



Industrial wearable robots
StepUp 4th Generation

Wear safety
StepUpTM

FRT ROBOTICS





FRT ROBOTICS

CEO and Founder	Jaeho Jang (PhD of Engineering)
Date of Establishment	March 10, 2015
Type of Business	Manufacturing, Service
Main products	Exoskeleton robots, Special purpose robots, Extreme environment robots
Address	HQ : 1220 Daehak-ri, Hayang-eup, Gyeongsan-si, Gyeongsangbuk-do Branch office : 18, Yangjae-daero 2-gil, Seocho-gu, Seoul, Republic of Korea
Patent applications	16 technology patents (6 registered), 4 design patents (2 registered)
Awards and Certifications	2022 Gyeongsangbuk-do Startup Innovation Grand Prize 2 022 Ministry of Industry and Trade, GOOD DESIGN AWARD Prime Minister Award (Gold Prize) 2022 Confirmation of venture business 2021 Technology evaluation excellent company certification 2019 KiCTA member 2018 ICT Patent Management Commendation 2017 Future Challenge Demo Day Prime Minister Award 2017 Minister of Trade, Industry and Energy Award 2015 Korea GOOD COMPANY Grand Prize



StepUp™ 4th Generation

StepUp, the 4th generation muscle support wearable robot, can correct the wearer's posture, improve fatigue during repetitive work and prevent back injuries that may occur during transportation work by using a passive motion system.



Active assist

Size(cm) : 100 x 45 x 25

Weight(kg) : 4.3 Mode

: Assist / Free

Muscular power assist(kgf) : 15

Battery life : 8 hrs (3 hrs for full charge)

Safety Sensor : Customizable

Muscle support area : Back, Thigh



Assist mode

The assist mode supports the back posture and muscle strength when a worker moves a load up and down.

Switch operation

You can easily switch between Assist and Free mode.

Free mode

In the free mode, a power is temporarily suspended and you can walk free.

Hybrid actuator

Conversion between passive and active types is convenient through hybrid actuators.

Main features (additional)

1. Real-time monitoring: Manage the working environment and worker's conditions(working posture, worker's location, vital signs) on the spot
2. Safety sensor: Measure an oxygen saturation of a workspace, recognize combustible gases, and check temperature, humidity and hydrogen sulfide
3. Camera module: Monitor working environment through 5G communication, check any risk factor and quickly response to any safety accident
4. Customizable according to work environment

Core technology

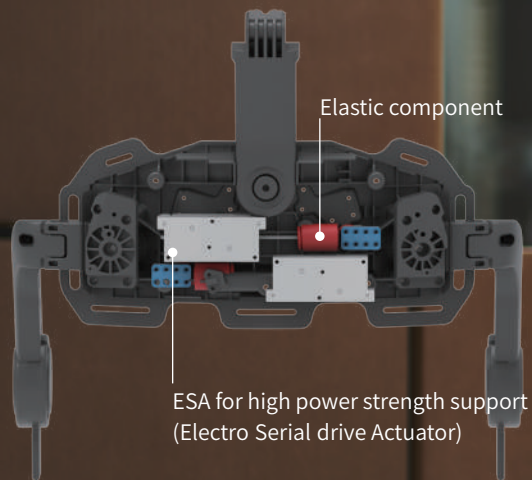
1. Real-time user intent recognition technology
2. User intention-based wearable robot control technology
3. Wearable robot actuator optimization technology
4. Exoskeleton joint and instrument design technology

StepUp has user intention reading and state prediction (Digital Twin) technology using a reinforcement learning algorithms.

The digital twin model based on human data and human factors

- Model generation using musculoskeletal system dynamics algorithm
- Reinforcement learning human model update based on real-time usage data

With hybrid robot driving technology (serial elastic driving technology), we have the original technology that can extend the use time and consider worker safety in emergency situations.





Robot control & Real time monitoring

You can monitor a robot operation, working environment and worker status in real time through the APP.



StepUp™

04 Application

Military, construction, firefighting, rescue, logistics, rehabilitation, nursing, manufacturing, maintenance, the 1st industry, etc.

MILITARY



CONSTRUCTION



FIREFIGHTING



CARRY



REHABILITATION



MAINTENANCE



StepUp™

05 Ergonomic design



**GOOD
DESIGN
KOREA**
산업통상자원부선정

2022 Good design award
Prime Minister Award (Gold Prize)

05 Ergonomic design



Ergonomic design

The wearable robot StepUp is shaped like an exoskeleton suit which supports and assists human muscle strength and enables mutual cooperations between the human and the robot.


It is designed to fit human body parts like spine, waist, hips and thighs to provide a wearing comfort, using each body shape data.

The design is also ergonomically optimized to prevent problems that may occur during repetitive human movements, improper postures, and excessive movements.


CMF



Robot case & Frame

Color	Black & Silver 
Material	Thermoplastic(ABS)
Technological process	Forming ▶ Molding ▶ Injection Molding ▶ Insert Injection Surface Treatment ▶ Coating ▶ Painting + Corrosion

Harness

Color	Light black 
Material	Outer: Polyester 100% / Lining: Polyester 100% Webbing: Polypropylene 100% / Secondary materials: Plastic (ABS) / Aluminum
Technological process	Technological process: Fiber ▶ Synthetic fiber



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Address Headquarters: 1220 Daehak-ri, Hayang-eup, Gyeongsan-si, Gyeongsangbuk-do
Branch office : 18, Yangjae-daero 2-gil, Seocho-gu, Seoul, Republic of Korea

Phone number 82-53-851-0028

Fax 82-70-7610-6823

Email marketing@frtrobotics.com

Website <https://frtrobotics.com/>