

RIEGL VQ[®]-450

- **very high laser pulse repetition rate (PRR) up to 550 kHz**
- **very high scanning rate up to 200 lines/sec.**
- **very long range up to 800 m**
- **high-accuracy ranging**
- **multiple target capability - unlimited number of targets**
- **perfectly linear scan lines**
- **compact, rugged and lightweight design**
- **electrical interfaces for GPS data string and Sync Pulse (1PPS)**
- **mechanical interface for IMU mounting**
- **integrated LAN-TCP/IP interface**

The V-Line[®] "Full Circle" laser scanner *RIEGL VQ-450* is a very high speed, non-contact profile measuring system using a narrow infrared laser beam and a fast line scanning mechanism, enabling full 360 degree beam deflection without any gaps.

High-performance pulsed laser ranging, based on *RIEGL's* well-proven echo signal digitization technology with subsequent online waveform processing results in superior measurement capabilities even under adverse atmospheric conditions and in excellent multiple target echo discrimination.

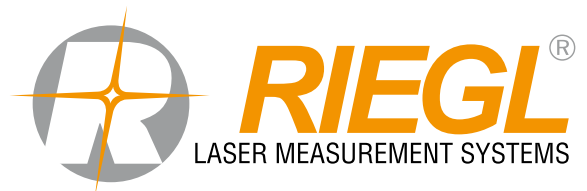
The *RIEGL VQ-450* is a compact and lightweight scanner, mountable in any orientation and even under limited space conditions on land based vehicles, tunnel measuring devices, watercrafts, etc. The instrument needs only one power supply and provides line scan data via the integrated LAN-TCP/IP interface. The binary data stream can easily be decoded by user-designed software making use of the available software library *RivLib*.

The *RIEGL VQ-450* is optimally suited for

- **Long Range, High Speed, High Accuracy Mobile Mapping Applications**



visit our website www.riegl.com



Laser Product Classification

Class 1 Laser Product according to IEC60825-1:2007
The following clause applies for instruments delivered into the United States:
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.



Range Measurement Performance

Measuring Principle

- time of flight measurement
- echo signal digitization
- online waveform processing

Effective Measurement Rate ¹⁾	150 kHz	200 kHz	300 kHz	380 kHz	550 kHz	550 kHz ²⁾
Max. Measurement Range ³⁾						
natural targets $\rho \geq 10\%$	300 m	260 m	200 m	180 m	140 m	70 m
natural targets $\rho \geq 80\%$	800 m	700 m ⁴⁾	450 m ⁴⁾	330 m ⁴⁾	220 m ⁴⁾	200 m
Max. Number of Targets per Pulse	practically unlimited (details on request)					

1) Rounded values.
2) Reduced laser power for avoiding of ambiguous echo range readings.
3) The following conditions are assumed: target larger than the footprint of the laser beam, perpendicular angle of incidence, visibility 23 km, average ambient brightness.
4) Limited by PRR.

Minimum Range

Accuracy ^{5) 7)}

Precision ^{6) 7)}

Laser Pulse Repetition Rate ^{1) 8)}

Max. Effective Measurement Rate ¹⁾

Echo Signal Intensity

Laser Wavelength

Laser Beam Divergence

Laser Beam Footprint (Gaussian Beam Definition)

1.5 m

8 mm

5 mm

up to 550 kHz

up to 550 000 measurements/sec

(@ 550 kHz PRR & 360° FOV)

for each echo signal, high-resolution 16 bit intensity information is provided

near infrared

0.3 mrad

7 mm @ exit aperture

17 mm @ 50 m

32 mm @ 100 m

5) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.
6) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.

7) One sigma @ 150 m range under RIEGL test conditions.
8) User selectable.

Scanner Performance

Scanning Mechanism

Field of View (selectable)

Scan Speed (selectable)

Angular Step Width $\Delta \theta$ (selectable)

between consecutive laser shots

Angle Measurement Resolution

Internal Sync Timer

Scan Sync (optional)

rotating mirror

up to 360° „full circle“, without gaps

up to 200 scans/sec

$0.01^\circ \leq \Delta \theta \leq 0.48^\circ$

0.001°

for real-time synchronized time stamping of scan data

scanner rotation synchronization

Data Interfaces

Configuration

Scan Data Output

GPS-System

LAN 10/100/1000 Mbit/sec

LAN 10/100/1000 Mbit/sec

Serial RS232 interface for data string with GPS-time information,

TTL input for 1 PPS synchronization pulse

Mechanical Interfaces

Mounting of Laser Scanner

Mounting of IMU Sensor

6x dia 11 mm mounting slots

3x M6 thread inserts, depth 8 mm at bottom

General Technical Data

Power Supply Input Voltage

Current Consumption

Main Dimensions (L x W x H)

Weight

Humidity

Protection Class

Temperature Range

18 - 32 V DC

typ. 70 W, max. 180 W ⁹⁾

377 x 205.5 mm x 218 mm

approx. 12.5 kg (without protective cap)

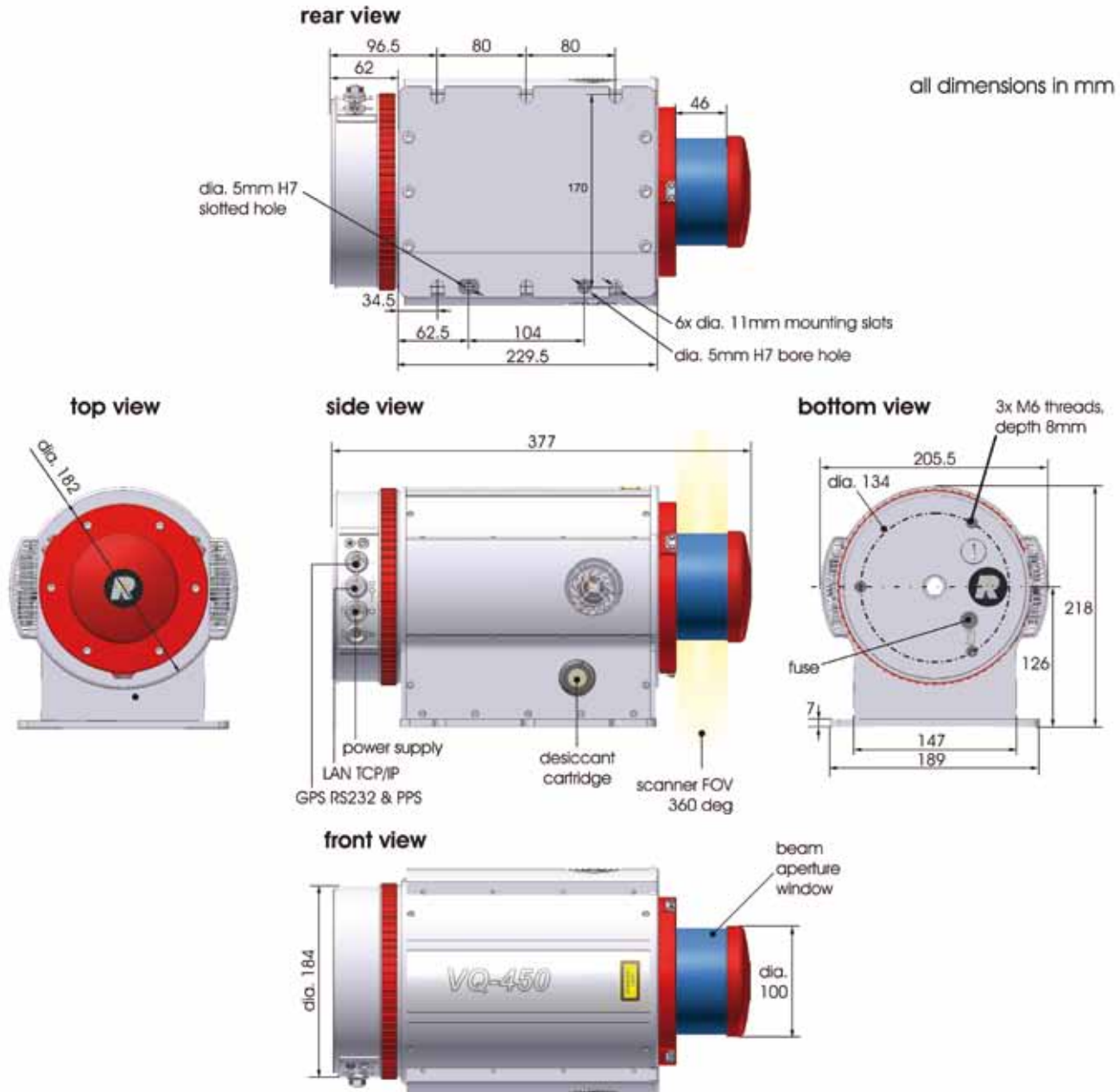
max. 80 % non condensing @ +31°C

IP64, dust and splash-proof

-10°C up to +40°C (operation) / -20°C up to +50°C (storage)

9) At the maximum scanning rate of 200 scans/sec and ambient temperature < +10°C.

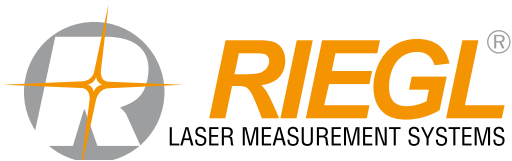
Note: In Germany and in the U.S.A. only, use of the VQ-450 for other applications than Mobile Mapping and Tunnel Profile Measurement is not permitted.



Protective Cap:



When not in operation, a protective cap is to be attached to shield the high precision optical front end from mechanical damage and soiling.



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