY MEASURING SYSTEM

PRODUCT DATASHEET

Detonation velocity is one of the main explosion parameter. **VOD 812** is an electronic device designed to directly and precisely measure velocity of detonation (VOD) or velocity of deflagration of either liquid or solid samples. The principle of VOD measurement is based on the ability of the optical fibre to receive a light signal when the detonation wave arrives, and to transmit that signal to suitable measuring equipment. The time taken for a detonation wave or a fast burning zone to pass between two probes placed in a specific distance from each other is tracked. From the measured time interval and the corresponding distance travelled by the detonation wave, the detonation velocity is calculated. **VOD 812** is applicable for measurements in a wide range of detonation velocities of up to 20 000 m.s⁻¹ and time interval from 10 nanoseconds up to 40 seconds by 8 independent probes.

APPLICATIONS

The determination of the detonation velocity is based upon the measurement of the time interval needed for the detonation wave to travel a known distance through the explosive being tested

This method is based on the ability of the optical fibre to accept a light signal when the detonation wave arrives, and to transmit that signal to suitable measuring equipment, which enables precise recording of the time interval between the two signals. From the measured time interval and the corresponding distance travelled by the detonation wave, the detonation velocity is calculated.

VOD 812 is designed to comply with requirements of the following standards of testing:

- EN 13631-14, Explosives for civil uses – High explosives – Part 14: Determination of velocity of detonation

INSTRUMENT DESCRIPTION

The **VOD 812** Main Unit is a battery-charged instrument equipped with an internal memory for storage of 100 results, a 4-line LCD display and a waterproof keyboard. Supplied accessories include optical extension line, optical probes, USB communication cable and software WinVOD WinXP/Win7 for data acquisition. The instrument and accessories are stored in an impact resistant waterproof transport case.

VOD 812 features 7 independent timers capable of tracking time intervals that elapse between sequential illuminations of 8 optical probes. With all of these probes, **VOD 812** has the ability to provide a semi-continuous VOD measurement system. One of the probes starts the timer and every triggered probe stops its own time measurement. Based on the distances between individual probes, velocity of detonation is automatically calculated. The **VOD 812** is equipped with digitally controlled comparators for setting up the value of the triggering signal,



with an adjustable level of positive or negative triggering signal. The use of optical fiber ensures excellent immunity against electrical noise. Optical fiber is used to transmit the signal from the probes, so there is no signal disturbance by stray currents and other factors. Instrument is also equipped with an output testing light to allow for checking of the functions of a channel.

The entire installation on the blasting site takes less than 10 minutes. Operation of **VOD 812** is very simple. Operator arranges optical leading cables and plugs the optical probes directly into the explosive cartridge. Each shot destroys only about 20 cm of each optical probe depending on a test configuration.

The WinVOD WinXP/Win7 software allows you to download measured data from the device's internal flash memory and evaluate them on the PC.



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TECHNICAL PARAMETERS

Main Unit

Interface:	Communication with PC via a USB serial interface
Fiber Optic:	Plastic fiber optic cable – Core: 1 mm diameter; Jacket: 2.2 mm diameter
Safety:	Distance between VOD812-MU and the blasting site: up to 80 m
Accuracy:	Time and Velocity measurement: 20 nanosecond
Resolution:	Time and Velocity measurement: 10 nanosecond
Operating range:	Distance between two optical test probes on the explosive: 1 – 9999 mm Detonating velocity up to 20 000 m.s ⁻¹ Time interval measurement: 10 nanosecond – 40 seconds
Operating temperature:	0 - 50 °C
Operates on batteries:	Over 20 hours of autonomy, rechargeable with AC/DC adapter/charger
Weight:	VOD812-MU: 0.8 kg VOD812-MU with case and attachments: 5 kg
Dimension:	VOD812-MU ABS case: 202 x 114 x 36 mm Transport case, watertight and unbreakable, outside diameter: 486 x 393 x 194 mm

STANDARD INSTRUMENT PARTS

VOD812-MU	VOD 812 instrument - 8 input channels - communication port
VOD812-KIT-PP	Probe Preparation Kit - 1 polishing kit - 40 optical connectors
VOD812-C500	Fibre Optic Cable - length 500 m
VOD812-DCOC	Duplex Optical Cable Extension - length 25 m - connectors for 2 optical probes
VOD812-SG8	Signal generator for testing of optical fiber and VOD 812 - 8 outputs
VOD812-BC	Automatic battery charger 230 V / 250 mA - leading cable
VOD812-OP10	Starting set of 8 pieces prepared optical probes - length 10 m
Accessories	Set of accessories - USB cable - 2 bulkhead feedthrough - WinVOD software installation CD - 2x hermetic transport case - vernier caliper - knife - aluminium tape

CONSUMABLES

VOD812-C500	Fibre Optic Cable - length 500 m
VOD812-KIT-PP	Probe Preparation Kit - 1 polishing kit - 40 optical connectors
VOD812-EB	External battery 9,6 V - leading cable
VOD812-PE	PE hose 5 x 1 mm for protection of optical fibre (length 50 m)
VOD812-BF	Set of bulkhead feedthroughs 10 pcs

SHIPPING DATA

Package dimensions (W x L x H): 50 x 75 x 45 cm
Package net weight: 11 kg
Package gross weight: 14 kg
Country of origin: Czech Republic
Custom code: 9031 49 90