



REINVENT HOW THE WORLD CLEANS



# AMR Lithium- Ion

## Battery technology

A smarter way to power worry-free cleaning. Zero maintenance. Zero hassles. Maximum cleaning productivity.

### Key benefits

-  Zero maintenance
-  Long battery life
-  Simplified operations
-  Safer facilities
-  Maximized productivity

# Spend more time cleaning. Spend zero time worrying.

Make sure your equipment is ready to go all day, every day with lithium-ion battery technology. Create a true zero-maintenance power source: no battery watering, no fuel-tank replacement and storage, and no engine maintenance. With Tennant lithium-ion batteries, your machines are always ready to go and you spend zero time worrying.

## KEY BENEFITS



### Zero maintenance

No more battery watering. No more engine maintenance. No worries.



### Long battery life

Tennant's lithium-ion battery has a life of 2,000+ charge cycles. This means fewer battery replacements.



### Simplified operations

No need to train or learn complicated charging processes because opportunity charging does not reduce battery life.



### Safer facilities

Improve indoor air quality and reduce the risk of accidents by eliminating exposure to flammable fuels and battery acid.



### Maximized productivity

Optimize equipment uptime by spending more time cleaning and less time dealing with your power source.

## LITHIUM-ION VS. LPG/DIESEL/GAS FUEL

### Reduce cost to clean — and enhance safety

- Improved uptime: Full-shift cleaning without fuel tank filling/changing
- Lower costs: Zero engine maintenance, fuel costs, fuel storage costs, shop supply costs and significantly reduced training costs
- Enhanced safety: Zero fuel emissions, no flammable fuels on-site and lower dBa sound levels
- Sustainable cleaning: Eliminate reliance on non-renewable natural resources

## LITHIUM-ION VS. LEAD-ACID BATTERIES

### Maximize fleet performance — at a great value

- Improved uptime: Fast charging, longer runtimes and opportunity charging to minimize idle time
- Great value: Eliminates all worries associated with traditional wet batteries
- Low operating costs: Fewer battery replacements, no battery watering, lower charging costs and minimal training required
- Enhanced safety: No risk of encountering battery acid and no harmful gases produced during charging

# Tennant lithium-ion technology: A fully integrated solution

Lithium-ion batteries fully integrated with Tennant machines to deliver safety, efficiency and performance advantages over third-party offerings.

## 1. Battery SoC (state of charge)

**indicator state** of charge / discharge and fault status

## 2. Signal connector

Intelligent communication between the battery packs and machine

## 3. Battery management system (BMS)

Intelligent communication, protection, and diagnostics to the machine for optimal performance and long life (not shown)

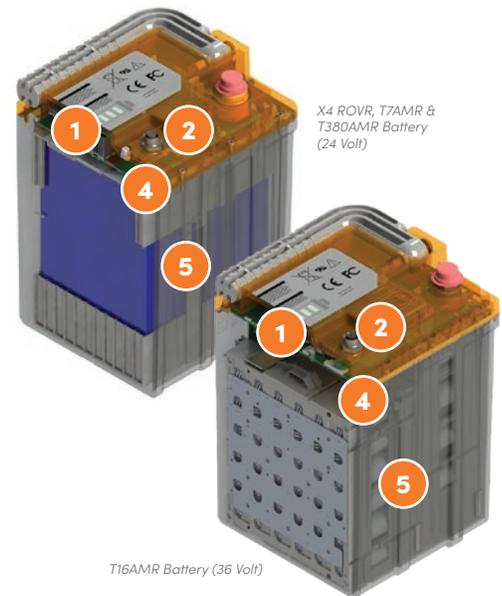
## 4. O-ring seal

IP65 rated protects the battery from dust and water exposure

## 5. Lithium-ion cells

High performance, reliable and safe

- 24V - Iron Phosphate
- 36V - Nickel Cobalt Aluminum
- More energy dense
- Provides 30% more energy & peak power to support performance needs of larger cleaning equipment



## KEY BENEFITS

### Leading edge lithium technology

Lithium-ion battery technology provides exceptional energy density for longer runtimes than other battery types.

### Fully integrated design

Unlike many lithium-ion batteries, each Tennant lithium-ion battery is fully integrated with the Tennant machine for worry-free operations. The battery discharge indicator is always visible, and the scrubbing function shuts down at 95% depth of discharge leaving enough power to get to a charging area.

### Battery management system (BMS)

An intelligent system provides continuous communication between battery and machine to protect the user and equipment from unsafe operating conditions.

### 5-year warranty & Tennant support

A comprehensive 5-year warranty\* backed by unmatched Tennant service support and expertise provides peace-of-mind.

### Proven in extreme environments

Tennant's lithium-ion batteries are a proven power source in rigorous applications and environments. Extensively testing meet relevant UL, IEC and UN 38.3 standards for safety.

# Lithium-ion availability

Lithium-ion batteries are available on AMR machines.



**X4 ROVR**  
90AH (2.3 kWh)

**T380AMR**  
180AH (4.6 kWh)

**T7AMR**  
360AH (9.2 kWh)

**T16AMR**  
320AH (11.5 kWh)

**Contact your Tennant sales representative to see how lithium-ion technology can help your operations.**

## Tennant – Reinvent how the world cleans

With a vision to become a global leader in sustainable cleaning innovation that empowers our customers to create a cleaner, safer and healthier world, Tennant creates solutions that are changing the way the world cleans.



### We are where you are

Tennant has the industry's largest direct sales and service organization and a well-supported network of authorized distributors worldwide.



### Buying, leasing, renting

We offer flexible options to get you the machines you need, however you need them.



### Solutions for your unique needs

Tennant's dedicated AMR customer success focuses on making your robotic cleaning program successful. Our industry-leading customer success team combines their robotics implementation experience and in-depth knowledge of cleaning equipment to serve our robotics customers.



### TennantTrue®

Optimize equipment performance and protect your investment with TennantTrue® parts and service.

For a demonstration or additional information, call **+1.800.553.8033** or email **info@tennantco.com**

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