ITW GSE

2400 COMPACT GPU

ECO GATE ENABLED

Small and powerful solid-state GPU
30-45-60-90-120-140-180 kVA

PLUG & PLAY
UNIQUE VOLTAGE QUALITY

ITW GSE 2400 GPU
ISO 6858: 2017(E)
IN COMPLIANCE WITH

It's all about connections

OPTIMAL POWER AT THE AIRCRAFT

GO GREEN ON GROUND

At ITW GSE, we monitor the market and are at the forefront of new aircraft requirements and market developments. This has been an objective since we introduced our first 400 Hz unit to the market. The 2400 series is the market's best choice when it comes to solid-state, point-of-use units. It is small and simple, reliable and robust. It has outstanding technical qualities from the unique output voltage, the smart ITW GSE user interface, software update via USB and the standard overload capabilities that matches all types of aircraft.

UNIQUE VOLTAGE QUALITY AT THE PLUG MEANS ON-TIME DEPARTURES

ITW GSE's Plug & Play voltage compensation system ensures that the 2400 keeps the required voltage quality (115±3 V) at the aircraft connector. The Plug & Play system is based on a true individual phase regulation combined with a predetermined model of the actual cable installation. Therefore, the 2400 GPU provides an outstanding voltage quality at the connector thus ensuring on-time departures and happy passengers!

ECOGATE – ADVANCING GATE ECONOMICS

EcoGate is a new approach to power and air supply that enables airports to improve gate capabilities using their existing infrastructure. By linking your ITW GSE ground support equipment together in an integrated system, EcoGate unlocks new efficiencies and removes power-related barriers to affordable progress at the gate. As the heart of EcoGate, the ITW GSE 3500 PCA uses intelligent power management to monitor power consumption and needs, and then allocates power dynamically. Since your GPU is the most critical connection, the 3500 PCA always makes sure this unit gets the power it needs, adjusting its own consumption to ensure that your total gate power capacity is never exceeded.

FURTHER BENEFITS OF THE ITW GSE 2400

- 400% overload
- 90 kW continuous at an ambient temperature of 56°C
- Clean input power with a unity power factor and a current THD less than 5% due to the magnetic wave-shaping topology
- TCP / IP connection to BMS as standard

SPECIFICATIONS

ITW GSE 2400 30-45-60-90 kVA solid-state GPU

Input

Type	Amps (0.8)	Amps (1.0)	Hertz	Voltage
30 kVA	63 A	78 A	45-65	230 ± 15%
	38 A	49 A	45-65	400 ± 15%
	32 A	41 A	45-65	480 ± 10%
	26 A	33 A	45-65	600 ± 15%
45 kVA	91 A	114 A	45-65	230 ± 15%
	58 A	70 A	45-65	400 ± 15%
	48 A	59 A	45-65	480 ± 10%
	38 A	47 A	45-65	600 ± 15%
60 kVA	75 A	93 A	45-65	400 ± 15%
	63 A	80 A	45-65	480 ± 10%
	50 A	64 A	45-65	600 ± 15%
90 kVA	112 A	141 A	45-65	400 ± 15%
	94 A	117A	45-65	480 ± 10%
	75 A	94 A	45-65	600 ± 15%

- Rectification: Magnetic wave-shaping
- Line current distortion:
  90 kVA <5%, 60 kVA < 9%
  45 kVA< 10%, 30 kVA < 12%
- Power factor:
  90 kVA: 1 @ nominal load
  45-60 kVA: 0,99 30 kVA: 0,97
- Inrush current: None

Output

- Rated Power: 30-45-60-90 kVA PF 0,8-1
- Voltage: 3 x 115/200 V
- Frequency: 400 Hz ± 0,1%
- Power factor:
  0,7 lagging to 0,95 leading
- Voltage regulation:
  <0,5% for balanced load and up to 30% unbalanced load
- Voltage recovery: ΔU <8% and rec. time <10 ms at 100% load change
- Total harm. content: <2% at linear load (typ. 1,5%) <2% at non linear load according to ISO 1540
- Crest factor: 1,414 ± 3%
- Voltage modulation: <1,0%
- Phase angle symmetry:
  120° ± 1° for balanced load
  120° ± 2° for 30% unbal. load

Specifications are subject to change without prior notice

Protection

- Protection class: IP55
- No break power transfer
- Over/under voltage at output
- Overload
- Internal high temperature
- Control voltage error
- Short circuit at output
- GPU enable
- 90% switch interlock
- Neutral voltage supervision
- Broken neutral supervision
- Leakage current supervision

Weight

- Fixed & PBB units: 310 kg (683 lbs.)
- Mobile units: 460 kg (1,014 lbs.)

Efficiency

- Overall efficiency:
  0,94 at 35-90 kVA load PF 0,8
  0,90 at 25 kVA load PF 0,8
- Stand by losses: 65 W
- No load losses: 2,2 kW

Environmental

- Operating temperature:
  -40°C to 56°C (-40°F to +132°F)
  (+60°C (+140°F) at Aircraft Load)
- Relative humidity 10-100%
- Noise level <65 dB(A)@1m
  - typically 60 dB(A)

Overload Ratings

- 125% for 600 seconds
- 150% for 60 seconds
- 200% for 30 seconds
- 300% for 10 seconds
- 400% for 1 second

Miscellaneous

- MTTR: max. 20 minutes
- Colour: RAL 7035 (standard)

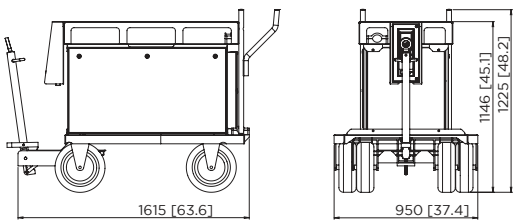
Available Standard Options

- 28 VDC, 600 A output (ARU)
  Kindly refer to page "Power two aircraft with just one GPU"
- Additional base module
- Additional output contactor
- Terminal extension for 2 pcs. of 7 core cable
- Remote control box
- Lockable door
- Door switch
- RS485 interface
- Military interlock
- Dry Contacts
- ITW GSE service tool
- Power Share: 50/60 Hz receptable for charging of eGPU's or other AC Units

Norms and Standards

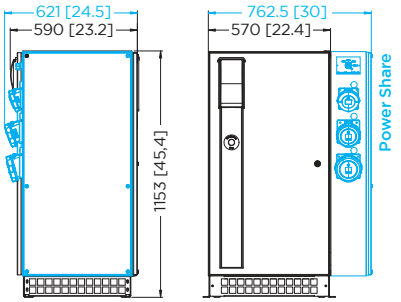
- See next page

Mobile Unit

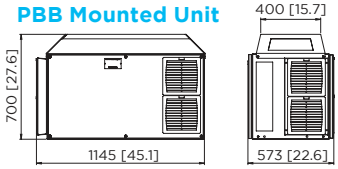


Fixed Unit

Numbers in blue is for Power Share.



PBB Mounted Unit



Converter for under-bridge mounting

Dimensions are shown in mm and [inches]

ITW GSE 2400 120-140-180 kVA solid-state GPU

Input

Type	Amps (0.8)	Amps (1.0)	Hertz	Voltage
120 kVA	150	190	45-65	400 ± 15%*
	125	160	45-65	480 ± 10%*
	105	130	45-65	600 ± 15%*
140 kVA	175	220	45-65	400 ± 15%*
	150	185	45-65	480 ± 10%*
	120	150	45-65	600 ± 15%*
180 kVA	230	285	45-65	400 ± 15%*
	195	240	45-65	480 ± 10%*
	150	190	45-65	600 ± 15%*

* Values adjusted to next 5A value

- Rectification: Magnetic wave-shaping
- Line current distortion: 120 kVA: 9%, 140 kVA: 7%, 180 kVA: 5%
- Power factor: 120 - 140 kVA: 0,99 180 kVA: 1 @ nominal load
- Inrush current: None

Output

- Rated Power: 120-140-180 kVA PF 0,8-1
- Voltage: 3 x 115/200 V
- Frequency: 400 Hz ± 0,1%
- Power factor: 0,7 lagging to 0,95 leading
- Voltage regulation: <0.5% for balanced load and up to 30% unbalanced load
- Voltage recovery: ΔU <8% and rec. time <10 ms at 100% load change
- Total harm. content: <2% at linear load (typ. 1,5%) <2% at non linear load according to ISO 1540
- Crest factor: 1,414 ± 3%
- Voltage modulation: <1,0%
- Phase angle symmetry: 120° ± 1° for balanced load 120° ± 2° for 30% unbal. load

Protection

- Protection class: IP55 input & output zones
- No break power transfer
- Over/under voltage at output
- Overload
- Internal high temperature
- Control voltage error
- Short circuit at output
- GPU enable
- 90% switch interlock
- Neutral voltage supervision
- Leakage current supervision

Weight

- Fixed & PBB units: 650 kg (1,433 lbs.)

Efficiency

- Overall efficiency: 0.93 at 180 kVA load PF 0.8-1
- Stand by losses: 150 W
- No load losses: 4,4 kW

Environmental

- Operating temperature: -40°C to +56°C (-40°F to +132°F) (+60°C (+140°F) at Aircraft Load)
- Relative humidity 10-100%
- Noise level < 65 dB(A) @1m

Overload Ratings

- 125% for 600 seconds
- 150% for 60 seconds
- 200% for 30 seconds
- 300% for 10 seconds
- 400% for 1 second

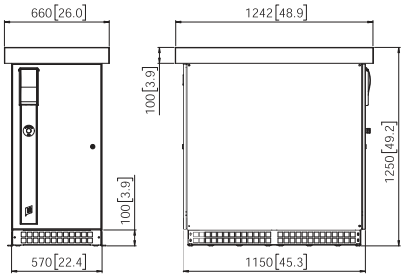
Miscellaneous

- MTTR: max. 20 minutes
- Colour: RAL 7035 (standard)

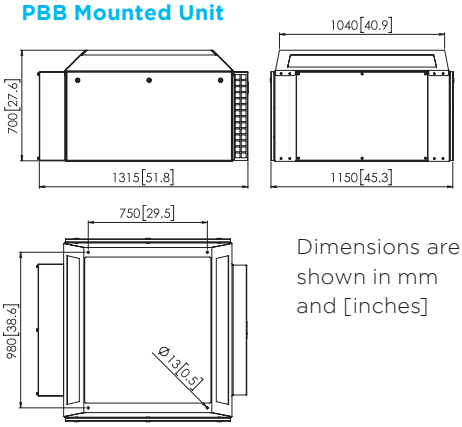
Available Standard Options

- Additional base module
- Single output configuration
- Terminal extension for 2 pcs. of 7 core cable
- Remote control box
- Lockable door
- Door switch
- RS485 interface
- Military interlock
- Dry Contacts
- ITW GSE service tool
- Power Share: 50/60 Hz receptable for charging of eGPU's or other AC Units

Fixed Unit



PBB Mounted Unit



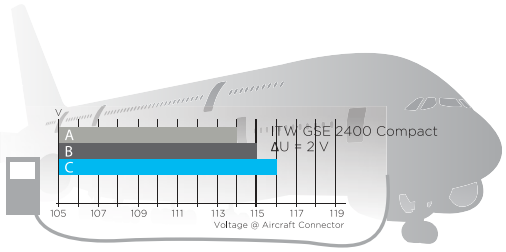
Dimensions are shown in mm and [inches]

Norms and Standards (valid for 30 to 180 kVA units)

- DFS400 Specification for 400 Hz aircraft power
- ISO 6858:2017(E) Aircraft ground support electric supplies
- BS 2G 219 General requirements for ground support equipment
- MIL-STD-704F Aircraft electric power characteristics
- SAE ARP 5015 Ground equipment 400 Hz ground power performance requirement
- EN2282 Aerospace series characteristics of aircraft electrical supplies
- EN62040-1-1 General & safety requirement
- EN61558-2-6 General & safety requirement
- EN61000-6-4 Electromagnetic compatibility Generic emission standard
- EN61000-6-2 Generic immunity standard
- EN1915-1&2 Machinery; general safety requirements
- EN12312-20 Machinery; specific safety requirements
- Listed per UL1012 (Only valid for 230/480/600V versions)

UNIQUE VOLTAGE QUALITY

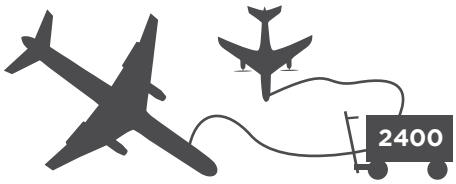
The output voltage quality of the ITW GSE 2400 Compact is unique due to the Plug & Play system.
The ITW GSE 2400 is designed to fulfil the ISO 6858:2017(E) standard that requires max. phase unbalance of less than 4 V and a phase angle of 120° ± 2.5°.
The example to the right shows the voltage of the 3 phases at 35% unbalanced load @ PF 0.8 by use of a typical cable consisting of 65 m of 7x35 mm² installation cable and 26 m of 4x70 mm² flexible cable.



The ITW GSE 2400 Compact fulfils the ISO 6858:2017(E) standard

SUPPLY ALL AIRCRAFT INCL. PF1

The ITW GSE 2400 Compact is a true Power factor 1 ground power unit that allows for 400% overload meaning that it can be used for all types of aircraft from the narrow-body to the wide-body incl. B787/A350/A380.



COMMON DESIGN PLATFORM

The backbone of all ITW GSE design is our common design platform that offers significant advantages. All products are equipped with the ITW GSE operator interface that is easy and intuitive to use. This is your guarantee for correct operation and on-time aircraft departures. The operator interface is common from one ITW GSE product to another. Therefore, airport staff familiar with one ITW GSE product can easily switch to another as the icons and display are the same. The operator only has to press the combined start/stop button. Also, he can monitor various parameters such as voltage and current at the display screen.

MAXIMUM PERSONAL SAFETY

- Protective covers behind access doors to prevent accidental exposure to “live” parts
- Supervision of neutral conductor rupture & leakage current
- Supervision of neutral voltage
- Detection of hazardous voltages at aircraft frame (by supervision of interlock voltage)
- Avoidance of hazardous voltages in control wires through prevention of insulation failures in cable or plug

EASY CABLE CONNECTION

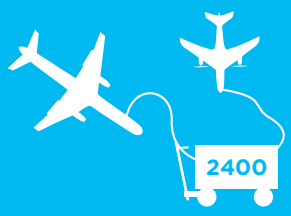
Connection of the rigid in- and output cables is easy since there is room for a very good manoeuvrability at the bottom of the cabinet. Further, we have integrated a robust bar at the bottom for cable relief. Access to the vital parts of the converter is extremely easy since those parts have all been positioned right behind the front door in a well-arranged way.

PUT YOUR EXCESS POWER TO WORK

To make more of your available gate power, add on an ITW GSE Power Share. This smart power outlet box lets you allocate excess power from your 2400 to eGPUs and other AC units – without having to upgrade gate infrastructure. Power Share can be attached to your fixed 2400 GPU or installed independently and connected to a Power Coil or PCA. To ensure power and air supply continuity, Power Share always prioritizes the needs of your GPU and PCA. Supply to other equipment is toggled automatically when power is available.

POWER TWO AIRCRAFT WITH JUST ONE GPU?

Yes – Choose option
ITW GSE 2400 Combi Compact Unit



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Often, the same parking position accommodates a large mix of aircraft during a day. Typically, a parking position would require a 400 Hz source in the morning where the bigger aircraft are docking – but 28 V during other times of the day. Is this your requirement, the 2400 Compact Combi unit is the answer.

The combi unit is capable of delivering 400 Hz and regulated 28 VDC power, simultaneously and independently! The 28 V Active Rectifier Unit (ARU) - available as a standard option - delivers superior voltage quality at the aircraft plug without jeopardising the 400 Hz voltage. It goes without saying that the ITW GSE 2400 Compact Combi will power your aircraft, whether a narrow body or a turbo prop, whenever you need it!

Output Specifications, 28 VDC ARU

- Voltage: 28 VDC
  Max. output power for complete unit is limited to the nominal rating of the 400 Hz part of the unit
- Current: 600 A (400 A) continuously
- Voltage regulation: < 0,5%
- Voltage ripple: < 2%
- Voltage transient recovery
  Complies with ISO 6858:2017(E) / MIL-704F
- Overload capability: 600 A (400 A)
  1200 A (800 A) for 30 seconds
  1800 A (1200 A) for 10 seconds
  2100 A (1400 A) for 5 seconds
  2400 A (1600 A) for 2 seconds
  To protect the aircraft, the output voltage is decreased by 2 V per 600 A (400 A) in the overload range 600-2400 A (400-1600 A)
  Complies with ISO 6858:2017(E)

Setup:

- Output voltage: 19-33 V
- Voltage compensation: 0-3 V (600/400 A)
- Current limit: 300-2400 A in steps (600 A units)
  200-1600 A in steps (400 A units)

Protection

- Rectifier temperature too high
- Short circuit at output
- Over and under voltage at output
  U < 20 VDC for more than 4 seconds
  U > 32 VDC for more than 4 seconds
  U > 40 VDC for more than 150 ms

Weight

- Fixed Combi Compact: 410 kg (903 lbs.)
- Mobile Combi Compact: 585 kg (1,290 lbs.)

Environmental

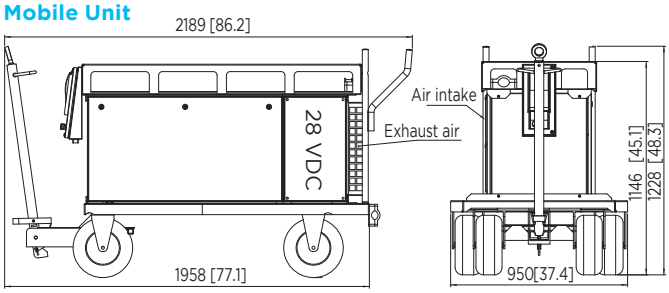
- Operating temperature -40°C to +45°C (-40°F to 113°F)

Available Ratings

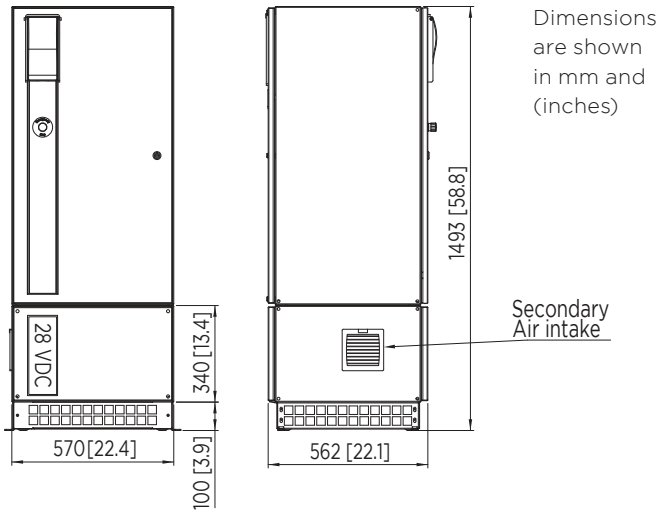
- 30 kVA with 28 VDC ARU
- 45 kVA with 28 VDC ARU
- 60 kVA with 28 VDC ARU
- 90 kVA with 28 VDC ARU

All available in fixed and mobile versions

Mobile Unit

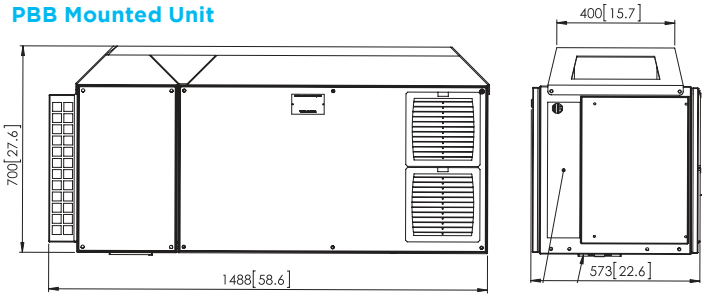


Fixed Unit



Dimensions are shown in mm and (inches)

PBB Mounted Unit



It's all about connections