

VOD 815

DETONATING VELOCITY MEASURING SYSTEM

PRODUCT DATASHEET

Detonation velocity is one of the most important detonation parameters. VOD 815 is an electronic device designed to directly and precisely measure velocity of detonation (VOD) or deflagration of either solid, liquid or gaseous 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 recorded. From the measured time interval and the corresponding distance travelled by the detonation wave, the detonation velocity is calculated. VOD 815 is applicable for measurements of velocities of up to 20 000 m·s⁻¹ and time intervals from 0 to 40 seconds with 10 nanosecond resolution using 8 independent probes.

APPLICATIONS

The VOD 815 is primarily used for quality control in explosives production industry, optimization of mining and blasting procedures, and education in the field of energetic materials. In these cases, simplicity of operation and evaluation of results are highly appreciated. The instrument is applicable for all high or low, military or civilian explosives. The fiber optic probes provide full resistance against humidity and electromagnetic disturbances which allows using the instrument together with any other instrumentation.

VOD 815 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 815** 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 Win7 for data acquisition. The instrument and accessories are stored in an impact resistant waterproof transport case.

VOD 815 features 7 independent timers capable of tracking time intervals that elapse between sequential illuminations of 8 optical probes. With all of these probes, **VOD 815** 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 815** is equipped with digitally controlled comparators for automatic setting of the value of



the 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 815** 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 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
Time accuracy:	± 0.05 % of time interval + 20 nanoseconds
Time resolution:	± 10 nanoseconds
Operating range:	Recommended distance between two probes: > 30 mm Maximum distance between two adjacent probes: 9999 mm Minimum recommended charge length: 250 mm Minimum recommended charge diameter: 6 mm Maximum length of probe cables: 80 m Velocity range: 0 - 9999 mm/s or 0 - 20 000 m/s Time interval: 0.01 microseconds - 40 seconds
Operating temperature:	0 - 50 °C
Operates on batteries:	Over 20 hours of autonomy, rechargeable with AC/DC adapter/charger
Weight:	VOD815-MU: 0.8 kg VOD815-MU with case and attachments: 5 kg
Dimension:	VOD815-MU ABS case: 202 x 114 x 36 mm Protection case: 298 x 214 x 98 mm Transport case: 486 x 393 x 194 mm

STANDARD INSTRUMENT PARTS

VOD815-MU	VOD 815 instrument - 8 channels with independent timers - bright display and numerical keyboard - communication port	VOD815-4C200	Fibre optic probe cable - 4-core optical cable for probe preparation - coloured cores - length 200 m - for up to 800 measurements (depends on sample mass)
VOD815-SPC	Shock-proof protection case - protects the instrument in outdoor use - resists shockwaves and low energy fragments	VOD815-BC	Battery charger 230 V / 250 mA - leading cable
VOD815-4CE30	Four-core plastic optical cable extension - length 30 m - 4 core cable with connectors for 4 optical probes - includes cable reel	Accessories	Set of accessories - USB cable - 4 bulkhead feedthroughs - WinVOD software installation CD - durable transport case - vernier caliper - knife - aluminium tape - one example of assembled optical probe (4 channel)
VOD815-PPS	Probe preparation set - polishing kit - optical connectors (40 pcs) - quadruple plugs (4 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:	9029 20 38

MANUFACTURING NOTE

The product is manufactured according to relevant EU directives and manufacturing standards.

CONSUMABLES

VOD815-IHP	In-hole probe - for detonation velocity measurement in boreholes - 1 pc, i.e. for one borehole measurement - 30 m total length, 4 channels - 3 x 5 m intervals, i.e. 15 m active length
VOD815-OBS	Optical break screen set - for measurement of shaped charge jet velocity - 8 pcs, i.e. for one test with 8 channels - 20 x 20 cm active area
VOD815-CX500	Fibre optic cable - 1-core optical cable for core preparation - length 500 m - X = colour
VOD815-BF	Set of bulkhead feedthroughs - 10 pcs