Meiden

AGV Kit

Add-on type AGV with features of low price and high function
AGV Kit is the one and only AGV its kind in the world.

“We want to introduce the AGV, but we don’t have enough budget.”
“Conventional simplified AGVs are not enough for our plan.”
Our AGV Kit has been born from such voices on the site. The AGV Kit can combine both the keen requirements of low cost and high function. This is a simplified AGV with a high degree of freedom and expansibility.

Great Changes Shown below as a Result of Model Changeover!

1. Improved functions
   - The number of available stations increased to 200, and branches to 203, respectively.
   - Speed setup increased to 5 speeds (relative address system)
   - Timer start possible after stopping at a station
   - Adjustment of station start position enabled
   - External I/O control functions reinforced (improvement of speed / sensor setup)

2. Optional functions increased
   - Motor-powered wheel lift available
   - Vehicle towing and automatic uncoupling can be carried out

3. Reduced control unit size and improved installation freedom
   (Volumetric ratio reduced to 50% of conventional)

Advantages of AGV Kit introduction:

- Low cost
  - AGV Kit:
    - The price is almost 1/6 that of an ordinary AGV.
  - Ordinary AGV:
    - Even a standard vehicle costs more than thousands of dollars.
- Low cost and high function:
  - A high-function AGV can be obtained for about 1/6 of the ordinary price. Many options are available for functional upgrading.
- Simplicity
  - Easy assembly:
    - The customer can produce an original AGV by simply installing a new unit on the existing vehicle.
  - Simple setup:
    - The user can easily set up the unit by connecting a PC. After that, the AGV starts and stops automatically when the switch is merely pressed ON.
- Flexibility
  - Free layout:
    - By sticking magnetic tapes to the floor, the traveling route and stop positions can be easily set. Urgent layout changes are acceptable.
  - Expandability:
    - Any AGV can be produced according to the user's idea to carry cargoes. If an external I/O system is utilized, it can be developed into an auto-control system.
Assembly is easy. Your present vehicle will become AGV you wanted.

Basic Assembly
You can produce your own AGV by installing the basic unit and some applicable options on your existing vehicle.

<table>
<thead>
<tr>
<th>STEP 0</th>
<th>Vehicle (belonging to the customer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 1</td>
<td>Basic unit</td>
</tr>
<tr>
<td>STEP 2</td>
<td>Optional unit (needed for traveling)</td>
</tr>
<tr>
<td>STEP 3</td>
<td>Optional unit (for higher functions)</td>
</tr>
</tbody>
</table>

* Refer to Pages 11~12 for details about components and units.

You can choose a just-fits driver unit according to the carrying weight and the traveling speed.

1 unit: 1000kg Max. 
2 units: 1400kg Max.

Example of basic unit installation

Applications
AGV Kit can make any type AGV according to the cargo being transported.

Hand-pallet towing vehicle
The truck installed with AGV Kit tows the hand pallet behind it. The joint is released, and the towed hand pallet can be used as an ordinary one.

Pick-up box carrying vehicle
With the digital pickup system, collected cargos can be supplied to the assembly line. Many parts boxes can be carried at a time.

Cart towing vehicle
AGV Kit tows and moves the exclusive merchandise-carrying cart from the in-cargo spot to the storage spot.

Heavy-duty AGV
If two driver units are installed, a maximum of 1400kg can be transported. (Up to 1000kg per driver unit)

Vehicle with a inclined conveyer
The loading and unloading of heavy articles can be done easily. Since a driving conveyer need not be installed, this application is useful for cost reduction.

Lengthy article carrying vehicle
If two driver units are installed, the transportation of lengthy articles becomes possible. Because these two driver units run along the guided lines independently, stabilized traveling is assured.

Please don’t hesitate to contact us by phone or facsimile and ask us for explanations and a quotation. *Please use the Specification Selection Sheet in Page 14.

When your AGV Kit is delivered, start up the assembly work immediately.

Assembly Procedures

Step 1
When your AGV Kit is delivered, start up the assembly work immediately. In the first place, install the driver unit and motion sensors on the reverse side of the vehicle.

Step 2
Then, install the control unit. The control unit is so-to-speak the brain of AGV Kit. It gives traveling instructions to the driver unit.

Step 3
Install the operator switch and the wheel lifter. As required, install options according to the purposes.

Confirmation of Details and Asking for Quotation

Please don’t hesitate to contact us by phone or facsimile and ask us for explanations and a quotation. *Please use the Specification Selection Sheet in Page 14.
This is a kit, but what a high function! AGV Kit assures such an achievement.

Anyone can operate it. It is an easy-to-handle AGV.

Select the station with the operational console. The vehicle starts moving just by pressing the START switch. Any person can drive it easily.

Available also as a dual mode (manual/AGV) handle cart. It can be flexibly applied to all kinds of situations.

"Changeover from AGV to handle cart"

When the wheel lifter is operated, the AGV can be simply modified into an ordinary handle cart. Such a changeover action is useful where no guided lines are laid.

Versatile speed adjusting function to cope with a variety of working applications.

"High-speed operation, creepage operation"

The maximum traveling speed is 60 meters per minute. For a lightweight class of the 30m/min type, an optional assembly can assure such a creepage traveling at 0.4 meters per minute.

The AGV permits sharp spin turns.

"Turning radius & 2-wheel differential speed control"

When the route is defined, stick the magnetic tapes to establish AGV Kit traveling route. Stick the command markers to the branch spots and stations.

Connect a personal computer to the control unit that is installed on the truck. Select the required truck motions. For example, the setting for going to ST1 is instructed to go to the left at Branch 1, and to the right at Branch 2.

On the PC screen, select "left" for Branch 1 and "right" for Branch 2. By simply clicking on the screen for the selection of the destination station and branch directions, even a complicated route can be set up easily.

The addition of a back-traveling sensor realizes backward traveling simply.

"Back-traveling, simplified back-traveling"

Back travelling: The use of two units can go along the same curves as for advancing.

Simplified back travelling: One unit is used. Linear traveling only is possible for back traveling.

A maximum of 200 stations and 200 branches are acceptable.

"Station and branch setup"

If an onboard setter is used, more complicated courses can be set up.

AGV Kit controls the revolving speed of the right and left wheels independently of each other. Therefore, high turning performance and stable running are assured even for a small turning radius.

Operational console type A

Setting is possible up to 8 stations and 7 branches.

(ST system designated by the command marker)

Operational console type 2B

Setting is possible up to 200 stations and 200 branches.

(Relative address system)

Command marker

To set up the course, a station marker is stuck to a stop position and a branch marker is located in front of each branch.

Turning radius

1 unit

Wheel base length

2 unit

Wheel base length

For a turning of less than 90 degrees: Wheel length × 0.75

For a turning of over 90 degrees: Wheel length × 1.1

AGV Kit controls the revolving speed of the right and left wheels independently. Therefore, high turning performance and stable running are assured even for a small turning radius.

Operational console

Setting is possible up to 8 stations and 7 branches.

Equipment designed by the command marker

Side-surface type auto-charge

A charging station is installed on the traveling course of the AGV Kit.

A maximum of 200 stations and 200 branches are acceptable.

"Station and branch setup"

If an onboard setter is used, more complicated courses can be set up.

AGV Kit makes backward traveling so that it is connected to the auto-charger terminal. Not in the middle of the course. It travels backwards to the refuge position and stops there automatically.

Auto-charge is started after the AGV Kit has stopped.

Backward type auto-charge

The AGV Kit makes backward traveling so that it is connected to the auto-charger terminal. Not in the middle of the course. It travels backwards to the refuge position and stops there automatically.

auto-charge

# #

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A maximum of 200 stations and 200 branches are acceptable.

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Command marker

To set up the course, a station marker is stuck to a stop position and a branch marker is located in front of each branch.

Wheel length

1 unit

2 unit

AGV Kit controls the revolving speed of the right and left wheels independently of each other. Therefore, high turning performance and stable running are assured even for a small turning radius.

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AGV Kit controls the revolving speed of the right and left wheels independently of each other. Therefore, high turning performance and stable running are assured even for a small turning radius.
There are a variety of applications because you can customize your original system by yourself. The scope of the application can be widespread according to your idea.

Examples of the application of AGV Kit

Assembled components carrying vehicle

“Wo could cut the logistic job and more than to other job” (By a machine manufacturer)

Backward function 2 units High speed

This system is used to convey the parts to the assembly line. The upper section of the vehicle is flat and is devised to have the height and shape suitable for putting parts on it. Assembly parts are procured from multiple parts shelves, and supplied to the assembly line.

- The vehicle can go backwards. It can enter a narrow space and a narrow space can be towed and transported. There is an automatic shutter on the way to the warehouse, but this shutter can be automatically opened and shut by means of a sensor that senses the arrival of AGV Kit.
- The hand pallet is directly towed. The vehicle comes in a small body with its length being approximately 700mm only.
- The carrying mass is 500kg, which is a heavy capacity.

Hand pallet towing vehicle

“This is a very convenient system because hand pallets can be towed immediately.” (By a food manufacturer)

1 unit Heavy load

The hand pallet as a whole, carrying stacks of product boxes, can be towed and transported. There is an automatic shutter on the way to the warehouse, but this shutter can be automatically opened and shut by means of a sensor that senses the arrival of AGV Kit.

- The hand pallet is directly towed.
- The vehicle comes in a small body with its length being approximately 700mm only.
- The carrying mass is 500kg, which is a heavy capacity.

Product cart towing vehicle

“We feel relieved because the transportation to the stowage warehouse can be automated.” (By a medical product manufacturer)

2 units Heavy load

AGV Kit has two types of product carts, a box pallet and a flat pallet. These are combined with the pallet vehicle by means of joint pins, and automatically transported as far as the stowage warehouse. An automatic shutter on the way can be opened and shut automatically by means of a sensor that senses the arrival of AGV Kit.

- The carrying mass is 500kg, which is a heavy capacity.
- A joint mechanism for traction is added to a standard sheet metal truck.

Printed matter carrying vehicle

“Even an intern student could assemble it easily.” (By a printing company)

1 unit Standard

AGV Kit carries the printed plan sheets to the next process. The operator attending to each printing machine puts the printed matters on the vehicle and presses the START switch for transportation to the destination. This is the standard type with the carrying weight of 250kg and speed of 30m per minute.

- This is the standard type with a carrying mass of 250kg.
- A joint mechanism can operate the AGV easily with a single button.

Examples of The Application of AGV Kit (More sophisticated classes)

Printing materials carrying vehicle

“An AGV exclusively used for large-size pallets has been established easily.” (By a printing company)

Backward function 2 units Heavy load

This is AGV Kit used to supply raw materials to the printing machine. Raw materials are put in stacks on a pallet of 1.050mm square and AGV Kit carries the materials from the material storage to the raw material supply port of the printing machine. A request for the material supply is transmitted in wireless mode from the station of the printing machine and AGV Kit carries the raw material.

- This is the large-scale forward/backward type with a carrying mass of 400kg.
- The vehicle height is made as low as possible by incorporating the hand pallet.

Slip-in carrying vehicle

“This is our first experience to have an AGV that permits such a sharp spin turn.” (By a specific vehicle manufacturer)

Backward function 2 units Heavy load

AGV Kit creep under a carrying truck to be used as a tractor. The vehicle height is suppressed as low as possible and AGV Kit creeps under and a traction pin is protruded from the bottom to hook it on the truck frame so that the vehicle as a whole can be towed and moved. Upon the arrival at the station, the traction pin is automatically withdrawn to let the truck remain there. AGV Kit alone moves to another point for the next transportation.

- An automatic shutter on the mechanical parts processing line, which can be opened and shut automatically by an optical communication unit mounted on the ground conveyers.

Mechanical parts carrying vehicle

“Existing AGVs have been replaced with a low cost.” (By a machine manufacturer)

Backward function 2 units Heavy load

This AGV Kit is used for materials loading and empty bucket recovery on the mechanical parts processing line. Each bucket full of materials is received from the elevator and automatically fed to the conveyer of the processing line. An empty bucket is automatically received from the processing line and automatically transferred to the elevator.

- Loading and unloading units are installed to automatic load transfer with ground conveyers.
- Loading and unloading units are installed at an optimal communication unit mounted on the ground conveyers.

Physical Distribution Center Cart Towing Vehicle

“Advantages are great because transportation personnel has been curtailed and wrong delivery is prevented.” (By a warehouse owner)

Backward function 2 units Heavy load

AGV Kit is using printing machine station, loading station, and unloading station. This is AGV Kit used to supply raw materials to the printing machine. Raw materials are put in stacks on a pallet of 1.050mm square and AGV Kit carries the materials from the material storage to the raw material supply port of the printing machine. A request for the material supply is transmitted in wireless mode from the station of the printing machine and AGV Kit carries the raw material.

- This is the large-scale forward/backward type with a carrying mass of 400kg.
- The vehicle height is made as low as possible by incorporating the hand pallet.

The hand pallet is directly towed. The vehicle comes in a small body with its length being approximately 700mm only.

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AGV Kit control method

Utilization of I/O systems “Automatic control”

It is possible to use an I/O system. By setting up applicable motions, a more functional AGV can be produced.

Examples of possible items with applicable I/O systems

- Speed setting change
- Direction change
- Auto start-stop
- Forward/forward start/stop switch
- Bumper signal
- Branch signal
- Direction changeover
- External speed command
- Obstacle sensor stop prevention

Wireless controller exclusive for AGV Kit where a wireless LAN is installed

An optional wireless LAN is also used.

- With a signal from the I/O system, an instruction of servicing can be given to AGV KIT that is in rest condition at a station.
- Since the conveyor connection mode and the switch box connection mode are available, a nearby AGV Kit can be called up easily.

Example:
When the signal of a conveyer cargo sensor is applied to the controller, AGV Kit waiting for an instruction at the specific station can be called up to travel to this conveyer.

* Cargo transfer communication between the conveyer and AGV Kit can be exchanged by optical communication equipment. It also applies to the call switch.

Easy setting of an AGV route by using magnetic tapes and command markers

AGV Kit traveling route can be established easily by sticking the magnetic guidance tapes to the traveling course.

*Use only Meidensha magnetic tape.

Unit of command marker system

Until arrival at the goal station, the command markers stuck to the floor are read out and commands are sequentially executed.

A variety of command markers can be used to give instructions of stop, branch, speed change, and so on.

Unit of relative address system

Command markers stuck to the floor are read out and AGV Kit goes running according to the command instructions preliminarily entered in these command markers.

Command markers are stuck to positions where the AGV Kit has to perform stop, branch, and speed change.

Multiple commands can be executed according to a command marker in one position.

Speed setting is possible up to a maximum of 15 speeds. Obstacle sensors (scanner type) can be set up in a maximum of 15 areas. A maximum of 200 stations and a maximum of 200 branches can be set up.
Unit introduction

We can offer a variety of lineups to cope with various needs.

Optional functions

<table>
<thead>
<tr>
<th>Optional units (required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery (24V)</td>
</tr>
<tr>
<td>Battery charger</td>
</tr>
<tr>
<td>Auto-charger (Back type)</td>
</tr>
<tr>
<td>Magnetic tape, marker</td>
</tr>
<tr>
<td>Optional units (for further improvements)</td>
</tr>
<tr>
<td>Light-duty class unit</td>
</tr>
<tr>
<td>Heavy-duty class unit</td>
</tr>
<tr>
<td>Control unit</td>
</tr>
<tr>
<td>Operation switch</td>
</tr>
<tr>
<td>Operation check</td>
</tr>
<tr>
<td>Extension of power supply</td>
</tr>
<tr>
<td>I/O connector &amp; harness</td>
</tr>
<tr>
<td>Wireless controller</td>
</tr>
<tr>
<td>Motor-powered wheel lifter</td>
</tr>
<tr>
<td>Marker sensor</td>
</tr>
<tr>
<td>Auto-charger (Side type)</td>
</tr>
<tr>
<td>Obstacle sensor</td>
</tr>
<tr>
<td>Battery voltmeter</td>
</tr>
<tr>
<td>Manual operation pendant</td>
</tr>
</tbody>
</table>

Back-traveling function

This is a function for the backward traveling of AGV Kit. Two sets of driver units and guidance sensors are added to modify the control unit.

Simple reverse function

This is a function for the short-span backward traveling. It is applicable to a linear course and a large curvature. By requiring the addition of any driver units, this function can be established with the addition of guidance sensors.

Electromagnetic brake

The shifting of cargos at the time of cargo transfer and vehicle stoppage on a slope can be prevented. (Standard installation for heavy articles)

Encoder

With an encoder, Light-duty-30m/min type vehicle can travel at lowest speed, 0.4m/min. Reading a pulse improves driving speed accuracy. This encoder function is used for assembling or picking work with moving AGV (instead of conveyer).

Stopping accuracy upgrading

The stopping accuracy is upgraded from the standard level (±0.000m ± 0.10m/m) to the Heavy-duty type (±0.0001m ± 0.01m/m) (Heavy-duty type includes this option as a standard).

Safety facts

This product is a unit to make an AGV and an AGV system. The final security under the operating conditions shall rest with the judgment of the customer. Please refer to the JIS description in regard to the standard way of thinking (JIS 6960 Safety Rules for the Automated Guided Vehicle Systems).

Contact prevention

There is a danger of bone fracture or similar injury when you collide with the AGV’s driver block. The AGV stops after the bumper comes in contact with an obstacle. If the AGV has to be stopped before any contact, the use of an obstacle sensor is effective. In consideration of the worst case, the emergency switch should be located where it can be touched from any position.

Emergency stop

To reduce the braking distance in an emergency stop the electromagnetic brake option must be installed (installed by default on heavyweight models).

Operation check

To know whether the AGV is moving, there is a visual method such that the laminate pilot lamp is made to light or blink. As an audio method, a melody may be used to notify of the running conditions.
Assembled vehicles with AGV Kit are also available.

### Sheet metal carrying vehicle
- **Simple backward**
- **Backward**
- **2 units**
- **Heavy load**
- **Lightweight class**

**Application Example**
- **External truck size**: W620×H1015×L942mm
- **Platform size**: W620×H265×L785mm

**Key Features**
- Only this model is allowed to install all the specifications and options from the lineups of completed vehicles.
- Assembled vehicles with AGV Kit
- Meiden AGV Kit
- Meiden AGV Kit

### Pipe carrying vehicle
- **Simple backward**
- **Backward**
- **2 units**
- **Heavy load**

**Application Example**
- **External truck size**: W700×H1320×L1250mm
- **Platform size**: W700×H340×L1400mm

**Key Features**
- This is a model whose body can be modified daily.
- Assembled vehicles with AGV Kit
- Meiden AGV Kit
- Meiden AGV Kit

### Flat vehicle
- **Simple backward**
- **Backward**
- **2 units**

**Application Example**
- **External truck size**: W700×H950×L1323mm
- **Platform size**: W500×H550×L1000mm

**Key Features**
- This is a compact low-platform model.
- Assembled vehicles with AGV Kit
- Meiden AGV Kit
- Meiden AGV Kit

### Vehicle with a towing hook
- **Backward**
- **Heavy load**

**Application Example**
- **External truck size**: W620×H1015×L942mm
- **Platform size**: W620×H265×L785mm

**Key Features**
- Only this model is allowed to install all the specifications and options from the lineups of completed vehicles.
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### Specification

<table>
<thead>
<tr>
<th></th>
<th>Light-duty class (M2)</th>
<th>Heavy-duty class (M3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guidance system</strong></td>
<td>Standard type</td>
<td>Magnetic guidance system</td>
</tr>
<tr>
<td><strong>Towing direction</strong></td>
<td>Forward</td>
<td>Backward (optional)</td>
</tr>
<tr>
<td><strong>Rated load</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 unit / 2 units</td>
<td>250/500kg</td>
<td>500/700kg</td>
</tr>
<tr>
<td>2 units</td>
<td>500/700kg</td>
<td>1000/1400kg</td>
</tr>
<tr>
<td><strong>Rated speed</strong></td>
<td>30m/min</td>
<td>60m/min</td>
</tr>
<tr>
<td>30m/min</td>
<td>60m/min</td>
<td>30m/min</td>
</tr>
<tr>
<td><strong>Stoppage accuracy</strong></td>
<td>Standard ±30mm</td>
<td>Standard ±15mm±30mm</td>
</tr>
</tbody>
</table>

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### Using conditions

- Not available for outdoor use.
- Do not apply a large impact to the vehicle while cargos are loaded.
- Road surfaces refuse traveling.
- Road surfaces heavily contaminated 3+.
- For wireless LAN control (Ad hoc communication function provided)

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### Specification selection sheet

#### Basic unit

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic unit</td>
<td>Standard type</td>
<td>Light-duty</td>
</tr>
<tr>
<td>Driver unit, control unit, operator switch, elevator lever, marker sensor</td>
<td>Standard type</td>
<td>Light-duty</td>
</tr>
<tr>
<td>Standard unit</td>
<td>Light-duty</td>
<td>Heavy-duty</td>
</tr>
<tr>
<td>High-speed type</td>
<td>Light-duty</td>
<td>Heavy-duty</td>
</tr>
<tr>
<td>Heavy load type</td>
<td>Light-duty</td>
<td>Heavy-duty</td>
</tr>
</tbody>
</table>

#### Standard vehicle

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard truck (completed truck)</td>
<td>Sheet metal vehicle type</td>
<td>1</td>
</tr>
<tr>
<td>Pipe vehicle (light-duty only)</td>
<td>Heavy-duty</td>
<td>1</td>
</tr>
<tr>
<td>Flat vehicle type</td>
<td>Light-duty</td>
<td>1</td>
</tr>
<tr>
<td>Vehicle with a towing hook</td>
<td>Heavy-duty</td>
<td>1</td>
</tr>
</tbody>
</table>

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### Options (Selected as required, or procured by customers)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery</td>
<td>24V (25-35-65-100Ah)</td>
<td>1</td>
</tr>
<tr>
<td>Connector only</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Charger</td>
<td>Separated charger (for AC 100V)</td>
<td>1</td>
</tr>
<tr>
<td>Separate charger (for AC 200V)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Simplified auto-charger (for AC 200V)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Magnetic type</td>
<td>For ranging guidance (W180mm×L225mm×H55mm)</td>
<td>1</td>
</tr>
<tr>
<td>For marker (W50mm×L50mm×H30mm)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>For marker (W55mm×L50mm×H30mm)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Bumper</td>
<td>Bumpers for completed vehicles (forward)</td>
<td>1</td>
</tr>
<tr>
<td>Bumpers for completed vehicles (backward)</td>
<td>Light-duty</td>
<td>1</td>
</tr>
<tr>
<td>Bumper alone</td>
<td>mm</td>
<td>1</td>
</tr>
<tr>
<td>Battery voltmeter</td>
<td>Analog type</td>
<td>1</td>
</tr>
<tr>
<td>Onboard cover</td>
<td>Digital type</td>
<td>1</td>
</tr>
<tr>
<td>Onboard set</td>
<td>Type A (50A at 9 stations)</td>
<td>1</td>
</tr>
<tr>
<td>Type B (Stop at 200 stations)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Wireless controller</td>
<td>For wireless LAN control (Access communication function provided)</td>
<td>1</td>
</tr>
<tr>
<td>Wireless LAN unit</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

### Notes

1. A self-mass is included.
2. The standard frame is unloaded and the battery is fully charged.
3. For the relative address unit, an optional stopping accuracy upgrading function can be added to make the stop position accurate to ±10mm.
4. Recommended to use if there is a strong impact to be received frequently at the drive unit.
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