

# M300-TT

## Model 300 Tunnel/Tugger

### 4,000 Lbs Max Towing Capacity

The Model M300-TT is part of the top-selling family of AGVs 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.

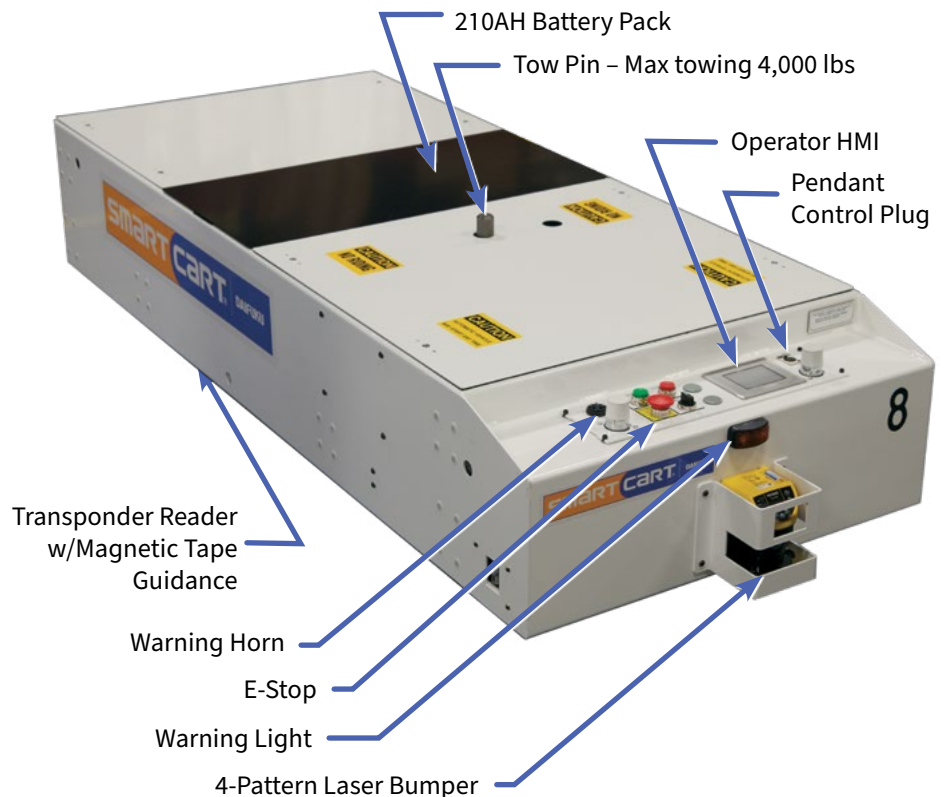
**Safe:** The M300-TT offers a 16-pattern laser to detect obstructions and personnel.

**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.



#### NAVIGATION AND GUIDANCE OPTIONS

**Natural Feature Navigation (NFN):** Environmental feature data is collected by on-vehicle sensors and used by the vehicle computer to determine location.

**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

- Wi-fi Communications 802.11 a/b/g
- Automatic Shut Off
- Sleep/Auto-wake
- Automatic Charging
- Wheel Brushes
- Side Swipe Optics
- Warning Light/Horn
- Cab Side Covers

This product is available with Magnetic Guidance Technology



“The Best Magnetic Guidance on the Market.”

### General Specifications

Weight / with batteries	860 lbs (390 kg) / 1,100 lbs (500 kg) with traction weight
Dimensions	W: 31" (790 mm) L: 78" (1980 mm) H: 14" (355 mm)
Traction Power	80 lbs constant, 160 lbs starting
Safety – Front/rear	ANSI B56.5 compliant bumper
Speed – Laser Bumper	15 to 160 FPM, ( 240 FPM w/Inertial Guidance) 6 speeds, 1 FPM increments
Rated Trailer	4,000 lbs ( 1,814 kg) @ 160 FPM, With 2% friction factor trailer wheels Capacity reduced by 10% when reversing 1% Incline/Decline 2,600 lbs @ 100 FPM
Battery Options	AGM 210 AH 24VDC battery pack AGM/TPPL 204 AH 24VDC battery pack
Automatic Charge	80 amp charge rate (if equipped)
Fast Automatic Charge	140 amp charge rate (if equipped)
Manual Charge	Up to 25 amp charge rate

### Environment

Environment – Atmosphere	0 to 40° C, 25% to 95% non-condensing humidity
Dust/Water-proof	No
Floor Specs – Edges/Debris	¼" abrupt elevation change maximum, smoothed
Expansion Joints	¼" maximum
Grade Rating	0%
Flatness	1% and ¼" variation in 5' or less
Floor Conductivity	0.6 coefficient of friction between wheels and floor, minimum
Static Dissipative	Less than 3.5 x 10 <sup>7</sup> Ω
Radio Communication	IEEE 802.11a/b/g, plus security encryption (if equipped)

### Detailed Specifications

Available Wheel Loading	Front add'l – 200 lbs, Rear add'l – 230 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 diameter 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 1-3/8" 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, 1-½" 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
Steer Angle Encoder	Yes
Steering/Stopping Accuracy	+/- ½" from physical path
HMI Display	3.5" color touch screen – errors & destinations
Manual Movement	Pendant – via pendant plug receptacle, Rescue dolly
Minimum Path Radius	24" – 90° turn, 30" – 180° turn
Drive Stalled Detection	Yes
Distance Initiated Functions	Yes – in 1" increments
Program Method	PC and Wireless (if equipped)
Obstacle Detection	180°, programmable up to 2.8 meters
Emergency Stop	Front
Wiring	Per NEC ampacity guidelines

\* For any applications greater than these specifications, please contact Engineering.

### 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. Wireless Bluetooth (optional)



Reverse Magnetic Tape Guidance – By just adding another guidance sensor and laser bumper, the M300-TT can act as a shuttle cart.



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