

ITW GSE

# 7400 eGPU



Zero Emission

Battery-powered Ground Power Unit  
Ideal for hangars and remote stands with  
no fixed 400 Hz installations



**Aviation  
Ground  
Equipment Corp.**

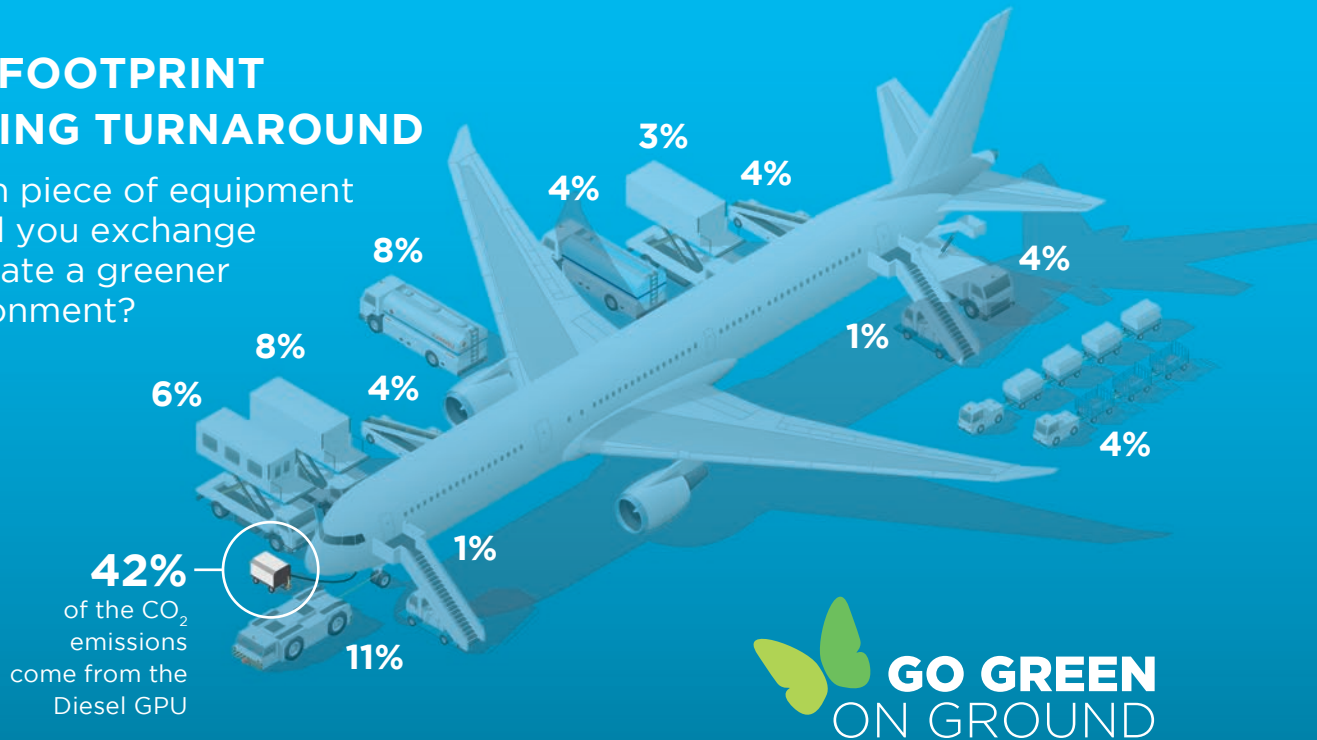
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It's all about connections



## CO<sub>2</sub> FOOTPRINT DURING TURNAROUND

Which piece of equipment would you exchange to create a greener environment?



## IT'S THE GREEN WAY OR NO WAY

Airports all over the world are beginning to think greener. At the time of writing, almost half of global passenger traffic passes through Airport Carbon Accredited airports. The number of these airports is rapidly increasing, and more and more airports are interested in reducing their environmental impact. Often the world's largest airports are located next to major cities that are growing in line with global trends, meaning cities and airports are coming into ever-closer contact. This leads to stricter requirements in terms of the emissions local governments can and will accept.



### BATTERY-POWERED GSE MARCHES FORWARD

To reduce emissions to airports, battery powered Ground Support Equipment is rapidly replacing diesel-powered equipment such as cargo loaders and pushback tractors. However, 400 Hz Ground Power Units are an even greater energy guzzler. More energy needs to be delivered over a longer time period. This is why ITW GSE's

groundbreaking and environmentally friendly 7400 eGPU is a game changer. A great benefit stands to be gained from replacing popular diesel-hungry GPUs and creating a better environment. Did you realize that savings would correspond to emissions in the range of approx. 88,000 kgs / 190,000 lbs of CO<sub>2</sub>, 80 households, 50 cars or 100 acres of forest?

**190,000 LBS CO<sub>2</sub>**



**80 HOUSEHOLDS**

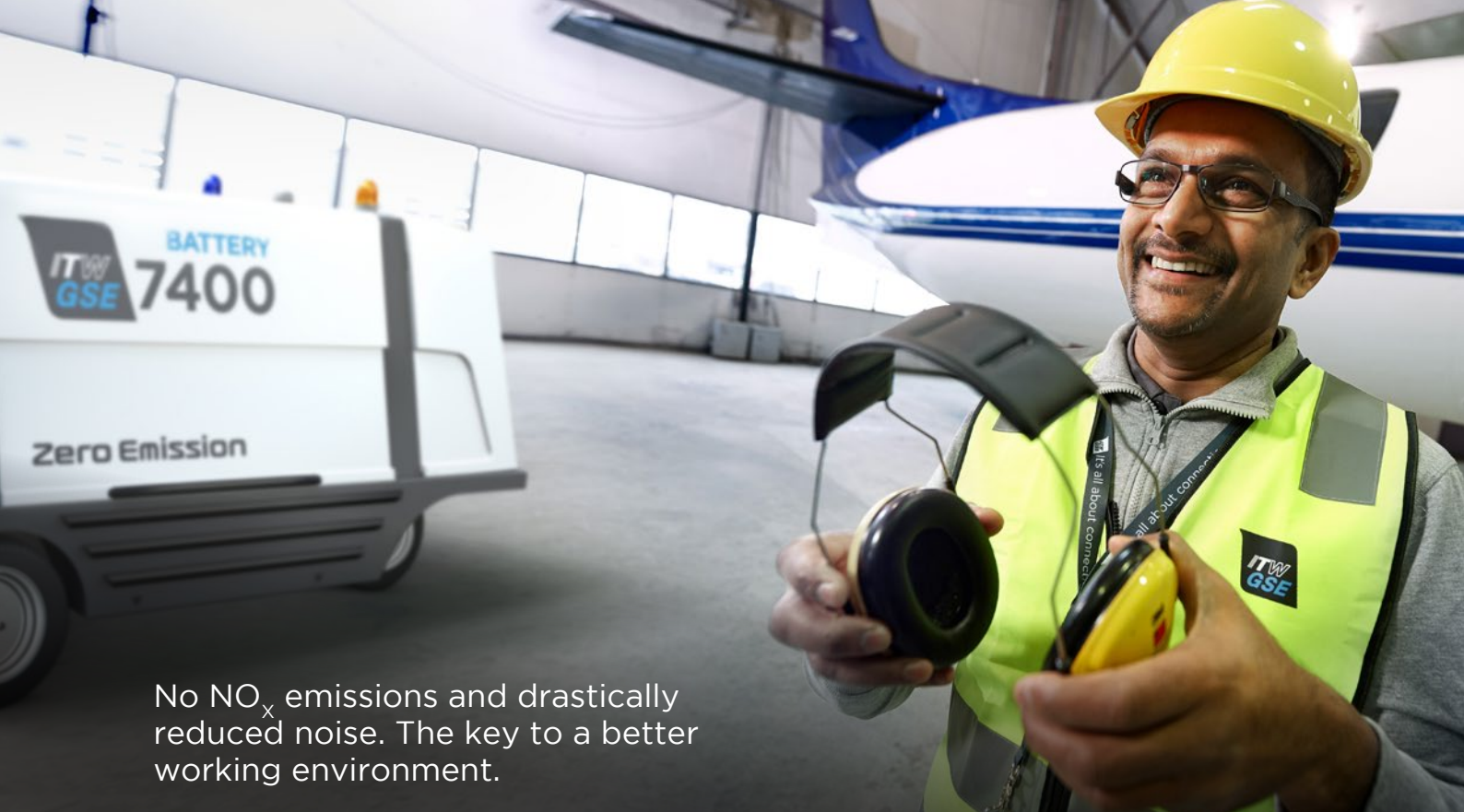


**50 AVG. CARS**



**100 ACRES FOREST**

(Numbers are subject to change depending on country)



No NO<sub>x</sub> emissions and drastically reduced noise. The key to a better working environment.

# A GIANT LEAP FORWARD THAT LEAVES A TINY FOOTPRINT

WITH AN ITW GSE 7400 eGPU, YOU CAN REDUCE YOUR CO<sub>2</sub> EMISSIONS BY 90% AND NO<sub>x</sub> EMISSIONS BY 95%

## CO<sub>2</sub> EMISSIONS

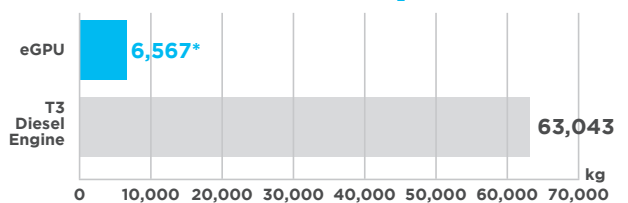
Diesel GPUs have high fuel consumption since they need to be constantly running at high engine speeds to generate the 400 Hz power an aircraft requires. This means high CO<sub>2</sub> emissions and high noise levels.

The ITW GSE 7400 eGPU is a zero-emission alternative that uses battery power instead of conventional diesel, meaning it is practically clean and silent.

## NO<sub>x</sub> EMISSIONS

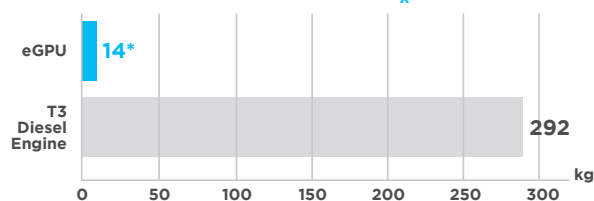
Diesel GPUs have a high level of NO<sub>x</sub> emissions. The harmful health effects hereof are becoming increasingly better understood. The eGPU emits no NO<sub>x</sub> into its operating environment, so it can contribute significantly to a cleaner and safer working environment for your employees.

### OVERALL IMPACT ON CO<sub>2</sub> EMISSIONS



CO<sub>2</sub> emissions for 1 unit for 1 year (Avg. 5 ½ operating hours per day)

### OVERALL IMPACT ON NO<sub>x</sub> EMISSIONS



Annual NO<sub>x</sub> emissions (Avg. 5 ½ operating hours per day)

\*Calculated using average power plant emissions based on data from [electricitymap.org](http://electricitymap.org)



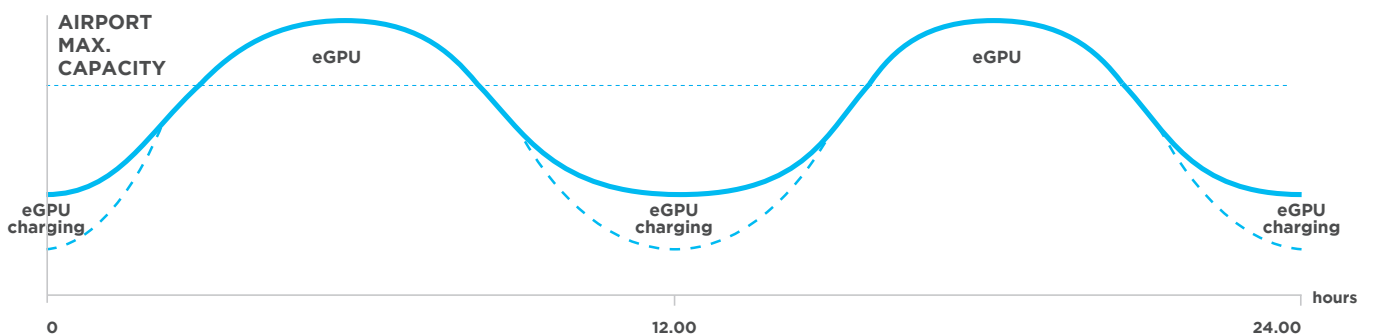
# GROW THE CAPACITY OF YOUR EXISTING INFRASTRUCTURE



## WITH THE 7400 BATTERY eGPUs

Airports frequently experience peak load periods with a consumption level very close to the power grid's maximum capacity. Increasing the grid capacity requires huge investments in infrastructure.

Making eGPUs a part of your airport's electrical infrastructure allows you to smooth out your capacity demands over a 24-hour period. The eGPUs can be charged during quiet periods and contribute to increasing total capacity in peak periods.

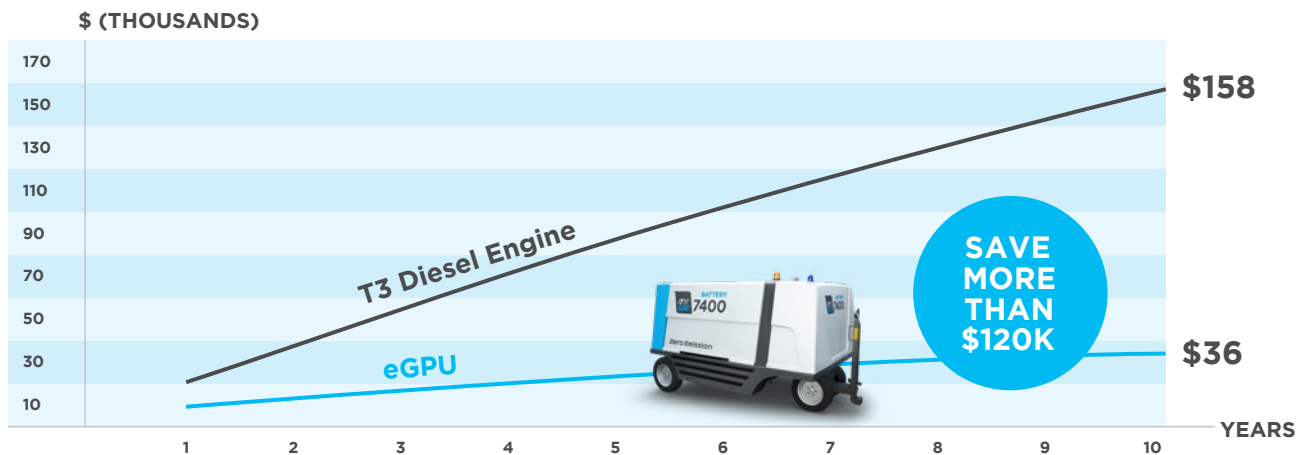


**eGPUs CAN MITIGATE OR ELIMINATE THE NEED FOR EXPENSIVE UPGRADES  
OF AIRPORT INFRASTRUCTURE**

# SAVE MORE THAN \$120,000 ON OPERATING EXPENDITURES

The 7400 GPU is a unique product with a green approach. Thanks to its lack of moving parts, vulnerable to wear and tear, maintenance costs are almost non-existent, meaning overall operating

costs stay low. With current electricity prices and maintenance costs, the eGPU is a clear winner in comparison to a diesel GPU.



## CUMULATIVE OPEX - DIESEL ENGINE GPU VS eGPU

The graph shows the cumulative operating costs of a diesel GPU and an eGPU used 5 ½ hours/day/year. Lower electricity and maintenance costs make the eGPU a winner in this comparison. Provide your fuel and electricity prices for a customized calculation of *YOUR* savings.

## FROM AMSTERDAM TO BRISBANE AND FRANKFURT TO LOS ANGELES

Environmentally conscious airports are already benefitting from the eGPU

In 2017, a desire to develop Schiphol airport's sustainability led to Nissan and ITW GSE carrying out a comprehensive test of a prototype eGPU based on Nissan Leaf battery technology in combination with an ITW GSE 2400 converter. The result was clear. After the test, Marcel van Beek, Manager for Process Innovation at Schiphol said:

### “THE FUTURE LOOKS CLEAN AND BRIGHT”

The desire was for a quiet, zero-emission eGPU with light maintenance requirements and solid reliability that did not require retraining employees. The 7400 eGPU was the answer.

During Autumn 2018, the Royal Schiphol Group took the first eGPU into regular service. And so did FRAPORT, Brisbane Airport, United Airlines and customers in the UAE.



Plug & Play  
Voltage  
Compensation

Use in  
hangars  
– no input  
power  
cables

Mobile  
GPU and  
linepowered  
converter  
in one unit

On-Board  
Charging  
System

BC

Can supply  
power and  
recharge at the  
same time

Recharge  
from any  
50/60Hz  
standard  
socket



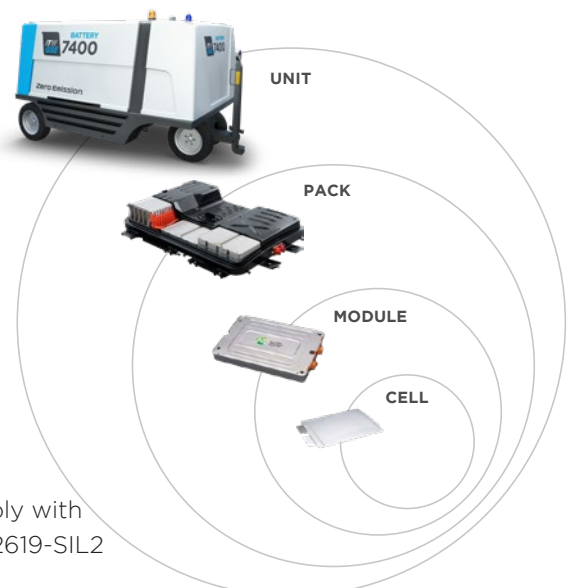
## EXTREME FLEXIBILITY

The ITW GSE 7400 eGPU changes how airports think about ground power without making compromises. It is independent due to the onboard battery packs and can easily be transported to wherever it is needed. The flexibility of the 7400 eGPU provides the same outstanding, well-proven

features as other ITW GSE solid-state GPUs, including accurate and clean output voltage at the aircraft plug, and individual phase regulation of each output phase. It can perform multiple turnarounds before it needs recharging, and can be recharged from any standard 50/60Hz socket.

## FOUR SHIELD SAFETY DESIGN

The ITW GSE 7400 eGPU has a four shield safety design. Each cell contains resistance for internal shorts circuit. The module can withstand deformation. The battery pack is fail-safe, and waterproof too. In testing, it can withstand free falls from a height of 6 meters (19.6 feet). And finally, the outermost layer is crush safe. It has a total of four shields which form an effective protective layer against hazardous impacts of a mechanical, electrical, and thermal nature.



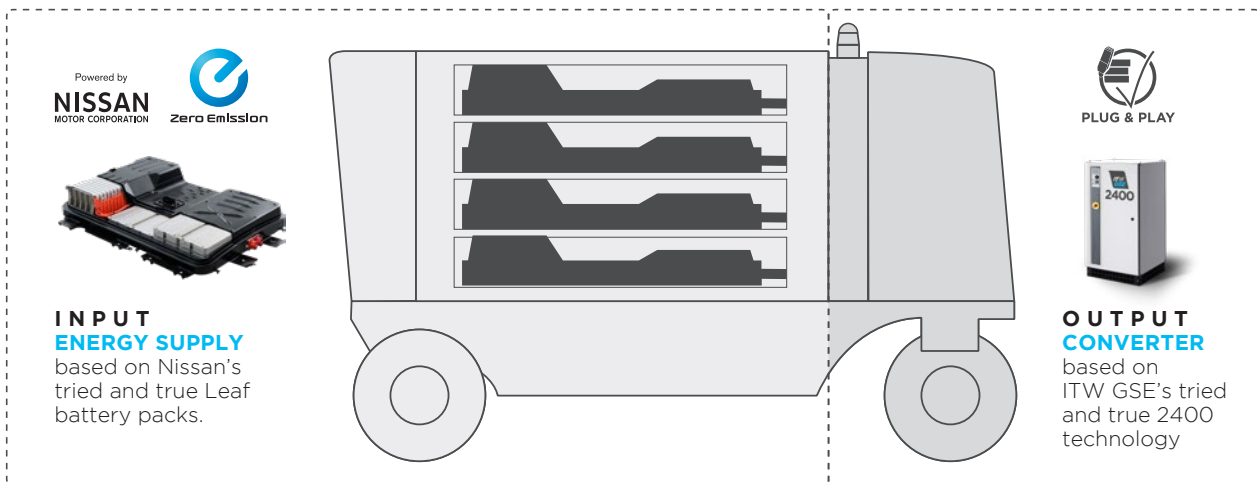
Comply with  
EN 62619-SIL2

# A WELL-PROVEN SOLUTION

## THE ITW GSE 7400 eGPU COMBINES TWO KNOWN TECHNOLOGIES INTO ONE INNOVATIVE GPU

The ITW GSE 7400 eGPU is powered by 4 fourth-generation Nissan Leaf battery packs. Each pack has a capacity of 40 kWh. This is the same type of battery found in all Nissan-branded electric vehicles. Since 2010, over 400,000 of these vehicles have been sold, with close to 90,000 in 2018 alone.

At the output of the eGPU is ITW GSE's well-proven 2400 solid-state converter. This combination of two tried and true technologies has created the rock-solid eGPU. The eGPU is, of course, equipped with our patented Plug & Play system and can therefore deliver a unique voltage at the aircraft plug, right where it matters.



## SAME EASY-TO-USE PLATFORM AS ALL OTHER ITW GSE PRODUCTS

Like all ITW GSE products, the 7400 eGPU has a common icon-based user interface that is as easy to use as a smartphone or a tablet. This means airport employees already familiar with one ITW GSE product can easily operate another, reducing human error during operation and making product training easier.

### MODULAR DESIGN

Modular design is the hallmark of ITW GSE. The 7400 eGPU is built from modular components. This ensures fast replacement, servicing and spares communality.







Zero Emission

## SPECIFICATIONS

ITW GSE 7400 eGPU

324 South Service Road, Unit 104  
Melville, NY 11747 Tel (631)815-5520 |  
Toll-Free (800)758-0044  
Email: sales@aviationgroundequip.com

## Input

- Charger input range:  
3 phased @ 260-520 V / 45-65 Hz

## Charging Time :

Pre-Fuse			
16 A	32 A	63 A	125 A
< 15 h	< 8h	< 4 h	< 3 h

Values based @ 3x400 V and 20°C ambient

## Output

- Rated power: 90 kVA PF 0.8-1
- Voltage: 3 x 115/200 V
- Frequency: 400 Hz  $\pm$  0.1%
- Power factor: 0.7 lagging to 0.95 leading
- Voltage regulation:  
<0.5% for balanced loads and up to 30% for unbalanced loads
- Voltage recovery:  $\Delta$ <8% and recovery time<10 ms to 100% load change
- Total harmonic content:  
<2% at linear load (typically 1.5%)  
<2% at non-linear load according to ISO 1540
- Crest factor: 1.414  $\pm$  3%
- Voltage modulation: <1.0%
- Phase angle symmetry:  
120°  $\pm$  1° for balanced loads  
120°  $\pm$  2° for 30% unbalanced loads

## Protection

- Protection class: IP55
- No break power transfer
- Over/under voltage at output
- Overload
- Internal high temperature
- Control voltage error
- Short circuit at output
- Plug insertion interlock
- Neutral voltage supervision
- Neutral voltage displacement
- Leakage current supervision

## Overload Ratings

- As per ISO 6858:2017- type 1 equipment

## Weight

- Mobile unit: 2,100 kg (4,630 lbs)

## Turnarounds as Function of Time and Aircraft

Based on average measured consumption. Subject to aircraft configuration.		4 Packs (160 kWh)		
		Time at gate in minutes		
Aircraft Narrow Body 1 x 90 kVA Unit	CRJ-900LR	16	11	8
	A320-200	15	10	9
	A321-200	8	5	4
	B737-800	10	6	5
Aircraft Wide Body 2 x 90 kVA Unit	A340		6	5

Depending on ambient conditions and usage, the capacity can be expected to derate up to 30% over 10 years

## Norms and Standards

- DFS400 Specification for 400 Hz Aircraft Power
- MIL-STD-704F Aircraft Electric Power Characteristics
- SAE ARP 5015 Ground Equipment - 400 Hertz Ground Power Performance Requirements
- ISO 6858:2017 Aircraft Ground Support Electrical Supplies
- EN 62619:2017 Safety Requirements for Li-Ion Batteries
- UN38.3 Certified Battery System
- EN 62040-1-1 General & Safety Requirement
- EN 61558-2-6 General & Safety Requirement
- EN 61000-6-4 Electromagnetic Compatibility
- EN 61000-6-2 Generic Standards - Emission Standard
- EN 1915-1 & 2 Generic EMC Standards
- EN 12312-20 Machinery; general safety requirements

## Environmental

- Operating temperature:  
-10°C to 45°C (14°F to 113°F)  
without additional heating/cooling.  
For other operational temperatures,  
please contact ITW GSE
- Relative humidity: 10-100%
- Noise level: <65 dB(A) @1 m  
- typically 60 dB(A)

## Efficiency

- 400 Hz converter and charger part  
> 0.95

## Miscellaneous

- MTTR: max. 20 minutes
- Color: RAL 7035, Light grey (standard)  
Trailer: RAL 7043, Traffic Grey  
Rear cover: Pantone 2393, Cleantech Blue



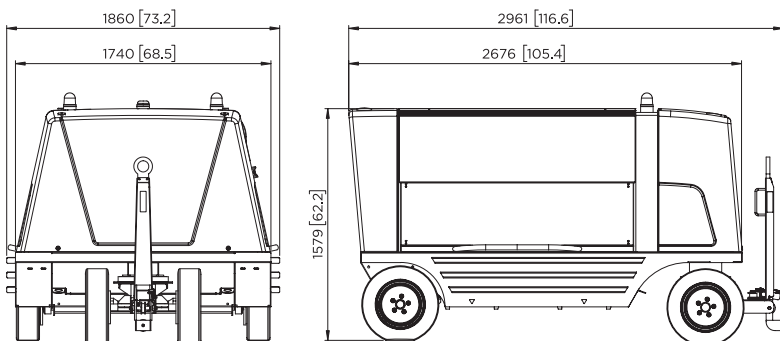
## Standard Features/Equipment:

- Plug & Play automatic voltage compensation
- Adjustable max. input current settings  
(e.g. 16 to 125 A in steps of 1 A)
- Beacon for operation/charging\*
- Beacon for warning/low battery\*  
incl. siren
- Towbar interlock (non-lock version)
- Simultaneous charging while supplying  
400 Hz power

\*Color acc. to customer specification

## Standard Options Available

- Dual 400 Hz output (excludes ARU option)
- 28 VDC / 600 A ARU (Automatic Rectifier Unit)  
Simultaneous usage 45 kW(AC)  
+ 300 A (DC)
- Input cable and plug according to  
clients specifications
- 4 x 50 mm<sup>2</sup> output cable (AWG 1/0)  
(recommended)
- Lockable towbar interlock
- Towbar with DIN40 towing eye
- White clearance light
- TrackUnit incl. APP & Data Manager  
(data/location over GSM/GPS)
- Ability to power the 7400 from another  
GPU in case of unexpectedly long  
turnaround time
- Forklift pocket for transportation



Dimensions are shown in mm and [inches]

Specifications are subject to change without prior notice



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