

THE DEXTEROUS HANDS

PIONEERING HUMANOID ROBOTIC HAND







ABOUT INSPIRE-ROBOTS

Smaller and Higher-precision Motion Control Experts

Founded in 2016, INSPIRE ROBOTS is a leading manufacturer of core robotic components. The signature products include Micro Linear Servo Actuator and Dexterous Hands. With unique advantages in micro size, high precision and force control technology, our products are widely used in robotics, new energy, semiconductors, 3C electronics and biomedical fields.

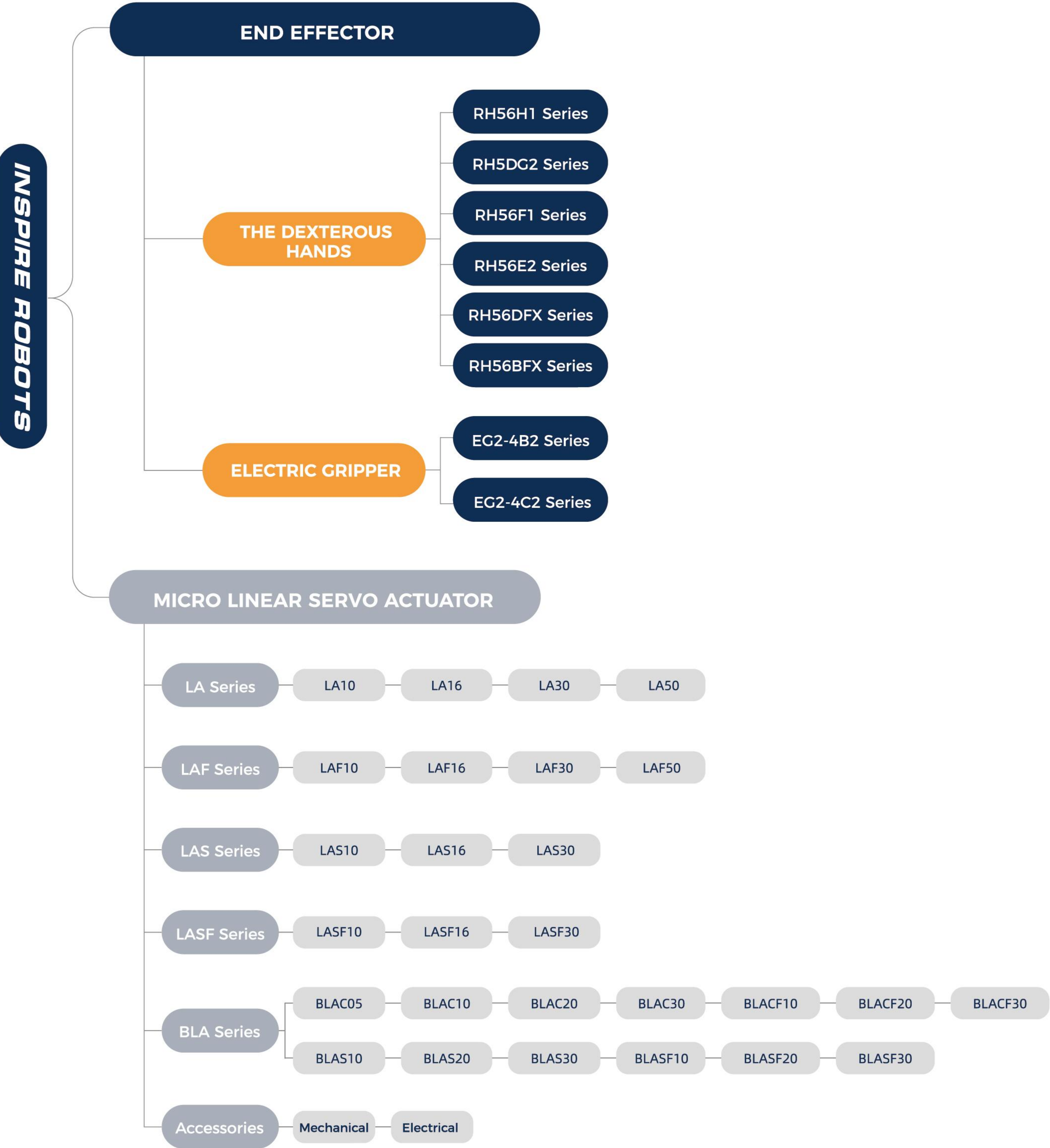
Micro Linear Servo Actuator

The Dexterous Hands

Electric Gripper

Products

All product lines feature in-house R&D and manufacturing of critical components, delivering exceptional application value across Robotics, Precision manufacturing, Biomedical engineering, and Educational research sectors.



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PART C

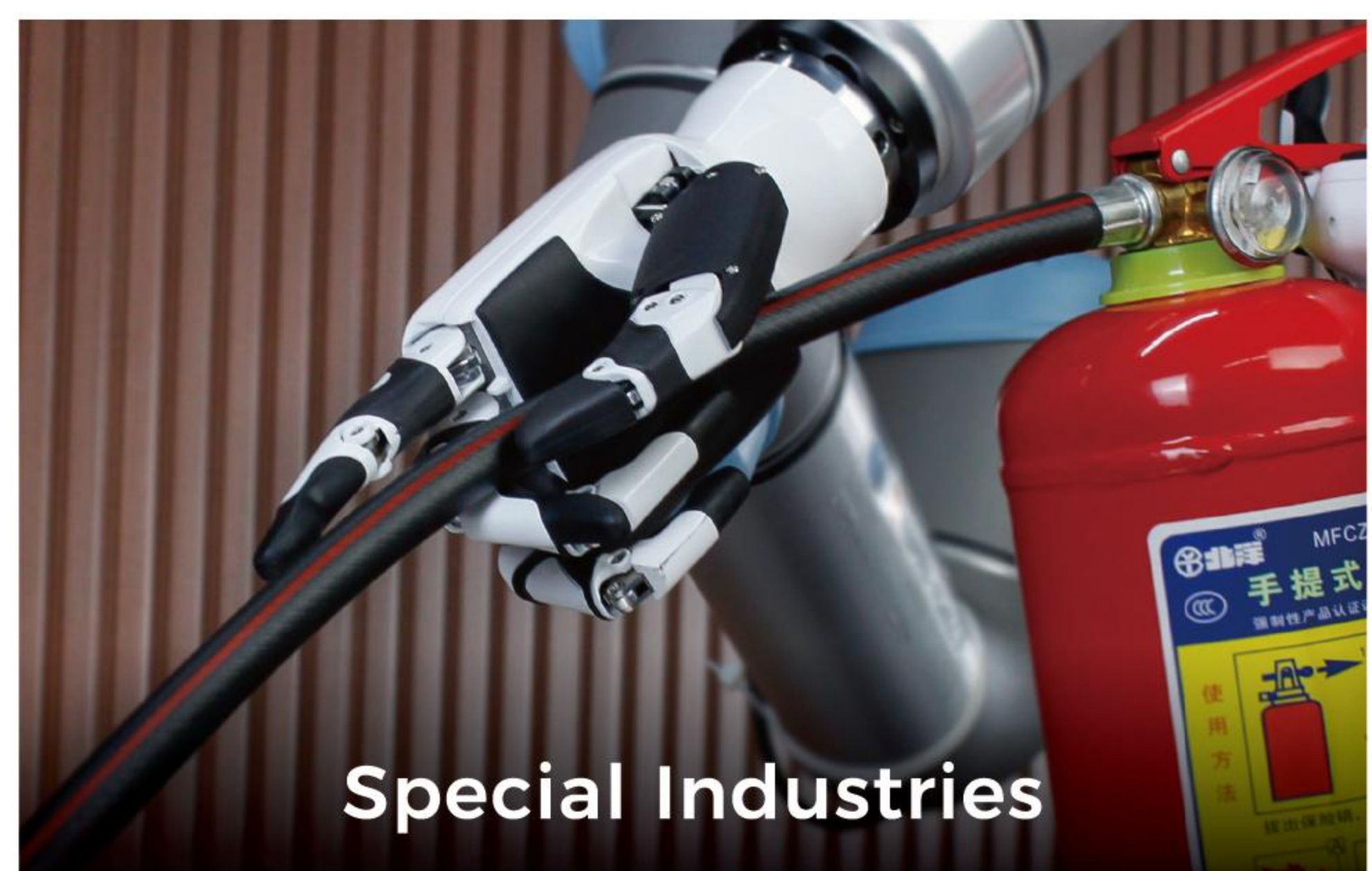
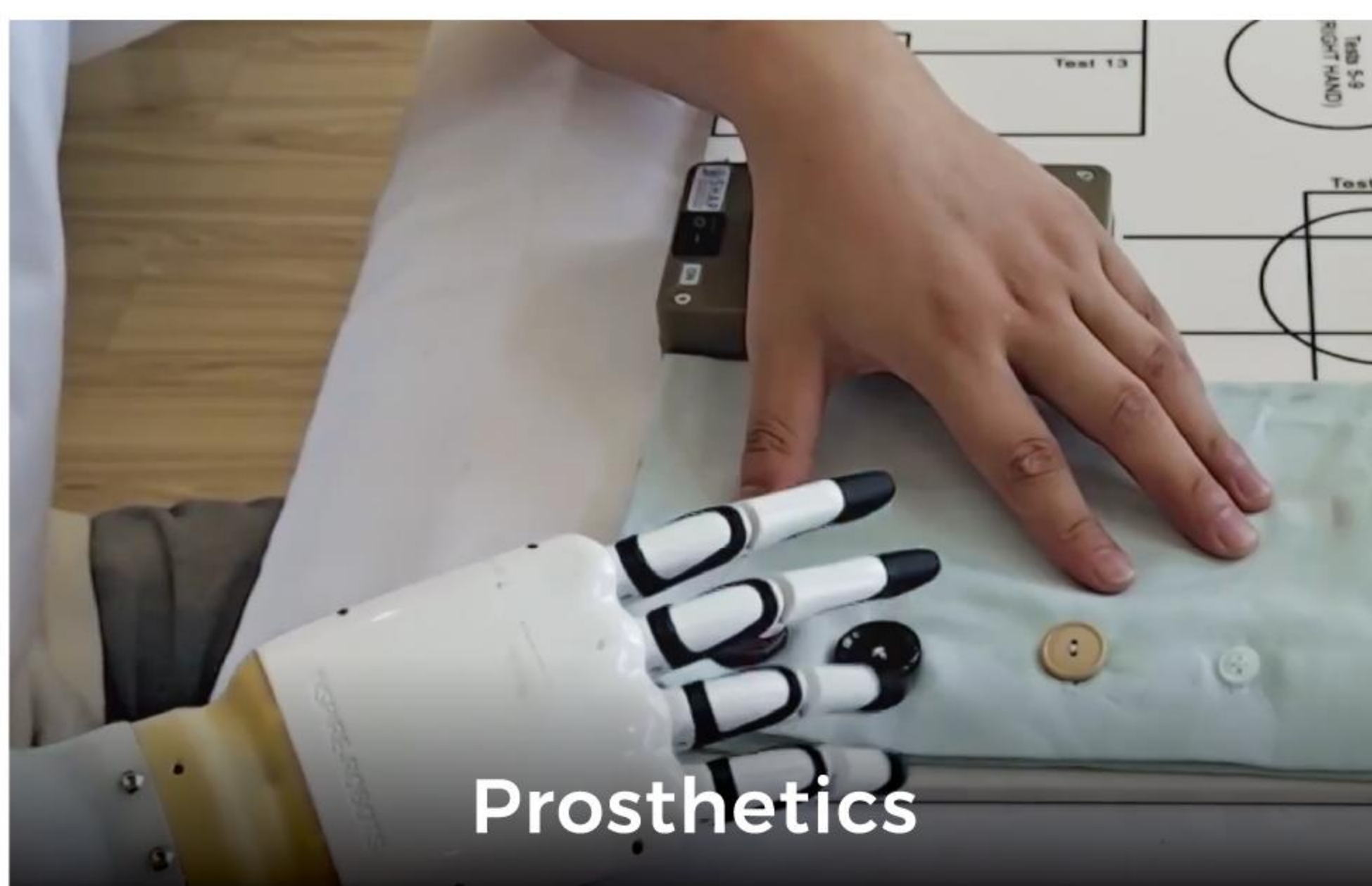
ELECTRIC GRIPPER

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The Dexterous Hands

The dexterous hands employ an innovative linear drive design, with micro linear servo actuator as its core motion parts. Integrated with a hybrid force-position control algorithm, it delivers $\pm 0.2\text{mm}$ positioning precision, several kilograms grasping force, real-time force feedback control. Additionally, the dexterous hand was launched in 2020. It is China's first commercial mass-produced dexterous hand.

APPLICATIONS



The Dexterous Hands



**Small size and
light weight**

231g+

**Strong
grasping**

3KG Fingertip

**High
repeatability**

$\pm 0.2\text{mm}$

**Force
control**

0.05N

**Power
off self
locking**

*Non-standard parameters

RH56**H1** Series

The H1 Series dexterous hand features an ultra-compact design while delivering equally powerful output. Its metal structure provides exceptional rigidity. Deeply integrated with multi sensors and advanced software algorithms, the hand supports multiple intelligent control modes. With an ultra-compact form factor of 75*159 mm, it delivers 15N thumb fingertip strength and a single-finger static passive load capacity of 8 kg, enabling robust and stable heavy-duty grasping. 1 kHz high-speed real-time communication ensures millisecond-level response to commands. It truly redefines high performance in a compact body.

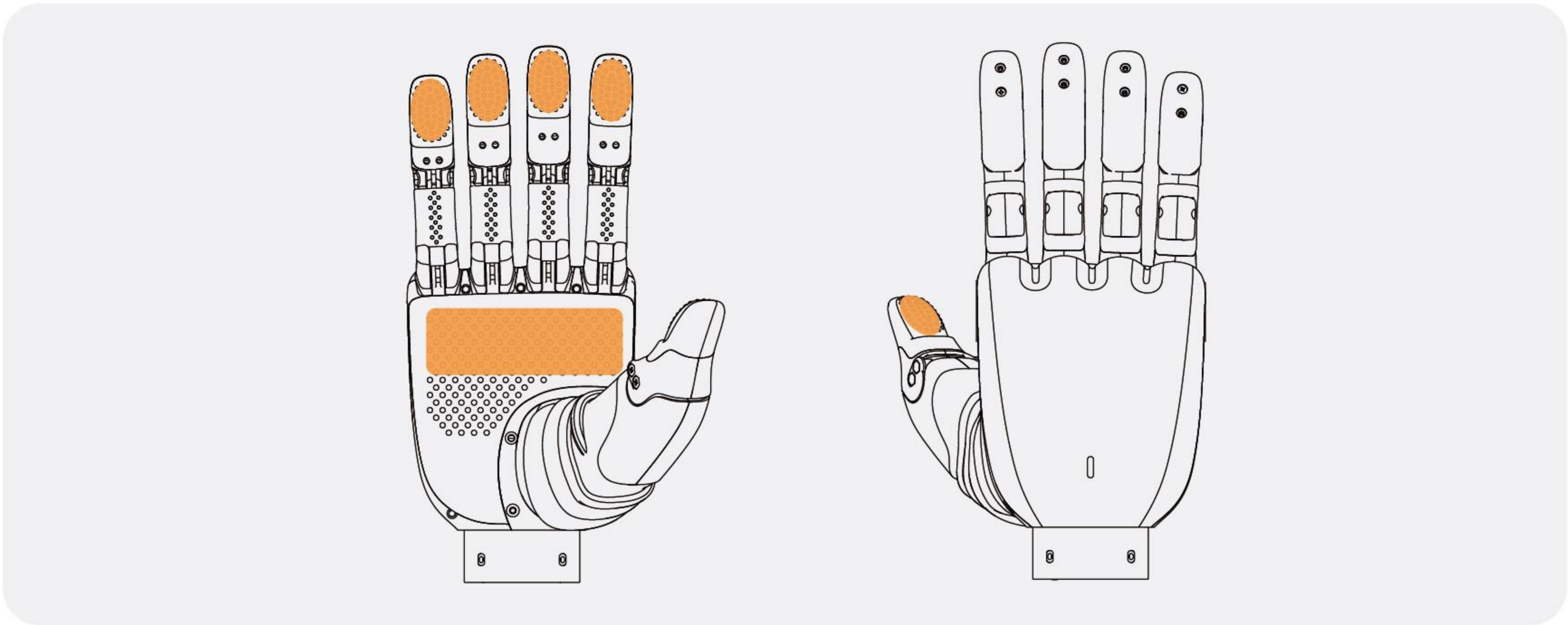
- **Small size**
- **High gripping force**
- **Open-source ecosystem**





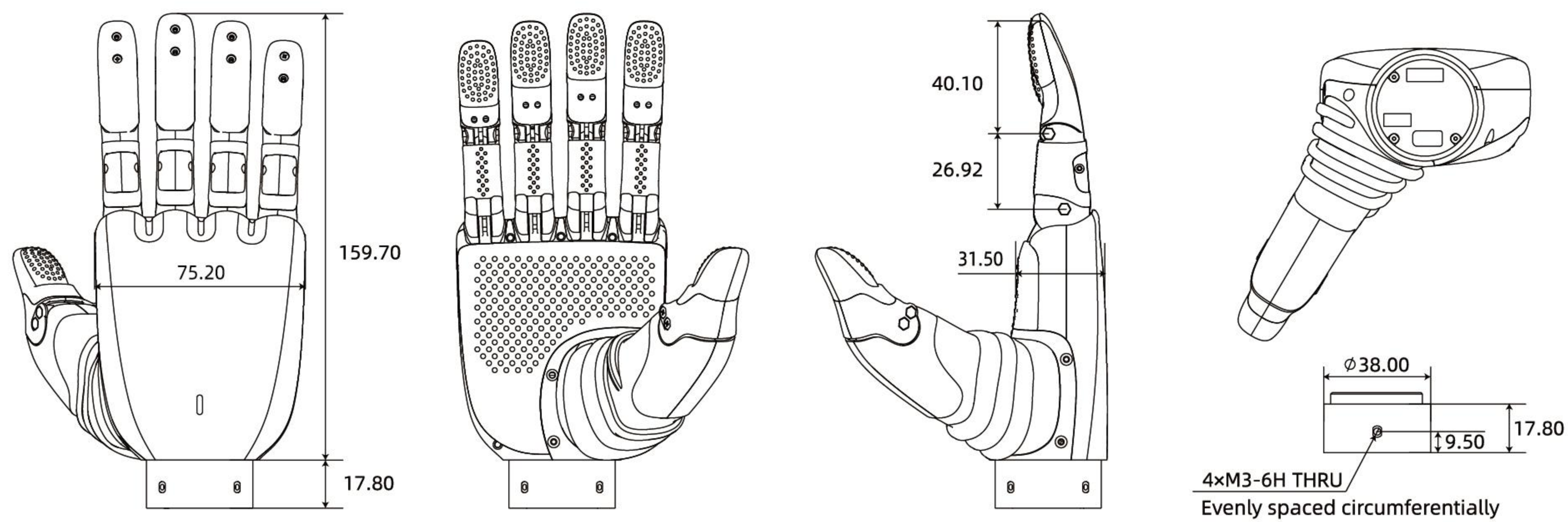
Model	RH56H1-42R-T2 (Right hand model) RH56H1-42L-T2 (Left hand model)	RH56H1-E6R-T2 (Right hand model) RH56H1-E6L-T2 (Left hand model)
Control interface	RS485+CANFD	EtherCAT+CAN-FD+RS485
Degrees of freedom	6	6
Numbers of joints	11	11
Weight	470±10g	470±10g
Operating voltage	24V~60V	24V~60V
Quiescent current	160mA±20mA @24V	160mA±20mA @24V
Peak current	5A @24V	5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥15N	≥15N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	70-170°	70-170°
Lateral rotation speed of thumb	>157°/s	>157°/s
Flexion speed of thumb	>65°/s	>65°/s
Flexion speed of four finger	>110°/s	>110°/s
Range of tactile sensor	30N	30N
Tactile sensor accuracy	5%FS	5%FS
Number of tactile sensors	6	6
Hand closing time	≤0.8s	≤0.8s

Distribution of tactile sensors



Model	RH56H1-42R (Right hand model)	RH56H1-42L (Left hand model)
Control interface	RS485+CANFD	RS485+CANFD
Degrees of freedom	6	6
Numbers of joints	11	11
Weight	470±10g	470±10g
Operating voltage	24V~60V	24V~60V
Quiescent current	160mA±20mA @24V	160mA±20mA @24V
Peak current	5A @24V	5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥15N	≥15N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	70-170°	70-170°
Lateral rotation speed of thumb	>157°/s	>157°/s
Flexion speed of thumb	>65°/s	>65°/s
Flexion speed of four finger	>110°/s	>110°/s
Range of tactile sensor	/	/
Tactile sensor accuracy	/	/
Number of tactile sensors	/	/
Hand closing time	≤0.8s	≤0.8s

Dimensions



RH5DG2 Series

G2 Series High-Freedom Dexterous Hand features 13 active DOF and 18 motion joints. Adopting a lightweight and compact integrated structure, it delivers a powerful fingertip grasping force of 20N, enabling both precise operation and stable high-load grasping to adapt to multi-scenario operational requirements.

Equipped with 8 sets of highly sensitive tactile sensors, it integrates multi-dimensional perception technologies including force sensing, position detection and temperature monitoring. It accurately captures operational details and real-time force feedback, greatly improving grasping stability and motion control accuracy.

Benefiting from the modular design, the dexterous hand achieves excellent flexibility and structural reliability.

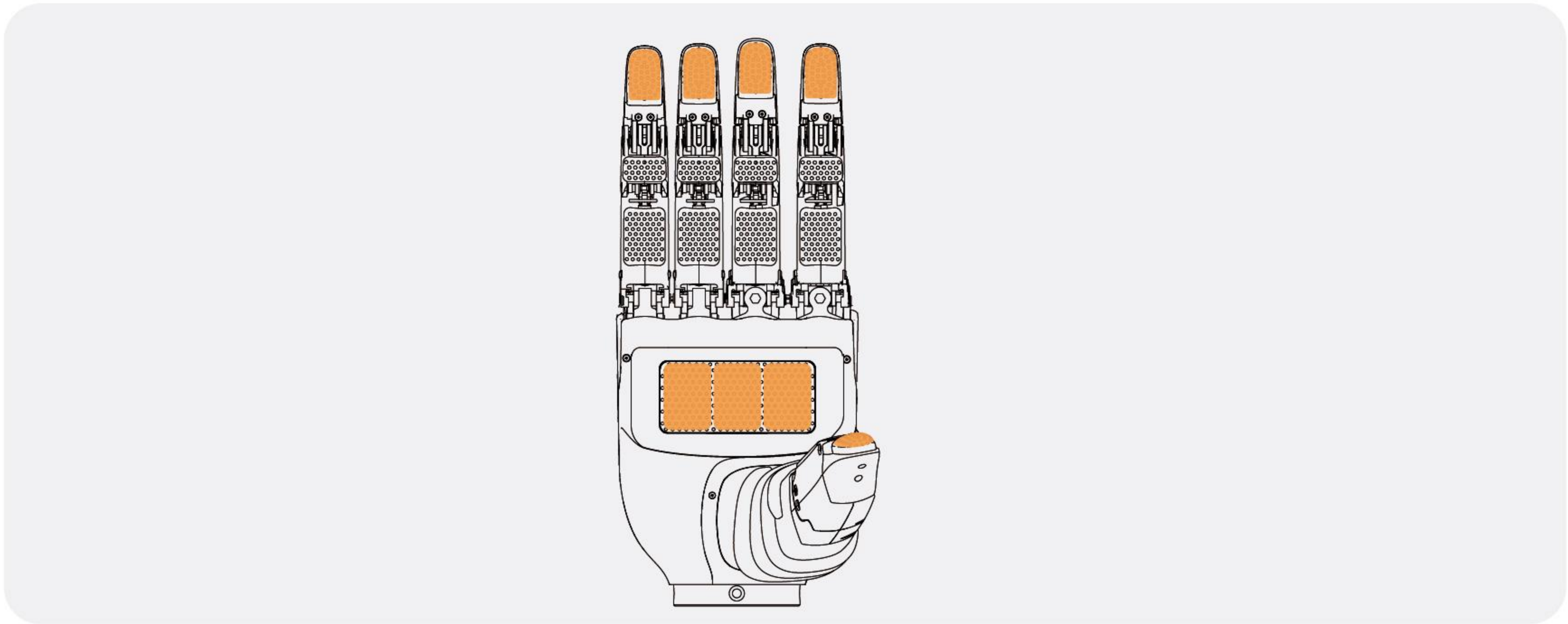
- **13 DOF**
- **18 Joints**
- **20N Fingertip Strength**





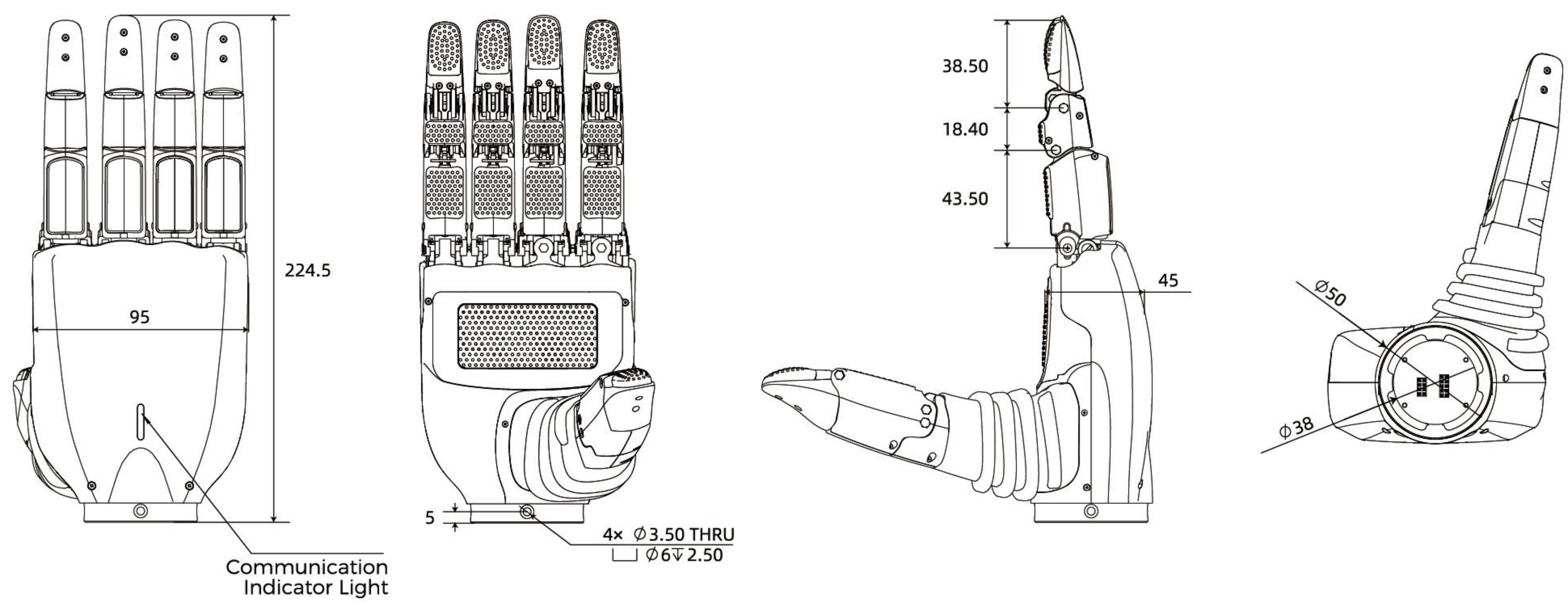
Model	RH5DG2-E4R-T1 (Right hand model)	RH5DG2-E4L-T1 (Left hand mode)
Control interface	EtherCAT+CAN FD	EtherCAT+RS485
Degrees of freedom	13	13
Numbers of joints	18	18
Weight	1020±15g(excluding wrist)	1020±15g(excluding wrist)
Operating voltage	18V~60V	18V~60V
Quiescent current	310±20mA (24V)	310±20mA (24V)
Peak current	7.5A @24V	7.5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥20N	≥20N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	65°~175°	65°~175°
Index/Middle finger lateral swing	±15°	±15°
Maximum pressure on fingertip	8kg	8kg
Range of tactile sensor	30N	30N
Tactile sensor accuracy	5%FS	5%FS
Number of tactile sensors	8	8
Hand closing time	≤0.8s	≤0.8s

Distribution of tactile sensors



Model	RH5DG2-E2R-T1 (Right hand model)	RH5DG2-E2L-T1 (Left hand mode)
Control interface	EtherCAT+RS485	EtherCAT+RS485
Degrees of freedom	13	13
Numbers of joints	18	18
Weight	1020±15g(excluding wrist)	1020±15g(excluding wrist)
Operating voltage	18V~60V	18V~60V
Quiescent current	310±20mA (24V)	310±20mA (24V)
Peak current	7.5A @24V	7.5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥20N	≥20N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	65°~175°	65°~175°
Index/Middle finger lateral swing	±15°	±15°
Maximum pressure on fingertip	8kg	8kg
Range of tactile sensor	30N	30N
Tactile sensor accuracy	5%FS	5%FS
Number of tactile sensors	8	8
Hand closing time	≤0.8s	≤0.8s

Dimensions



RH56F1 Series

The RH56F1 Series Dexterous Hand features an all-metal, integrated skeleton for superior rigidity. Its software deeply fuses multi sensors with algorithms, enabling multi-mode control. Delivering 1kHz real-time communication, 30kg passive payload, 15N fingertip force, and passing 20 stringent tests—it's a better fit for robots!

■ Precision Craftsmanship

All-metal body | innovative concealed wiring

■ Intelligent Sensing

24 sensors in 4 types tactile, force, position, temper

■ Stable Operation

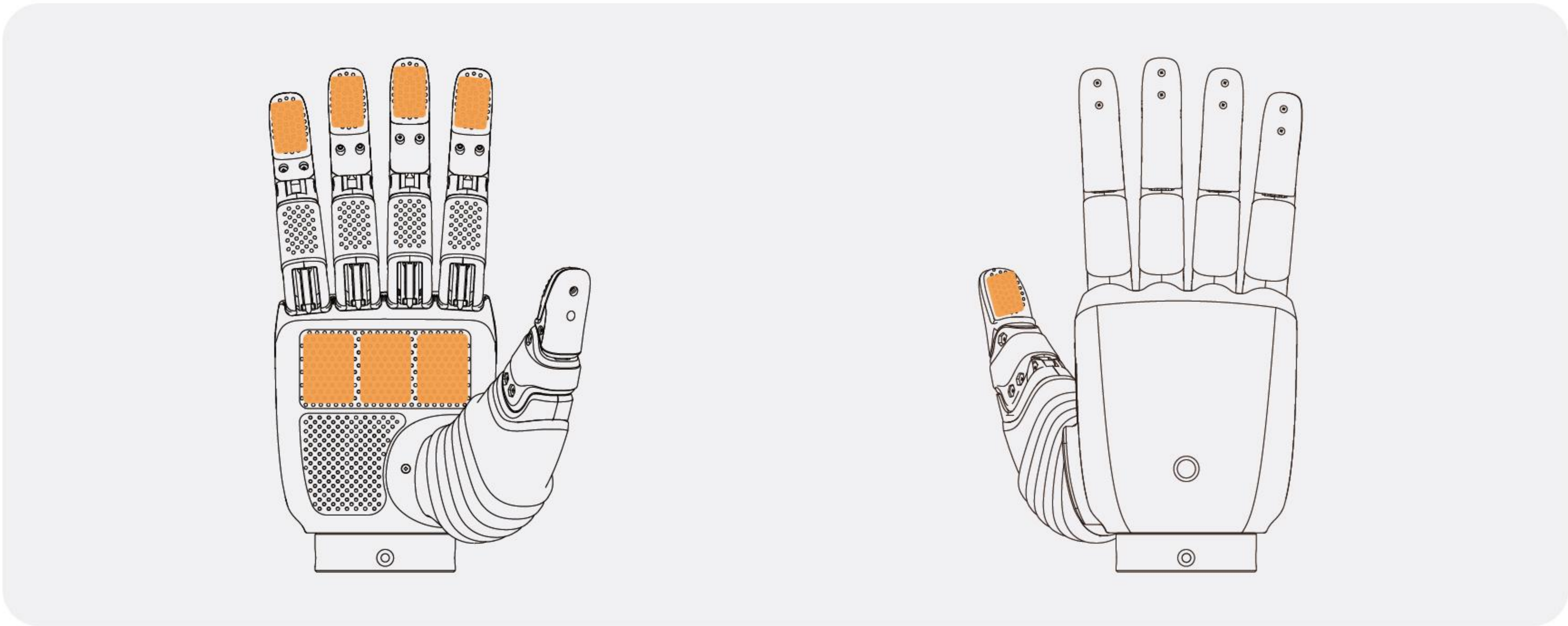
30kg passive payload | 20-stage stringent tests





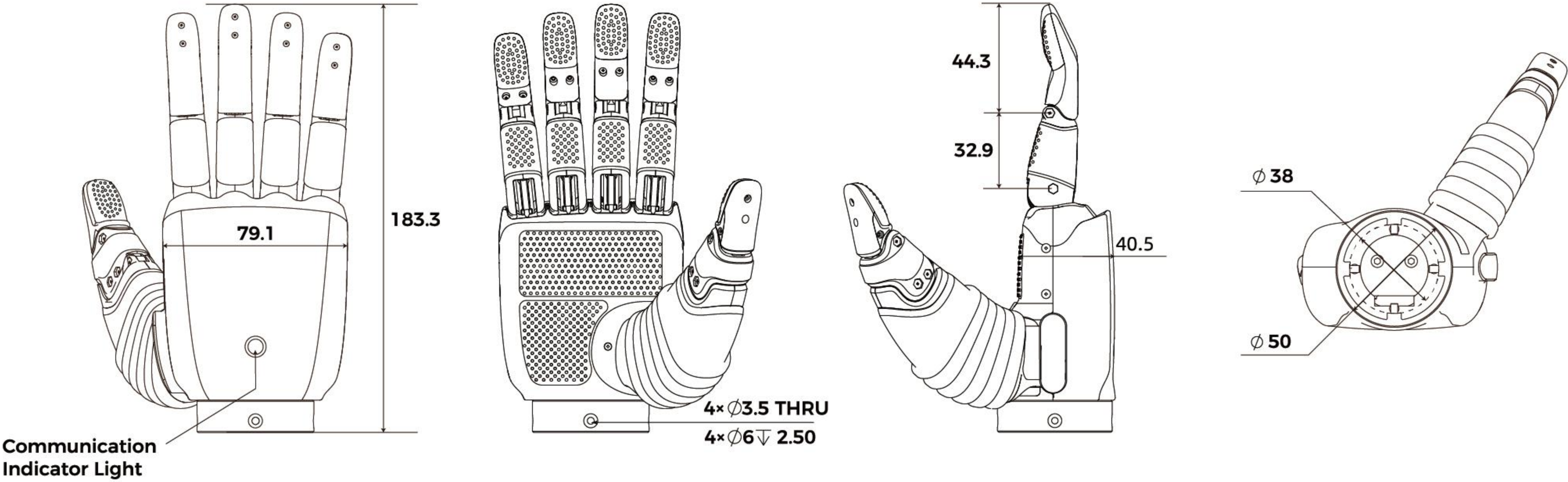
Model	RH56F1-E2R-T1 (Right hand model) RH56F1-E2L-T1 (Left hand model)	RH56F1-E2R (Right hand model) RH56F1-E2L (Left hand model)
Control interface	EtherCAT+RS485	EtherCAT+RS485
Degrees of freedom	6	6
Numbers of joints	12	12
Weight	630±10g	615±10g
Operating voltage	24V~48V	24V~48V
Quiescent current	RS485: 194±10mA @24V EtherCAT: 10±10mA @24V	RS485: 194±10mA@24V EtherCAT: 10±10mA @24V
Peak current	5A @24V	5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥15N	≥15N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	60-180°	60-180°
Lateral rotation speed of thumb	>155°/s	>155°/s
Flexion speed of thumb	>37°/s	>37°/s
Flexion speed of four finger	>107°/s	>107°/s
Range of tactile sensor	30N	/
Tactile sensor accuracy	5%FS	/
Number of tactile sensors	8	/
Hand closing time	≤0.8s	≤0.8s

Distribution of tactile sensors



Model	RH56F1-E4R-T1 (Right hand model) RH56F1-E4L-T1 (Left hand model)	RH56F1-E4R (Right hand model) RH56F1-E4L (Left hand model)
Control interface	EtherCAT+CAN FD	EtherCAT+CAN FD
Degrees of freedom	6	6
Numbers of joints	12	12
Weight	630±10g	615±10g
Operating voltage	24V~48V	24V~48V
Quiescent current	CAN FD: 193±10mA@24V EtherCAT: 206±10mA @24V	CAN FD: 193±10mA@24V EtherCAT: 206±10mA@24V
Peak current	5A @24V	5A @24V
Repeatability	±0.2mm	±0.2mm
Thumb Fingertip Strength	≥15N	≥15N
Fingertip Strength	≥10N	≥10N
Force resolution	0.1N	0.1N
Lateral rotation range of thumb	60-180°	60-180°
Lateral rotation speed of thumb	>155°/s	>155°/s
Flexion speed of thumb	>37°/s	>37°/s
Flexion speed of four finger	>107°/s	>107°/s
Range of tactile sensor	30N	/
Tactile sensor accuracy	5%FS	/
Number of tactile sensors	8	/
Hand closing time	≤0.8s	≤0.8s

Dimensions



RH56E2 Series

Heavy-load Dexterous Hand boasts a fingertip gripping force of 30N and an overall load capacity equivalent to 15KG, delivering gripping performance comparable to that of a human hand. Equipped with built-in force sensors, it provides real-time feedback on finger force distribution. Meanwhile, it supports integration of tactile sensor modules to capture real-time tactile data from all palm areas.

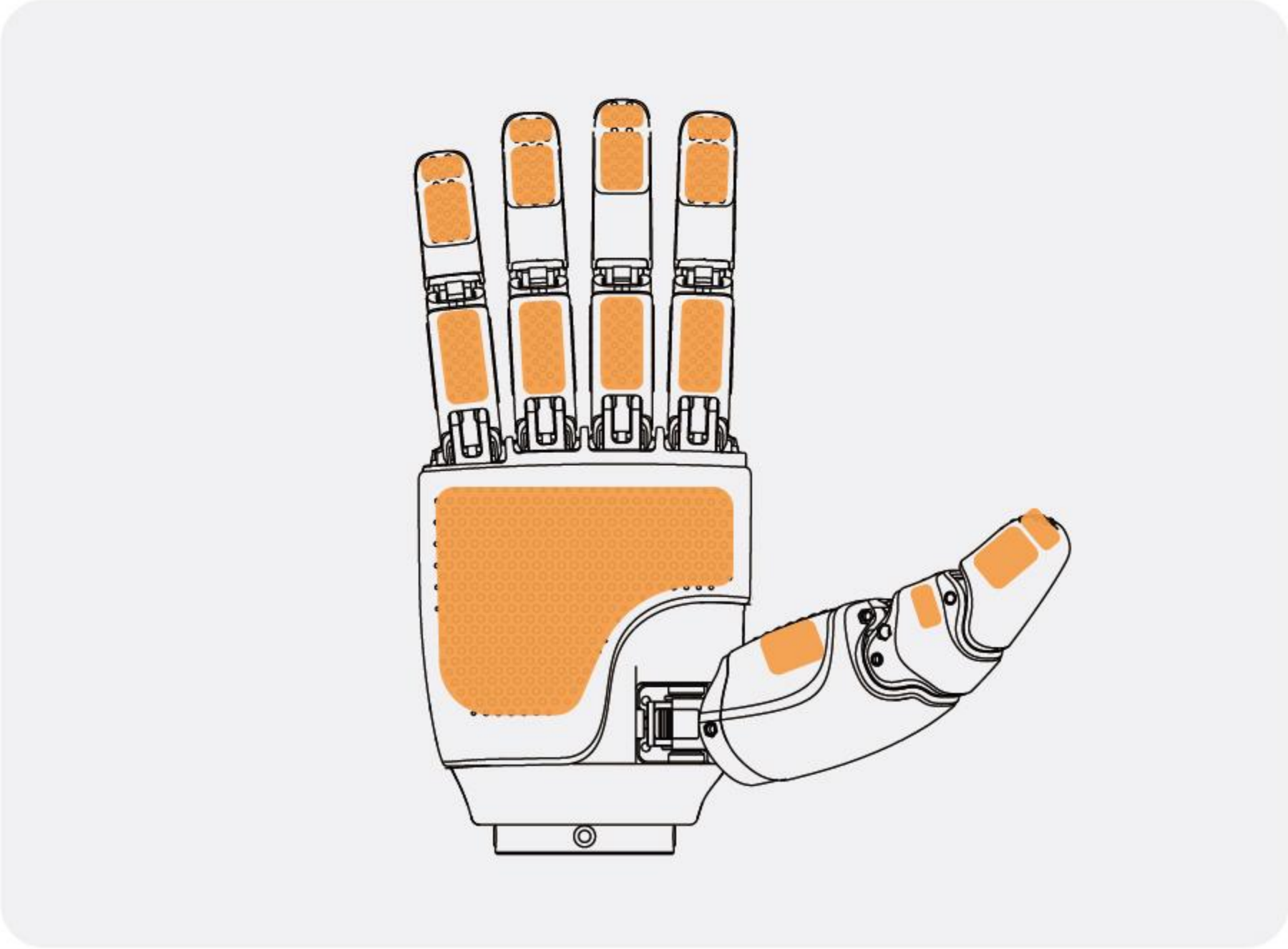
- **Accurate tactile real-time perception**
- **Strong grip comparable to manual labor**
- **Power off self-locking is stable and reliable**



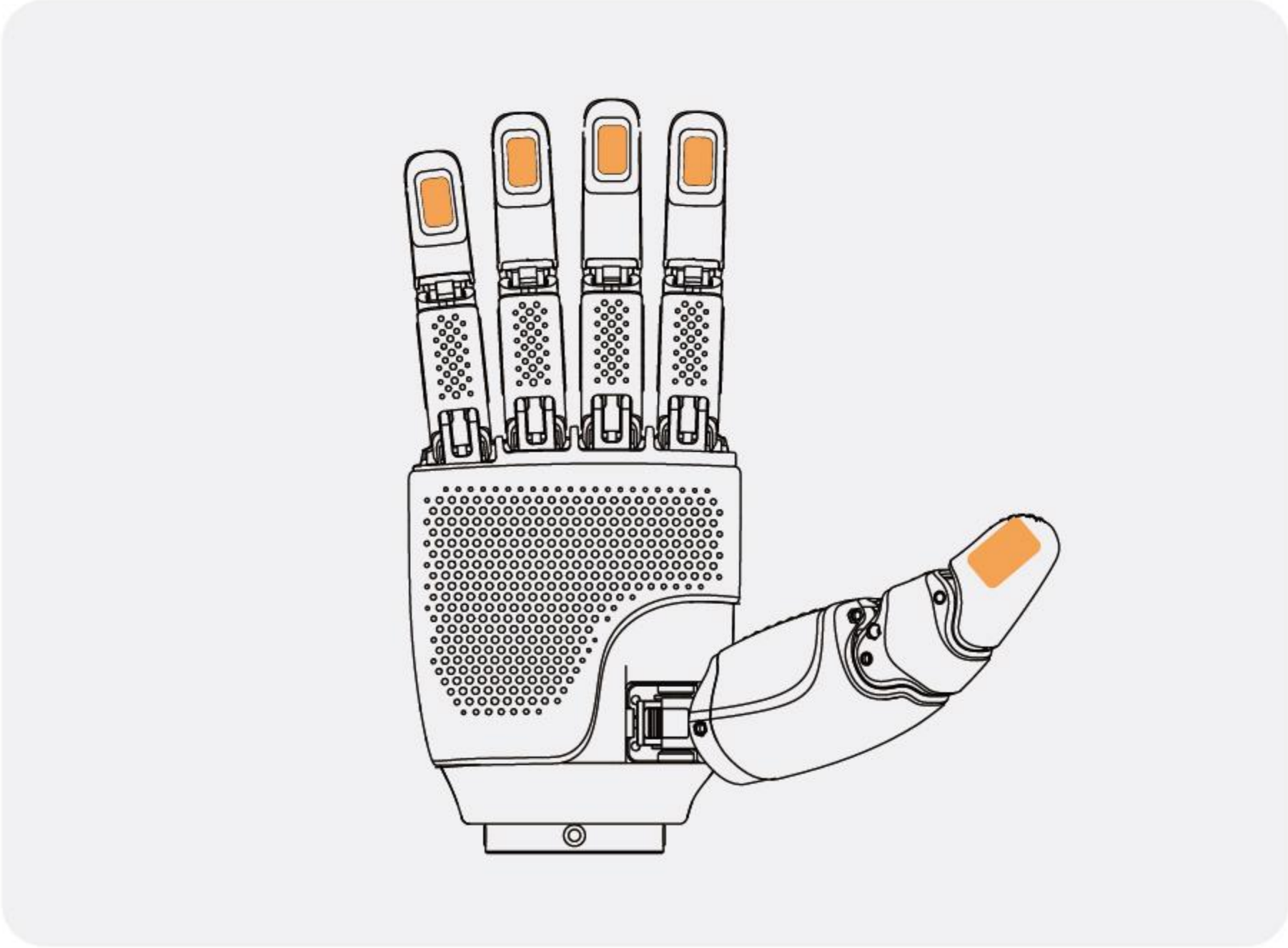


Model 0-CAN 2-RS485 T1-Resistance T2-Capacitance	RH56E2-0R-T1 (Right hand model)	RH56E2-0R-T2 (Right hand model)
	RH56E2-0L-T1 (Left hand model)	RH56E2-0L-T2 (Left hand model)
	RH56E2-2R-T1 (Right hand model)	RH56E2-2R-T2 (Right hand model)
	RH56E2-2L-T1 (Left hand model)	RH56E2-2L-T2 (Left hand model)
Control interface	RS485、CAN、ModbusTCP	RS485、CAN、ModbusTCP
Degrees of freedom	6	6
Numbers of joints	12	12
Weight	790g±10g	790g±10g
Operating voltage	24V±10%	24V±10%
Quiescent current	0.25A @24V	0.25A @24V
Peak current	4A @24V	4A @24V
Repeatability	±0.20mm	±0.20mm
Thumb Fingertip Strength	30N	30N
Fingertip Strength	28N	28N
Force resolution	0.05N	0.05N
Lateral rotation range of thumb	75°~170°	75°~170°
Lateral rotation speed of thumb	>130°/s	>130°/s
Flexion speed of thumb	>130°/s	>130°/s
Flexion speed of four finger	>200°/s	>200°/s
Range of tactile sensor	0~30N	0~20N
Tactile sensor accuracy	≤5%FS	≤5%FS
Number of tactile sensors	17	5
Hand closing time	0.8S	0.8S

Distribution of tactile sensors



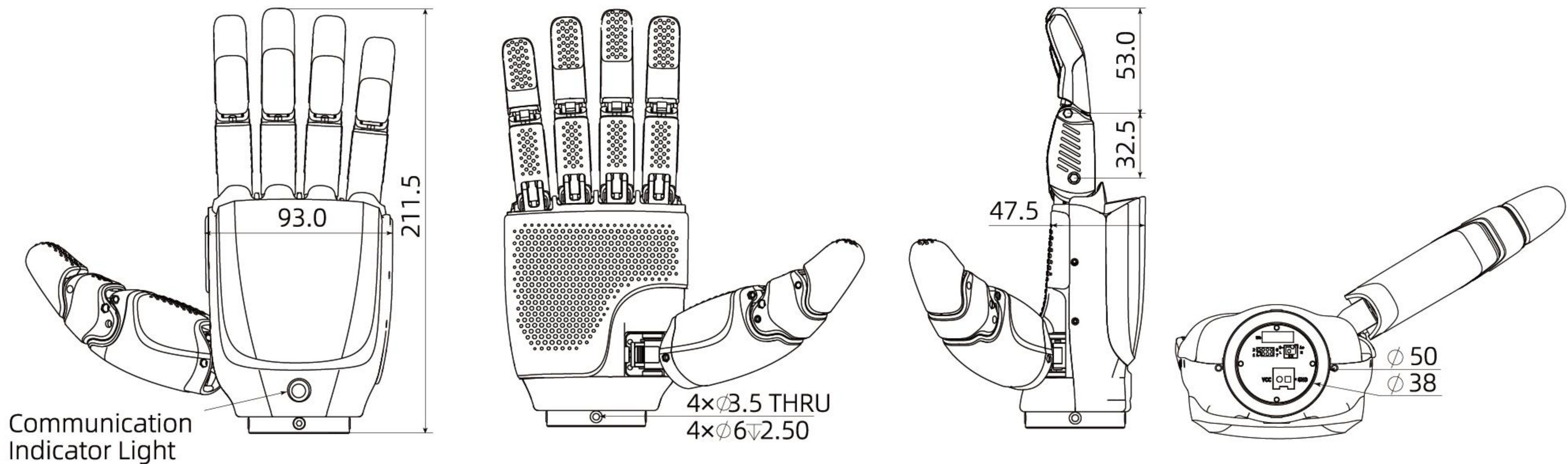
T1-Resistance



T2-Capacitance

Model 0-CAN 2-RS485	RH56E2-0L (Left hand model) RH56E2-2L (Left hand model)	RH56E2-0R (Right hand model) RH56E2-2R (Right hand model)
Control interface	RS485、CAN、ModbusTCP	RS485、CAN、ModbusTCP
Degrees of freedom	6	6
Numbers of joints	12	12
Weight	770g±10g	770g±10g
Operating voltage	24V±10%	24V±10%
Quiescent current	0.2A @24V	0.2A @24V
Peak current	4A @24V	4A @24V
Repeatability	±0.20mm	±0.20mm
Thumb Fingertip Strength	30N	30N
Fingertip Strength	28N	28N
Force resolution	0.05N	0.05N
Lateral rotation range of thumb	75°~170°	75°~170°
Lateral rotation speed of thumb	>130°/s	>130°/s
Flexion speed of thumb	>130°/s	>130°/s
Flexion speed of four finger	>200°/s	>200°/s
Hand closing time	0.8S	0.8S
Number of tactile sensors	/	/

Dimensions



RH56DFX Series

The DFX series humanoid five finger dexterous hand is a perfect combination of strength and speed, with a thumb active output force of 1.5KG and a four finger fingertip output force of 1KG. Integrated absolute position sensors and force sensors, it provides real-time force feedback . Power off self-locking, no need to change position when powering on.

- **Large Grip Force**
- **Small size and light weight**
- **Built in force sensor**



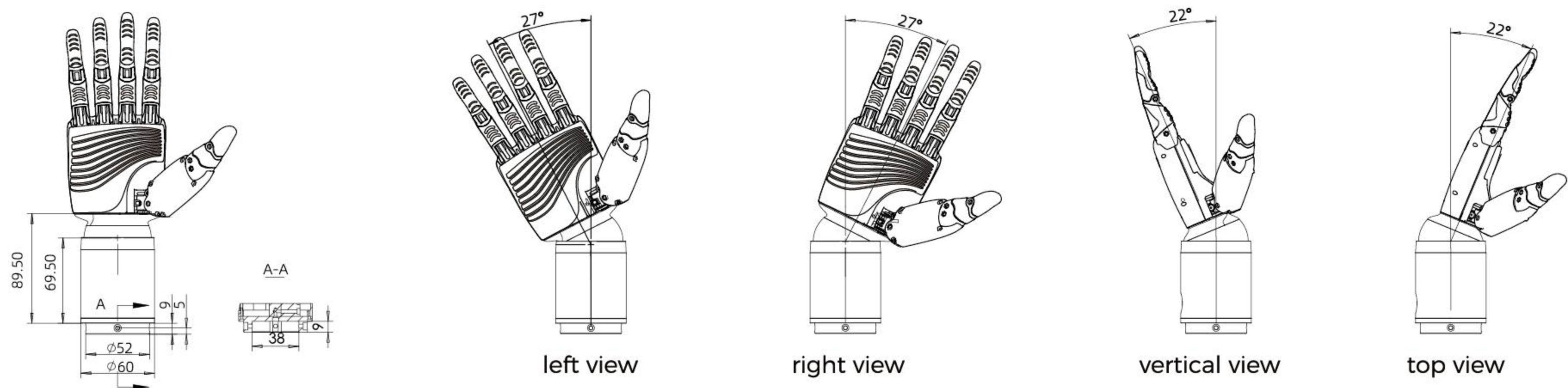
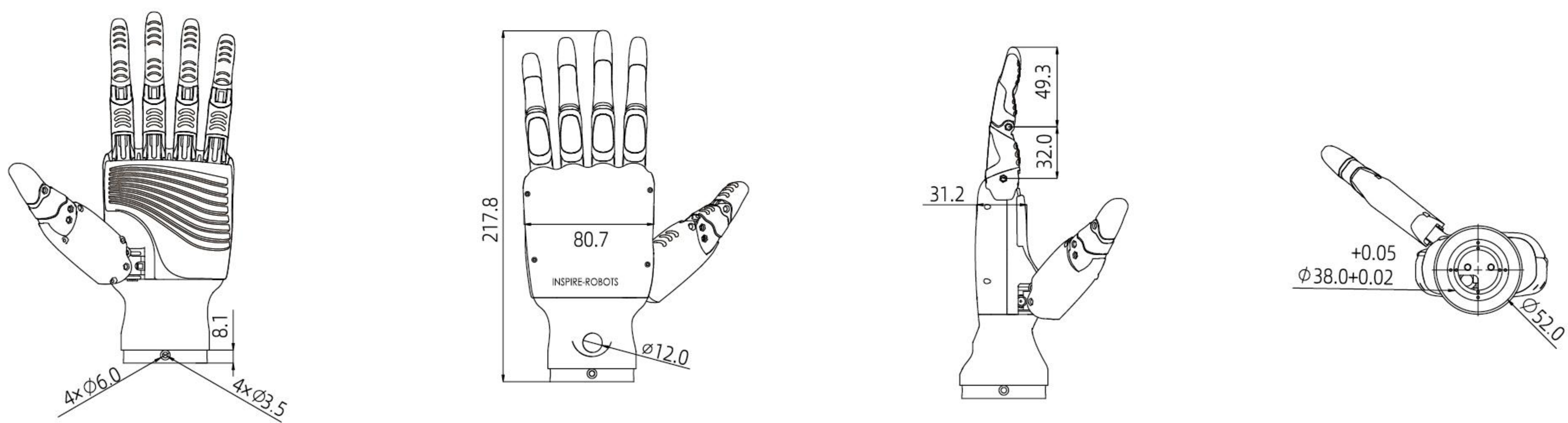
[The Dexterous Hands]



[The Dexterous Hands + Wrist]

Model	RH56DFX-2L (left hand model) RH56DFX-2R (Right hand model)	RH56DFXW-2L (left hand model) RH56DFXW-2R (Right hand model)
Wrist	null	include
Control interface	RS485	RS485
Degrees of freedom	6	6+2
Numbers of joints	12	12
Weight	540g	650g
Operating voltage	DC12V-48V	DC12V-48V
Quiescent current	0.09@24VA	0.1A@24VA
Peak current	2A@24V	2A@24VA
Repeatability	±0.20mm	±0.20mm
Thumb Fingertip Strength	15N	15N
Fingertip Strength	10N	10N
Force resolution	0.50N	0.50N
Lateral rotation range of thumb	>65°	>65°
Lateral rotation speed of thumb	107°/s	107°/s
Flexion speed of thumb	70°/s	70°/s
Flexion speed of four finger	260°/s	260°/s
Wrist Yaw movement	/	±27°
Wrist Pitch movement	/	±22°
Wrist Load torque	/	2NM (Excluding hand weight)

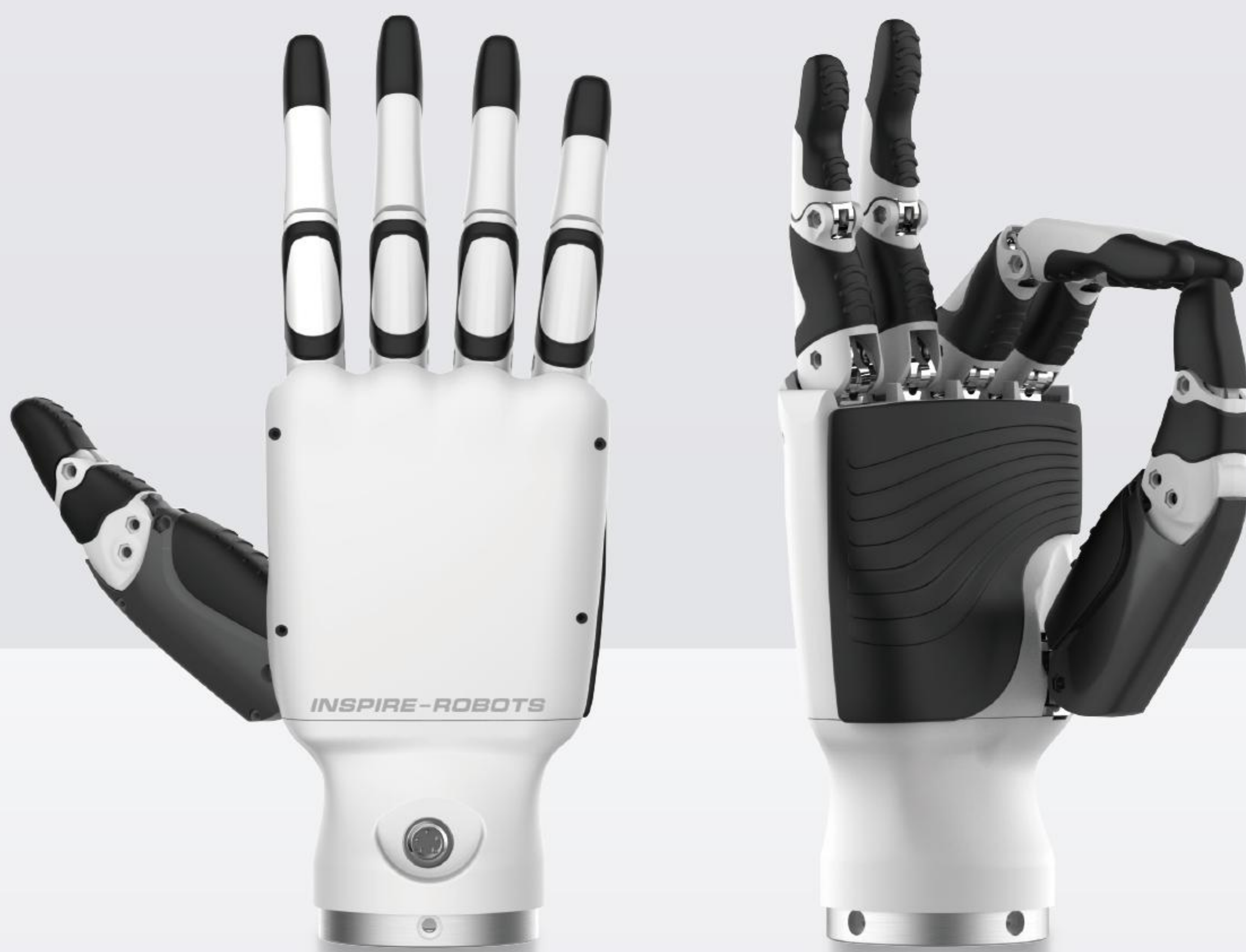
Dimensions



RH56BFX Series

The BFX series renowned as the "Piano Hand", achieves a peak flexion speed of 570°/s in its four fingers. This enables a 100% win rate against humans in vision-guided rock-paper-scissors games. Integrated absolute position sensors and force sensors, it provides real-time force feedback. Power off self-locking, no need to change position when powering on.

- High Moving Speed
- Small size and light weight
- Built in force sensor



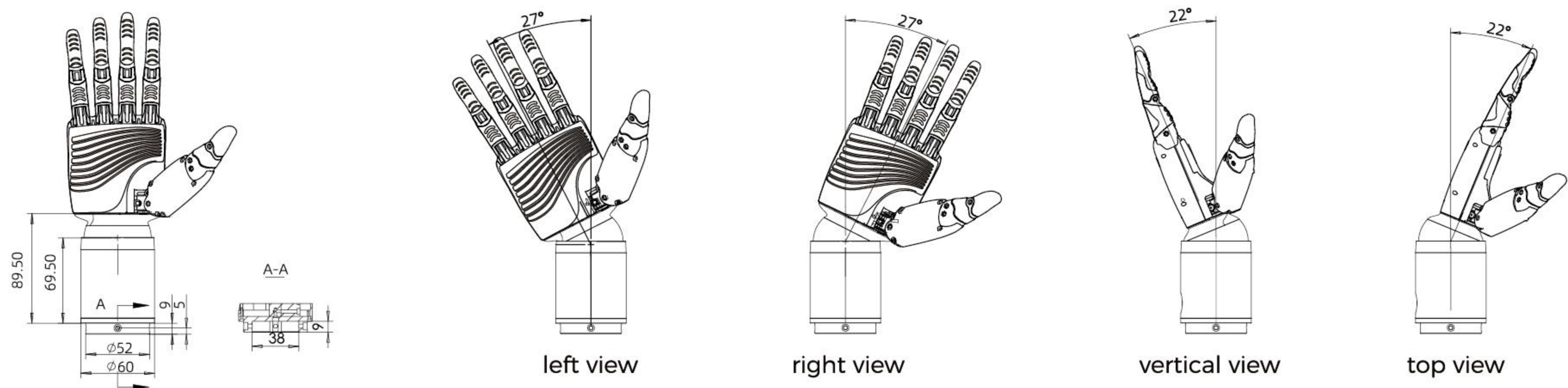
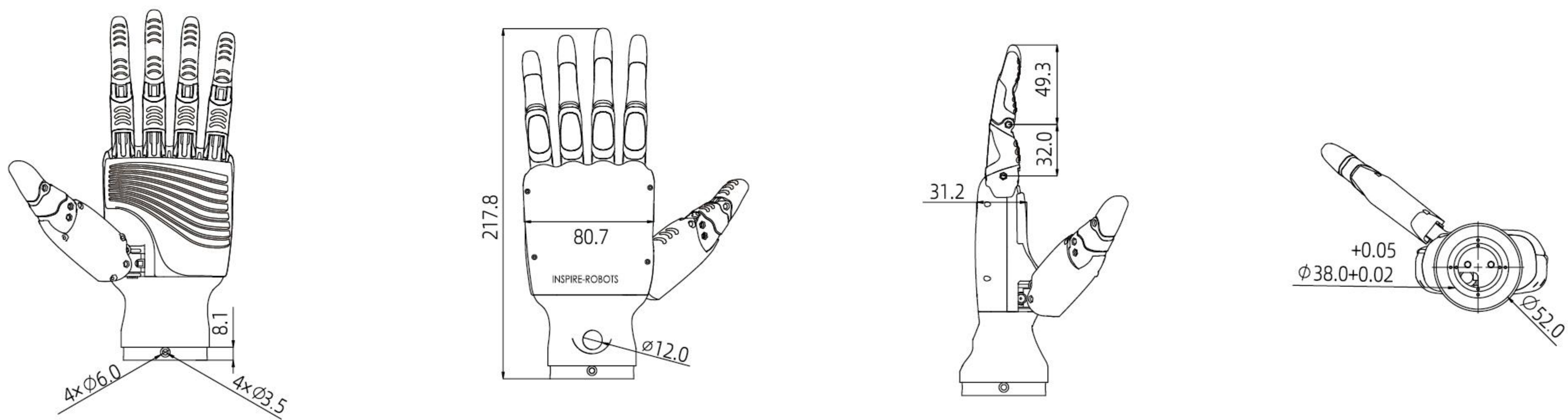
[The Dexterous Hands]



[The Dexterous Hands + Wrist]

Model	RH56BFX-2L (left hand model) RH56BFX-2R (Right hand model)	RH56BFXW-2L (left hand model) RH56BFXW-2R (Right hand model)
Wrist	null	include
Control interface	RS485	RS485
Degrees of freedom	6	6+2
Numbers of joints	12	12
Weight	540g	650g
Operating voltage	DC12V-48V	DC12V-48V
Quiescent current	0.09A@24VA	0.1A@24VA
Peak current	2A@24VA	2A@24VA
Repeatability	±0.20mm	±0.20mm
Thumb Fingertip Strength	6N	6N
Fingertip Strength	4N	4N
Force resolution	0.50N	0.50N
Lateral rotation range of thumb	> 65°	> 65°
Lateral rotation speed of thumb	235°/s	235°/s
Flexion speed of thumb	150°/s	150°/s
Flexion speed of four finger	570°/s	570°/s
Wrist Yaw movement	/	±27°
Wrist Pitch movement	/	±22°
Wrist Load torque	/	2NM (Excluding hand weight)

Dimensions



Electric gripper

Electric Gripper features controller integrated design, large stroke range, precise force and position control, drop detection, and self-lock even during power loss. Application includes biomedical automated inspection, automated sorting and loading/unloading on production lines, precision assembly, unmanned retail, service robotics, etc.

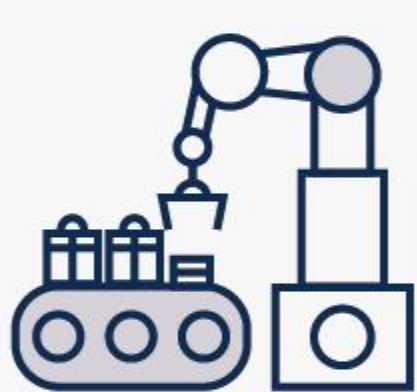
APPLICATIONS

- 3C semiconductor
- Precision machining and assembly
- Automotive parts
- New energy industry
- Unmanned retail
- Biomedical laboratory

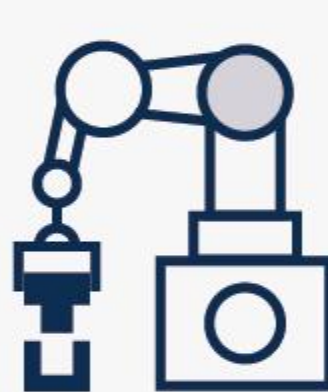
EXAMPLES



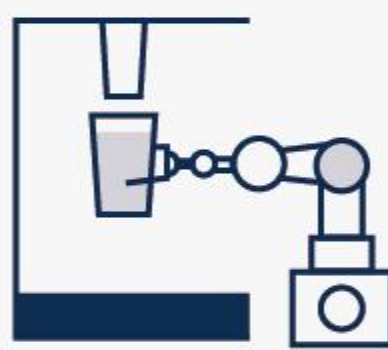
Loading and unloading



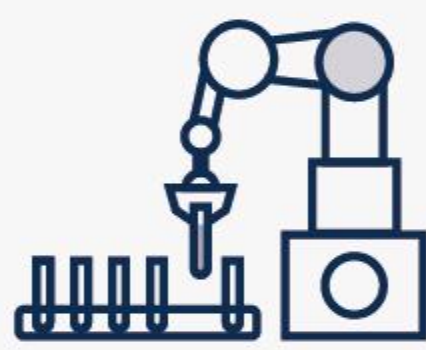
Sorting



Parts assembly



Unmanned retail



Scientific research experiments

FEATURES OF ELECTRIC GRIPPER



Controller integrated



Large stroke, precisely



Grip force precisely and controllable



Power-off Self-locking

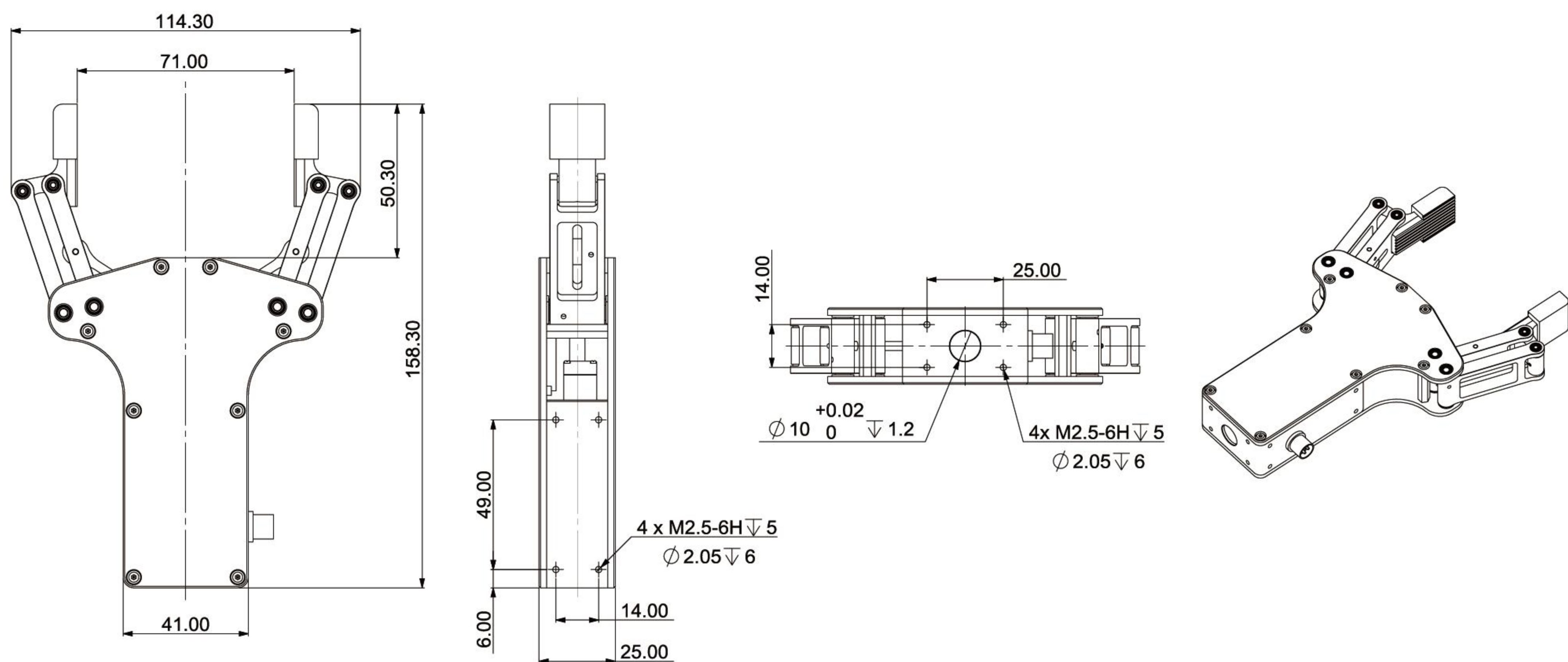
EG2-4B2

Features: Innovative linear mechanical linkage design, force and position control, large stroke, light weight, power off self-locking.



Model	EG2-4B2
Communication interface	RS485
Full stroke (both side)	70mm
Weight	223g
Grip force	0-15N
Force repeatability	±1N
Operating voltage	DC24V±10%
Idling current	30mA
Peak current	0.70A
Positioning repeatability	± 0.50mm
Full stroke closing time	0.85s
Unloaded current	200mA
Protection level	IP40
Recommended working temperature	0-40℃
Maximum speed	97mm/s

Dimensions



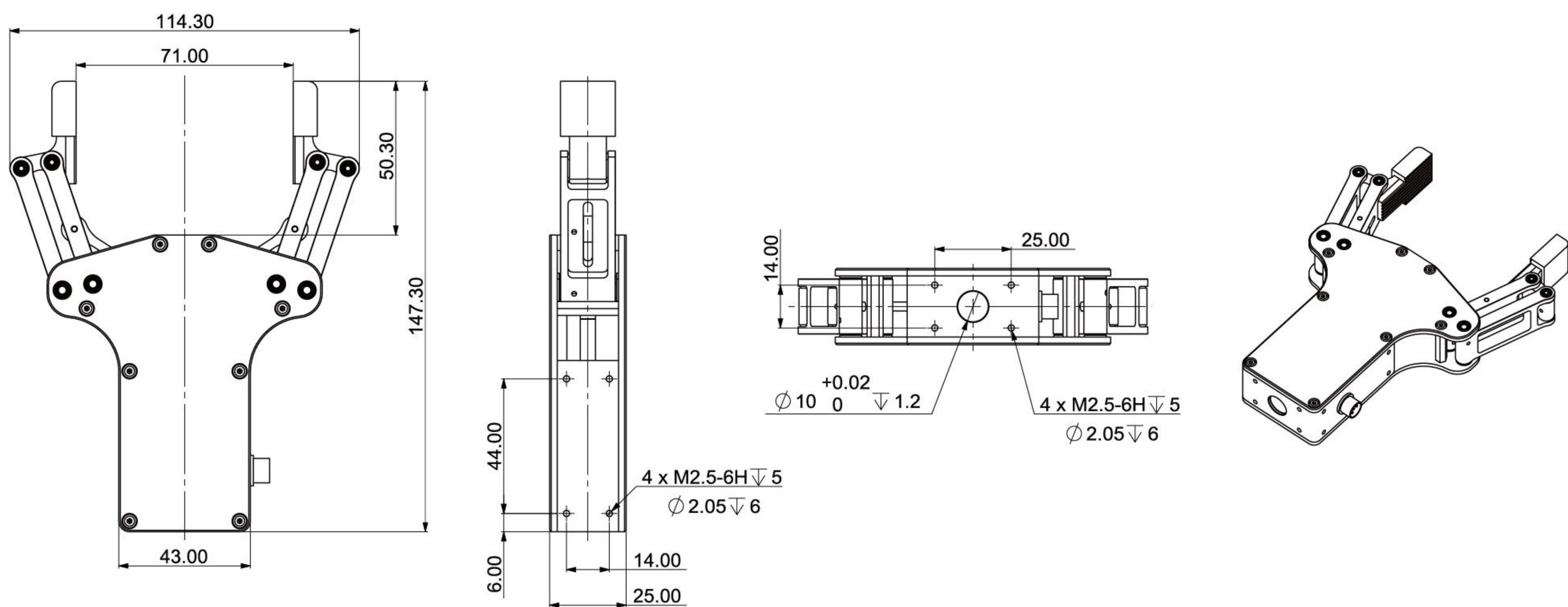
EG2-4C2

Features: Innovative linear mechanical linkage design, force and position control, large stroke, light weight, power off self-locking.



Model	EG2-4C2
Communication interface	RS485
Full stroke (both side)	70mm
Weight	231g
Grip force	0-20N
Force repeatability	±1N
Operating voltage	DC24V±10%
Idling current	30mA
Peak current	0.70A
Positioning repeatability	± 0.50mm
Full stroke closing time	1.3s
Unloaded current	200mA
Protection level	IP40
Recommended working temperature	0-40℃
Maximum speed	70mm/s

Dimensions





INSPIRE-ROBOTS

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