

**GREEN SOLUTIONS  
FOR AIRCRAFT  
GROUND POWER SUPPLY**

# ABOUT ESTONIA

- ❖ **Almost 50% forest and over 2000 islands**
- ❖ **Has a digital society – 1<sup>st</sup> country with online voting and all services available online, only country to offer e-residency**
- ❖ **Start-ups from Estonia - Wise, GrabCAD, Pipedrive, Starship Technologies, Skype, Bolt, Wolt**



# INTRODUCTION OF ELECTROAIR



Established  
in Estonia  
in 2006



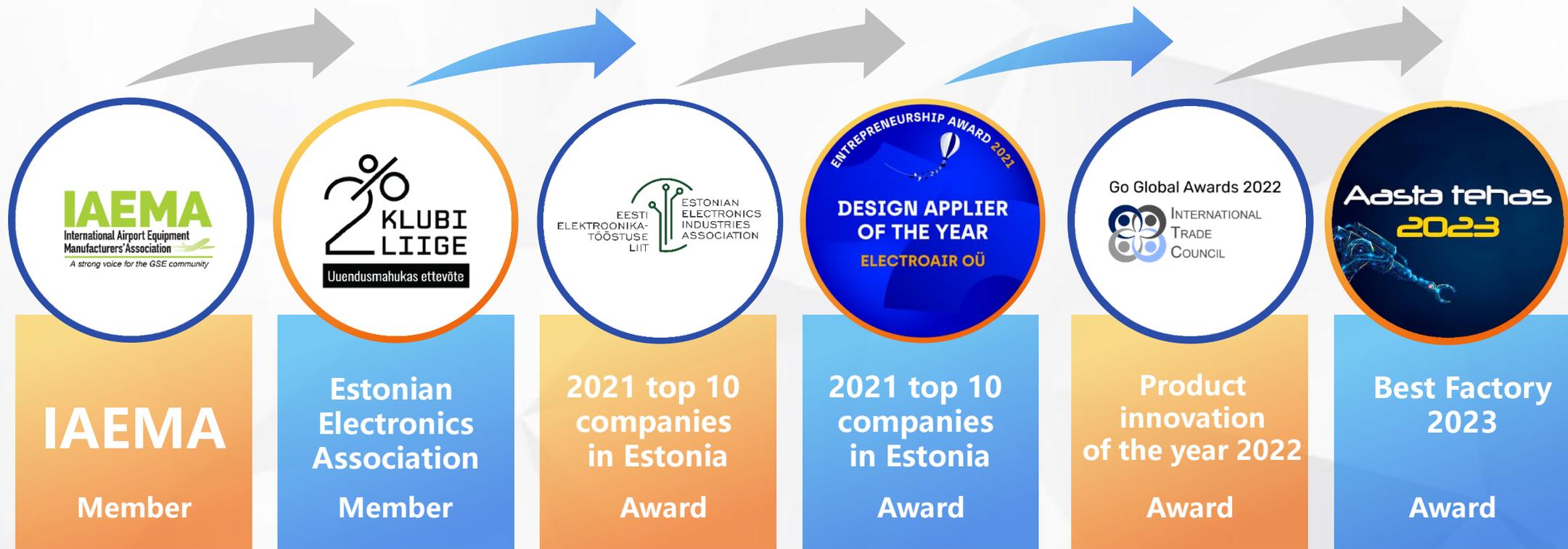
ISO 9001  
ISO 14001  
ISO 45001  
AQAP 2110  
CE



> 16000 m2  
Production  
area



> 500 Clients  
worldwide  
> 100 Countries





# 500+ clients in 100+ countries



# SAFETY. QUALITY. ECOLOGY.

ISO 6858

ISO 1540

BS 2G 219

MIL-STD-704F

EN 50091-1

EN 61000-6-4

EN 61000-6-2

EN 50082-2

EN 61558-2-6

EN 2282

SAE ARP 50 15

IEC 60721

IEC 60529

DFS400

GOST 54073-2010

MH/T6107-1024

2004/108/EC

EN 124 F900

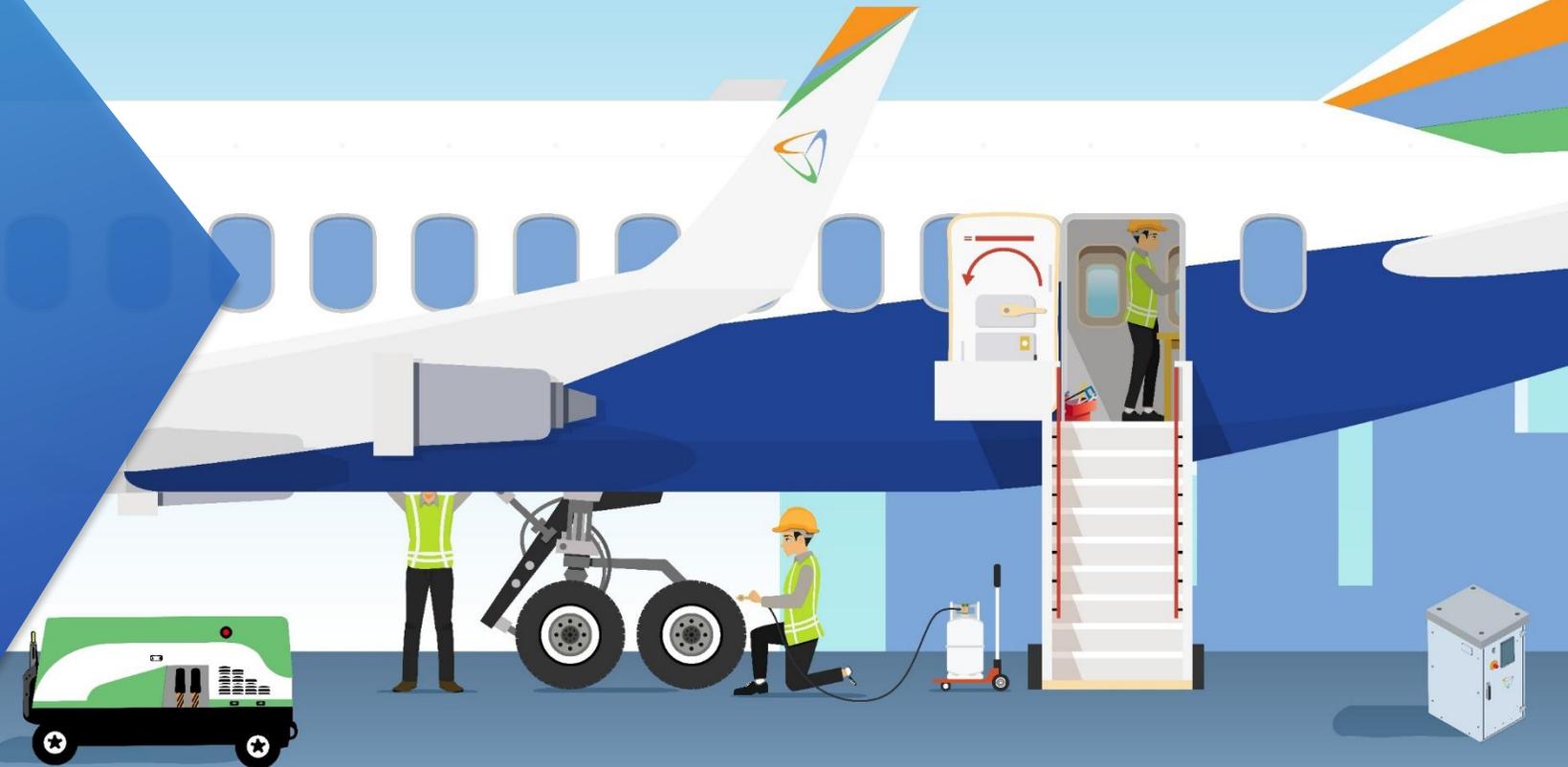
ISO 9001

ISO 14001

ISO 45001

73/23 EEC

F900



# MAIN PROBLEMS IN AVIATION



**Air pollution**



**Noise level**



**Apron traffic**



**Expenses**



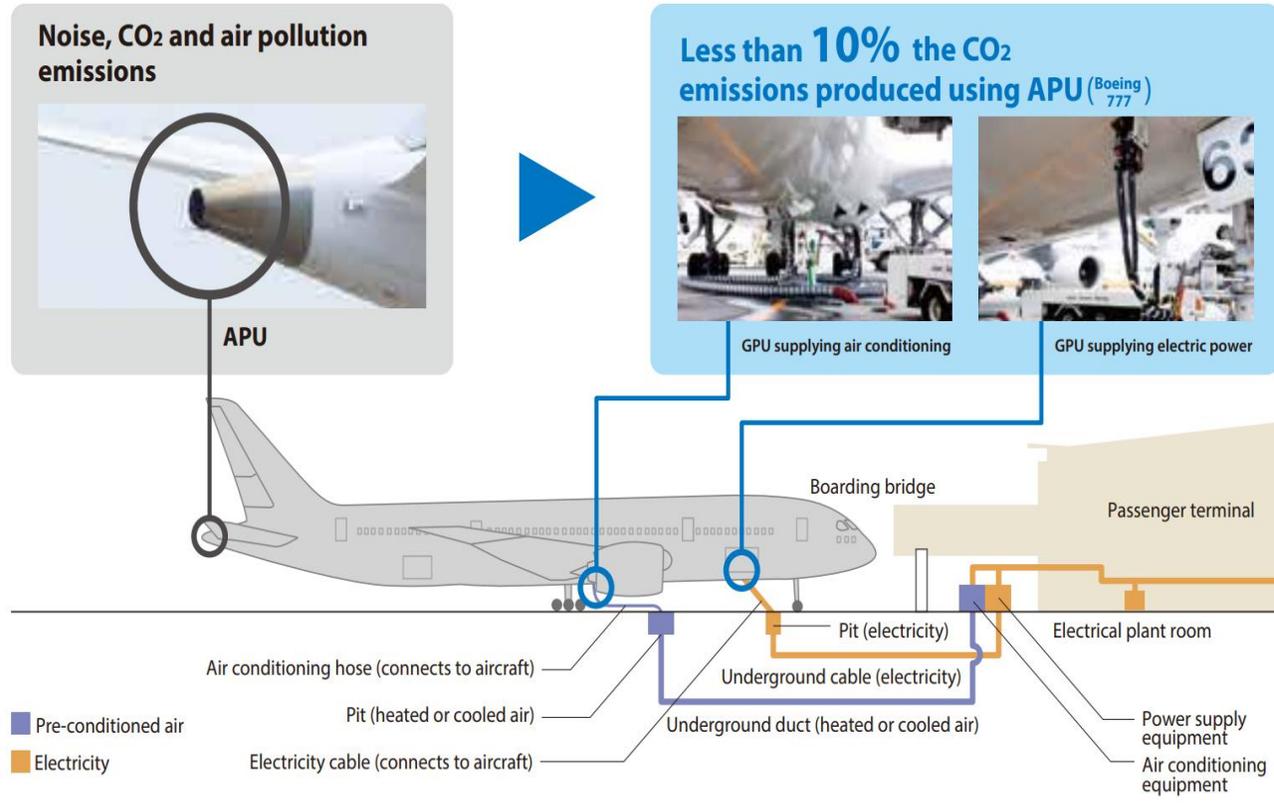
**Time**



**Risk of aircraft damage**

# AIR POLLUTION (kg/hour)

770



50

6,9%

# **NOISE**

**By IATA**

**Service Locations: 85 dBA**

**20-m Perimeter: 90 dBA**

**APU - 90-99 dB (A)**

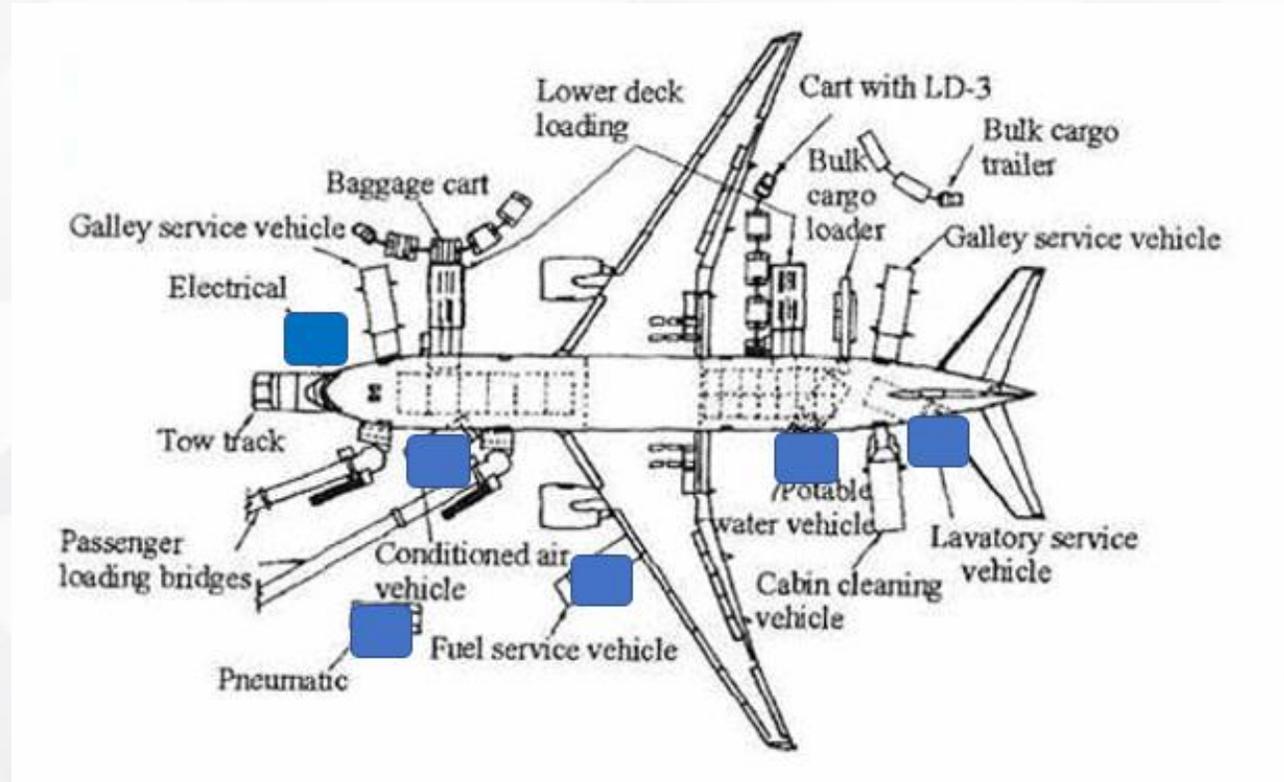
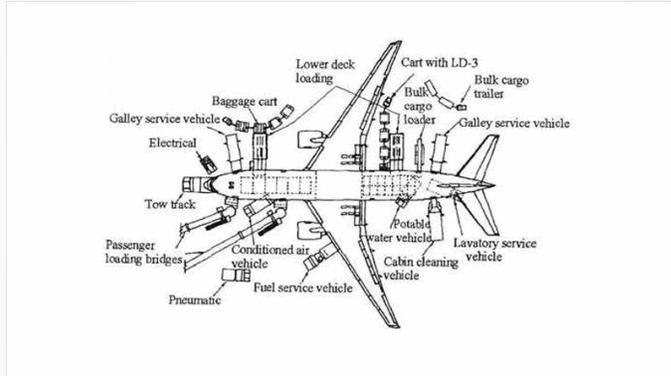
**Diesel GPU – 75-80 dB (A)**

**Electrical GPU -60 dB (A)**

# OOPS...



# TRAFFIC



- 40%

# ONE-STOP SOLUTION

The concept encompasses the entire service cycle:

- Consultation
- Project engineering and design
- Manufacturing and customization
- Equipment installation
- Commissioning
- Maintenance
- Staff education
- After-sales services and spare-parts



# GPU & GSE INTRODUCTION

## Climatic execution



- Standard (-20°C to +55°C)
- Tropical (-10°C to +75°C)
- Nordic (-40°C to +55°C)
- Alpine (up to 3000 m)
- Relative humidity up to 100%



## Protocols

- SCADA
- MODBUS
- TCP / IP
- RS485
- Others



- Energy consumption monitoring system
- Power log and “black box” mode
- GPS / GSM



- Any power rate according to client needs
- Up to 4 output channels
- Simultaneous work of output channels



- Modular system — easy to replace
- Mean time to repair is less than 15 min



- Supervision and Commissioning

# FREQUENCY CONVERTERS

## EAC SERIES



- Absolute voltage quality — ISO 6858
- Max. phase unbalance is less than 2V
- Automatic voltage drop compensation on the cable (up to 200m)
- Phase angle  $120^\circ \pm 2.5\%$



- Very stable frequency  $400\text{Hz} \pm 0.01$
- Possibility to regulate from 360Hz to 420Hz



- No CO<sub>2</sub> emissions
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate
- Noise level  $<65\text{dB(A)}$  @1m



- Power rate according to client needs
- Up to 4 output channels
- Simultaneous work of output channels



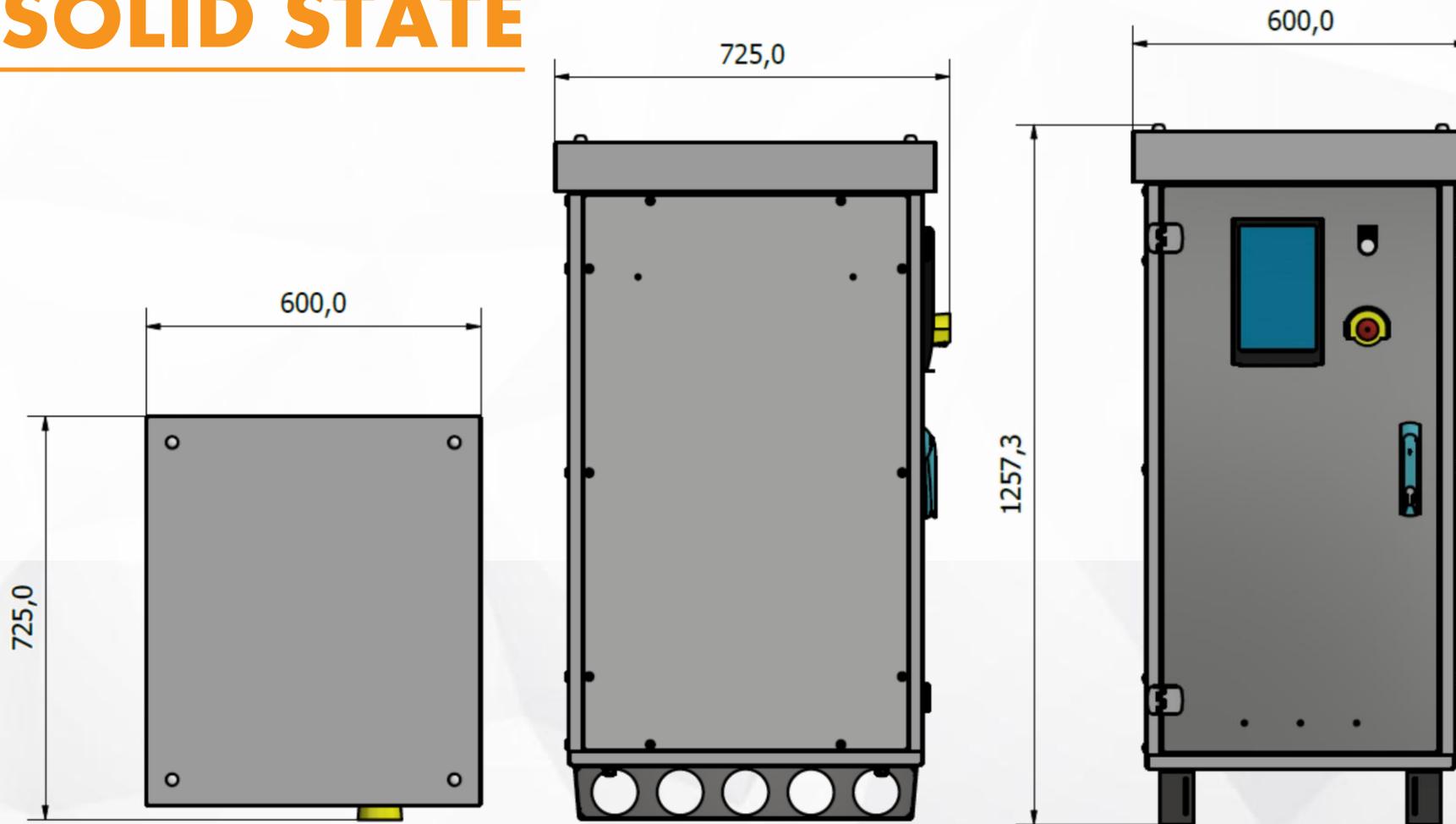
# FREQUENCY CONVERTERS

## EAC SERIES



# FREQUENCY CONVERTERS

## EAC SOLID STATE



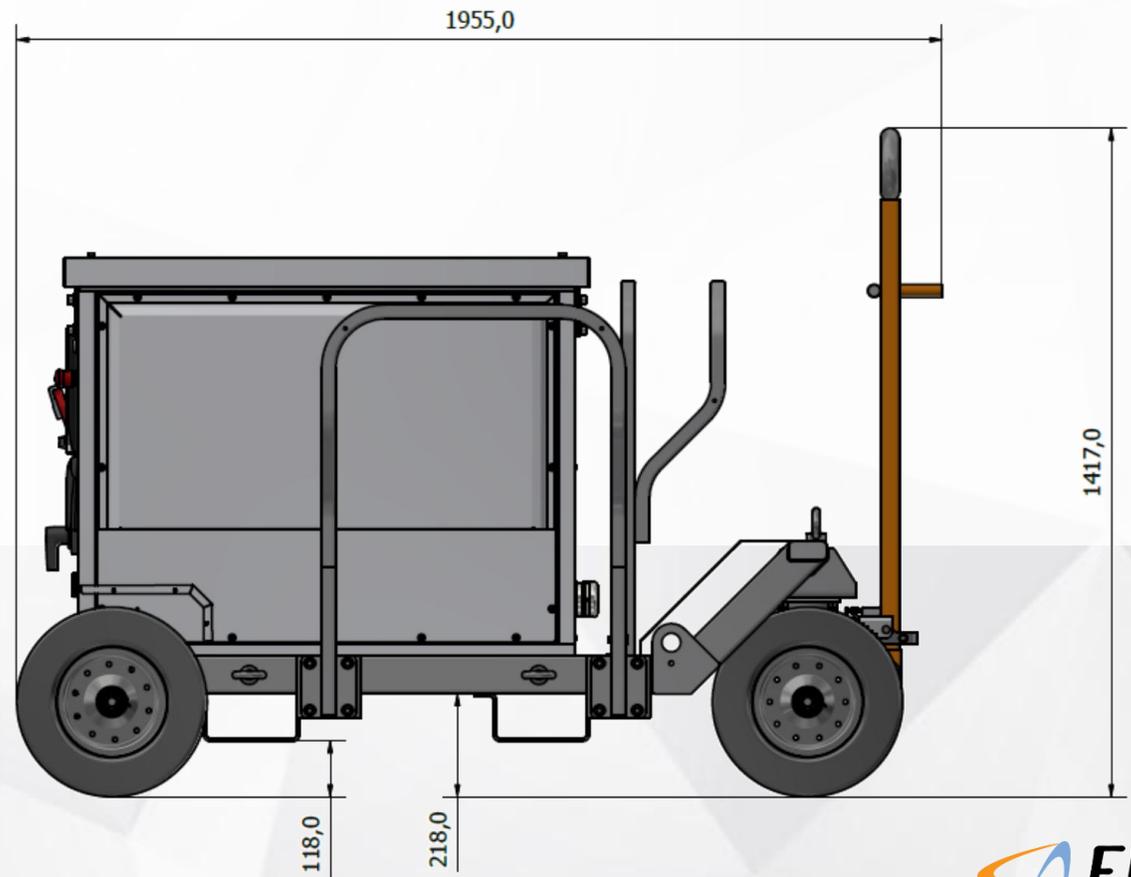
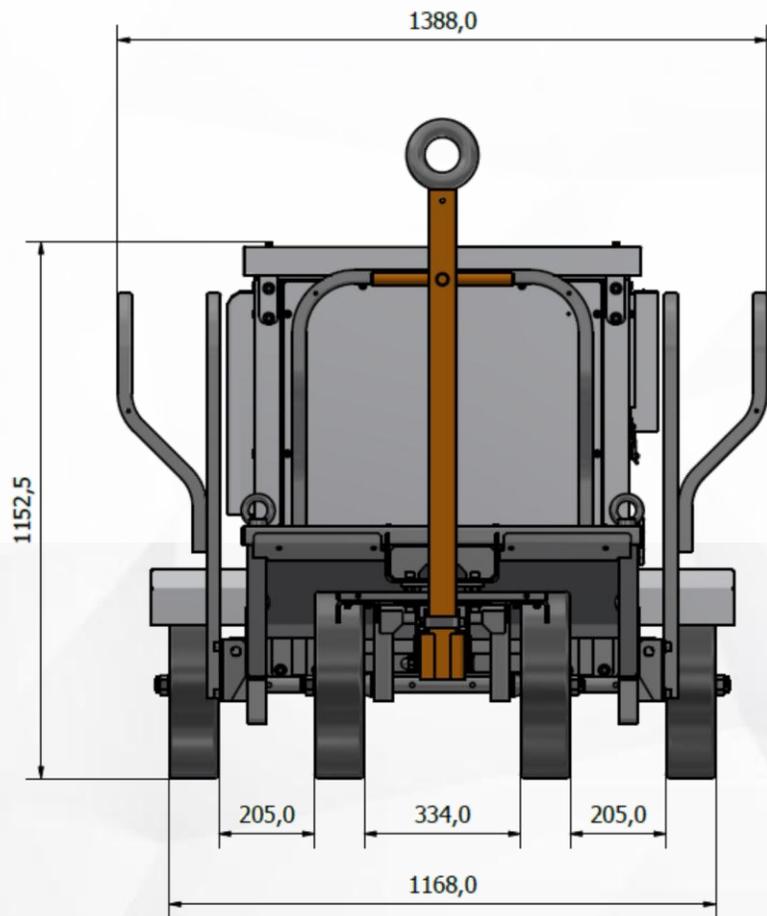
# FREQUENCY CONVERTERS

## EAC MOBILE



# FREQUENCY CONVERTERS

## EAC MOBILE



# UNDER BRIDGE UNIT SET

## EAC-PBB SERIES



- Absolute voltage quality — ISO 6858
- Max. phase unbalance is less than 2V
- Automatic voltage drop compensation on the cable (up to 200m)
- Phase angle  $120^\circ \pm 2.5\%$



- Very stable frequency  $400\text{Hz} \pm 0.01$



- Up to 30m cable length



- Emergency STOP
- Input power indicator
- IN/OUT for cable coiling controls
- Error indication and RESET
- Control from aircraft connector



- No CO<sub>2</sub> emissions
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate
- Noise level  $<65\text{dB(A)}$  @1m



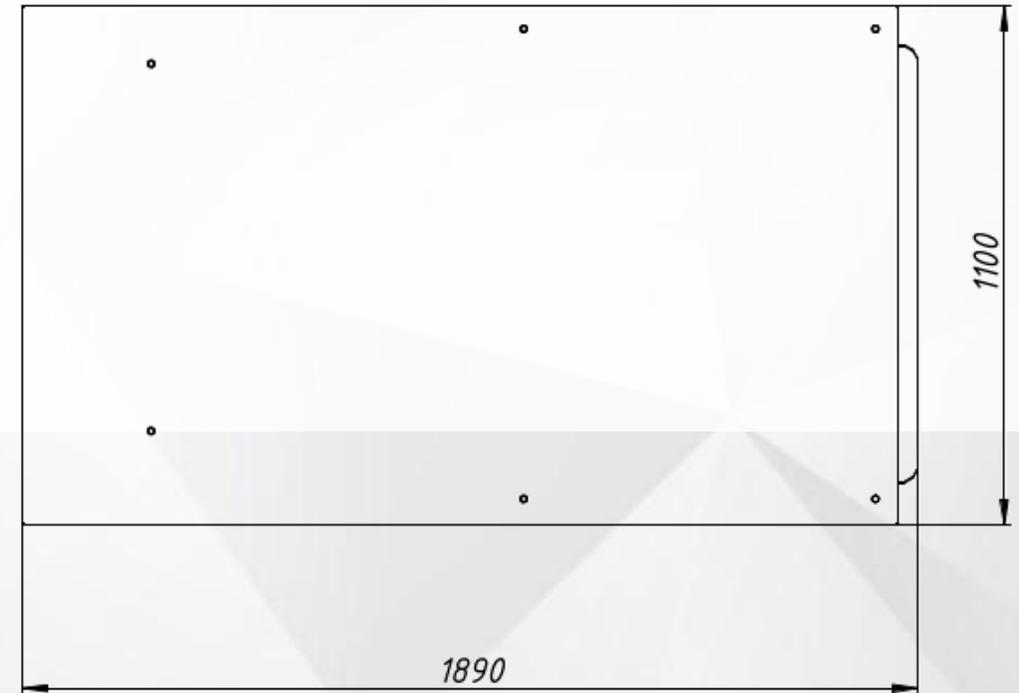
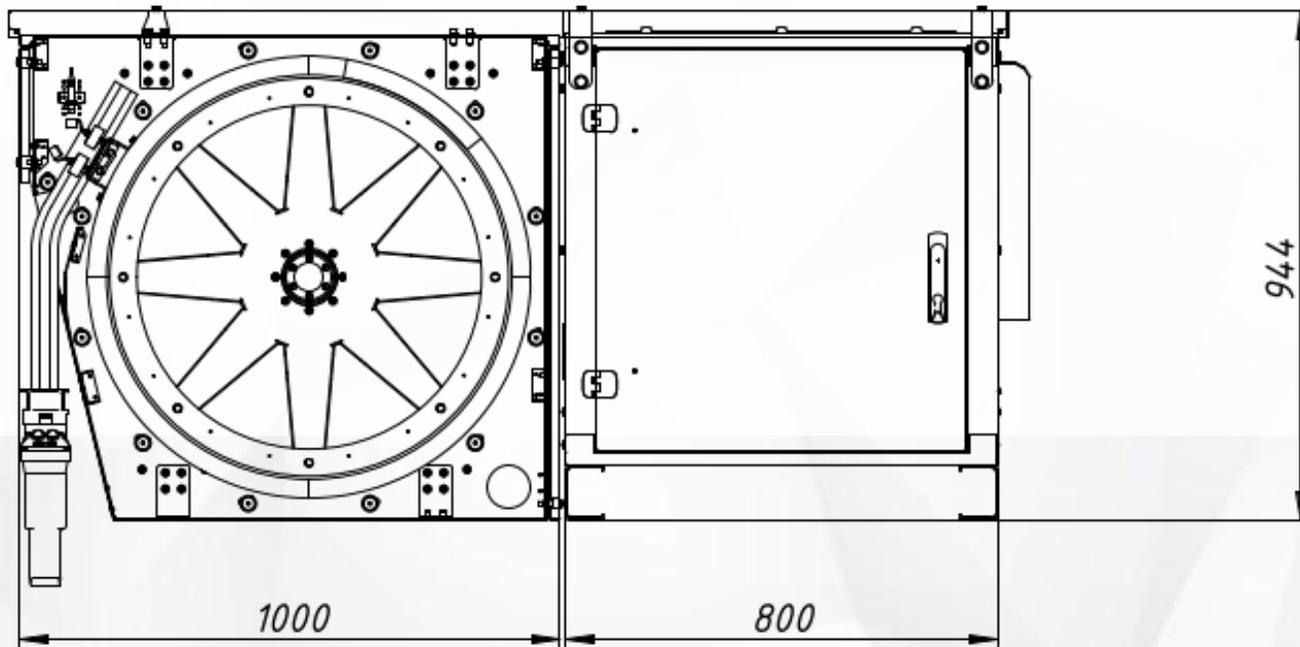
# UNDER BRIDGE UNIT SET

## EAC-PBB SERIES



# UNDER BRIDGE UNIT SET

## EAC-PBB SERIES



# RECTIFIERS

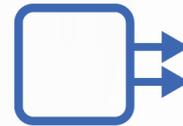
## EAR SERIES



- For helicopters and business jets



- Rated current up to 1500A with overloads up to 2500A



- Dual independent output channel option
- Ability to work on a "28V/56V" mode



- Very stable voltage
- Automatic voltage drop compensation on the cable (up to 50m)



- No CO<sub>2</sub> emissions
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate
- Noise level <65dB(A) @1m

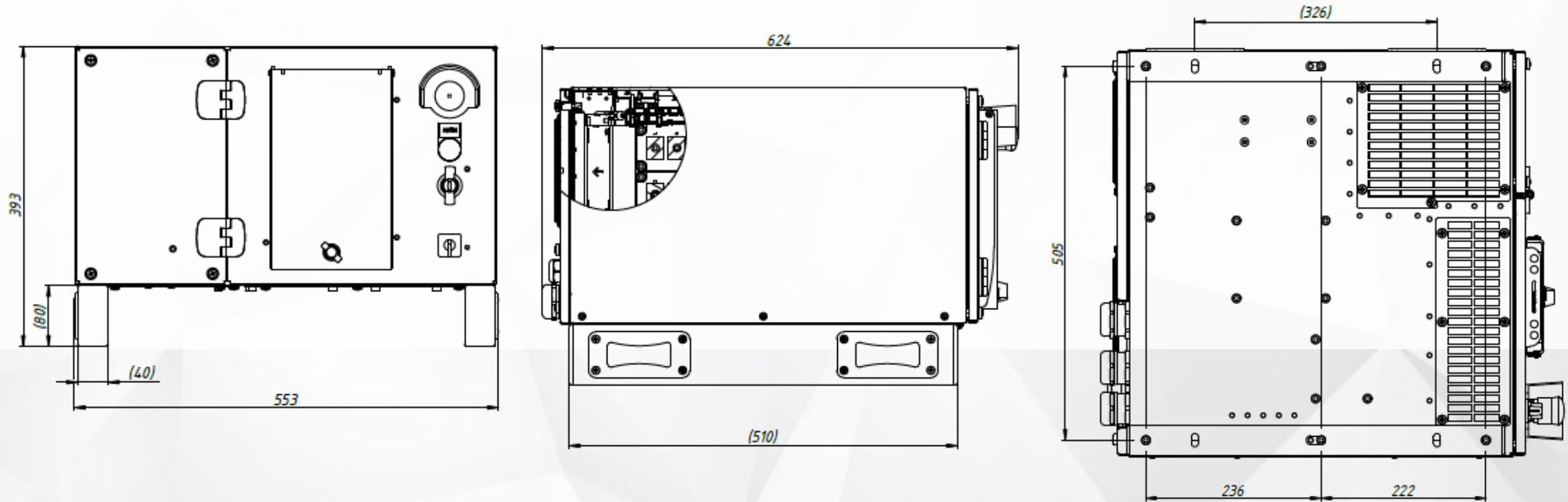
# RECTIFIERS

## EAR SOLID STATE



# RECTIFIERS

## EAR SOLID STATE



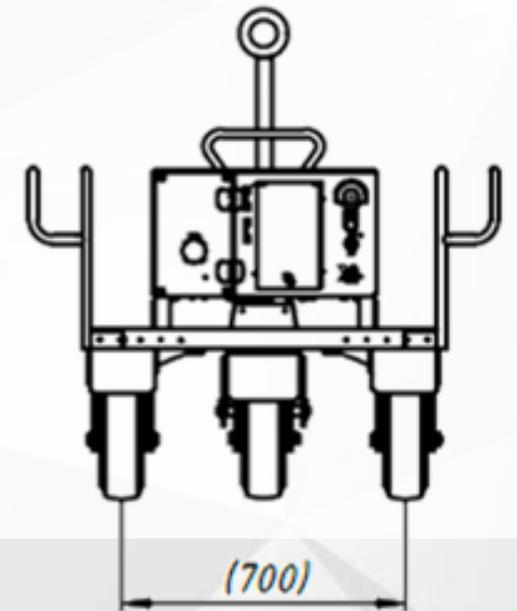
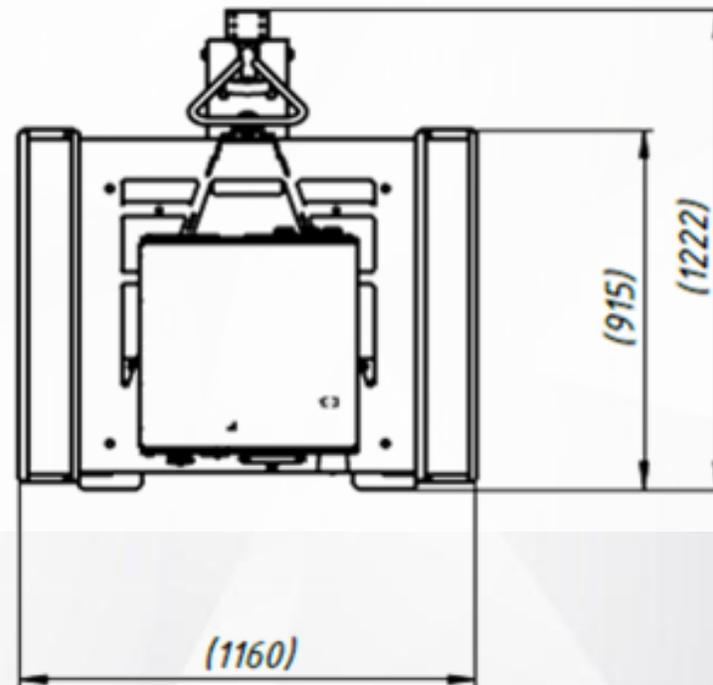
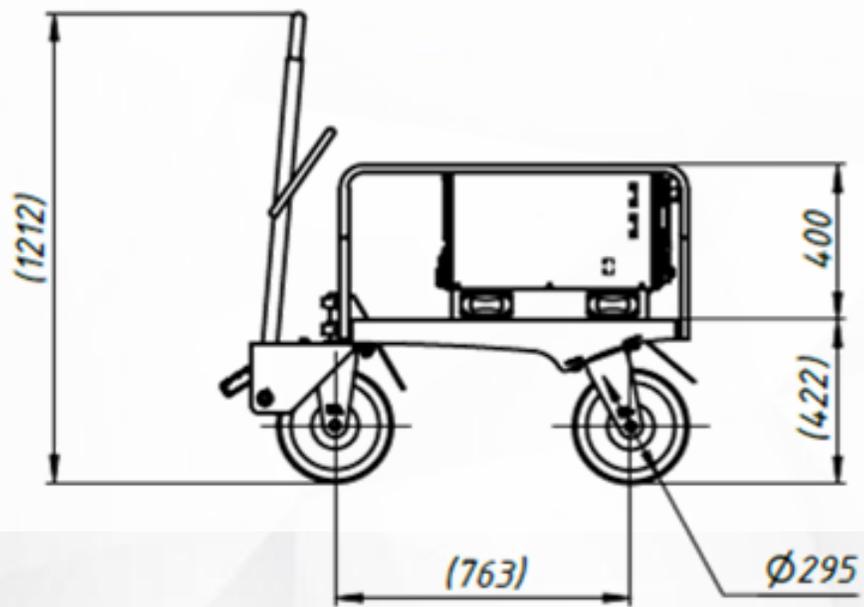
# RECTIFIERS

## EAR MOBILE



# RECTIFIERS

## EAR MOBILE



# COMBINED UNITS

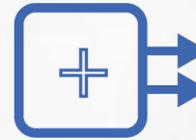
## EACR SERIES



- Independent AC and DC outputs
- Possibility of simultaneous work of all channels



- Ventilation & cooling is located on top on top of unit
- Low noise fans
- Less time for maintenance



- Special 400Hz 36V output
- Ability to work on a 28V/56V mode
- 50/60 Hz sockets



- No CO<sub>2</sub> emissions
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate
- Noise level <65dB(A) @1m

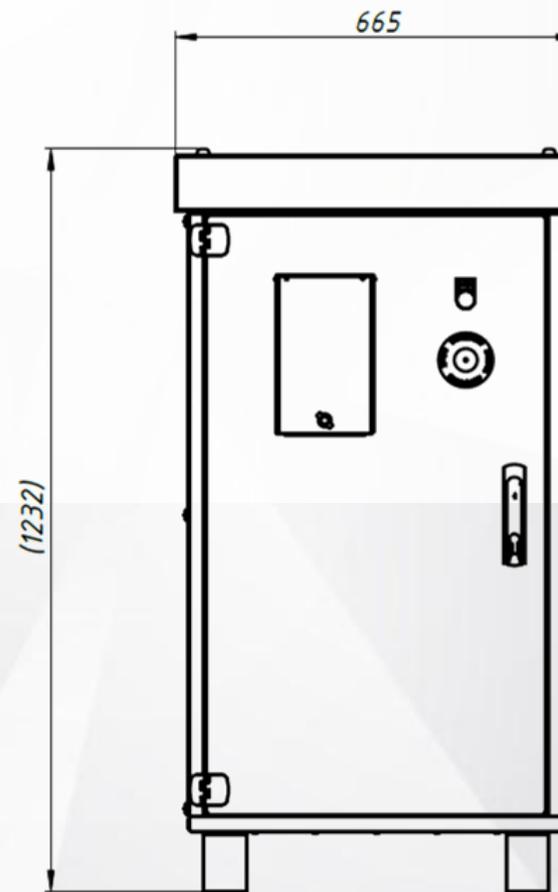
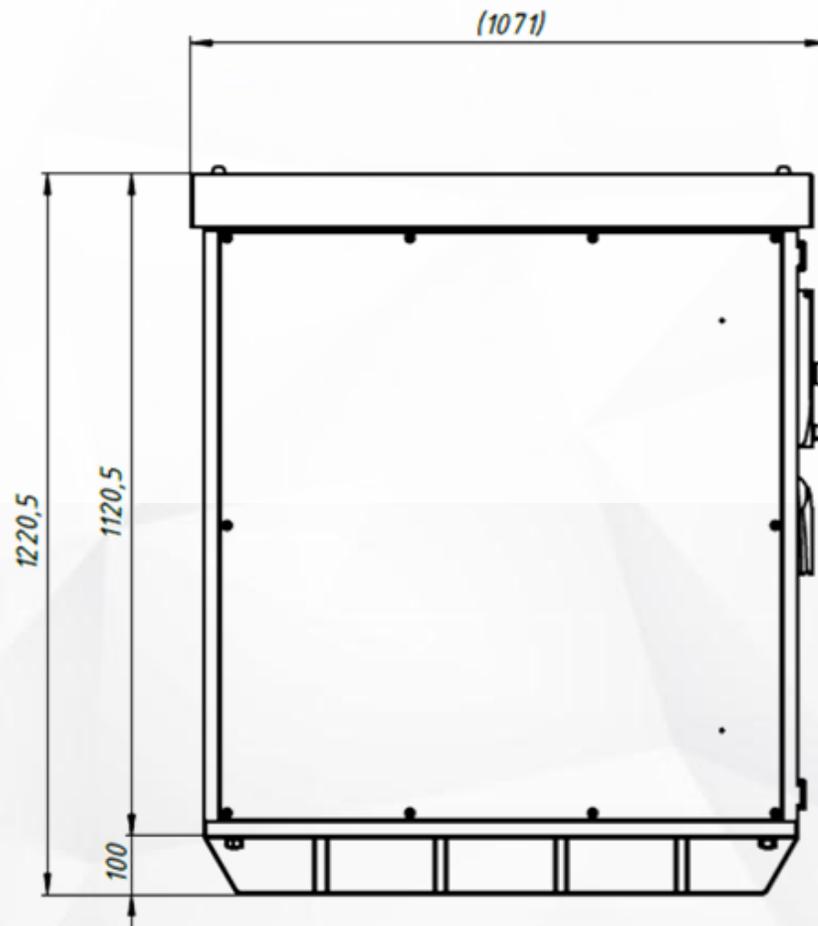
# COMBINED UNITS

## EACR SOLID STATE



# COMBINED UNITS

## EACR SOLID STATE



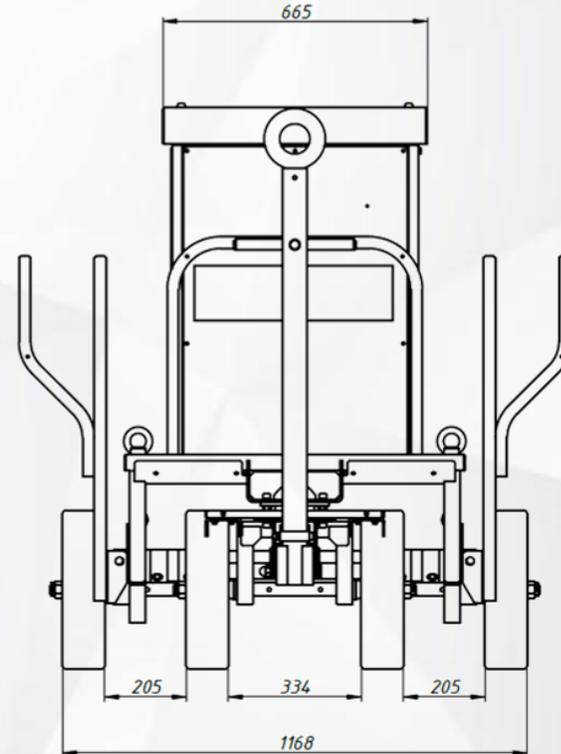
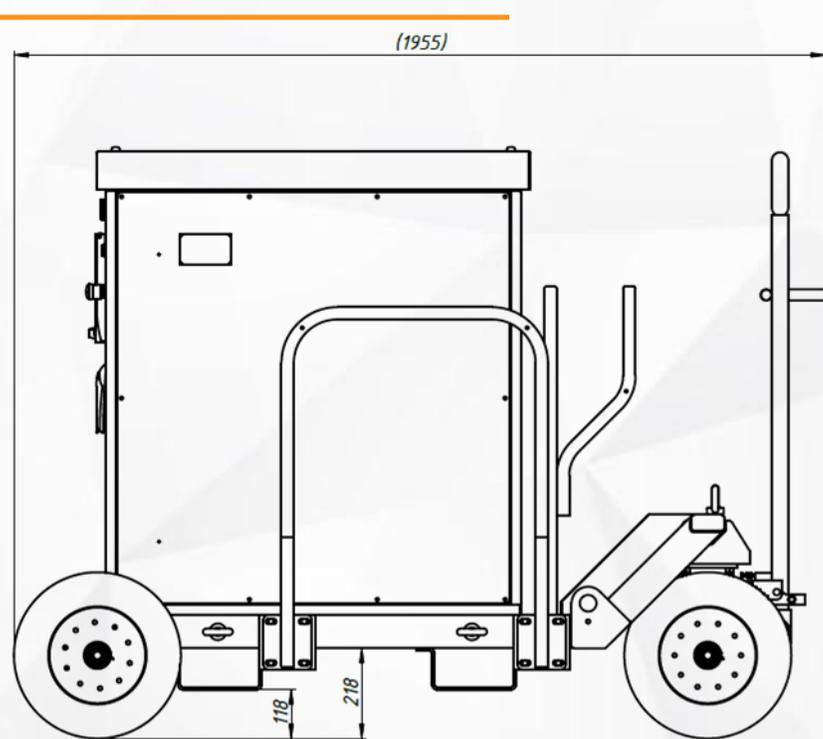
# COMBINED UNITS

## EACR MOBILE



# COMBINED UNITS

## EACR MOBILE



# HYBRID RECTIFIERS

## APA-10 SERIES



- For helicopters and business jets



- Diesel and battery



- Very economic fuel consumption:  
3 liters per 1 hour



- Low CO2 emissions
- Low noise



***Smallest diesel engine driven / battery powered rectifier unit on the market!***

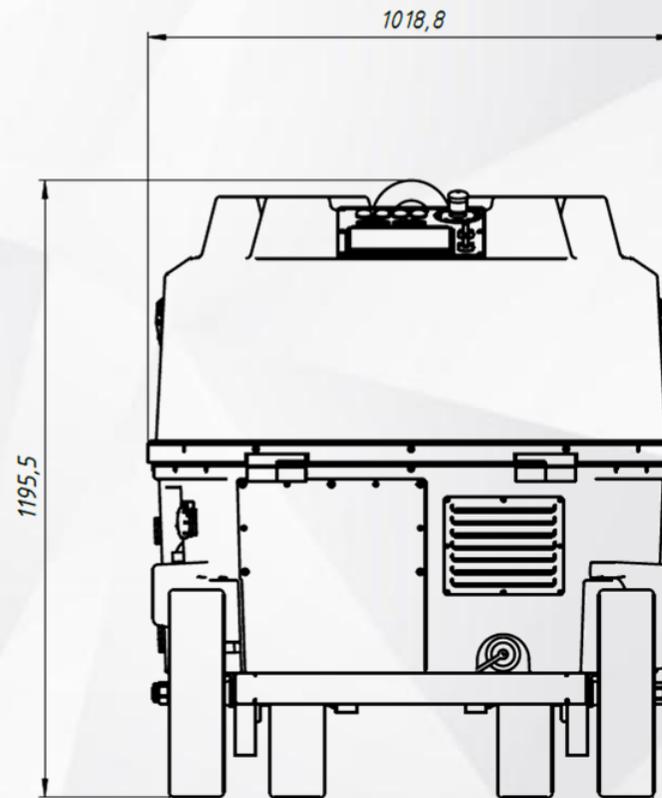
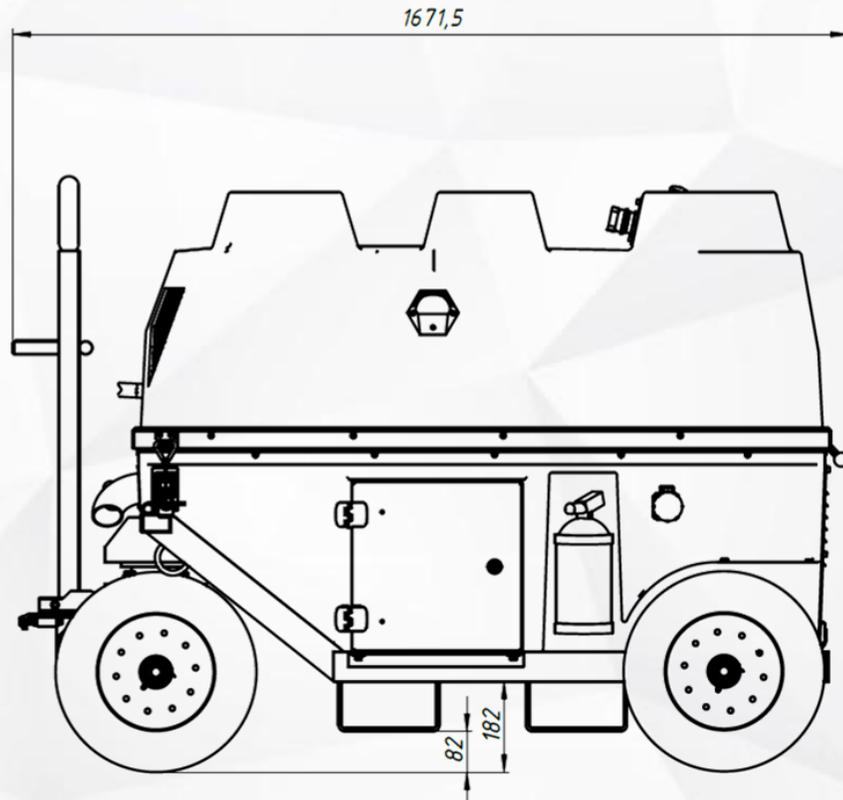
# HYBRID RECTIFIERS

## APA-10 SERIES



# HYBRID RECTIFIERS

## APA-10 SERIES



# RECTIFIERS

## APA-65 SERIES



- For helicopters and business jets



- Very economic fuel consumption



- Diesel and main power



- Low CO2 emissions
- Low noise



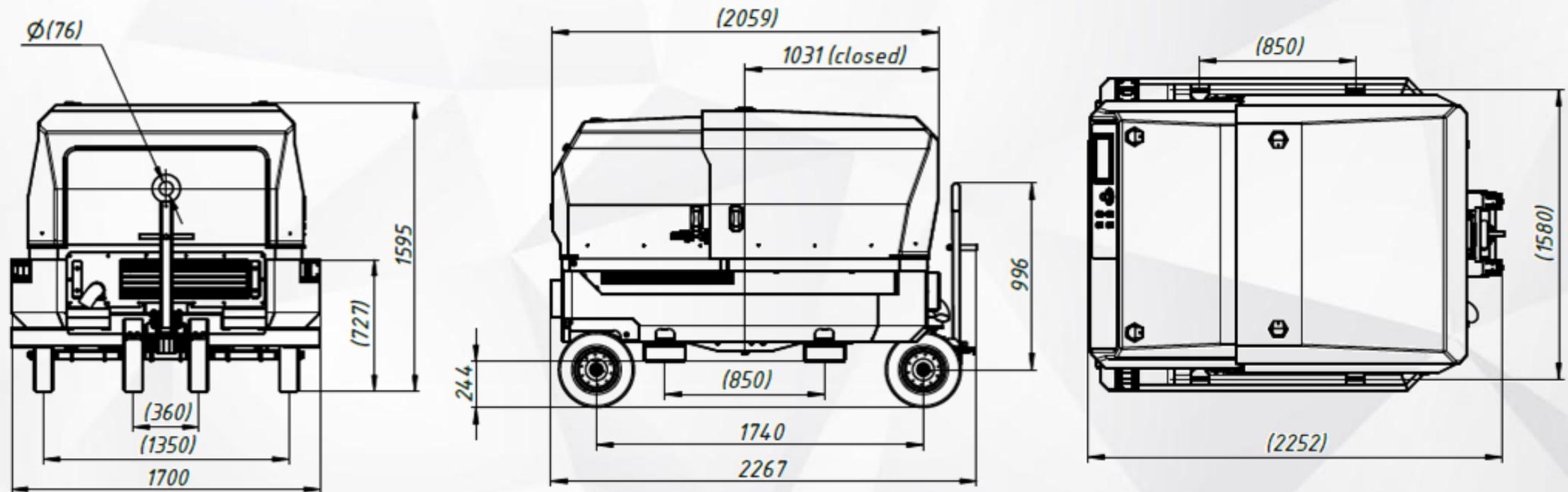
# RECTIFIERS

## APA-65 SERIES



# RECTIFIERS

## APA-65 SERIES



# DIESEL GPU WITH HYBRID FUNCTION

## APA SERIES



- Diesel
- Jet fuel



- Possibility to work with mains power



- Solid state
- Mobile
- On truck



- Up to 12 hours of continuous work



- Low CO2 emissions
- Low noise
- Tier 3, 4



- Optional 50/60 Hz output up to 125A



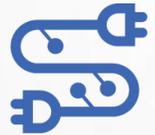
- AC up to 180kVA and 28 VDC option
- Turntable / 5-th wheel
- Brakes at towbar upright position
- Anti-tow feature

# BATTERY DRIVEN GPU

## APA-ECO SERIES



Green  
Connected



- Independent AC and DC outputs
- Possibility of simultaneous work of all channels



- Very stable frequency 400Hz +/- 0,001
- As per ISO6858



- Up to 320 kW/h
- Recharge from any socket
- Built-in fast charging



- Can provide power and recharge simultaneously



- Very stable voltage
- Peak current up to 2500 A



- No CO<sub>2</sub> emission
- No noise
- Intuitive display

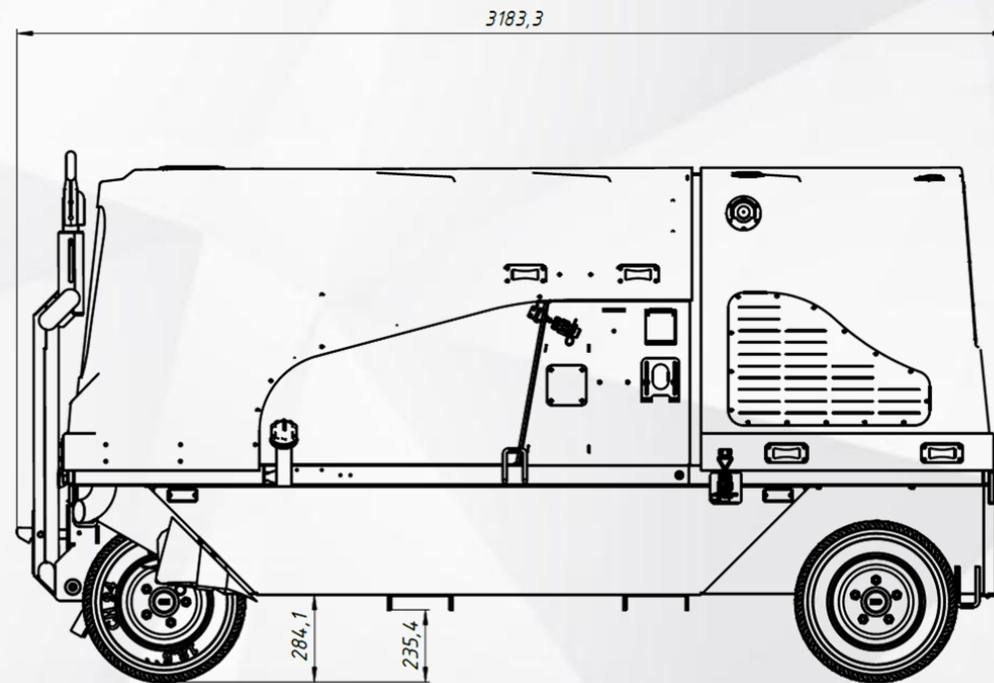
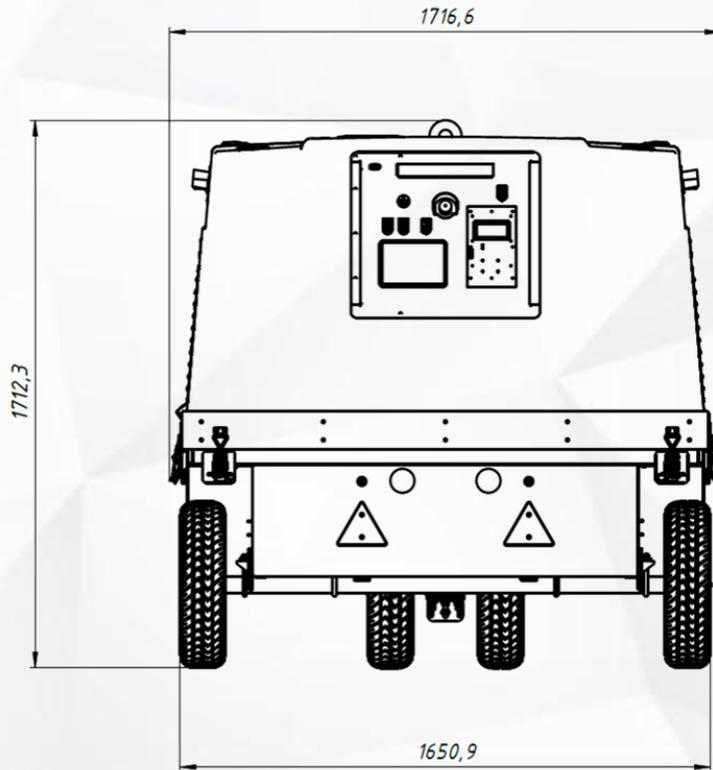
# DIESEL & BATTERY DRIVEN GPU

## APA SERIES



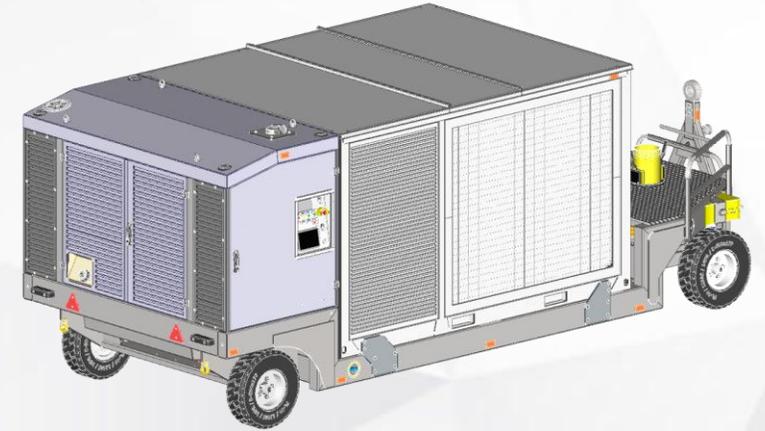
# DIESEL & BATTERY DRIVEN GPU

## APA SERIES



# AIR CONDITIONING UNITS

## EA-ACU SERIES



- Low CO2 emissions
- Low noise
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate
- Option - use as hybrid unit through 3ph 400V



- Hot Galvanized steel case provides excellent protection against corrosion



- Mobile
- On truck



- Diesel
- Jet fuel

***Hybrid option – by using 3ph 400V the EA-ACU works as an electrical unit!***

# AIR CONDITIONING UNITS

## EA-ACU SERIES



# AIR CONDITIONING UNITS

## EA-ACU SERIES



# PRECONDITIONED AIR UNITS

## EA-PCA SERIES



- No CO<sub>2</sub> emissions
- Maximum usage of recycle materials
- Extraordinary personnel safety features
- Easy to operate



- Hot Galvanized steel case provides excellent protection against corrosion



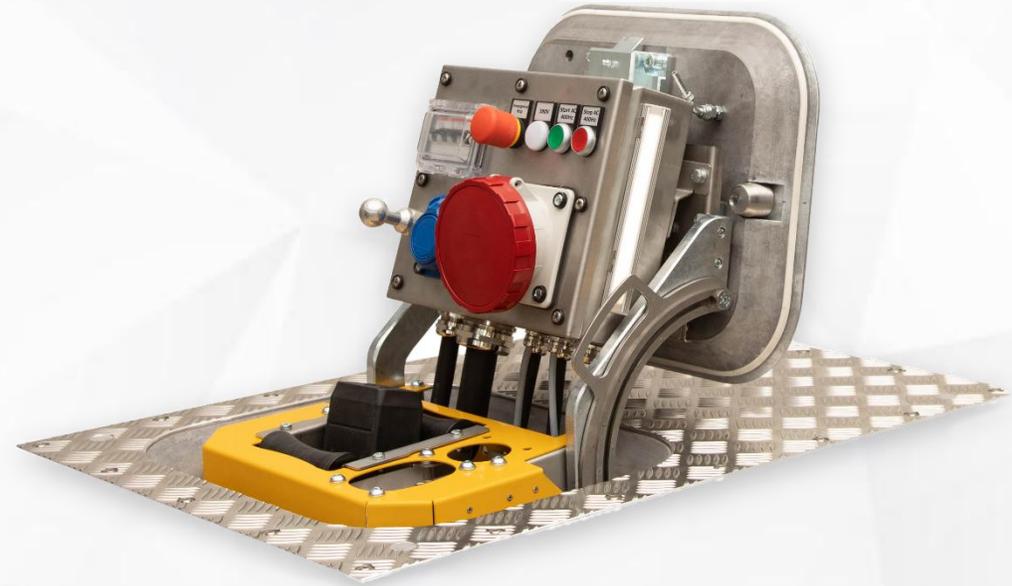
- All bridge mounted products have its own cooling module system



- Co-operation with the hose retriever

# PIT SYSTEMS

## HATCH EAPIT



- Certified to EN 124 F900 standard
- Certified to MH/T 6107-1024 F900



- Multifunctional - 400 Hz, 28.5 VDC, PCA, compressed air, water, fuel, sockets, tank ventilation



- Opening: counterweight mechanical system
- Closing: soft close system



- The hatch is equipped with remote control - ON/OFF, regulations, emergency stop



- Sump pump
- Anti-condensation heater
- Microclimate system option

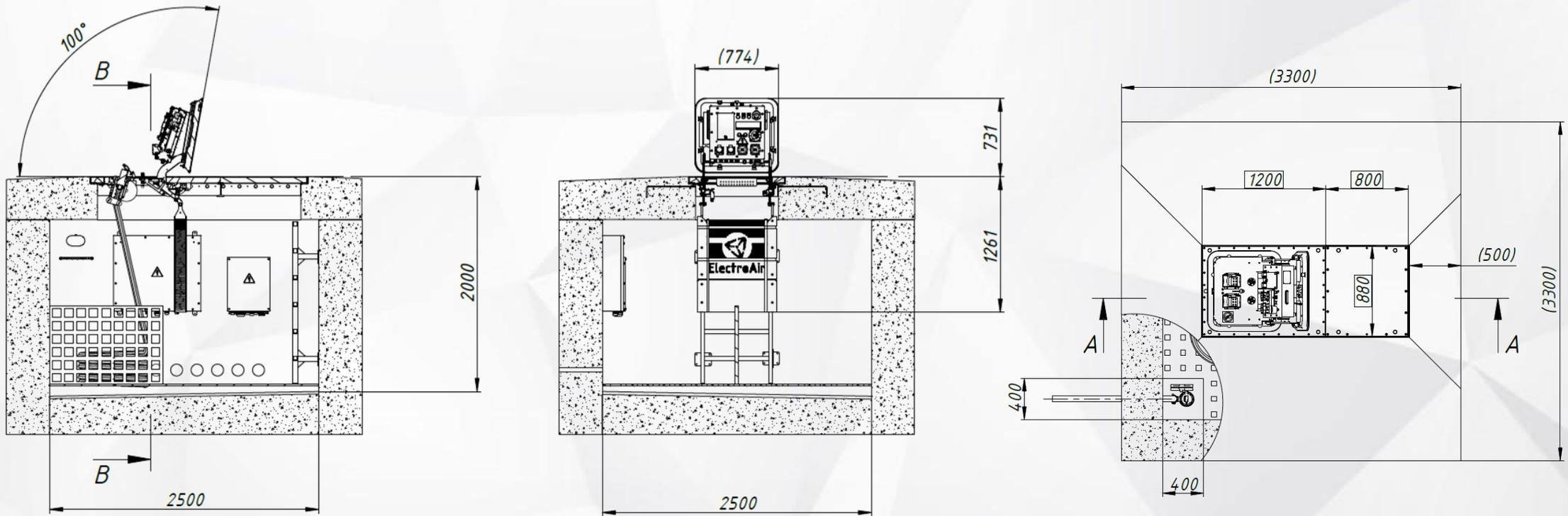
# PIT SYSTEMS

## HATCH EAPIT



# PIT SYSTEMS

## HATCH EAPIT



# PIT SYSTEMS

## POP-UP EAPIT



- Certified to EN 124 F900 standard
- Certified to MH/T 6107-1024 F900



- Multifunctional - 400 Hz, 28.5 VDC, compressed air, water, fuel, sockets, tank ventilation



- Opening: counterweight mechanical system



- Sump pump
- Anti-condensation heater
- Microclimate system option

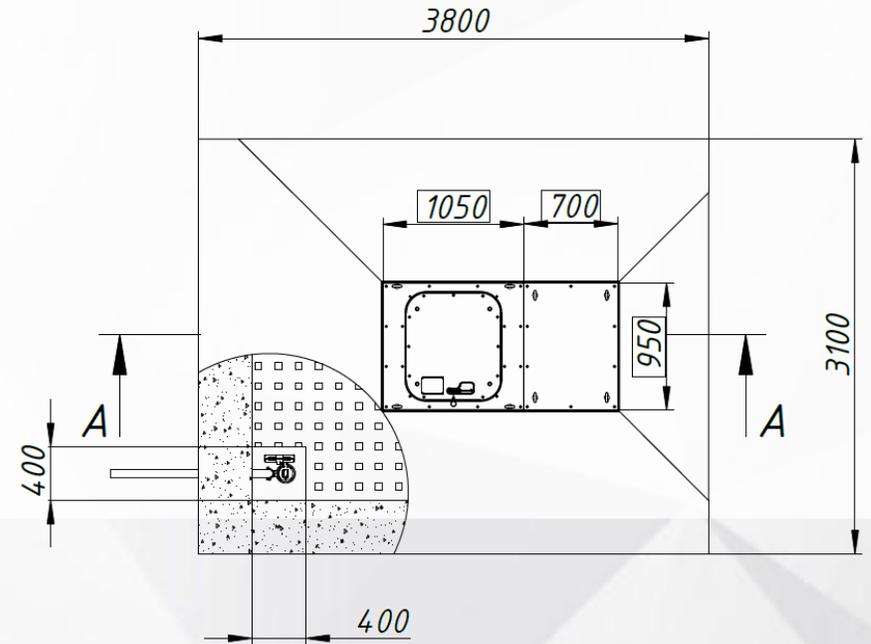
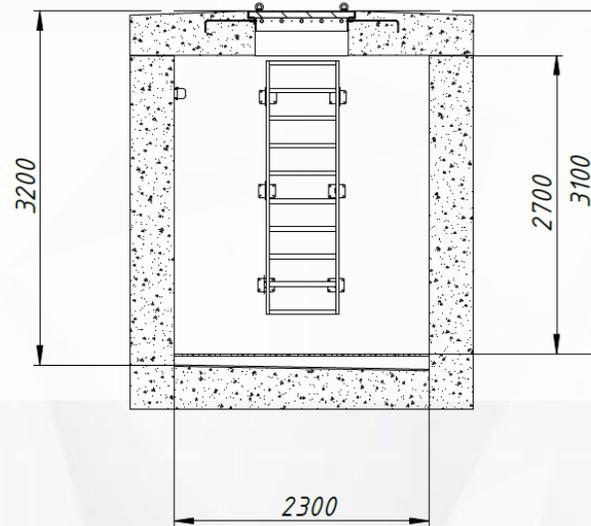
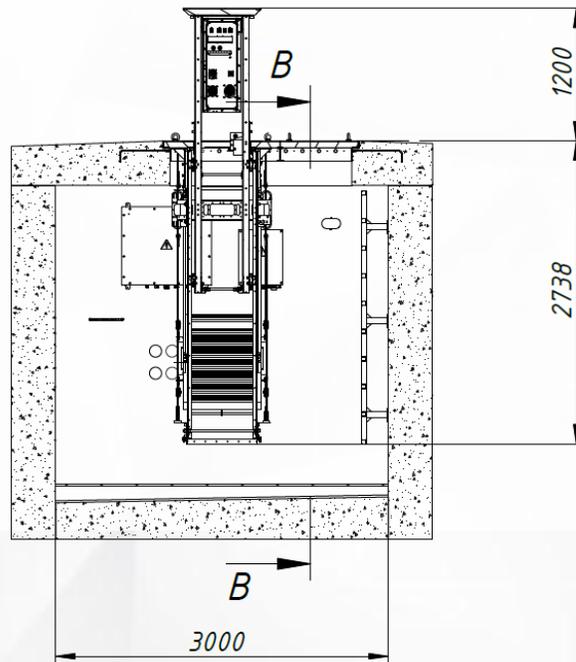
# PIT SYSTEMS

## POP-UP EAPIT



# PIT SYSTEMS

## POP-UP EAPIT



# LOAD BANK

## EAL SERIES



- Digital meters - voltmeter, ammeter, frequency meter
- Touch screen



- USB connection
- Reports
- Wi-Fi option



- Load tests:**
- Engine start simulation
  - 6 steps (35 sec)
  - Continuous test



- Air cooling system with low noise fans



# CHARGER-DISCHARGER

## EAR-CH SERIES



- Ability to print the results of charging-discharging



- Connection to computer
- Monitoring function



- More than 160 programs installed
- Ability to create your own program



- Can be used as DC power supply



- Memorizes last function
- Restore function



# CABLE EXTENDERS

## EABT SERIES



- Storing and moving cables from GPU to aircraft



- Capacity is up to 100 m cable section  
4x70 mm<sup>2</sup> or 7x35 mm<sup>2</sup>



- Advantages - two bearings drum rotation



# CABLE EXTENDERS

## EAZ SERIES

simple modular  
unique design

low maintenance cost  
€



- Storing and moving cables from GPU to aircraft



- The extender is equipped with remote control



- Consisted of up to 4 cables for AC 400 Hz or 28,5 V DC



**THANK YOU FOR YOUR ATTENTION!**



**SEE YOU AT OUR STAND:**

**1234 in HALL B5**

# STAY CONNECTED!



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PRODUCT INNOVATION  
OF THE YEAR

Go Global Awards 2022



**IAEMA**  
International Airport Equipment  
Manufacturers' Association  
*A strong voice for the GSE community*

**AND ONCE AGAIN...**



**FIND YOUR SOLUTION AT STAND:**

**1234 in HALL B5**