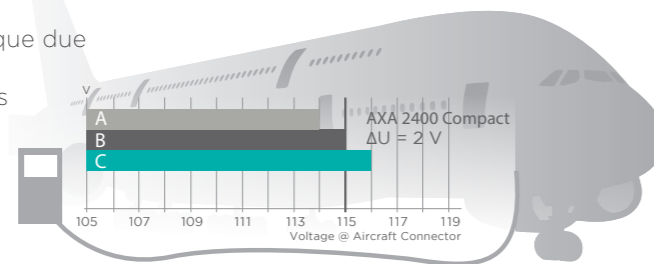


## UNIQUE VOLTAGE QUALITY

The output voltage quality of the AXA 2400 Compact is unique due to the patented Plug & Play system. The AXA 2400 is even designed to fulfil the coming ISO 6858 standard that requires max. phase unbalance of less than 4 V and a phase angle of  $120^\circ \pm 2.5\%$ .

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 mm<sup>2</sup> installation cable and 26 m of 4x70 mm<sup>2</sup> flexible cable.



The AXA 2400 Compact is designed to fulfil the coming ISO 6858 norm

## SUPPLY ALL AIRCRAFT INCL. PF1

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



## THE ITW GSE OPERATOR INTERFACE

The ITW GSE operator interface is easy and intuitive. This is your guarantee for correct operation and on-time aircraft departures. 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. For easy set-up and maintenance purposes, there is a deeper level dedicated for the technician. 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.



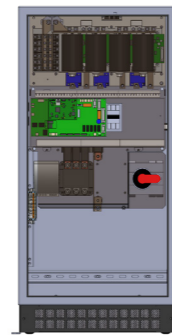
## MAXIMUM PERSONAL SAFETY

- 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 are 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.



## DOWNLOADS AND UPDATES

The software-based control system means your AXA 2400 COMPACT can be updated and given additional capabilities in the future, simply by transferring new software from a USB stick/flash drive. Service log files and maintenance data can also be transferred the same way for analysis and to help ensure more efficient back-office procedures and more effective facility management.



## POWER TWO AIRCRAFT WITH JUST ONE GPU?

YES - CHOOSE OPTION  
**AXA 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 AXA 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 AXA 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 / 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

### Setup:

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

### 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
- Mobile Combi Compact: 585 kg

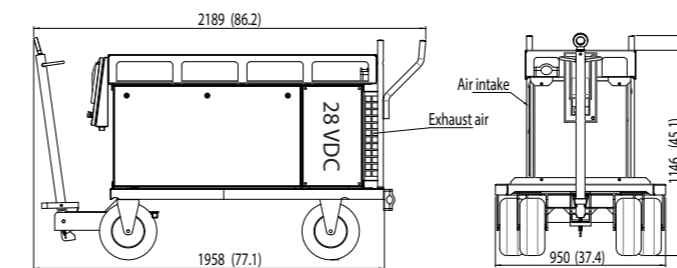
### Environmental :

- Operating Temperature: Max. 45°C (complete unit)

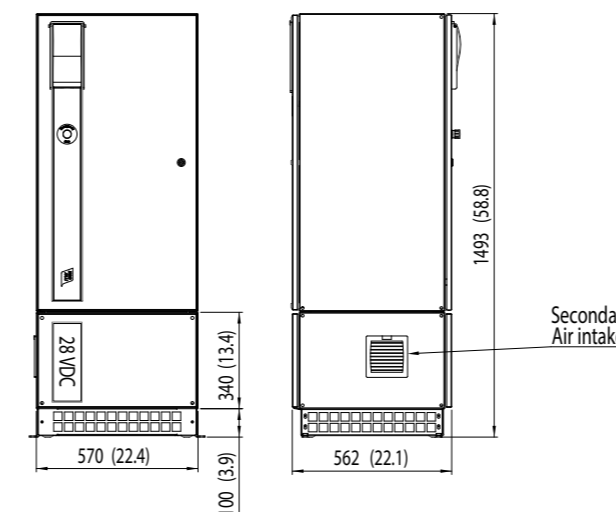
### Available Ratings

Type	Model	Part No.
30kVA+28VDCARU	Fixed	578.159
	Mobile	578.161
45kVA+28VDCARU	Fixed	578.156
	Mobile	578.158
60kVA+28VDCARU	Fixed	578.153
	Mobile	578.155
90kVA+28VDCARU	Fixed	578.150
	Mobile	578.152

### Mobile Version



### Fixed Version



Dimensions are shown in mm and (inches)

Specifications subject to change without prior notice

August 2015

# AXA 2400 COMPACT

30-45-60 & 90 kVA solid-state GPU



**PLUG & PLAY**  
UNIQUE VOLTAGE QUALITY

AXA POWER is part of ITW GSE  
- the world's leading supplier of Ground Support Equipment

**ITW GSE AXA POWER**

It's all about connections

It's all about connections



# OPTIMAL POWER AT THE AIRCRAFT

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. And it still is! Therefore, the AXA 2400 Compact is designed to fulfil the next edition of the ISO 6858 norm regarding voltage imbalance and phase displacement at the aircraft connector.

### SMALL, SIMPLE, RELIABLE AND ROBUST

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 all kinds of 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

Fixed installations often include a mix of long symmetrical and asymmetrical output cables as well as connection boxes that

makes it difficult to keep the required voltage quality at the aircraft connector. This is exactly where ITW GSE's patented Plug & Play voltage compensation system makes a difference.

### ON-TIME DEPARTURES

The Plug & Play system is based on a true individual phase regulation combined with a predetermined model of the actual cable installation. Therefore, the AXA 2400 GPU provides an outstanding voltage quality at the connector thus ensuring on-time departures and happy passengers!

### FURTHER BENEFITS OF THE AXA 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

## AXA 2400 Compact – 30-45-60-90 kVA solid-state GPU

### Input

- Voltage range: 3 x 400 V ±15%
- Frequency: 50/60 Hz ±5 Hz
- Rectification: Magnetic wave-shaping
- Rated current: PF (load) 0.8 / PF 1
- 90 kVA: 111 A ±15% / 141 A ±15%
- 60 kVA: 75 A ±15% / 93 A ±15%
- 45 kVA: 58 A ±15% / 71 A ±15%
- 30 kVA: 38 A ±15% / 48 A ±15%
- 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 ± 0.001
- 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
- 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  
Mobile units: 460 kg

### 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
  - (+60°C 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)

### Dimensions

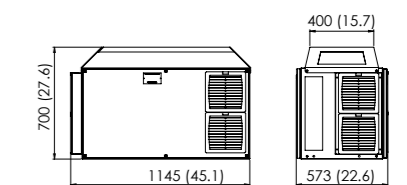
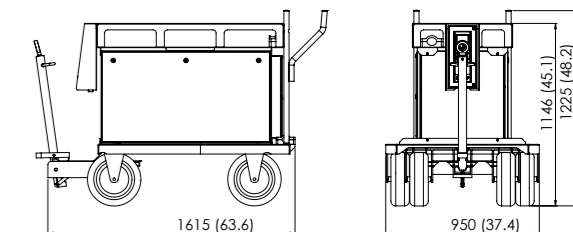
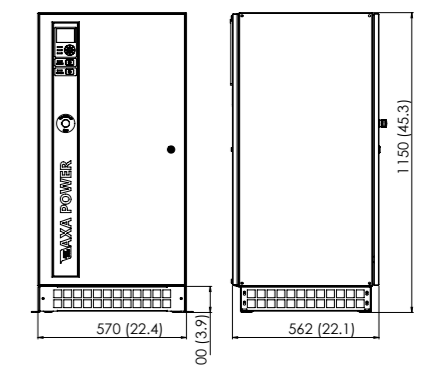
Kindly refer to drawings or to further information at [www.itwgse.com](http://www.itwgse.com)

### 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 interlock
- RS485 interface
- Military interlock
- Dry Contacts
- AXA service tool

### Norms and Standards

- DFS400 Specification for 400 Hz aircraft power
- ISO 6858 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



Converter for under-bridge mounting

Dimensions are shown in mm and (inches).

Specifications subject to change without prior notice