Press Release

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Independent testing confirms performance of modular exoskeletons in human-machine collaboration

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TÜV SÜD awards Certification to Ascentiz Exoskeletons

Shenzhen, China. TÜV SÜD has awarded its Human-Machine Performance Certification to the Ascentiz Modular Exoskeleton, covering the Ascentiz Pro and Ascentiz Ultra (Hip Model). The certification confirms the results of independent third-party testing across key performance indicators, including physical workload reduction, fatigue relief, operating range and noise levels.



Certification Ceremony

As exoskeletons transition from the research phase to commercial applications, the development of reliable performance evaluation methods for human-machine collaboration is becoming increasingly important. As well as technical specifications, human performance evaluation examines how effectively the devices support users in real-world activities.

In collaboration with CAICT CTTL, TÜV SÜD assessed the exoskeleton's human and engineering performance. Human performance testing covered electromyography (EMG), metabolic expenditure, heart rate, and rating of perceived exertion (RPE). Engineering tests

assessed assistive output, operating range, and noise levels. The evaluation included seven everyday activities: walking, running, ascending and descending stairs, walking uphill, cycling and squatting.

Human Performance Indicators

Across several test scenarios, including walking, uphill walking, descending stairs and cycling, using assistance improved the EMG indicators for the target muscle groups. The exertion of key muscles involved in movement was significantly reduced. During uphill walking, for instance, exertion in the knee extensor muscle group and the triceps surae decreased by over 44 per cent. These results demonstrate that the modular hip exoskeleton can reduce muscular workload by supporting hip extension.

Metabolic measurements showed similar improvements. During activities such as uphill walking, cycling and level walking, reductions in muscle activation were accompanied by lower overall energy expenditure. The maximum reductions in participants' metabolic expenditure ranged from 16.71 to 44.87 per cent.

Engineering Performance Indicators

Operating-range tests showed that the exoskeleton can achieve a range of over 6 km, even under demanding conditions involving maximum assistance and an incline. Under normal operating conditions, its theoretical range exceeds 25 km.

The exoskeleton delivered peak hip extension torque of approximately 22.5 N·m per side. According to the test results, the difference in assistance output between the left and right sides was less than 1 per cent, demonstrating highly consistent performance.



Ascentiz Modular Exoskeletons certified with the TÜV SÜD Human-Machine Performance Mark

Cody Kou, Vice President of International Business at Ascentiz Innovation, Inc., said: “We are honoured to receive the Human-Machine Performance Certification from TÜV SÜD. It recognizes our commitment to putting users' real-world experience at the centre of product development. Through modular design, we aim to make exoskeleton technology accessible in an increasingly broad range of everyday applications.”

Radu Gosav, Vice President of EMC and RF Services at TÜV SÜD North Asia, said: “As exoskeletons interact directly with the human body, their performance needs to be evaluated from both technical and human perspectives. Our Human-Machine Performance Certification provides an independent assessment of how effectively these devices support users in real-world activities. We will continue to contribute our testing expertise to the standardized development of the consumer exoskeleton industry.”

The certification also demonstrates the potential of the “One Test, Multiple Certifications” service model, which was jointly developed by TÜV SÜD and CAICT CTTL. By addressing domestic and international market requirements through coordinated testing, the model helps manufacturers avoid duplicate assessments, reduce compliance costs, and accelerate their access to global markets.

About Ascentiz Innovation, Inc.

Ascentiz is a consumer brand specializing in wearable robotic exoskeletons. Built on human-robot collaboration technology, the brand uses a modular, expandable product design, allowing users to combine modules to suit their activities. From everyday journeys to outdoor activities, Ascentiz aims to bring exoskeleton technology into everyday life, helping people go farther, move more easily, and explore new possibilities for human movement. ascentizexo.com

Note for editorial staff: The press release and the pictures are available at: tuvsud.com/newsroom.

Media Relations:

Ms. Jolie Lin Marketing TÜV SÜD Shenzhen Building 6, 12 & 13, Zhiheng Wisdom-land Business Park, Guankou Erlu, Nantou, Nanshan District Shenzhen 518052	Tel.: +86 755 3359 5349 Mobil: +86 13686401690 Email: Jolie.Lin@tuvsud.com Website: tuvsud.cn

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