



# WITHOUT **DELAY**

## **RHEINMETALL MSU 200/400**

KEEP AIRCRAFT RUNNING ON TIME WITH THE  
ONLY TURBINE-POWERED AIR START UNIT.

**TAKING RESPONSIBILITY** IN A CHANGING WORLD

 **RHEINMETALL**



Aircraft on-board auxiliary power units are designed to power aircraft systems on the ground. But they are not perfect and they also use costly on-board fuel.

A reliable external air-start system is one that avoids unnecessary financial losses while ensuring aircraft run on time. Overall, it is the best way to get started and the Rheinmetall MSU Air Start Unit (ASU) is the preferred solution by far.

Designed to be reliable and versatile, the Rheinmetall MSU

is powered by a gas turbine engine, unique in its class. Proven across the globe, the MSU is also remarkably easy to operate.

One of the Rheinmetall MSU's main advantages is its low total cost of ownership, thanks to its state-of-the-art design. Rheinmetall ASUs have a long service life (20+ years) and are virtually maintenance free. With a short runtime of only 6 minutes per start and no need for a cool-down phase, fuel consumption is minimised, which also benefits the environment.

**The Rheinmetall MSU can run on Sustainable Aviation Fuel allowing you to significantly reduce carbon emissions.**

↳ Did you know? 65% of the IATA's Net Zero CO2 emission reductions could be achieved by using Sustainable Aviation Fuel.

## SERVICE IS THE NUMBER ONE PRIORITY

Rheinmetall prides itself on its superior customer service and rapid delivery of spare parts. To provide greater service, Rheinmetall offers a global distribution network with centres in three strategic locations: North America, Europe, and Asia.

Rheinmetall ASUs are compliant with all international standards (IATA, CE, AHM, SAE) and are compatible with all makes of aircraft which are started pneumatically, including:

- Airbus
- BAE
- Boeing
- Bombardier Aerospace
- Embraer
- Eurofighter Jagdflugzeug
- Fokker
- General Dynamics
- Ilyushin
- Lockheed
- McDonnell Douglas
- Northrop Grumman
- Suchoi
- Tupolev

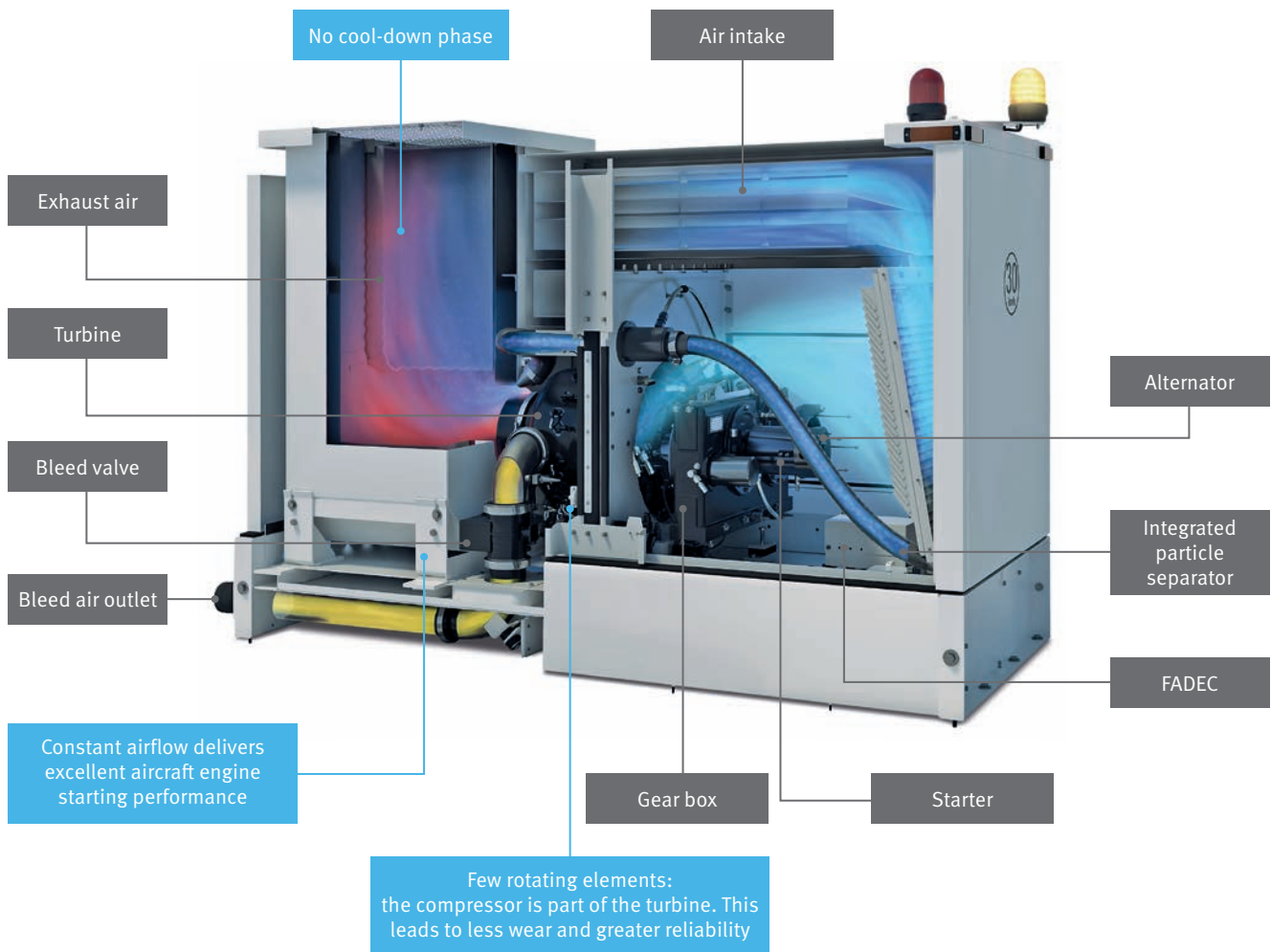
## FIELDIED AROUND THE WORLD

More than 1,400 units sold to 300+ customers in more than 50 countries!





## THE TECHNOLOGY IN DETAIL



## SYSTEM HIGHLIGHTS

A robust and reliable partner on the apron, Rheinmetall MSU offers unsurpassed features and impressive benefits.

- **Free choice of fuel:** Rheinmetall MSU runs on your choice of fuel. Jet fuel, diesel, any mix of the two or Sustainable Aviation Fuel (SAF).
  - ↳ Fuel up flexibly, anywhere, anytime.
  - ↳ Reduce your carbon footprint by using Sustainable Aviation Fuel.
- **Dual-function system:** Bleed air can be used for both the main engine start and environmental control system; the changeover takes place automatically.
  - ↳ Benefit from flexibility.
- **Multiple configurations:** Rheinmetall MSU can be installed on a trailer or vehicle, or used as a stationary system.
  - ↳ Mobilize a solution customized to your needs.
- **Compact size:** Rheinmetall MSU has a small footprint on the apron and in storage.
  - ↳ Take advantage from easy handling and operation.
  - ↳ Defence customers will find the unit easily airtransportable to deployed locations.
- **Proven cutting-edge technology:** Driven by high-performance Pratt & Whitney turbine engines, Rheinmetall MSU is a mark of quality since 1996.
  - ↳ Harness superior engine-starting performance.
- **Demonstrated efficiency in any climatic conditions:** Developed to handle ambient temperatures of  $-32^{\circ}\text{C}$  to  $+52^{\circ}\text{C}$  ( $-25.6^{\circ}\text{F}$  to  $+125.6^{\circ}\text{F}$ ).
  - ↳ Experience outstanding reliability, 24/7, 365 days a year.

## EASY-TO-USE INTERFACE

The operator panel is intuitively designed, operation is safe, and instructions are easy to follow.

### Get started in five easy steps:

1. Connect the bleed air hose to the aircraft.  
Press ON to turn on the MSU.
2. A self-test is performed. The display reads "SELF-TEST O.K." once completed.
3. Press START to begin the short warm-up phase.  
The START button starts flashing.
4. When the START button stays lit, the system is ready to deliver compressed air.
5. Press BLEED to initiate air flow and start the aircraft engine.



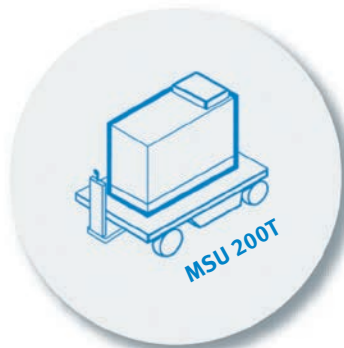
## A MODEL FOR EVERY NEED

A compact design and a choice of configuration provide the flexibility to meet a variety of requirements.

**MSU 200** – Rheinmetall's basic air start unit is available as a skid version (S) or mounted on a trailer (T).

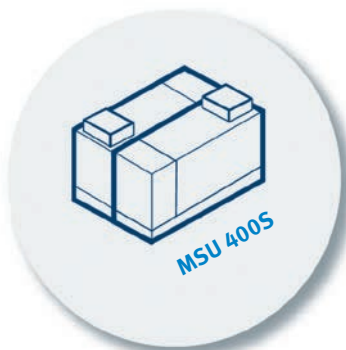


The skid version can be integrated with legacy equipment.



The trailer-mounted version can be manually moved into position.

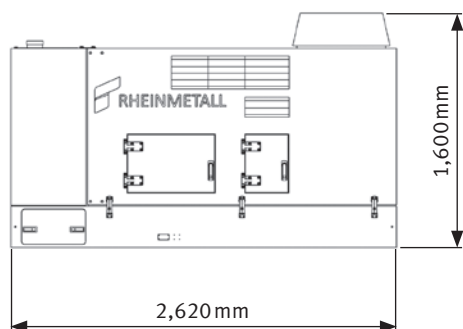
**MSU 400** – Rheinmetall's two-unit model provide more power when needed (e.g. Boeing 777, Airbus A380); each unit can be operated individually. The MSU 400 is also available in skid (S) and trailer (T) configurations.



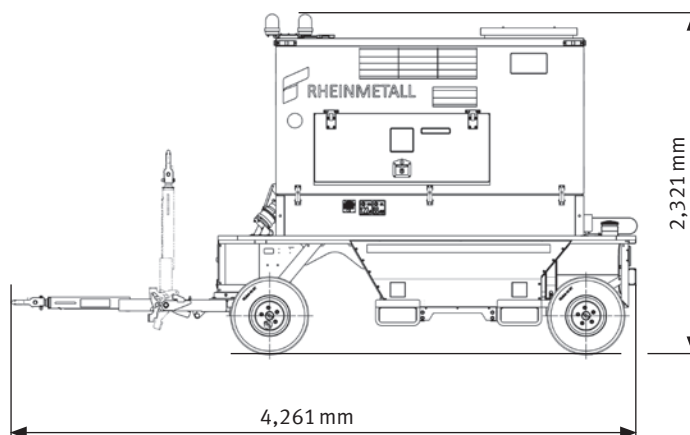
| TECHNICAL DATA                                    | MSU 200S                                                                                                                                    | MSU 200T                                   | MSU 400T                                   |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>Nominal rating</b>                             |                                                                                                                                             |                                            |                                            |
| Bleed air output <sup>1)</sup>                    | 204 ppm (1.54 kg/s)                                                                                                                         | 204 ppm (1.54 kg/s)                        | 408 ppm (3.08 kg/s)                        |
| Delivery pressure                                 | 56 psia (3.86 bar abs)                                                                                                                      | 56 psia (3.86 bar abs)                     | 56 psia (3.86 bar abs)                     |
| Bleed air temperature                             | 215°C (420°F)                                                                                                                               | 215°C (420°F)                              | 215°C (420°F)                              |
| <b>Weight and dimensions</b>                      |                                                                                                                                             |                                            |                                            |
| Weight excluding fuel                             | 1,180 kg (2,601 lbs)                                                                                                                        | 1,623 kg (3,578 lbs)                       | 3,365 kg (7,419 lbs)                       |
| Length                                            | 2.62 m (103.2 in)                                                                                                                           | 4.30 m (169 in)                            | 5.70 m (227.6 in)                          |
| Storage length (with tow bar in upright position) | –                                                                                                                                           | 3.32 m (136.6 in)                          | –                                          |
| Width                                             | 0.9 m (35.4 in)                                                                                                                             | 1.61 m (63.4 in)                           | 2.18 m (85.8 in)                           |
| Height                                            | 1.6 m (63 in)                                                                                                                               | 2.32 m (91.3 in)                           | 2.45 m (96.5 in)                           |
| <b>Environmental data</b>                         |                                                                                                                                             |                                            |                                            |
| Temperature                                       | –32°C * (–25.6°F) to +52°C (125.6°F)                                                                                                        |                                            |                                            |
| Fuels                                             | JET-A, Jet-A1, Jet-B, JP 4, JP 5, JP 8, F-34, F-35, F-37, F-40, F-44, F-54<br>AVTUR, AVTUR/FSII, Diesel DIN EN 590, DF1, DF2, mixes allowed |                                            |                                            |
|                                                   | Runs on Sustainable Aviation Fuel                                                                                                           |                                            |                                            |
| Noise level                                       | 85 ±2dB(A) at 7m<br>(23 ft) with full load                                                                                                  | 85 ±2dB(A) at 7m<br>(23 ft) with full load | 90 ±2dB(A) at 7m<br>(23 ft) with full load |

<sup>1)</sup> At 15°C ambient temperature, sea level  
All data are subject to change without notice.

## MSU 200S



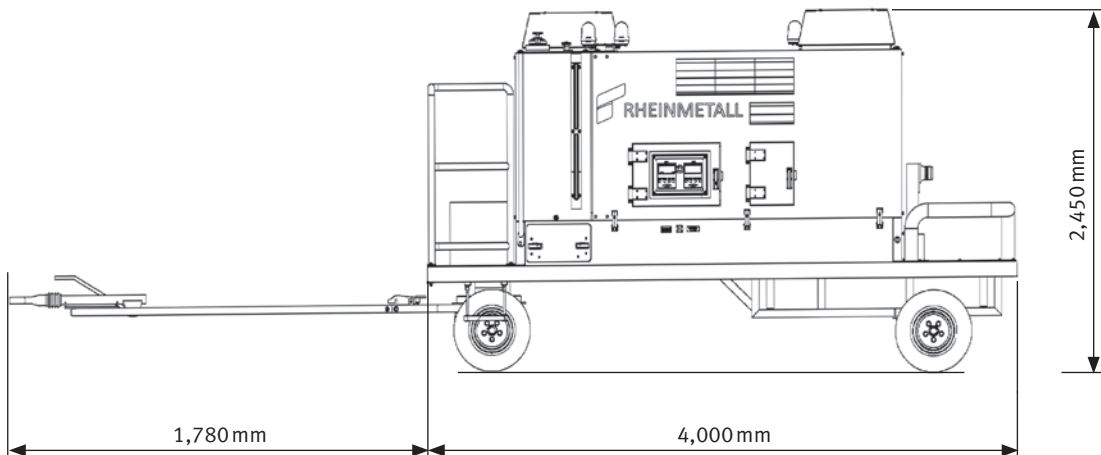
## MSU 200T



| TECHNICAL DATA           | MSU 200S                                            | MSU 200T | MSU 400T |
|--------------------------|-----------------------------------------------------|----------|----------|
| Air inlet                | Particle separator with scavenge system             |          |          |
| Control system           | Full Authority Digital Engine Control (FADEC)       |          |          |
|                          | Built-In Test Equipment (BITE)                      |          |          |
| Operating modes          | Main Engine Start (MES)                             |          |          |
| and functions            | Environmental Control System (ECS)                  |          |          |
|                          | Automatic mode selection (MES/ECS)                  |          |          |
|                          | No load restrictions in ECS mode                    |          |          |
| Safety                   | Overspeed shut down                                 |          |          |
|                          | Exhaust gas overtemperature control                 |          |          |
|                          | High oil temperature shutdown (override during MES) |          |          |
|                          | Low oil pressure shutdown (override during MES)     |          |          |
| Panel functions          | Multifunction display                               |          |          |
| International standards  | I.A.T.A. Regulations                                |          |          |
|                          | CE Regulations                                      |          |          |
|                          | SAE Regulations                                     |          |          |
| Options (costs may vary) | Galvanised trailer (powder coated)                  |          |          |
|                          | Jumpstart socket                                    |          |          |
|                          | Pull eye available in different diameters           |          |          |
|                          | MSU unit available in any RAL color                 |          |          |

All data subject to change without notice.

## MSU 400T



Rheinmetall also offers an air start unit with integrated ground power: **the MSU-GP 200T.**

For more information on Ground Support Equipment,  
contact us at:

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