

1. 20 m3 REFUELER.

20 m3 Articulated Vehicle with the following capacities:

- Underwing Refuelling by Deck hoses up to 2.000 lpm.
- Underwing Refuelling by Hose Reel up to 1.000 lpm.
- Overwing Refuelling through Hose reel up to 400 lpm.
- Defueling through deck hoses up to 400 lpm.
- Defueling through underwing hose reel up to 400 lpm.
- Sampling recovery to main tank.
- Sampling from Filter Water Separator's outlet.
- Sampling from Filter Water Separator's inlet (sump)
- Bottom Loading from Loading Dock up to 2400 lpm.
- Recirculation with underwing refuelling hoses.(one for Deck Hoses and one for Hose Reel hose)

1.1. Basic Chassis:

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Refueller manufactured on a Iveco S-Way o AD260S40YPS with automated gearbox.

Maximum flowrate is 2.000 lpm (640 USGPM) through Deck Hoses.

Maximum flowrate is 1.000 lpm through Hose Reel.

Approximate Dimensions for the equipment is:

- Approx. Length..11,80 mts
- Width: 2,55 mts
- Maximum Hight. 3,10 mts.

Chassis Iveco S-Way AD260S40Y/PS

- Limited speed at 30 km/h.
- 315/60 R22,5 Tyres
- AutomatedTransmission.
 - o Power Take Off 800 Nm
- White colour
- LED Day Lights.
- Suspensions
 - Front Axle with Leaf springs and stabilizer bar.
 - o Rear Axles with Pneumatic suspension (lifting capability in last axle).
With stabilizer bar and 2 channels controller.
- ADR Hazardous Goods Transportation Equipment.

- 12 T Elevator
- Pre-signalling triangles.
- Interface Electronic Box for bodybuilder BBM (expertise functions for bodybuilders via Bus CAN)
- Wheel chock.

1.2. Main Tank:

Main tank made of aluminium alloy EN AW 5182 of 20.000 lts + 4% expansion chamber, with slopes greater than 4%, 5 mm thickness. According to ADR Regulations. With the following features:

- 2 x 600 mm Manhole with Venting valve.
- Upper tray for manholes protection according to ADR 2017, with anti-slipping galvanized runway.
- Double railing, stainless Steel with pneumatic operation.
- Rear Lateral Access Stairway for access to the upper part of the tank.
- 6" Suction Bottom Valve.
- 4" Balanced bottom valve for Bottom loading.
- 4" Bottom valve for low point sampling.
- Double Mechanical Overfill system.
- High Flow rate venting valves.
- RAL 9010 painted.
- Measuring Rod and Measuring Table.
- 2 1/2" ISO 45 Aviation coupling, Tank unit with isolating valve and gauge at rear part of the tank to test the deck hoses nozzles.

Tank Bottom:

- 2x2 1/2" ISO 45 Aviation coupling, Tank unit with isolating valve and gauge.
- 1x2 1/2" Jet A1 Selective coupling, Tank unit.
- 1x4" Jet A1 Selective coupling. Tan Unit.
- Bottom Valve pneumatic switches with opening indication for loading and Sump draining.
- Testing valve for overfill prevention systems (bottom valve and in line valve separately).
- 4" balanced Bottom valve pneumatic operation.
- 6" bottom valve (suction).
- 4" bottom valve for low point (sump) from the main tank.
- Bottom valves with pneumatic operation.

1.3. Refuelling Equipment.

Refuelling Equipment is based on the use of the following main equipment:

- 6" Expansion Joints at pump's inlet.
- Centrifugal Pump for 2700 lpm (Gorman Rupp pump)
- Faudi FW24 Filter Water Separator according to EI 1581 6th Edition, made of stainless steel Following elements are included:
 - o Relief Valve, stainless Steel.
 - o Automatic Air eliminator in stainless steel

- Differential pressure gauge with spring valve for testing piston movement.
- Stainless Steel sight glass.
- Differential Pressure Sensor.

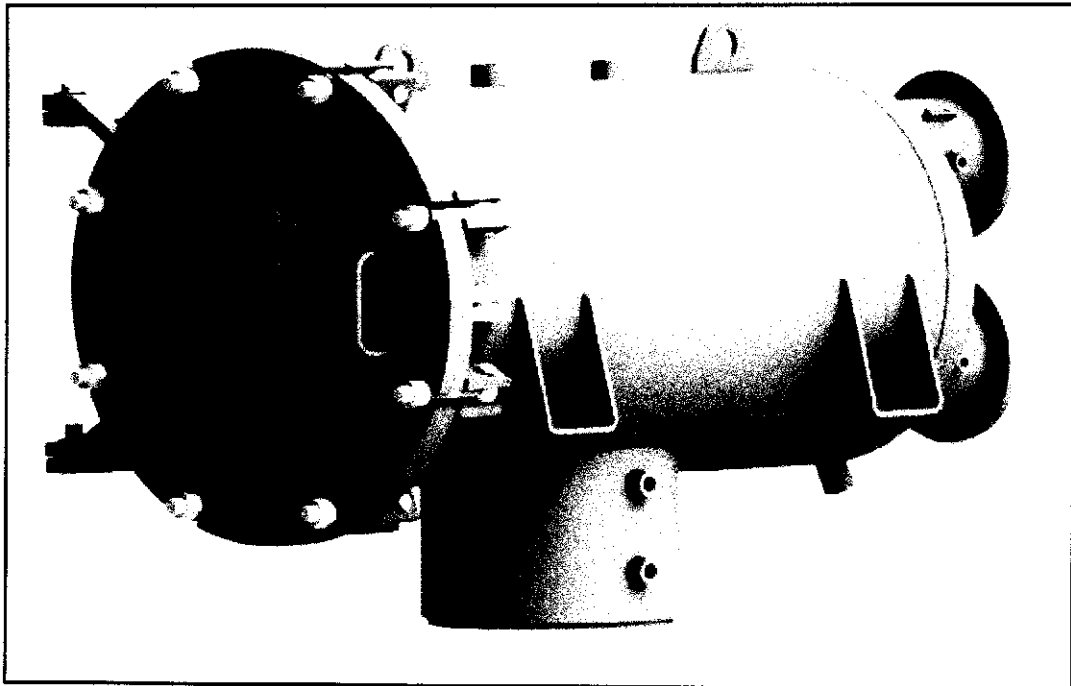


Figure 1. Horizontal Aviation Filter Water Separator.

- In line pressure control Valve.
- Lifting Platform suitable for refuelling Boeing 777 y A380 aircrafts. Equipped with:
 - 4" Lifting hose according to ISO 1825 for aviation use, pressure test certified by hose manufacturer.
 - Aluminium swivels with reinforced double bearing tracks.
 - 2 x 2 1/2" hoses according to ISO 1825 for aviation use, pressure test certified by hose manufacturer.
 - Pressure nozzles Carter 64200 or Cla-Val 347GF with 45 psi HECV, with 100 mesh strainer and vacuum breaker, Defueling Nozzles equipped with strainer ball valve to change its position for defueling operations.
 - Electronic Safety Sensors 30 cms above platform, it stops platform from rising in case of detecting any obstacle.
 - Emergency Stop Button. It stops all the equipment, even the truck's engine.
 - Emergency Descent system (Sealable), even with the engine switched off it permits to lower the platform. One control on the deck and the other at the floor level.
 - Rising and Lowing control with acoustic warning.
 - Anti-trapping system during descent.
 - Capacity: 200 kgs.
- DN 50 Hose according to ISO 1825 for aviation use, pressure test certified by hose manufacturer (Elaflex). Length: 25 m.
- DN 25 Hose according to ISO 1825 for aviation use, pressure test certified by hose manufacturer (Elaflex). Length: 30 m.

- Aviation Overwing nozzle Elaflex ZVF 50 with selectivity and normal spouts.
- Radial Hose reel made of aluminium alloy for 25 m DN50 aviation Hose. Automatic hydraulic rewind with reinforced hydraulic motor and control.
- Radial Hose reel made of aluminium alloy for 30 m DN25 aviation Hose. Automatic hydraulic rewind with reinforced hydraulic motor and control.
- Water Detector in FWS sump.
- Meter for underwing refuelling for 2500 lpm, with pulse emitter and temperature probe.
- Meter for overwing refuelling for 500 lpm, with pulse emitter and temperature probe.
- Flow computer, large Display included.
- Additive Injector with 65 lts Additive Tank (stainless steel) with complete circuit to dosing pump, connected to flow computer.
- Adjustable Venturis for underwing Operations (1 for deck hoses and 1 for hose reel hose)

1.4. Sampling System.

Sampling System is equipped with the following equipment:

- Product Recovery Tank made of aluminium alloy, capacity 50 lts, register cap of 150 mm, vent, sight glass, ISO 45 Tank Unit and ATEX level Emergency switch.
- 4 lts Sampling Jar.
- Spring Valve at Jar's inlet.
- Aluminium alloy or stainless-Steel piping depending on size.
- Outlet for external emptying, capability for fuel Recovery to the main tank through pneumatic pump.

Samples will be able to be taken from:

- Filter's inlet (sump).
- Filter's outlet.

There will be drainages points for the following locations, all equipped with spring valves and Camlock couplings.

- Low point from the Main tank, it has also a bottom valve and a second ball valve in line before the spring valve.
- Low point from the Product Recovery Tank.
- Drainage Chambers from FWS and sump.

Relief pressure system set at 2 bar connected to main tank.



Figure 3. Control Screen in Cabin for interlocks in Option 2, system based on PLC

1.5. Interlock System and Electric/Electronic system.

Interlock system according to international standards, with stainless Steel actuators and electronic ATEX sensors for:

- Underwing Deck hose Nozzles.
- Underwing Hose reel nozzle.
- Overwing Nozzle.
- Non-selective Spout for overwing nozzle.
- Lifting Platform out of safety position.
- Bottom valve couplings..
- Bonding cables out of position (one per side)
- Interlock 360.
- Railing out of safety position.
- Couplings to Towbar Tank used.
- Towbar Tank connected.

The system includes other controls in order to permit the vehicle to move:

- Driver's door open.
- PTO engaged.

Control Lights within the cabin for Interlocks and PTO control.

- Orange Light, Interlock activated.
- Red, Interlock system override activated.
- Green, PTO engaged.

Beacon lights over the roof connected to Interlock system. They can be switched on/off manually or controlled by the Interlock system (automatized)

Emergency Stop Buttons.

Emergency Stop Buttons for the vehicle's engine and the Refuelling system located at:

- Control Panel Driver's side.
- Right side from the vehicle.
- Cabin.
- Lifting Platform
- Reset of the system is done automatically when the vehicle is re-started.

Equipment Lightning.

ATEX lightning in hazardous areas by means of LEDs:

- Control Panel. Meter and gauges.
- Sampling Jar.
- ATEX Work light in platform.

It includes:

- ATEX switches.
- ATEX connection boxes.

1.6. Cabin Equipment

The electrical cabinet for the cabin includes the following controls and will contain safety barriers and other equipment:

- Interlock Override switch (sealable)

1.7. Other equipment:

- Deadman handle, with supporting box, adjusted to 1 minute 30 seconds and reset warning.
- Product Recovery Tank ATEX Switch.
- Deadman Override.
- ATEX Green light for Deadman activation Warning.
- ATEX Red light for High Level in Product Recovery Tank.
- Lights for Sampling jar and Control Panel.

1.8. Control Panel.

Aluminium alloy control panel with:

- Pump Pressure Gauge, with valve and Testing coupling.
- Venturi Pressure with valve and Testing coupling.
- Vacuum Gauge.

- Differential Pressure Gauge for FWS.
- Hydraulic Pressure Gauge.
- Pneumatic Pressure Gauge.
- Deadman Warning Light.
- ATEX High Level Warning Light for Product Recovery Tank.
- ATEX Alarm for water in FWS Sump (blue)
- Sealable Deadman Override system.
- Main Control Panel lightning switch.
- ATEX LED light
- ATEX Light switch.
- Pneumatic control to select Tank:
 - o Main Tank
 - o Main Tank + Towbar
 - o Tow bar.
- ATEX Control to accelerate or decelerate Truck's engine.
- Manual Control for Product Recovery pump.
- Air Service Unit.
- Refueling/Defueling controls.
- Filter Millipore Test point.
- Underwing reel hose Test Point.
- Underwing deck hose Test Point

1.9. Pneumatic System.

Complete pneumatic system for Deadman and Interlocks Controls is included.

1.10. Power Hydraulic System

Includes

- 150 lts Hydraulic Oil Tank
- Oil Pump connected to PTO.
- Hydraulic Control for Fuel Pump.
- Hydraulic Controls for Hose Reels rewind.
- Hydraulic Control for Lifting Platform.
- Parachute valve in Deck's scissors.
- Radiator for oil cooling during operations.

1.11. Lifting Platform.

Scissor lifting platform, 2,2 mts x 0,80 mts. Access through ladder. Made of stainless Steel for a maximum weight of 200 kgs to reach up to 5,7 mts from floor height (suitable for A380 and B777 aircrafts)

2 x 21/2" Deck hoses are included, equipped with Carter or Cla-Val Pressure nozzles with 45 PSI HECV. 1 of the Deck Nozzles ready to be used for defueling (pressure-breaker valve and strainer positioning valve) Interlock sensors (ATEX) are installed to control that the nozzles are in their safety position before the refueler can move.

Emergency lowering system is included, with sealable controls at the platform and at the floor level.

Speed control systems are included to control rising and lowering of the platform, even in emergencies.

Parachute valve is installed to avoid sudden fall due to hydraulic hose breakage.

1-meter railing with Knee protection and 15 CMS base board is included.

Emergency Stop Button included.

4 sensors are included to prevent hitting the plane according to JIG rules. These sensors only stop platform to rise but lowering is always permitted (if there is no obstacle during lowering).

Anti-trapping system is included with the platform in such a way that if an obstacle is detected the platform will stop lowering.

Access gate to platform is equipped with a mechanical blocking system that only permits its opening while the platform is in safety position (lowered).

The platform is equipped to block the lowering of the platform while maintenance works are being done.

1.12. Supports

Supports in stainless Steel, aluminium and carbon Steel depending on the use and location.

1.13. Other elements:

The following elements are included:

- 9 kgs 183 BC Dust extinguisher with supporting.

1.14. Documents.

The following documents are included meeting JIG1 y EN-12312-5 rules and standards.

- Operation and Maintenance Manuals. Digital and Paper formats.
- Main Components documentation.
- Base Vehicle Manuals.
- Quality Certificates.

2. ECONOMICAL PROPOSAL.

2.1. Refueller using system based on PLC and Satam meters and flow computer.

The Price for the unit is **267.725,20 € /unit no Taxes included.**

Delivery:

- **Base Truck (Renault) to be delivered to our facilities: 9 months after the order.**
- **Final Assembly in our facilities of Madrid: 4 months after receiving the chassis.**
- **Commissioning in Romania: 1 week.**

2.2. 45 m3 low Profile Tow Tank:

2.3. The Price for the unit is **107.328,80 € /unit no taxes included.**

Total approximately: 13-14 months

Comercial Terms:

- Ex-works.

Payment Terms: By the following rates per unit.

- 30% at Order.
- 65% at ending of the Refueler at our facilities and after Check List completion by the customer.
- 5% After commissioning in destination.

Validity: 2 months.

Warranty: 24 months against manufacturing defects in Spain. In case of individual equipment, the warranty is the one given by the original manufacturer.

Training and commissioning is included (1week) in Romania: **Included**

Transport to Romania: All Risk Insurance: To be determined once the final destination is given by the customer.

Madrid, May 2023

PROFATEC, S.L.
José Manuel Ruiz Vozmediano
