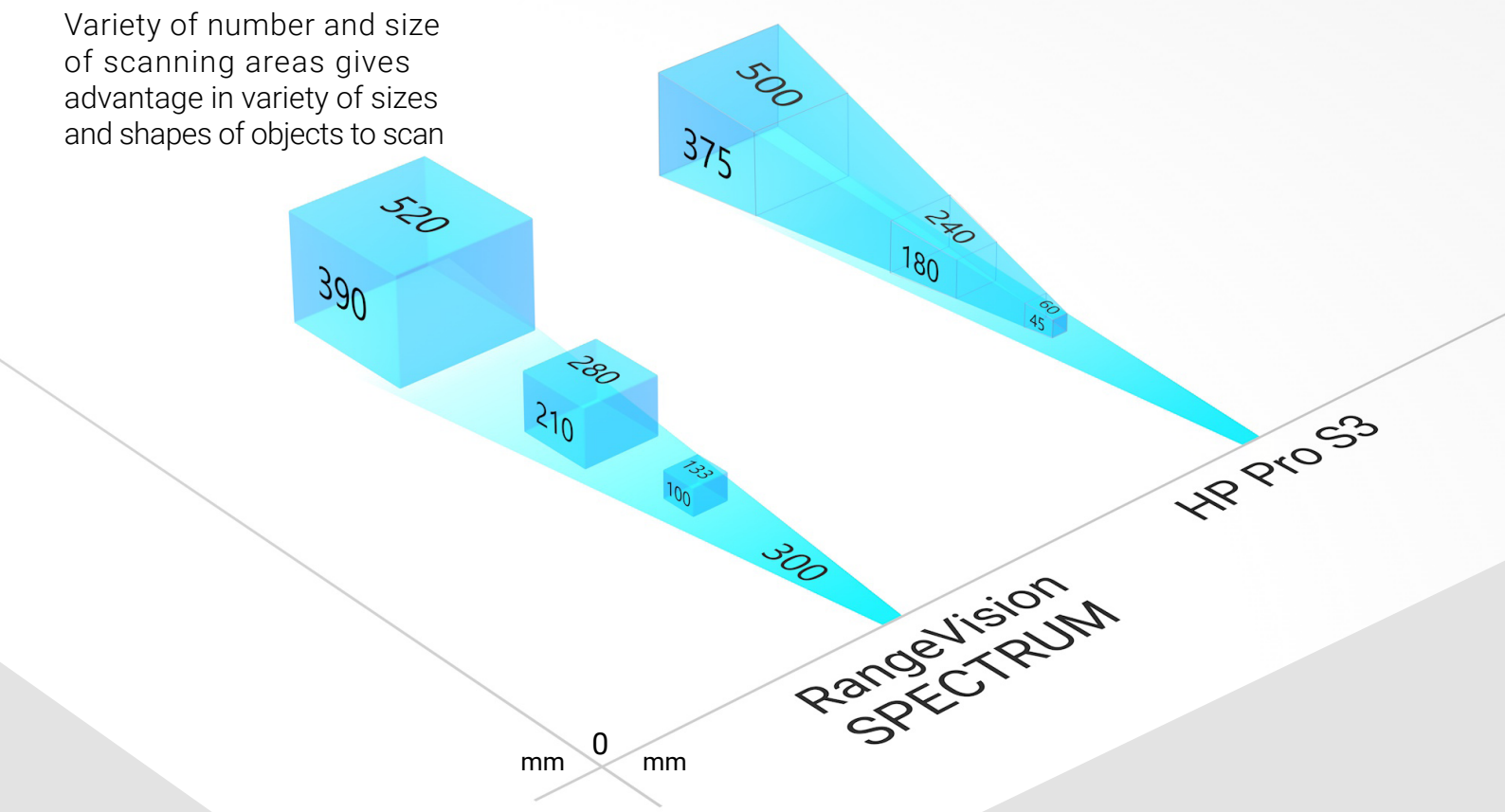
1 Scanning areas

Variety of number and size of scanning areas gives advantage in variety of sizes and shapes of objects to scan



Comparison of optical 3D scanners

2 Technical specifications

HP HP Pro S3		Technical specs		RangeVision Spectrum
structured light		**Type**		structured light
LED projector		**Light source**		LED projector
Up to .05% of scan size	✗	**3D Accuracy** Both scanners have close values of 3D accuracy.	✓	0.04 mm - 0.12 mm
Up to .05% of scan size	✗	**3D resolution, mm.** HP operates with only one parameter «Resolution/Precision» to indicate its accuracy and resolution. Mathematically, with given light source/ optics and minimum error .05% of scan size, it means that the best resolution for the smallest scanning area can't be higher than 0.07 mm. Spectrum technical specs are clear, that is convenient for a engineering tasks.	✓	0.072 mm - 0.260 mm
Up to 2,300,000 vertices per scan	✗	**Mesh density** With Spectrum, a user can get 30% more density of mesh per scan.	✓	Up to 3,000,000 vertices per scan
1 + 1 (optional)	✗	**Number of cameras** HP: the user can buy the second camera as an option. But the principle of action remains the same, single-camera. Spectrum is a two-cameras system, that makes a scanning process more accurate and stable, reducing the need to recalibrate the scanner during operations to a minimum.	✓	2
no information available		**Cameras**		3,1 Mpix
Scanning of different-sized objects				
-	✗	**Number of scanning areas**	✓	3
From 60x45 to 500x375	✗	**Size of a scanning area** With HP Pro S3 scanner the user has to define the scan area himself by changing the position of projector and angle of camera(s). It makes the setup of the scanner tricky and can result in scan errors. Spectrum has three tested and preset scanning areas. The setup process is simplified by the Setup Wizard, presented in the software.	✓	From 133x100 to 520x390
yes		**Texture**		yes
Software				
free, unlimited		**License** Both scanners have unlimited USB license dongle included in the price of the scanner.		free, unlimited
Purchasing of Upgrade Code is necessary to update from an existing license version to the next one	✗	**Updates**	✓	free
Usability				
One-snap calibration. It is recommended to repeat calibration as many times as possible during the scanning. Especially if the object is bigger than a field of view.	✗	**Calibration** One-snap calibration is the main disadvantage of HP - it is enough for hobbysts to start with 3D scanning, but professional calibration is done with 10-12 shots. One-snap calibration method is responsible for the scan errors and further alignment problems.	✓	11-snaps calibration.
Scans can only be aligned pairwise and globally. Often it is hard to get adequate alignment result (especially if the object has a complex shape or symmetrical surfaces).	✗	**Scans alignment**	✓	There are a lot of scan/scan group alignment options. Automatic alignment combines scans or groups of scans in any position relative to each other
In some cases the final 3D model is not as detailed as the source scans. For example, surfaces may become smoothed or the number of triangles may decrease	✗	**Building a 3D-model**	✓	Sufficiently high level: scan's level of detail is translated onto the final model
OBJ, STL, PLY	✗	**Export file format** Both scanners support the most popular export formats.	✓	stl, obj, ply, wrl, ascii, ptx
free scanning / scanning on a turntable	✗	**Scanning modes**	✓	free scanning / scanning on a turntable / with markets
no	✗	**Scanning with markers** Spectrum can scan and align scans by markers. It simplifies and ensures high accuracy when scanning large and smooth objects (eg cylindrical shape or with plenty of flat surfaces). All professional scanners use markers.	✓	yes
Hardware				
1	✗	**Calibration plates**	✓	3
carton box	✗	**Packaging**	✓	travel case
3136	✓	**Price, €**	✗	5490
turntable 964 € , HP 3D Dual Camera Upgrade Kit - PRO S3 1 165€, HP 3D Desk Scan Lever Pro 400€		**Accessories** Spectrum comes with all accessories to scan right out of the box while HP requires buying more options. A travel case enables 3D scanning to be easily performed directly on site.		table mount 345 €
5665	✓	**Total price with accessories, €**	✗	5835

Basic 3D scanning kit 3

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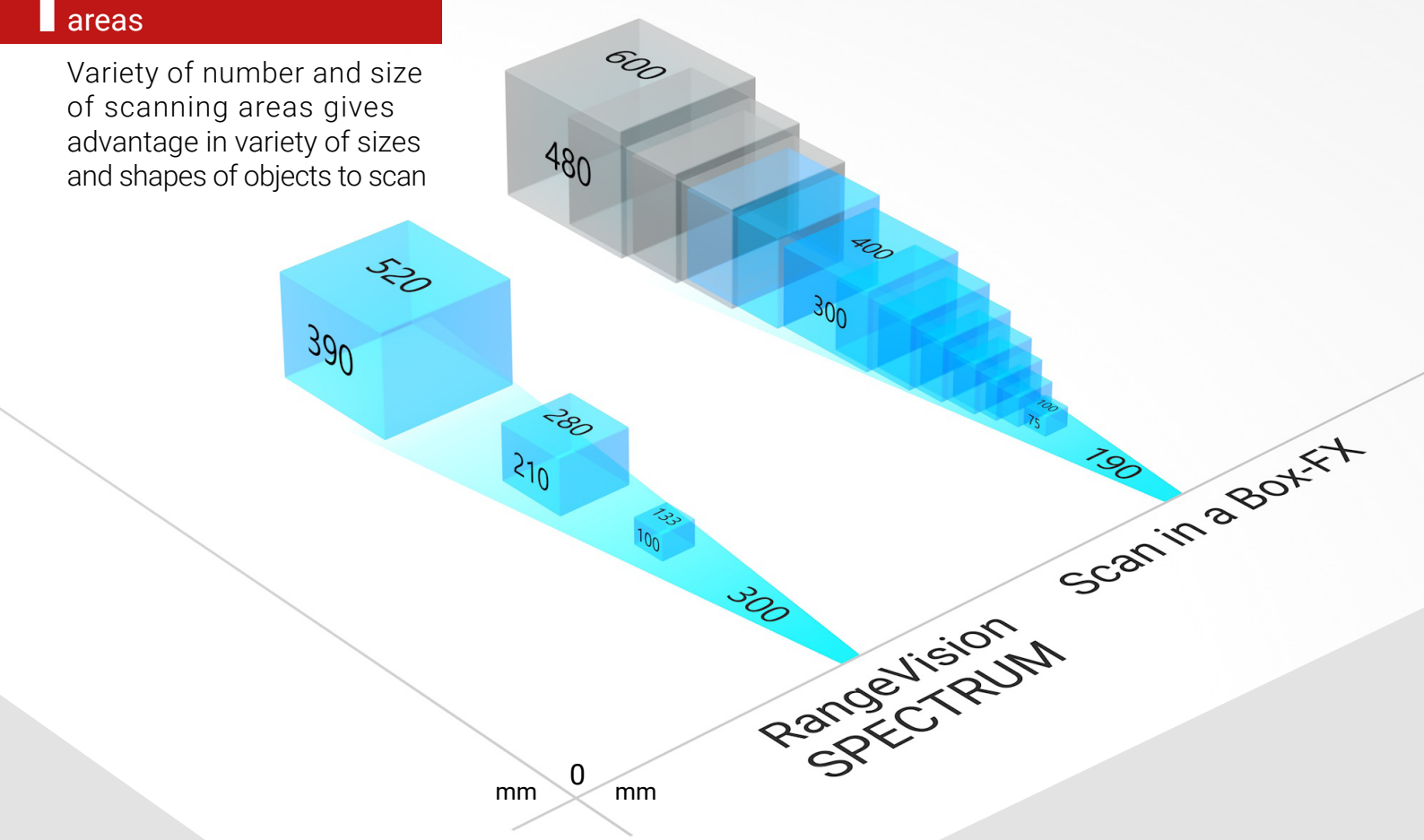

Comparison of optical 3D scanners

2 Technical specifications

Scan in a Box Scan in a Box-FX		RangeVision Spectrum
	Technical specs	
structured light	**Type**	structured light
LED projector	**Light source**	LED projector
0.04 mm	**3D Accuracy** Both scanners have close values of 3D accuracy.	0.04 mm - 0.12 mm
0.062 mm - 0.375 mm	**3D resolution, mm.** Maximum / minimum values of 3D resolution refer to maximum / minimum size of scanning areas. The scanners have very similar values. But Spectrum still offers a higher 3D resolution for a maximum scanning area.	0.072 mm - 0.260 mm
2	**Number of cameras**	2
2 Mpix ✗	**Cameras** Higher resolution of the cameras allows to capture more details of the object and get high-resolution 3D data.	✓ 3,1 Mpix
	Scanning of different-sized objects	
11	**Number of scanning areas** Large number of scanning areas is more an advertisement than an advantage. A real functionality can be estimated by the size of minimum and maximum areas. Both scanners have close-sized min and max scanning areas.	3
yes	**Texture**	yes
Scan in a Box Scan in a Box-FX		**RangeVision** Spectrum
	Software	
free, unlimited	**License** Both scanners have unlimited USB license dongle included in the price of the scanner.	free, unlimited
free	**Updates**	free
All functions like automatic alignment, editing tools are build-in	**Usability** RangeVision ScanCenter and IDEA-FX are similar.	All functions like automatic alignment, editing tools are build-in
Mesh: OBJ, STL, PLY, OFF / Point Cloud: ASC	**Export file format** Both scanners support the most popular export formats.	stl, obj, ply, wrl, ascii, ptx
free scanning, scanning on a turntable ✗	**Scanning modes**	✓ free scanning, scanning on a turntable, with markers
no ✗	**Scanning with markers** Spectrum can scan and align scans by targets. It simplifies and ensures high accuracy when scanning large and smooth objects (eg cylindrical shape or with plenty of flat surfaces).	✓ yes
	Hardware	
requied	**Calibration** Spectrum has all the calibration plates in a basic kit. Scan in a Box-FX requires purchasing a Calibration Master for larger scanning areas.	requied
optional ✗	**Travel case** Spectrum's travel case is included into a basic kit. One more thing the client should not worry about.	✓ included into basic config
8 kg in a box	**Weight**	10,5 kg in a travel case
4490	**Price, €**	5490
Transporter case 449,00 € Calibration Master Fx 400X400 mm 200,00 € automatic turntable 890,00 € ✗	**Accessories** Spectrum comes with all accessories to scan right out of the box while Scaninabox requires buying more options.	✓ table mount 345 €
6029 ✗	**Total price with accessories, €**	✓ 5835

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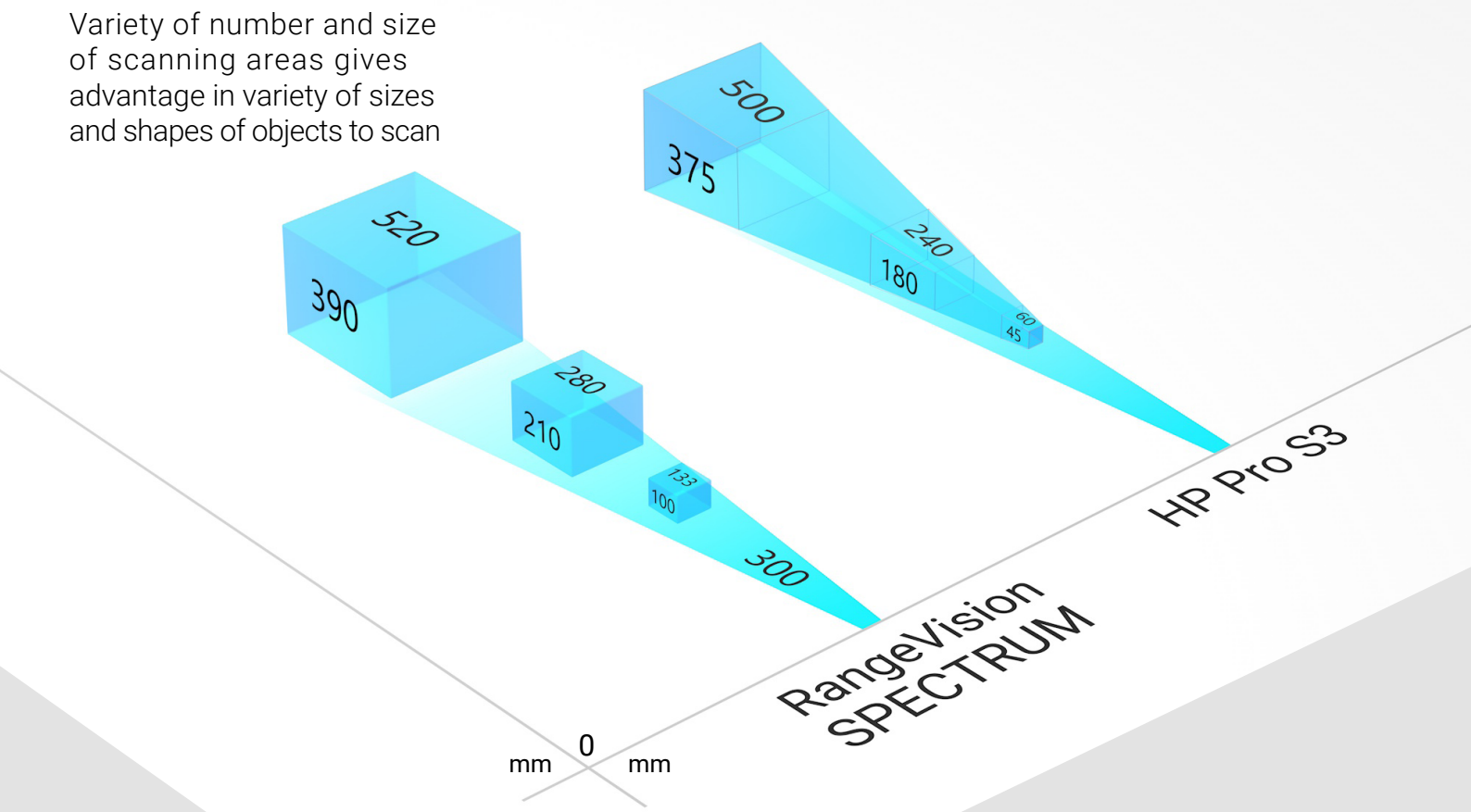

Comparison of optical 3D scanners

2 Technical specifications

HP			RangeVision
HP Pro S3			Spectrum
		Technical specs	
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LED projector		**Light source**	LED projector
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Up to .05% of scan size	✗	**3D resolution, mm.** HP operates with only one parameter «Resolution/Precision» to indicate its accuracy and resolution. Mathematically, with given light source/ optics and minimum error .05% of scan size, it means that the best resolution for the smallest scanning area can't be higher than 0.07 mm. Spectrum technical specs are clear, that is convenient for a engineering tasks.	✓ 0.072 mm - 0.260 mm
Up to 2,300,000 vertices per scan	✗	**Mesh density** With Spectrum, a user can get 30% more density of mesh per scan.	✓ Up to 3,000,000 vertices per scan
1 + 1 (optional)	✗	**Number of cameras** HP: the user can buy the second camera as an option. But the principle of action remains the same, single-camera. Spectrum is a two-cameras system, that makes a scanning process more accurate and stable, reducing the need to recalibrate the scanner during operations to a minimum.	✓ 2
no information available		**Cameras**	3,1 Mpix
		Scanning of different-sized objects	
-	✗	**Number of scanning areas**	✓ 3
From 60x45 to 500x375	✗	**Size of a scanning area** With HP Pro S3 scanner the user has to define the scan area himself by changing the position of projector and angle of camera(s). It makes the setup of the scanner tricky and can result in scan errors. Spectrum has three tested and preset scanning areas. The setup process is simplified by the Setup Wizard, presented in the software.	✓ From 133x100 to 520x390
yes		**Texture**	yes
		Software	
free, unlimited		**License** Both scanners have unlimited USB license dongle included in the price of the scanner.	free, unlimited
Purchasing of Upgrade Code is necessary to update from an existing license version to the next one	✗	**Updates**	✓ free
		Usability	
One-snap calibration. It is recommended to repeat calibration as many times as possible during the scanning. Especially if the object is bigger than a field of view.	✗	**Calibration** One-snap calibration is the main disadvantage of HP - it is enough for hobbysts to start with 3D scanning, but professional calibration is done with 10-12 shots. One-snap calibration method is responsible for the scan errors and further alignment problems.	✓ 11-snaps calibration.
Scans can only be aligned pairwise and globally. Often it is hard to get adequate alignment result (especially if the object has a complex shape or symmetrical surfaces).	✗	**Scans alignment**	✓ There are a lot of scan/scan group alignment options. Automatic alignment combines scans or groups of scans in any position relative to each other
In some cases the final 3D model is not as detailed as the source scans. For example, surfaces may become smoothed or the number of triangles may decrease	✗	**Building a 3D-model**	✓ Sufficiently high level: scan's level of detail is translated onto the final model
OBJ, STL, PLY	✗	**Export file format** Both scanners support the most popular export formats.	✓ stl, obj, ply, wrl, ascii, ptx
free scanning / scanning on a turntable	✗	**Scanning modes**	✓ free scanning / scanning on a turntable / with markets
no	✗	**Scanning with markers** Spectrum can scan and align scans by markers. It simplifies and ensures high accuracy when scanning large and smooth objects (eg cylindrical shape or with plenty of flat surfaces). All professional scanners use markers.	✓ yes
		Hardware	
1	✗	**Calibration plates**	✓ 3
carton box	✗	**Packaging**	✓ travel case
3136	✓	**Price, €**	✗ 5490
turntable 964 € , HP 3D Dual Camera Upgrade Kit - PRO S3 1 165€, HP 3D Desk Scan Lever Pro 400€		**Accessories** Spectrum comes with all accessories to scan right out of the box while HP requires buying more options. A travel case enables 3D scanning to be easily performed directly on site.	table mount 345 €
5665	✓	**Total price with accessories, €**	✗ 5835

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