DAIFUKU

Automatic Guided Vehicles

M100-TT
Tunnel/Tugger
1,950 lbs Towing Capacity

The Model M100-TT is the top-selling AGV, offering ultimate flexibility, reliability and scalability at an affordable price.

FEATURES

Low Profile: Designed to "tunnel" under mobile racks and trailers to tow them from underneath. This keeps the footprint of the AGV with trailer to a minimum.
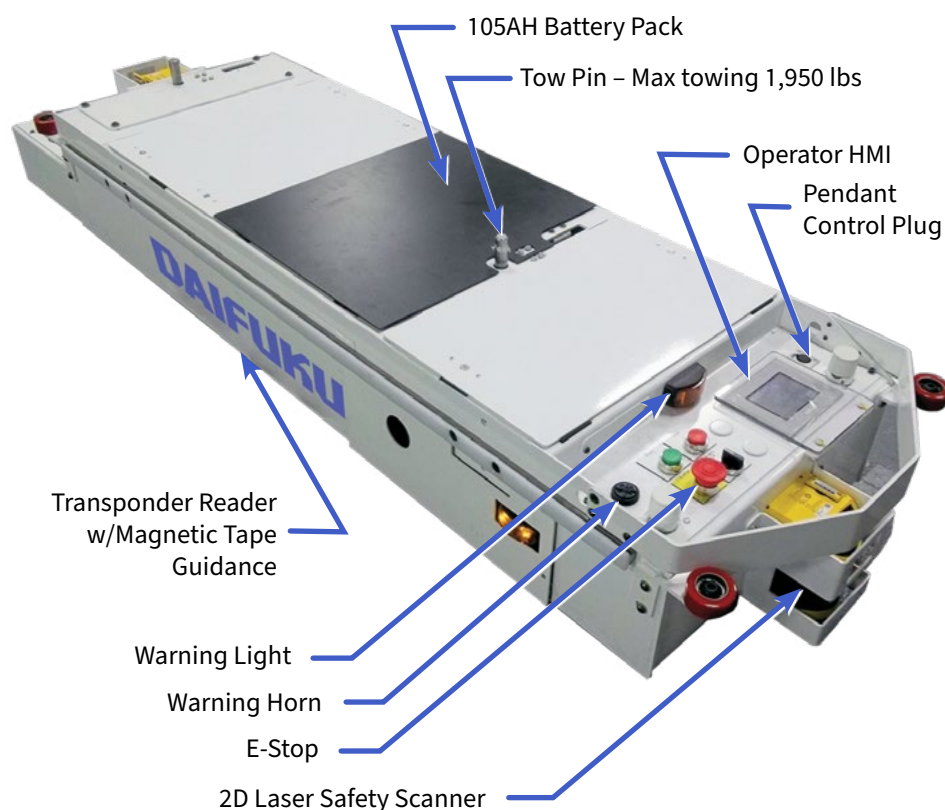
Safe: The M100-TT offers a 16-pattern laser to detect obstructions and personnel.

Affordable: Many applications can demonstrate Return on Investment in three months or less.

Simple: CartTools™ and AGV Tools software provide a user-friendly interface to implement/make changes.

Industrial: Steel construction with powder coat and industrial enamel paint.

Integration: Can integrate with Plant Control Systems via Wi-Fi communications and our System Automation Manager™ (SAM) software providing traffic control.

- 105AH Battery Pack
- Tow Pin – Max towing 1,950 lbs
- Operator HMI
- Pendant Control Plug
- Transponder Reader w/Magnetic Tape Guidance
- Warning Light
- Warning Horn
- E-Stop
- 2D Laser Safety Scanner

NAVIGATION AND GUIDANCE OPTIONS

Natural Feature Navigation (NFN): The AGV determines its location using LIDAR to identify structures in the environment and match their locations to a virtual map of the facility.

Inertial Navigation: Odometry data and in-floor waypoints are used by the vehicle computer to determine location.

Magnetic Tape/Bar Guidance: Magnetic path is followed using sensors.

NAVIGATION ENHANCEMENTS

Enhanced Navigation: Additional sensors can be added to augment the vehicle's navigation technology.

Co-Navigation Technology: Multiple navigation packages may be used on a vehicle in challenging environments.

FEATURES AND OPTIONS

- Communications Wi-Fi 5
- Automatic Shut Off
- Sleep/Auto-wake
- Automatic Charging
- Lithium Battery Pack

- Wheel Brushes
- Reverse Travel
- Warning Light/Horn
- Guide rollers/rails for tunneling

Smart Handling
AGV Solutions

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SMART HANDLING AGV SOLUTIONS

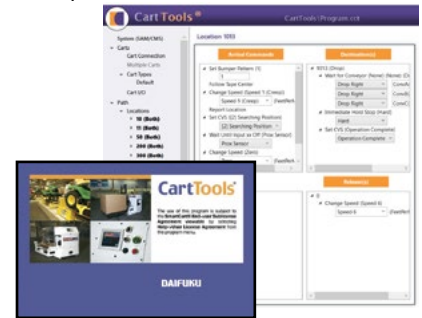| General Specifications	
Weight / with batteries	240 lbs (110 kg) / 360 lbs (165 kg)
Dimensions	W: 19.25" (490 mm) L: 58" (1595 mm) H: 10.8" (275 mm)
Traction Power	40 lbs constant, 80+ lbs starting
Safety – Front/rear	ANSI B56.5 compliant bumper
Speed – Laser Bumper	15 to 160 FPM - 6 speeds, 1 FPM increments
Rear Paddle Bumper	Maximum 30 FPM (if equipped)
Rated Trailer	1,950 lbs (885 kg) @ 100 FPM
	1,050 lbs (476 kg) @ 160 FPM
	With 2% friction factor trailer wheels
	Capacity reduced by 10% when reversing
	1% Incline/Decline 1,100 lbs @ 100 FPM
Battery Options	AGM 105 AH 24VDC battery pack
	AGM/TPPL 102 AH 24VDC battery pack
	Lithium 90AH 24VDC battery pack
Automatic Charge	40 amp charge rate (if equipped)
Fast Automatic Charge	85 amp charge rate (if equipped)
Manual Charge	Up to 25 amp charge rate, via manual plug

Environment	
Environment – Atmosphere	0 to 40° C, 25% to 95% non-condensing humidity
Dust/Water-proof	No
Floor Specs – Edges/Debris	.25" abrupt elevation change maximum, smoothed
Expansion Joints	.25" maximum
Grade Rating	0%
Flatness	1% and .25" variation in 5' or less
Friction	0.6 coefficient of friction between wheels and floor, minimum
Floor Conductivity	Static dissipative, less than $3.5 \times 10^7 \, \Omega$
Radio Communication	Wi-Fi 5, plus security encryption (if equipped)

Detailed Specifications	
Available Wheel Loading	Front add'l – 200 lbs, Rear add'l – 300 lbs each
	Weight added to module is subtracted from rated trailer
Drive Direction – Automatic	Forward and Reverse (if equipped)
Duty Cycle	100% @ 20 lbs drawbar (1,000 lbs)
Drive Unit – Wheel	Vulkolan 150 mm dia. x 50 mm wide
Drive Type	Gear driven steerable turntable
Motor	130 watts 24VDC permanent magnet
Steering	24 VDC motor
Brake	3Nm, spring actuated (fail-safe)
Caster Wheels	Solid elastomer 5" diameter x 2" wide
Guidance – Magnetic Tape/Bar	SmartCart AGV
Steer Angle Sensor	Analog 10 turn potentiometer
Steering Accuracy	+/- 1" from physical path
Guide Loss Error	Error generated within 6" of path loss
Hunt for Path	Not offered, violates ANSI B56.5
Sensor	16 millisecond data rate, 50 updates per second
SmartSteer Accuracy	+/- 3" @ 10'
Stopping Accuracy	½" proximity sensor, 1.5" transponder reader @ 30 fpm
Location Method	Transponder tags, 5 data bytes including checksum
	Virtual Locations via distance initiated functions
Program Capacity	5000 program steps
Navigation	Daifuku AGV - Natural Feature Navigation and Inertial
Steering Angle Encoder	Yes
Steering/Stopping Accuracy	+/- .5"
HMI Display	3.5" color touch screen – errors & destinations
Manual Movement	Pendant – via pendant plug receptacle, Rescue dolly
Minimum Path Radius	24" – 90° turn, 48" – 180° turn
Drive Stalled Detection	Yes
Distance Initiated Functions	Yes – in 1" increments
Program Method	PC and Wireless (if equipped)
Program Capacity	5000 program steps
Obstacle Detection	Front and rear (if equipped) programmable up to 2.8 meters
Emergency Stop	Front
Wiring	Per NEC ampacity guidelines

CARTTOOLS SOFTWARE

Simple, standardized toolbox of commands that make configuration a snap.

Pendant Control – When manual movement is required, it's as simple as driving the AGV where it needs to go.

Reverse Magnetic Tape Guidance – By just adding another guidance sensor and laser bumper, the M100-TT can act as a shuttle cart.

SmartSteer – CartTools directing the AGV to intentionally leave the magnetic tape path. It allows maneuvers like pivot turns and ignoring floor problems when in full automatic operation.

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