SpeedPod | Datasheet

1.254
m/s

Characterization of Door Closing Efforts

SpeedPod is a new generation measurement instrument for the fast, easy, and highly accurate characterization of door systems.

Capabilities include measurement of minimum closing speed, friction effect, hinge tip, door angle, and window shake.

The automated movement detection eliminates the need for button operation by the user during data collection. Programmable user profiles can adapt the device to any specific door.

The technology can be used on classic hinged doors, tail gates, liftgates, frunks, sliding doors, butterfly doors, and many more.

SpeedPod's wireless capabilities, in combination with the application software, provide a reliable platform for inspection requirements from product audits to 100% inline inspection.
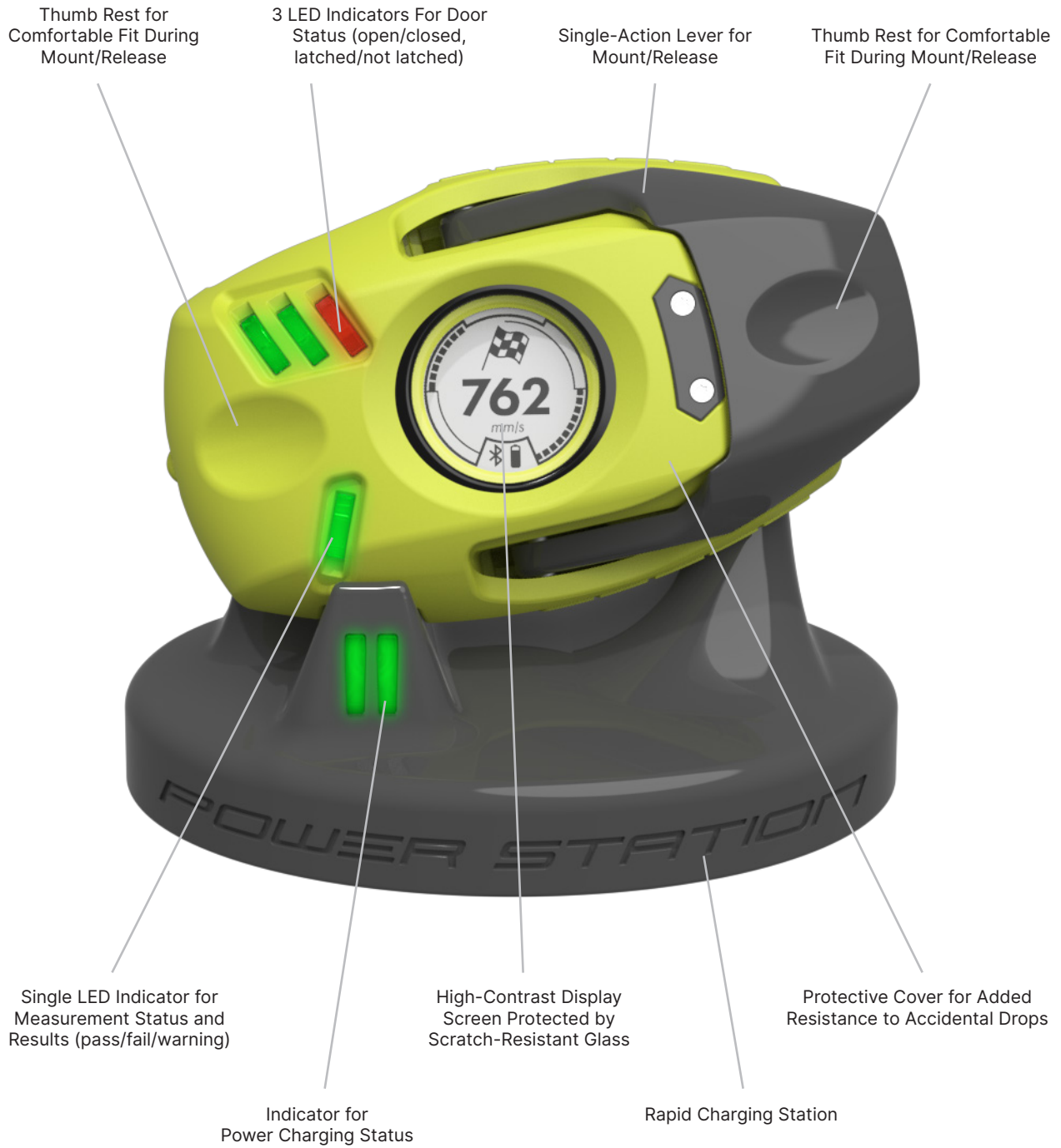
SpeedPod Features

Thumb Rest for Comfortable Fit During Mount/Release

3 LED Indicators For Door Status (open/closed, latched/not latched)

Single-Action Lever for Mount/Release

Thumb Rest for Comfortable Fit During Mount/Release

762
mm/s

POWER STATION

Single LED Indicator for Measurement Status and Results (pass/fail/warning)

High-Contrast Display Screen Protected by Scratch-Resistant Glass

Protective Cover for Added Resistance to Accidental Drops

Indicator for Power Charging Status

Rapid Charging Station

Figure 1. Key features illustrated for SpeedPod measurement device

Performance

Parameter	Range	Resolution	Accuracy
Speed	10 to 4300 mm/s 0.010 to 4.300 m/s	1 mm/s 0.001 m/s	< 1.5%
Vibration	± 160 m/s²	0.05 m/s²	< 1.5 %
Door Angle	0 to 90°	0.1°	< 0.8 %

Data Sampling Rate[1]

Data Sampling Rate[2] (Hz)	Max. Recording Time (s)
25	80
50	40
100	20
200	10
400	5
800	2.5

[1] Configuration of sampling rate available in Manual Recording; default value is 400 Hz
[2] Limited to 200 Hz with EZMetrology IOManager

Storage & Export

Parameter	Value
Onboard Non-Volatile Memory	32 GB
Discrete Data	Approx. 160M samples
Sensor Data	Approx. 50K Recordings
Export Format	CSV

Discrete Data

```
Date and Time,Vehicle Identification Number,Door Location,Profile Name,Closing Speed,Units, Door Radius,
Evaluation, Latched/Not Latched
11/29/2023 15:22,123456,RightRear,DEMO,1.019,m/s,1000,Pass, Latched
11/29/2023 15:22,123456,RightRear,DEMO,1.133,m/s,1000,Pass, Latched
```

Figure 2. Closing Speed measurement example with CSV output

```
Date and Time,Vehicle Identification Number,Door Location,Profile Name,Current X Value,Current Y Value,
Average X Value, Average Y Value,Angle Units,Evaluation, Latched/Not Latched
11/29/2023 3:31,5T54R2,LeftFront,DEMO,-3.2,-2,-3.2,-2,Degrees,Fail, Latched
11/29/2023 3:31,5T54R2,LeftFront,DEMO,-3.3,-1.9,-3.3,-1.9,Degrees,Fail, Latched
```

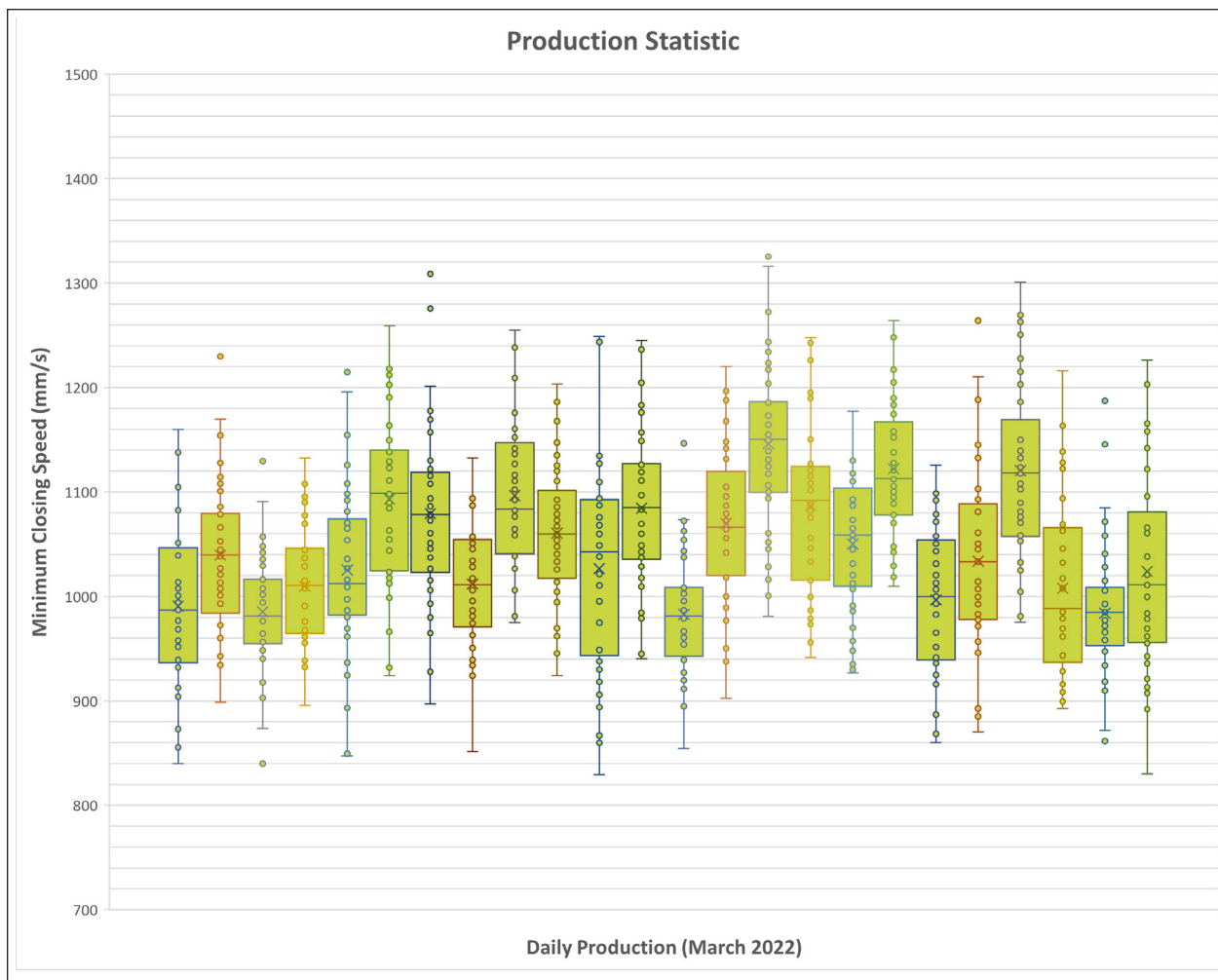*Figure 3. Hinge Tip measurement example with CSV output*

Figure 4. Example of Box and Whisker plot with discrete data export and Microsoft® Excel

Sensor Data

```
Time,GyroX, GyroY, GyroZ, AccelX, AccelY, AccelZ
0.0000, 0.03051,-0.06109,-0.12203,-0.02197,-0.99552,-0.00244
0.0025,-0.18305, 0.00762,-0.15254,-0.02343,-0.99796, 0.00097
0.0050,-0.11444,-0.03051, 0.16782,-0.02148,-0.99259,-0.00097
0.0075,-0.13736,-0.09154, 0.23648,-0.02392,-0.99356,-0.00634
```

Figure 5. Manually recorded hinged door trajectory example and CSV output
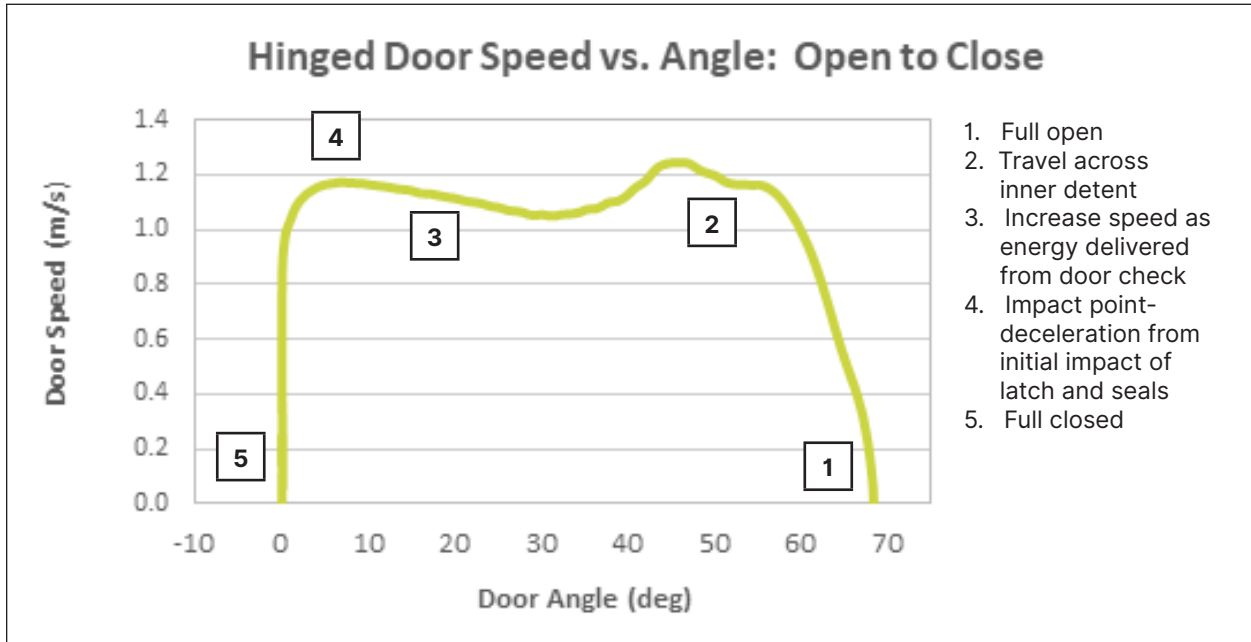

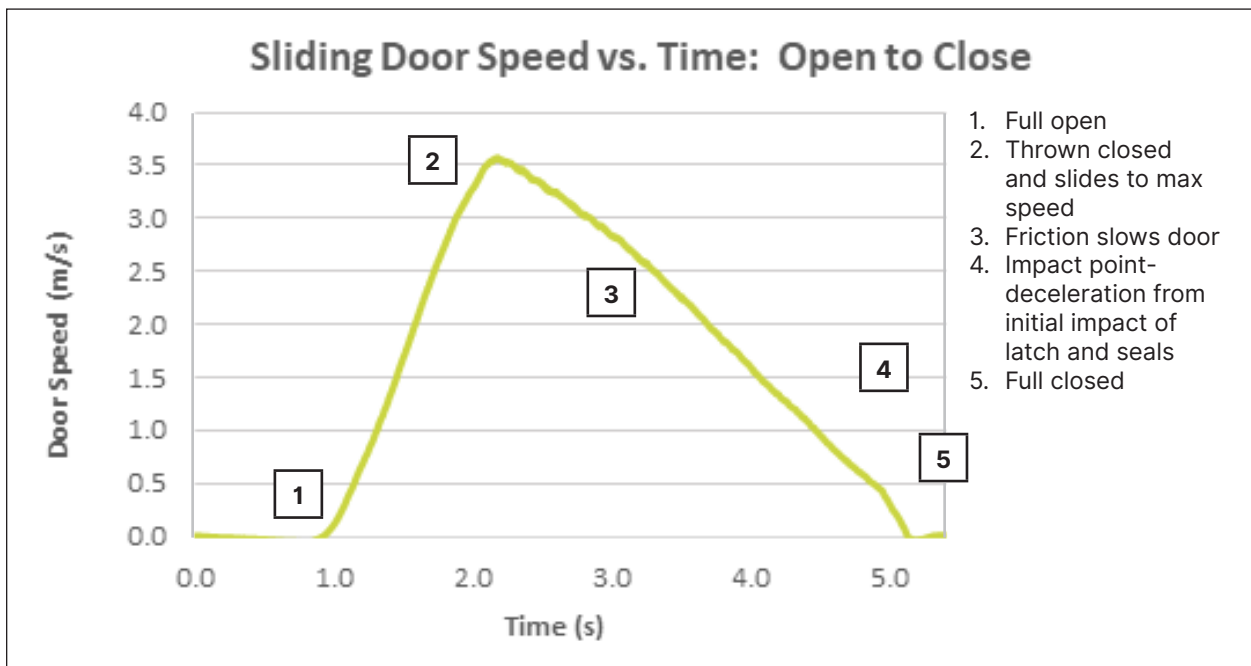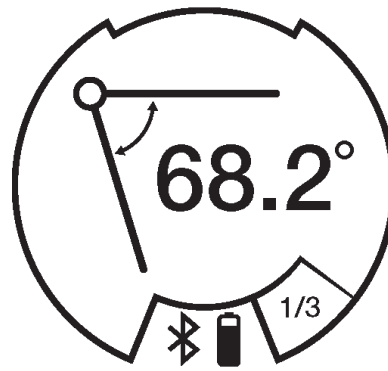*Figure 6. Trend Chart of Hinged Door Closing Speed vs. Angle from export of data into Microsoft® Excel*

Figure 7. Trend Chart of Sliding Door Speed vs. Time from export of data into Microsoft® Excel

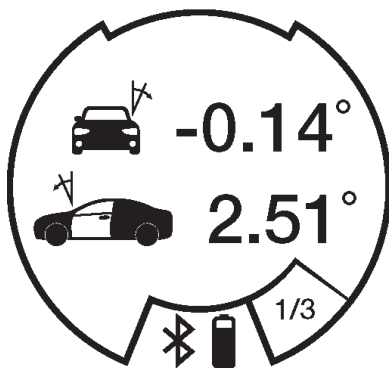# Device Screens: Discrete Measurement Values

Closing Speed

1.254 m/s

Door Angle

68.2° 1/3

Window Shake

13.2 mm

Friction Effect

0.267 m/s 1/3

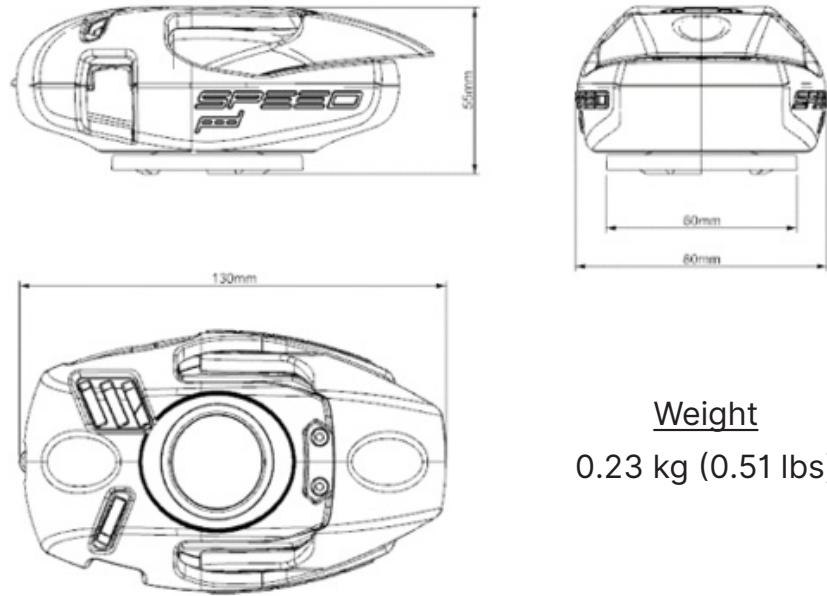**Hinge Tip**

-0.14° 2.51° 1/3

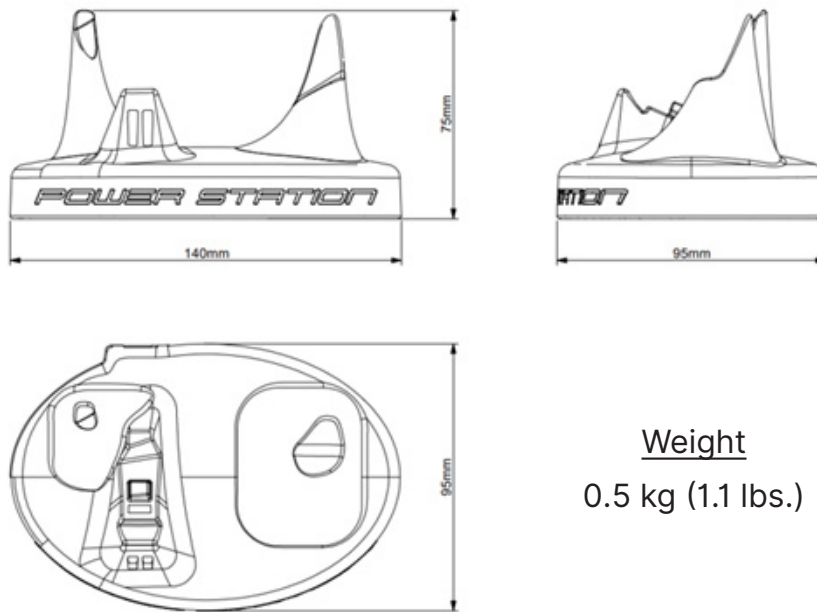**Finished Measurement**

762 mm/s

Figure 8. SpeedPod device screens in use for single measurement values

Dimensions & Weight

Weight

0.23 kg (0.51 lbs)

Figure 9. SpeedPod height, width, length, and weight

Weight

0.5 kg (1.1 lbs.)

Figure 10. Power Station height, width, length, and weight

Power Specifications

Parameter		Value
Batteries		2 independent Li-Ion, rechargeable; 1 battery removable
Voltage		3.7 V
Current Capacity		650 mAh
Power Capacity		2.5 Wh
Operation on Single Full Charge (normal use)		8 hours
Power Station Fast Charging	Requirements	110 - 210 VAC to 5 VDC, 6W
	0 to 40%	1 hour
	0 to 100%	< 3 hours

Connectivity

Parameter		Description
Bluetooth	Version	v4.2 + BR/EDR
	Transmit Power	Max. +3 dBm (limited by firmware)
	Receiver Sensitivity	-88dBm (min); -89 dBm (typical); -90 dBm (max)
	Range	10 meters, line of sight
	Transmitter/Receiver	Integrated chip antenna or U. FL connector
Wi-Fi		802.11 /b/g/n
USB-C		v3.1 Gen 2

EMC & Certification

Wireless Certifying Organization	Certificate/Identifier Number
Bluetooth Launch Studio	D051055
Canada ISED (RSS-247 Issue 2)	B20070614
China CMIIT	2020DP2713
Europe CE (EMC Directive 2014/53/EU)	B2004079
FCC (Part 15c)	2AC7Z-ESP32WROOM32E
Japan MIC	217-204070
Korea KCC	R-C-es5-ESP32WROOM32E
Taiwan NCC	CCAK21Y10020T0
Wi-Fi Alliance Interoperability	WFA97858

Environmental & Operational Sensitivity

Parameter	Value
Orientation Sensitivity[1]	0.50%
Placement Sensitivity[2]	0.46%
Operating Temperature (Continuous Operation)	0 to 50°C
Temperature Measurement Sensitivity	0.12% per 10°C
Storage Temperature	-20°C to +60°C

[1] Average measurement variation for SpeedPod mounted on car door and rotated between 0 and 360°
[2] Average measurement variation for SpeedPod mounted on car door for matrix of 2 different radii from
   hinge and 3 different vertical positions along metal + window door assembly

Reliability

Parameter		Value
Drop Resistance		1.8 m (6 ft)
Glass Screen Shatter Resistance		> 300 N
Suction Cup System[3]	Holding Force	120 N
	Holding Time	3 hours
	Durability	> 100,000 cycles

[3] Suction cup replacement kit available

Figure 11. Single-action lever to mount and release SpeedPod with patented suction cup

MyPod Software

Configuration software to customize devices with preferred profiles, units, & tolerances

Minimum Hardware Requirements	
Operating System	Windows 10
Microprocessor	Intel® i5 Core or equivalent
Memory	8 GB RAM
Hard Drive	SSD with 2.5 GB available for MyPod Software install and use
USB 2.0 Ports	2

Figure 12. MyPod software screen for device setup

Figure 13. MyPod software screen for viewing of live measurements

SpeedPod Exploded View

Figure 14. Exploded view of SpeedPod

Component Materials

	Component	Material
1	**Protective Cover**	Silicone (40 Shore A)
2	**Housing**	ABS
3	**Display Screen Transparent Cover**	Mineral Glass
4	**Retainer Ring**	Anodized Aluminum
5	**Suction Cup Lever**	Nylon
6	**Suction Cup**	Polyurethane
7	**Power Station Cover**	ABS

Kit Contents

SpeedPod

Power Station

USB A to C
• 1 m / 3 ft

Wrist Strap

**Rugged Transport Case
with Custom Foam Insert**
• Height x Width x Length: 30 x 25 x 12 cm
• Weight: 2.32 kg

MyPod Software
• 1 MyPod program and license provided
  on SD card

Wall Mount Adapter
• 110-240VAC to 5VDC 6W

Type A (NEMA 1-15 U.S. 2 pin)	North America
Type C (CEE 7/16 Europlug)	Europe
Type G (BS 1363 UK)	United Kingdom
Type I (Australian AS/NZS 3112)	Australia

Figure 15. SpeedPod kit with accessories

Calibration & Verification

All devices are initially calibrated at EZMetrology's Calibration Lab. The individual device serial numbers, procedures, and necessary information for traceability are listed in the calibration documents for each device. It is recommended to return devices to EZMetrology for recalibration after one year. Onsite calibration of SpeedPod devices is an additional option that is fully supported. EZMetrology also offers SpeedBay — a convenient tool for onsite verification that can be used by customers at any time to ensure SpeedPod performance is within tolerances.

Article #31300
SpeedBay

Replacement Kits

Article #31003
SpeedPod Suction Cup & Lever
Replacement Kit

Article #31004
SpeedPod Protective Cover Kit

Training

Online and onsite training options for SpeedPod are available from our technical experts.

Warranty

All SpeedPod devices are covered by 1 year factory warranty. Extended warranty for continued coverage is available.

Additional EZMetrology Devices

Visit our website below for information regarding additional products in the EZMetrology Pod family:

ForcePod   PressurePod   SensorPod

Order & Contact Information

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