

MESSRING

Safer Mobility.



MESSRING Products
Active Safety

MESSRING GmbH

Safer Mobility

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MESSRING – YOUR GLOBAL EXPERT IN VEHICLE SAFETY TESTING

In a world where mobility is evolving faster than ever, MESSRING GmbH has been driving innovation in automotive safety for over 50 years. Our cutting-edge test systems and facilities have set industry benchmarks in passive safety, helping manufacturers worldwide develop advanced, reliable technologies that protect vehicle occupants when it matters most.

Since 2018, we've expanded our expertise into the realm of active safety. With a growing portfolio of innovative testing solutions, we support OEMs and suppliers in the precise, realistic, and standards-compliant validation of driver assistance systems (ADAS) and autonomous driving features. Our mission? To help prevent accidents before they happen – and minimize their impact when they can't be avoided.

From Child Presence Detection (CPD) and lifelike VRU and vehicle targets, to carrier systems, weather simulations, and dynamic 6D motion platforms – MESSRING offers a comprehensive, future-ready test environment for all vehicle types and safety applications.

Why choose MESSRING for Active Safety Testing?

- **Expertise Meets Innovation:** Decades of leadership in vehicle safety, paired with state-of-the-art solutions for today's and tomorrow's mobility challenges.
- **Open & Compatible Systems:** Seamless integration with your existing test setups and software environments.
- **Real-World Test Scenarios:** Highly accurate and repeatable testing conditions using realistic targets and environmental simulations.
- **Global Reach, Local Support:** With hubs in Germany, USA, China, and a worldwide partner network – we're always close by when you need us.

At MESSRING, we don't just build testing equipment – we create the foundation for safer mobility. Whether it's protecting occupants in a crash or preventing collisions altogether, our solutions span the full spectrum of vehicle safety.



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VRU TARGETS

Our **VRU targets** are engineered to **realistically replicate** the movement, appearance, and radar/lidar signature of pedestrians, cyclists, and other vulnerable road users. These targets support testing according to global **NCAP protocols** and are essential tools for validating sensor performance in **ADAS** and **autonomous vehicle systems**.

- **Durable and robust design:** All targets are designed to withstand repeated impacts and extreme test conditions without compromising structural integrity or sensor signature.
- **Fully Compliant with global standards:** Targets meet or exceed international standards such as Euro NCAP, ISO 19206-2 (pedestrians), and ISO 19206-4 (cyclists), ensuring test validity worldwide.
- **Quick-Change and Repairability:** Replaceable outer skins and key components reduce downtime and allow for quick and easy repair.
- **Seamless integration:** Compatible with all major target carrier systems.



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VRU TARGETS

Euro NCAP Pedestrian Targets Adult and Child (EPTa & EPTc)	11
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Euro NCAP Pedestrian Targets Adult and Child (EPTa & EPTc)

VRU TARGETS

The Euro NCAP EPTa and EPTc reproduce the size, shape, and sensor signature of a pedestrian as well as his leg movements.

Available as 50% adult male and 7-year-old child.

- Euro NCAP certified
- Realistic response for Radar-, Lidar-, Camera-, and IR-Systems
- Articulated legs with realistic Micro-Doppler Effect
- Lightweight and soft structure
- Collision-proof design – Crash speed up to 60 km/h
- Compatible with all common target carrier systems
- Easy operation, intuitive software control via a web application
- Selectable movement speed of 3, 5 and 8 km/h for adult target
- Magnetic coupling for easy reassembly after a crash
- Activation of movement triggered by IMU sensor



TECHNICAL SPECIFICATIONS

General		
Crash speed	60 km/h	
Regulations	ISO 19206-2, Euro NCAP, ISO 19237, ISO CD 22737, NHTSA, CENCAP, JNCAP, ACEA v. 2.0, Asian NCAP	
Radio connection	Wi-Fi	
Frequency band	2.4 GHz	
Interface to target carrier system	Plate on holding rod according to ISO 19206-2:2018	
EPTa Target (50% adult male)		EPTc Target (7-year-old child)
Operation speed		
Walking	3 km/h	–
Jogging	5 km/h	5 km/h
Running	8 km/h	–
Weight	6,3 kg	3,0 kg
Body height	1820 mm	1120 mm
Shoulder width	525 mm	280 mm
Torso depth	250 mm	200 mm
Torso angle	85°	78°

Scope of Supply

- EPT Target
- Torso
- Left and right leg
- Battery chargers

Required Additional Equipment

- Target carrier interface
- Target carrier system

Spare parts

- Rechargeable batteries
- EPT Target legs
- EPT Target clothing
- Actuator without batteries
- Battery charger



ASTERA E-Scooter

VRU TARGETS

Target in the shape of a young woman (P50 median female) designed for the testing of autonomous vehicle sensors and software to increase the safety of Vulnerable Road Users (VRU).

- Realistic sensor response for radar, camera, lidar, ultrasound and IR
- Interface according to ISO19206 – testing with common platforms possible
- Durable design – impactable without causing significant damage to the VUT
- Fast setup, easy to use
- Extreme lightweight
- Soft structure



Segment	Dimensions (mm)	Tolerance
Body height (excl. scooter, incl. shoes)	1.660	± 20
Body height (incl. scooter)	1800	± 20
Hip point height	860	± 20
Shoulder width	415	± 20
Shoulder height	1380	± 20
Head width	168	± 10
Head height	240	± 10
Torso depth	187	± 10
Scooter length	1050	± 20
Scooter width	160	± 10
Scooter handlebar height	1120	± 20
Scooter handlebar width	390	± 20

Figure 1: Dimensions according to average body height (P50 Median) of 16-18-year-old girls (Robert Koch Institute, 2013) and the average adult female body height (Federal Statistical Office, 2017)

TECHNICAL SPECIFICATIONS

Weight	5.64 kg
Colors	Low contrast gray and black Customized colors available on demand
Interface	ISO19206
Options	Robust low profile static platform for static VRU tests
Compatibility	NCAP belt-system ABD Launchpad Mini Humanetics UForano MESSRING 6D Mover



Playing Child Target (PCT)

VRU TARGETS

Target in the shape of a two-year-old child sitting on a play car designed for testing of autonomous vehicle sensors and software to increase the safety of Vulnerable Road Users (VRU).

- Realistic sensor response for radar, camera, lidar, ultrasound and IR
- Interface according to ISO19206 – testing with common platforms possible
- Durable design – impactable without causing significant damage to the test vehicle
- Fast setup, easy to use
- Extreme lightweight
- Soft structure



Segment	Dimensions (mm)	Tolerance
Head height	160	± 10
Head width	150	± 10
Shoulder width	245	± 15
Body height (sitting)	680	± 15
Torso depth	135	± 10
Steering wheel height	360	± 20
Play car height	260	± 15
Play car length	580	± 20
Play car width (incl. shoes)	360	± 20

Figure 1: Dimensions compliant with ACEA specifications

TECHNICAL SPECIFICATIONS

Weight	2.2 kg
Default Colors	Play car: red, black and white Child: blue, orange, black, white
Options	Challenging low contrast gray and black version available on demand; Various customized colors available on demand
Interface	ISO19206
Compatibility	NCAP belt-system ABD Launchpad Mini Humanetics UFO nano



Euro NCAP Bicycle Target Adult (EBTa)

VRU TARGETS

The Euro NCAP Bicycle Target Adult (EBTa) offers realistic cyclist replication for safety testing. Its natural leg movement and turning wheels ensures precise Micro-Doppler detection by autonomous driving and driver assistance systems. Designed for durability, compatibility, and quick reassembly, the EBTa delivers stable and repeatable test results up to 25 km/h, all being compliant to ISO 19206-4 and Euro NCAP standard protocols.

- Riding stability up to 25 km/h for precise and repeatable results
- Realistic replication of leg movement and turning wheels
- Designed for robustness and durability
- Compatible with all common target carriers
- Quick reassembly for minimal downtime and efficient testing

COMING SOON



VEHICLE TARGETS

Our vehicle surrogate target, developed in accordance with ISO 19206-1, is engineered for the **evaluation of automotive safety systems** such as AEB (Autonomous Emergency Braking), FCW (Forward Collision Warning), and other ADAS and AV perception functions. It faithfully replicates the **shape, size, and sensor signature** of a real passenger car, enabling **safe, repeatable, and standardized testing** up to collision.

- **ISO 19206-1 certified:** Fully compliant with the international standard ensuring consistency across global testing programs.
- **Radar, Lidar, and camera accurate signature:** Constructed with materials and geometries that reflect realistic sensor data, enabling effective perception validation for radar, lidar, and vision-based systems.
- **Durable soft-structure design:** Lightweight foam cover and soft skin ensure the target safely absorbs impact, protecting the test vehicle and reducing operational costs.



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VEHICLE TARGETS

| Euro NCAP Vehicle Target

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Euro NCAP Vehicle Target

VEHICLE TARGETS

Autonomous emergency braking systems (AEBS) take measures before a possible accident to prevent or reduce possible personal injury and property damage. It warns the driver in various ways and initiates autonomous braking if the driver does not react, thus helping to ensure that the maximum braking force of the vehicle is used in critical situations.



AEB test system

Already today many vehicles are equipped with autonomous emergency braking systems and consumers are encouraged to choose a new vehicle with AEBS. MESSRING offers you comprehensive service, spare parts and training for the AEB test system.

Test scenarios:

- AEB City (Car-to-Car Rear Stationary)
- AEB inter Urban (Car-to-Car Rear Moving, Car-to-Car Rear Braking)
- IIHS, C-NCAP, ASEANNCAP, JNCAP





TARGET CARRIER SYSTEMS

MESSRING x HUMANETICS: The perfect synergy for future-proof security testing

The alliance between **MESSRING** and **Humanetics** redefines Active Safety Testing. Two leading companies **combine their strengths** to improve road safety worldwide. Through the seamless integration of Humanetics Ultra-Flat Overrunable (UFO) platforms and MESSRING targets, we are creating a **unique test setup** that takes **efficiency, precision and quality** to a new level.

- **Level up your testing:** Cutting-edge features like precise dynamic swarm testing, live monitoring, reporting, and extensive connectivity.
- **Quick start:** Pre-defined test scenarios that can be implemented by a few clicks, our digital suite is offering time and resource savings.
- **Quality matters:** Fully compliant with NCAP standards and associated ISO standards.



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TARGET CARRIER SYSTEMS

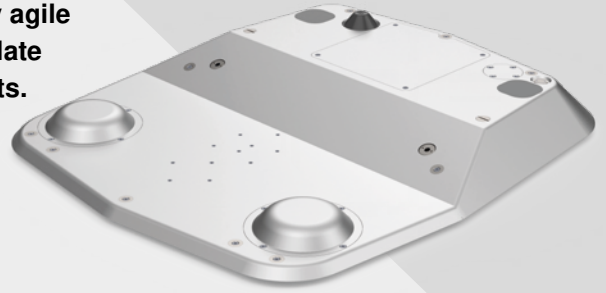
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UFO nano

TARGET CARRIER SYSTEMS

The UFO nano target carrier was developed specifically for pedestrian and bicycle testing. Its unique 2+2-wheeler design enables highly agile movements of pedestrian and bicycle targets, enabling it to simulate complex and realistic scenarios for VRU active safety system tests.

- Hot swappable batteries
- Speeds up to 20 km/h
- RTK DGNSS system for high accuracy
- On-the-spot turning for realistic pedestrian behavior
- Simple and reliable design
- Robust metal construction with ultra-low radar cross-section
- Special stealth outer shell design for optimized radar signature
- Shoulder-to-shoulder testing to 500 mm
- Weather resistance due to waterproof design



TECHNICAL SPECIFICATIONS

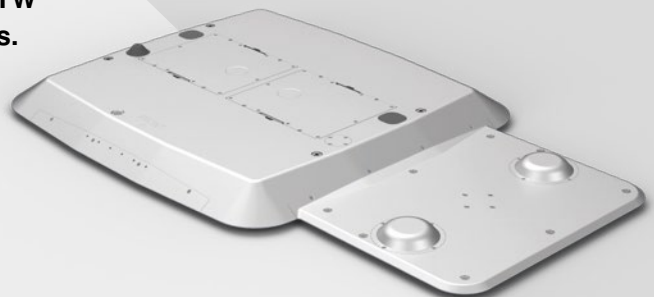
Transportation Size/ Test Ready Size	700 mm x 800 mm
Chassis Height / Clearance	15 - 65 mm / 10 mm
Test Ready Weight	25 kg
Overrun Capacity (per wheel)	3600 kg
Maximum Speed Forward	20 km/h
Maximum Turning Radius	0 m (turn on spot)

UFO micro

TARGET CARRIER SYSTEMS

The UFO micro target carrier was developed specifically for PTW (Powered Two Wheeler) and VRU (Vulnerable Road User) tests.

- Hot swappable batteries
- Speeds up to 90 km/h
- Weather resistance due to waterproof design
- Special stealth shell design for optimized radar signature
- Highly accurate dual antenna RTK DGNSS system
- Compatible for a large variety of targets with multiple extension options



TECHNICAL SPECIFICATIONS

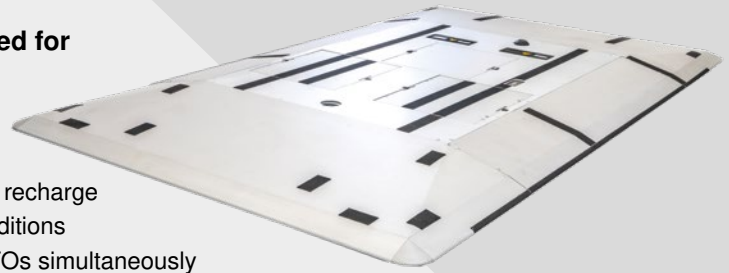
Transportation Size/ Test Ready Size	1050 mm x 980 mm
Chassis Height / Clearance	70 mm / 15 mm
Test Ready Weight	85 kg
Overrun Capacity (per wheel)	3600 kg
Maximum Speed Forward	90 km/h
Maximum Turning Radius	8 m

UFOpro

TARGET CARRIER SYSTEMS

The UFOpro is the default version of the UFO. It is designed for Euro NCAP ADAS testing.

- Low overrun height of 98 mm
- Removable ramps simplify transportation and storage
- Swappable batteries allow continuous testing with no downtime for recharge
- 100% waterproof system lets you run tests in adverse weather conditions
- UFO-Base software enables one operator to monitor up to nine UFOs simultaneously
- Available for purchase or rental
- Anti-lock braking system (ABS) for increased performance and longer tire life available
- Overrunable by passenger and commercial vehicles
- Easy to transport
- Ready for on-board V2X hardware
- Single central cover plate can be easily removed for access to all internal components



TECHNICAL SPECIFICATIONS

Transportation Size/ Test Ready Size	1605 mm x 1100 mm / 2950 mm x 1690 mm
Chassis Height / Clearance	98 mm / 15 mm
Test Ready Weight / Payload	244 kg (Standard), 264 kg (BlackSeries) / 125 kg
Overrun Capacity (per wheel)	1500 kg (Standard), 3600 kg (Heavy-Duty)
Maximum Speed Forward	80 km/h (Standard), 100 km/h (BlackSeries)
Maximum Speed Backward	20 km/h
Maximum Turning Radius	6 m



WEATHER SIMULATION

The SprayMaker system enables **controlled replication of rain and road spray** to test the reliability of automotive sensors in real-world driving conditions. Designed to **support ADAS and autonomous vehicle validation**, this tool helps to identify system performance limitations and edge cases in reduced visibility and challenging environmental scenarios.

- **Realistic Rainfall Simulation:** Adjustable droplet size, intensity, and spray angle to replicate light drizzle to heavy rainfall conditions.
- **Road Spray Replication:** Simulates wheel spray and splash from leading vehicles, crucial for validating sensor performance behind moving traffic or during overtaking maneuvers.
- **Mobile and flexible solution:** The system can be mounted on nearly all common vehicles to simulate mobile spray scenarios quick and easy.



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WEATHER SIMULATION

| SprayMaker

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SprayMaker

WEATHER SIMULATION

Vehicle spray and rain simulation tool.

- Creates perfect vehicle spray and rain
- Simulates the influence of rain and dispersed surface water
- Cost-effective, mobile simulation
- Easy attachment to any vehicle
- Easy to use, durable

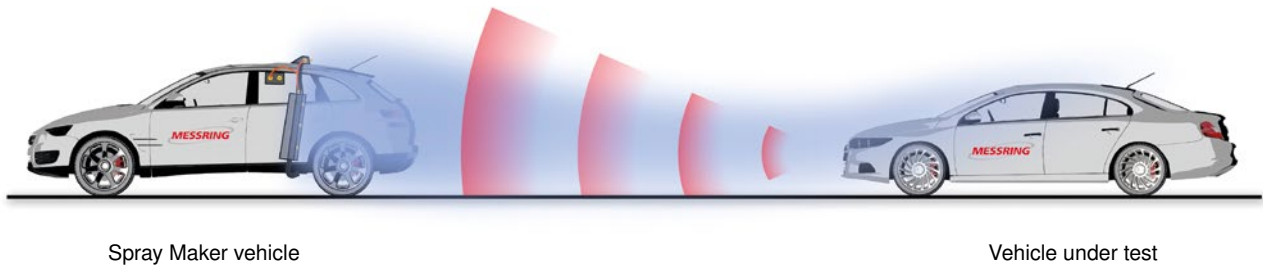


Figure 1: Test situation



Figure 2: Test situation: SprayMaker mounted on common vehicle target (Euro NCAP Vehicle)

TECHNICAL SPECIFICATIONS

Max. spray duration (non-stop)	60 - 90 s
Water tank size	100 l
Number of spray modules	4

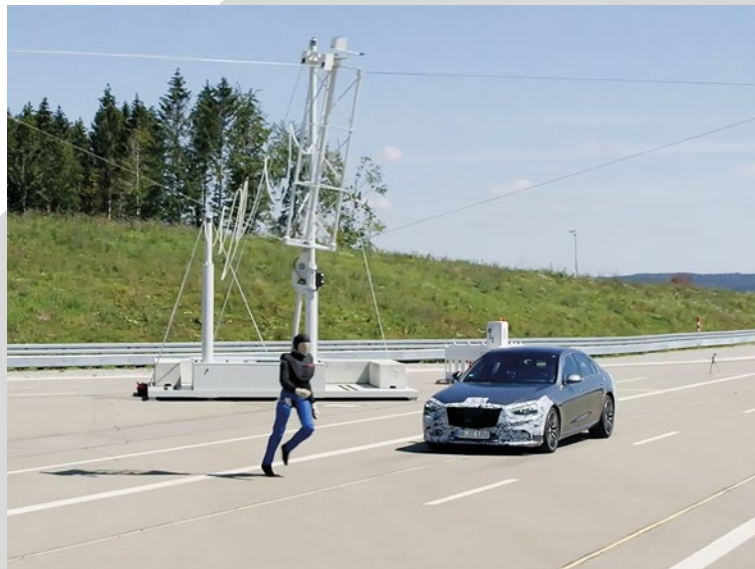
Scope of Supply

- 1 power supply unit
- 1 pump unit
- 4 spray units with different types of nozzles for heavy rain, spray and mud water
- 3 x 16 nozzles with variable openings (Type A, B, and C)
- 1 water tank
- 1 box for hoses, cables and connector set
- Remote control and trigger button with cable
- 25 kg mud additive for mud water mode
- Transport trolley

Optional Equipment

- 1,000 l stationary water tank incl. connection tubes and connectors





ADVANCED ACTIVE SAFETY SYSTEMS

MESSRING's advanced active safety solutions enable **precise and repeatable** validation of autonomous vehicle systems. With a focus on **realistic** pedestrian movement simulation, these combination of two tools accelerate the development and testing of emergency braking, perception, and prediction algorithms.

- **Realistic human motion simulation:** ASTERO replicates pedestrian biomechanics with articulated joints and ground-contacting foot motion — ideal for developing accurate detection and prediction algorithms.
- **Overhead 6D movement system:** The 6D Target Mover enables translation in three axes and full rotational control (yaw, pitch, roll).
- **Testing on uneven surfaces:** System remains stable and accurate over challenging test track conditions (e.g. curbs, rails, manhole covers), replicating real-world environments.



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ADVANCED ACTIVE SAFETY SYSTEMS

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ASTERO - Active Safety Test Robot	33

6D Target Mover

ADVANCED ACTIVE SAFETY SYSTEMS

Multi Dimensions Top Based Target Mover

The 6D Target Mover enables the test of a variety of new pedestrian AEB scenarios, including direction changes, velocity changes and level changes from the sidewalk to the street. In combination with a realistic pedestrian target, as for example the ASTERO, advanced pedestrian detection and AEB systems can be tested, including features like path prediction and the detection of pre-indicators, like the chest angle modification.

Furthermore, the 6D Target Mover can also be used to move bicycle targets within the defined test area including the typical replication of the leaning in the curve during direction changes when riding a bicycle.



ASTERO - Active Safety Test Robot

ADVANCED ACTIVE SAFETY SYSTEMS

Target designed for the validation of autonomous vehicle sensors and software with focus on pedestrian emergency brake systems.

- Mimics walking, jogging and running pedestrians
- Moves arms and legs realistically and reproducibly through pneumatic muscles
- Simple Design: fast setup, easy to use
- Fully programmable pedestrian motions
- Default templates for different velocities
- Articulated head, hips, lower legs, shoulders, lower arms
- Feet touching the ground
- Designed with a very low amount of metal components to avoid interfering with radar systems
- Compliant with Radar and optical reflectivity of the ACEA pedestrian target specifications
- Ruggedized design, durable for low speed impacts
- Compatible with all common platforms

TECHNICAL SPECIFICATIONS

Height	1.80 m
Weight	14.4 kg
Pressure requirements	Input: 8-10 bar
Step frequency	Fully programmable, default templates





CHILD OCCUPANT PROTECTION

Child Occupant Protection – Safety for the Youngest Passengers

Children are the most vulnerable occupants in a vehicle – which is why optimal protection is essential! Every year, children are left unattended in parked cars and lose their lives due to heatstrokes. **Child Presence Detection (CPD)** systems are designed to **prevent** just that. The CPD systems use **various sensors to detect the presence of a child** in the vehicle warn the driver whenever a child is left in the vehicle. Our CPD dummy family enables **reliable and standardized verification of presence**, including respiratory movement, in vehicles.

- **One system for all age groups:** The New-Born, 3-Year-Old and 6-Year-Old use the same pneumatic system and allow an easy switch between the dummies.
- **Accurate and Reproducible:** The system's constant self-adjustment of breathing amplitude and frequency ensures a reproducible breathing pattern every time.
- **Tailored to the protocol:** All dummies are in accordance to current Euro NCAP protocol and will allow OEMs to evaluate their systems and gain the required data to meet the assessment.



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CHILD OCCUPANT PROTECTION

| CPD Dummy

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CPD Dummy

CHILD OCCUPANT PROTECTION

The CPD Dummies reproduce the natural breathing motion, body size and shape of a newborn infant or a 6-year-old child. This test equipment is used to evaluate automotive child detection technologies. Furthermore, the CPD Dummies are able to achieve every breathing rate, selectable individually or per definition of the Euro NCAP protocol.

- Realistic breathing pattern matching the child's age
- Articulated limbs and head (6-year-old child dummy)
- All electronics, processors and control components outside of the dummy
- Metal-free design – no radar interferences
- Cost effective solution – all dummies can be operated with the same control and supply box
- Adjustable breathing rate
- Real-world representing static radar signature
- Easy operation via a mobile device using a web app
- Portable, fast and simple set-up



TECHNICAL SPECIFICATIONS

	CPD Dummy New-Born Infant	CPD Dummy 3-Year-Old Child	CPD Dummy 6-Year-Old Child
Weight	4.0 kg	6.6 kg	8.3 kg
Body height	550 ± 10 mm	990 ± 10 mm	1250 ± 10 mm
Shoulder width	150 ± 10 mm	275 ± 10 mm	330 ± 10 mm
Head circumference	370 ± 10 mm	500 ± 10 mm	530 ± 10 mm
Chest circumference	340 ± 10 mm	533 ± 10 mm	635 ± 10 mm
Material	Plastic, soft-touch surface, metal-free	Head: plastic, smooth lacquered, metal-free Body: plastic, metal-free Arms and legs: foam, closed-pore	Head: plastic, smooth lacquered, metal-free Body: plastic, metal-free Arms and legs: foam, closed-pore
Movement pattern	Chest and abdominal breathing: lifting and lowering, parameters preset or userdefined	Chest and abdominal breathing: lifting and lowering, parameters preset or userdefined Head: rotation with defined end-stop Arms (shoulders) and legs (hips): up and down movement with defined end-stop	Chest and abdominal breathing: lifting and lowering, parameters preset or userdefined Head: rotation with defined end-stop Arms (shoulders) and legs (hips): up and down movement with defined end-stop
Control and Supply Box			
Weight	32 kg		
Dimensions (L x W x H)	816 mm x 540 mm x 426 mm		
Power supply	Battery 18 V		
Wireless communication	WLAN		

Scope of Supply

- CPD Dummy
- Child seat and restraint system (CRS)
- Control and supply box (to be purchased separately)
- Radar absorber for different radar frequencies
- Euro NCAP blanket
- Battery and charger









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