



**AVIATION REFUELLING  
EQUIPMENT CATALOGUE**



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## COMPANY PROFILE

Aljac Fuelling Components Limited was formed in 2001 from a merger of Aljac Engineering Ltd. (founded in 1971) and Fuelling Components Ltd. (founded in 1988). The company is based at Shepperton in the United Kingdom, adjacent to London's Heathrow Airport, and we operate in the fluid and bulk solids handling and transport industries, specialising in aviation fuel handling systems and equipment. We are ideally situated to serve both Heathrow and Gatwick airports, but we also supply equipment to customers all over the world. In 2007 we established Aljac GmbH in Hamburg to serve our customers in Germany, Switzerland and Austria. Our German company is supported from the main UK warehouse so is able to supply any item from the product range within a short period of time, and our customers can be safe in the knowledge that they will enjoy the same high standards from either of our stockholding locations.

The company is owned and operated by two Chartered Professional Engineers and our business has been established on the twin foundations of technical competence and customer service. We aim to provide the most comprehensive range of the highest quality products and services to our clients at competitive prices, and wherever possible deliver equipment ex stock. Our range is one of the widest in the aviation refuelling industry and is underpinned by premium quality branded products from internationally respected manufacturers. The following are our major product lines.

**Faudi Aviation** fuel filter water separators, filter monitors, micro filters and clay filters for filtering aviation fuel and for general industrial filtration. We can supply new filter vessels and we hold large stocks of replacement elements to suit both Faudi's and their competitor's vessels. We are also the European distributor for **Kaydon Filtration** who manufacture turbine oil conditioning systems and associated filter elements.

**Eaton Carter** aviation refuelling couplings, inline pressure control/deadman valves, hydrant valves, hydrant dispenser intake couplings and tanker bottom loading systems. We hold extensive stocks of new equipment and spare parts for same day despatch, and our distribution territory covers Europe, Middle East and Africa.

**Isoil Impianti** positive displacement bulk flow meters, electronic metering systems, control valves, de-aerator vessels and packaged metering systems.

**Gammon Technical Products** who specialise in aviation fuel handling equipment and consumables, including filter differential pressure gauges, contamination test kits, tank floating suction assemblies, sampling valves, and a wide range of other ancillary items.

**Hammonds** additive injection equipment which can be supplied on a stand alone basis or as part of bespoke custom manufactured fixed or mobile additive injection systems. This equipment has a wide range of capabilities in both the aviation and industrial markets, including the injection of anti icing additive, corrosion inhibitor, +100, biocides, ground fuel performance enhancers and marker dyes.

**Elaflex** aviation refuelling hose which is approved by all the major fuel suppliers. From stock we are able to supply finished hoses cut to length, fitted with approved end connections, pressure tested on Jet A1 if required and with a fully traceable Certificate of Conformity. We also hold stocks of Elaflex flexible joints and refuelling trigger nozzles.

**Fjord Industrial Products** who manufacture a high quality range of Urethane products including aircraft refuelling coupling sealing caps and protection rings, hose protection beads, and aircraft wing protection mats.

**Sening** pneumatic tanker bottom valves, pneumatic bottom load systems and associated products.

**ZR Armaturen (Renus)** Aluminium ball valves and Storz couplings for petroleum and powder tankers.

**Delta RCS** wireless and wired 'deadman' control systems and spare parts.

**Conbraco** Apollo ball valves fitted with spring return 'deadman' levers.

**Conidia Bioscience** FuelStat microbiological contamination test kits

**Fosse** fuel spillage containment and clean up kits which reflects the growing awareness of environmental considerations when handling hydrocarbon fuels.

We also manufacture our own range of equipment, for example, static bonding and earthing equipment, 'deadman' control switches and cables, closed sampling systems for refuelling vehicles and tank farms, sandwich pattern non return valves, towable refuelling vehicles, and towable master meters.

In addition we hold large stocks of the most complete range of fuel quality control equipment and consumables, including water detector capsules and paste, lead seals/sealing wire, Stainless Steel buckets, glass sampling jars, hydrometers and thermometers, fuel conductivity meters and many other items associated with the day to day task of testing and checking fuel quality.

We are able to overhaul and service any item of equipment from our extensive product range. Our staff also have the qualifications, technical background and depth of industry experience to be able to offer the highest quality professional advice to our customers on all aspects of aviation refuelling and fuel handling.

Our customer base is constantly expanding as our reputation for quality and service spreads. We have already successfully supplied the major oil companies and into plane refuelling operators at airports all over the world and the major fuel suppliers trust in our ability to supply the correct items in the shortest possible time. In addition we supply fuel distribution terminals and refineries and the major aviation refuelling vehicle, petroleum tanker and bulk powder tanker builders.

We have also established an international distributor network to further enhance our ability to provide a premium service to our customers wherever they are located, but we consider it vital that our distributors all share our philosophy and uphold the Aljac level of customer service and technical ability.

Here are some of the larger companies and organisations who already purchase our equipment on a regular basis:-

Abu Dhabi National Oil Corporation.	Titan Aviation.	Police Air Support Units.
AFS Germany.	Emirates National Oil Company.	Qinetiq.
Air BP.	Exxon Mobil.	Repsol YPF.
Aircraft Service International (ASIG).	Fluid Transfer.	Rolls Royce.
Air Products.	GALP Portugal.	Ryanair.
APSCO Saudi Arabia.	Gammon Technical Products.	Shell International.
ARAMCO Saudi Arabia.	KAR Kunz (Hunert/Struver)	Simon Management..
Bahrain Aviation Fuelling Co.	Kellogg Brown and Root.	SJS Germany.
Bristow Helicopters.	KLM.	Skytanking.
British Aerospace.	KAFCO.	SLCA Spain.
British Airways.	Kuwait Aviation.	Stokota.
British Petroleum.	Ministry Of Defence.	Swire Group.
British Pipeline Agency (BPA).	Motherwell Bridge.	Terminales Canarias.
Chevron Texaco.	Neste Oil.	Total Outre Mer.
CLH.	Northair UK.	Ulrich Esterer and Co.
CMD (CEPSA).	Nutzfahrzeuge Rohr.	United Nations.
Cobham Group.	Oils and Pipelines Agency UK.	United States Air Force
Conoco Phillips.	Parker Hannifin.	Virgin Atlantic.
Costain.	PASCO Saudi Arabia.	Wincanton Group.
Dow Corning.	Protec Fire.	Wolseley Group UK.

## **PRODUCT LIST**

Aljac provides specialised equipment and services to the fluid and bulk solids handling and transport industries with particular emphasis on aviation fuel storage, distribution and dispensing equipment. Our clients include the major oil companies within the United Kingdom, Germany and overseas, original equipment builders and tanker manufacturers as well as the major international airports

Our product range is constantly expanding as we strive to offer our clients the most comprehensive range of equipment, but here are brief details of our current main stock product lines. However, if you have a requirement for equipment which is not shown on the list we will always attempt to assist you.

### **Eaton Carter Aviation Refuelling Equipment.**

Into aircraft pressure refuelling couplings.

Hydrant dispenser intake couplings.

Inline pressure control/deadman valves.

Tank bottom loading automatic high level cut off systems.

Fuel hydrant pit valves.

Pressure control venturis.

Unisex couplings.

Digital pressure control systems.

Full range of spare parts in stock.

### **Isoil Impianti Metering Equipment.**

Positive displacement bulk meters with mechanical readouts, rate of flow indicators, preset displays and valves, ticket printers.

Electronic metering systems.

ATEX approved large figure remote displays.

Master meters.

Control valves.

De-aerator vessels.

Packaged metering systems.

### **Faudi Filtration.**

API/IP1581 approved filter water separator vessels and replacement elements.

API/IP1590 approved microfilter vessels and replacement elements.

API/IP1583 approved water absorbing monitor vessels and replacement elements.

Clay filter vessels and replacement cartridges.

Industrial filter elements, band filters and precoat filters.

Electronic water monitoring systems.

Electronic filter differential pressure monitoring and control systems.

### **Gammon Technical Products.**

Minimonitor and multi minimonitor 'Millipore' type contamination test kits and consumables including colorimetric and gravimetric capsules.

Direct reading filter differential pressure gauges.

Fuel sampling probes and test fittings.

Spring rewind bonding reels.

Tank floating suction assemblies.

Aqua Glo kits for the measurement of water concentration in hydrocarbon fuels.

Complete range of fuel quality checking equipment.

### **Aljac Closed Circuit Samplers.**

Aljac closed sampling jars for the visual examination of aviation fuel and general hydrocarbon fuel samples. Available in 4, 20, 80 and 160 litre sizes with optional accessories to allow water detection, density and temperature measurement. Suitable for use on aviation refuelling vehicles, tanker loading and offloading stands, and main tank sampling.

### **Hammonds Additive Injection Equipment.**

Turbine and positive displacement driven additive injection units.

Complete additive injection systems which can be trailer, frame or vehicle mounted.

Full range of Hammonds spare parts.

Additive injection system commissioning and staff training.

### **Delta Deadman Systems.**

Wired deadman control systems for aviation refuelling vehicles, tanker loading and offloading.

Wireless deadman control systems for aviation refuelling vehicles.

### **Elaflex Hoses and Trigger Nozzles.**

Aircraft refuelling hoses to ISO1825.

Trigger nozzles for aviation refuelling and general petroleum duty.

Flexible pipework connections.

Hose end fittings and reducers.

### **Conbraco Ball Valves.**

Threaded ball valves in Stainless Steel, Bronze and Carbon Steel.

L port threaded ball valves in Stainless Steel and Bronze.

Deadman spring return handles, locking handles, electric and pneumatic actuators.

Ball cone and soft seat threaded non return valves in Stainless Steel and Bronze.

### **Fjord Sealing Caps and Protection Rings.**

Fully sealing dust caps and protective bump rings for Carter and Meggitt into plane refuelling nozzles.

Dust caps for 3 lug ISO45 tank units.

Dust caps for API tank units.

Urethane mats for the protection of the aircraft wing during overwing refuelling operations.

High visibility Urethane strips for the protection of refuelling hoses.

### **ZR (Renus) Ball Valves.**

Aluminium ball valves which can be TW or ASA flanged, or BSP male or female threaded. Suitable for air, water, petroleum products, powders or granules.

### **Sening Tanker Fittings.**

Pneumatically operated Aluminium tank bottom valves for petroleum tankers and aircraft refuelling vehicles.

Pneumatically operated tanker vent valves.

Complete bottom loading systems for petroleum tankers and aviation refuelling vehicles.

Pneumatically operated Aluminium in line shut off valves.

Deadman control valves for aviation refuelling vehicles.

### **Conidia Bioscience.**

Fuel Stat microbiological contamination testing equipment.

### **Fosse Fuel Spillage Control.**

Complete fuel spillage containment and clean up kits in a wide range of sizes and configurations.

Bagged fuel spill kits.

Oil absorbent pads for small scale spillages.

Oil absorbent socks for spillage containment purposes.

### **Kaydon Filtration Products.**

A complete range of industrial filter systems and elements with particular emphasis on turbine oil conditioning.

### **Miscellaneous Aviation Refuelling and Petroleum Tanker Products.**

Hand rewind and spring bonding reels for powder tankers, hazardous waste tankers, chemical tankers, aviation refuelling vehicles and fixed fuel depot applications.

Copper braid cored clear PVC and high visibility green covered bonding cable.

Steel cored clear PVC covered bonding cable.

Heavy duty bonding clips, a wide range is held in stock.

Tanker earthing sockets/suzie cables and bolt on earth pins.

Static earth system continuity testers.

Hand rewind lanyard reels for aviation refuelling vehicles.

Steel cored red PVC covered aviation lanyard cable with or without fitted ends and carbine hook.

Hand rewind electric deadman reels for aviation refuelling vehicles.

Deadman handswitches, coiled twin core orange suzie cables and associated weatherproof plugs and sockets.

Battery isolation switches, boost plugs and sockets for aviation refuelling vehicles.

ATEX approved lamps with clear or coloured lenses for use on aviation refuelling vehicles.

Automatic air eliminators.

Aviation hydrant dispenser air/fuel sense hose.

Hosereels, hand and power rewind.

Fuel sample collection and recovery tanks and complete systems, mobile or fixed.

Pit flags and flag poles for the clear identification of aviation fuel hydrant pits during refuelling operations.

High visibility hydrant dispenser intake hose sleeves.

Jet A1 and Avgas colour coded hose sleeves to identify the fuel grade during overwing aviation refuelling.

### **General Pipeline and Depot Construction Products.**

Sandwich pattern non return valves in Aluminium, Carbon Steel, Ductile Iron and Stainless Steel.

Sandwich pattern butterfly valves, in Ductile Iron, Steel, Stainless Steel and Aluminium.

Basket strainers in Carbon Steel and Stainless Steel.

Composite wire reinforced hoses for tanker and rail car loading and offloading.

Sight flow indicators for use in pipework systems. Available in Carbon Steel or Stainless Steel, flanged or threaded.

Kamlok couplings in Aluminium, Stainless Steel and Brass.

Threaded BSP hose couplings, dust/drip caps and connectors in Aluminium, Gunmetal and Stainless Steel.

Pressure gauges manufactured from Stainless Steel, dry or Glycerine filled.

De-aerator vessels and high capacity air release heads.

### **Fuel Handling And Quality Control Products.**

Clear glass jars for fuel sampling.

Wire carrying cages for glass jars.

Stainless Steel buckets for fuel sampling, 8, 10, 12 or 15 litre capacity with bonding wire and clip.

Brass heavy duty bonding clips/cables for sampling buckets and aviation refuelling nozzles.

Hydrometers and thermometers for fuel density measurement and associated ASTM density correction tables.

Hydrometer jars, glass and plastic.

Water detector capsules and syringes.

Water finding paste and paper for fuel systems.

Fuel finding dip paste.

Fuel sample retention and transport containers, 1 litre and 5 litre capacity, epoxy lined tinfoil, available with associated transport cartons. IATA approved for transport of fuel samples by air.

Fuel sample retention containers, epoxy lined tinplate, wire sealable for general fuel sample retention.

Fuel contamination test kits and colorimetric/gravimetric capsules and membranes.

Tank dip tapes.

Tank sample thief, Stainless Steel, 1 litre.

Pressure test pumps and associated threaded adapters.

Emcee fuel conductivity meters.

Sealing wire, lead seals and sealing pliers.

Stainless Steel locking wire.

Nitrile gloves for fuel handling and equipment maintenance duties.

Self adhesive decals and tapes for fuel grade marking on pipelines and tanks.

### **Systems and Servicing.**

Additive injection systems, trailer or skid mounted.

Fuel dispensing, filtration and metering systems, trailer or skid mounted.

Fuel test rigs.

Master meter trailers.

Towable aviation refuelling bowsers.

Closed sampling and product recovery systems for aircraft refuelling vehicles, fuel depots and main storage tank farms.

Servicing and overhaul of our complete range of fuel handling equipment and systems.

## AVIATION FUEL

### QUALITY CONTROL CONSUMABLES

#### Principal Consumables.

Category	Description	Part Number
Principal Consumables	Water Detector Capsules	0902000110
Principal Consumables	Syringe, 5ml Nylon, reusable, for use with water detector capsules	0902000120
Principal Consumables	Water finding paper, 3/8" wide by 5.1/2" long	0902000130
Principal Consumables	Water finding paste, Kolor Kut	0905003908
Principal Consumables	Single test membranes, Colourmetric contamination testing, complete with support pads, GTP1983	6002198300
Principal Consumables	Plastic monitors, non castellated, loaded with single membranes for Colourmetric testing and support pads, GTP1985	6002198500
Principal Consumables	Plastic monitors, non castellated, loaded with Matched Weight membranes for Gravimetric testing and support pads, GTP1986	6002198600
Principal Consumables	ASTM colour standards book	6002107401
Principal Consumables	Glass jar, square, 3.5 litre capacity, clear, wide neck, with screw cap and seal	0902000030
Principal Consumables	Special packing for glass jar	0902000031
Principal Consumables	Wire cage for 3.5 litre glass jar, plastic coated, with carrying handle	0902000040
Principal Consumables	Stainless Steel bucket, 12 litre, with base ring, graduated, with bonding wire and clip	0902000006
Principal Consumables	Sample retention container, 1 litre, cylindrical, Tinplate epoxy lined internally, 2" Trisure closure, IATA approved	0902000050
Principal Consumables	Sample retention container, 5 litre, cylindrical, Tinplate epoxy lined internally, 2" Trisure closure, IATA approved	0902000060
Principal Consumables	Hydrometer, BS718 M50SP, 0.775 to 0.825, Jet A1, complete with C of C	0902000090
Principal Consumables	Hydrometer, BS718 M50SP, 0.700 to 0.750, Avgas, complete with C of C	0902000091
Principal Consumables	Hydrometer jar, glass, with pouring spout, 65mm diameter by 350mm long	0902000099
Principal Consumables	Thermometer ASTM12C/ IP64C, minus 20 to plus 102 degC, blue spirit filled (non hazardous), complete with C of C	0902000080A
Principal Consumables	Bonding cable, Copper core, clear PVC cover	0100212001
Principal Consumables	Bonding cable, Copper core, high visibility green transparent PVC cover	0100212005
Principal Consumables	Bonding clip, Raco 70mm, Brass with insulated grips	0100213001
Principal Consumables	Electric deadman handswitch, no cable	0100400010
Principal Consumables	Deadman switch replacement Reed switch element	0100400011
Principal Consumables	Coiled suzie cable (approx. 14m fully extended)	0100400100
Principal Consumables	Niphan 2 pin plug (with strain relief gland fitted)	0100400311

## Full Product List.

Category	Description	Part Number
Fuel Testing	Water Detector Capsules	0902000110
Fuel Testing	Syringe, 5ml Nylon, reusable, for use with water detector capsules	0902000120
Fuel Testing	Syringe, 5ml PE, no internal seal, for use with water detector capsules	0902000125
Fuel Testing	Syringe, 5ml Nylon, reusable, reverse action (one handed operation) for use with water detector capsules	0902000127
Fuel Testing	Water finding paper, 3/8" wide by 5.1/2" long	0902000130
Fuel Testing	Water finding paste, Kolor Kut	0905003908
Fuel Testing	Fuel finding ( Ullage ) paste, Kolor Kut	0905013221
Fuel Testing	Fuelstat Resinae Plus	0901000012
Fuel Testing	Anti-Icing additive test kit	6002B/2000

Category	Description	Part Number
Fuel Contamination Monitoring	Single test membranes, Colourmetric contamination testing, complete with support pads, GTP1983	6002198300
Fuel Contamination Monitoring	Matched weight membrane pairs, Gravimetric contamination testing, GTP1984	6002198400
Fuel Contamination Monitoring	Plastic monitors, non castellated, loaded with single membranes for Colourmetric testing and support pads, GTP1985	6002198500
Fuel Contamination Monitoring	Plastic monitors, non castellated, loaded with matched weight membranes for Gravimetric testing and support pads, GTP1986	6002198600
Fuel Contamination Monitoring	ASTM colour standards book	6002107401
Fuel Contamination Monitoring	Tweezers, membrane handling, locking	6002209900
Fuel Contamination Monitoring	Contamination test kit, Mini Monitor, Gammon	6002017200
Fuel Contamination Monitoring	Contamination test kit, Multi Mini monitor, Gammon	6002117200
Fuel Contamination Monitoring	10 litre sampling bottle. graduated, bonded	08PP18569

Category	Description	Part Number
Fuel Sampling	Glass jar, square, 3.5 litre capacity, clear, wide neck, with screw cap and seal	0902000030
Fuel Sampling	Special packing for glass jar	0902000031
Fuel Sampling	Replacement screw cap with seal for 3.5 litre glass jar	0902000035
Fuel Sampling	Wire cage for 3.5 litre glass jar, plastic coated, with carrying handle	0902000040
Fuel Sampling	Wipes, 240mm X 420mm	0902000032
Fuel Sampling	Stainless Steel bucket, 8 litre, low profile, no base ring, ungraduated, no bonding wire and clip	0902000001
Fuel Sampling	Stainless Steel bucket, 8 litre, low profile, no base ring, ungraduated, with bonding wire and clip	0902000002
Fuel Sampling	Stainless Steel bucket, 10 litre, with base ring, graduated, no bonding wire and clip	0902000003
Fuel Sampling	Stainless Steel bucket, 10 litre, with base ring, graduated, with bonding wire and clip	0902000004
Fuel Sampling	Stainless Steel bucket, 12 litre, with base ring, graduated, no bonding wire and clip	0902000005
Fuel Sampling	Stainless Steel bucket, 12 litre, with base ring, graduated, with bonding wire and clip	0902000006
Fuel Sampling	Stainless Steel bucket, 15 litre, with base ring, graduated, no bonding wire and clip	0902000009
Fuel Sampling	Stainless Steel bucket, 15 litre, with base ring, graduated, with bonding wire and clip	0902000010
Fuel Sampling	Funnel 10" diameter, Stainless Steel, no bonding wire and clip	0902000013
Fuel Sampling	Funnel bonding wire and clip, supplied loose ready to fit	0902000014
Fuel Sampling	Jug, 2 litre, Stainless Steel graduated	0902000068
Fuel Sampling	Sample retention container, 1 litre, cylindrical, Tinplate epoxy lined internally, 2" Trisure closure, IATA approved	0902000050
Fuel Sampling	Sample retention container, 5 litre, cylindrical, Tinplate epoxy lined internally, 2" Trisure closure, 181mm diameter by 258mm high, IATA approved	0902000058
Fuel Sampling	Sample retention container, 5 litre, cylindrical, Tinplate epoxy lined internally, 2" Trisure closure, IATA approved	0902000060
Fuel Sampling	Transit carton to suit 5 litre cylindrical IATA container	0902000061
Fuel Sampling	Vermiculite absorbent loose fill packing for fuel sample containers	0902000062
Fuel Sampling	Sample retention container, 2.5 litre, Tinplate, unlined internally, single trip only, with wire sealable screw cap and carrying handle	0902000065
Fuel Sampling	Sample retention container, 5 litre, Tinplate, epoxy lined internally, single trip only, with wire sealable screw cap and carrying handle	0902000066

Category	Description	Part Number
Tank Sampling	Tank sample thief, weighted, Stainless Steel, 1 litre capacity, without rope	0902000070
Tank Sampling	Rope for tank sample thief	0902000071
Tank Sampling	Bacon bomb tank bottom sampler, 16oz	6002TL3573
Tank Sampling	Tank dip tape, Carbon Steel, 10 metre, IPM pattern, complete with weight and winding frame	0902000075
Tank Sampling	Tank dip tape, Carbon Steel, 15 metre, IPM pattern, complete with weight and winding frame	0902000076
Tank Sampling	Tank dip tape, Carbon Steel, 20 metre, IPM pattern, complete with weight and winding frame	0902000077
Tank Sampling	Tank dip tape, Carbon Steel, 25 metre, IPM pattern, complete with weight and winding frame	0902000078

Category	Description	Part Number
Seals, Sealing Wire and Pliers	Sealing wire, fine, galvanised Steel, on a plastic bobbin	0902000300
Seals, Sealing Wire and Pliers	Sealing wire, medium, galvanised Steel, on a plastic bobbin	0902000310
Seals, Sealing Wire and Pliers	Sealing wire, medium, Copper, on a plastic bobbin	0902000315
Seals, Sealing Wire and Pliers	Sealing wire, fine, galvanised Steel, 20cm long cut lengths	0902000320
Seals, Sealing Wire and Pliers	Sealing wire, fine, galvanised Steel, 40cm long cut lengths	0902000322
Seals, Sealing Wire and Pliers	Lead seal, 10mm diameter, parallel hole	0902000210
Seals, Sealing Wire and Pliers	Lead seal, 11mm diameter, cross hole	0902000211
Seals, Sealing Wire and Pliers	Lead seal, 12mm diameter, parallel hole	0902000220
Seals, Sealing Wire and Pliers	Lead seal, 14mm diameter, parallel hole	0902000230
Seals, Sealing Wire and Pliers	Plastic seal, yellow, 10mm diameter, parallel hole	0902000270
Seals, Sealing Wire and Pliers	Plastic seal, Griptie, with integral tie and numbered tag	0902000260
Seals, Sealing Wire and Pliers	Sealing pliers, plain dies, to suit 10mm and 12mm diameter seals	0902000360
Seals, Sealing Wire and Pliers	Sealing pliers, plain dies, to suit 11mm and 14mm diameter seals	0902000380
Seals, Sealing Wire and Pliers	Locking wire, annealed Stainless Steel, 0.71mm diameter, to lock quick disconnect screws	0902000330
Seals, Sealing Wire and Pliers	Locking wire twisting pliers	0902000350

Category	Description	Part Number
Hydrometers and Thermometers	Hydrometer, BS718 M50SP, 0.775 to 0.825, Jet A1, complete with C of C	0902000090
Hydrometers and Thermometers	Hydrometer, BS718 M50SP, 0.700 to 0.750, Avgas, complete with C of C	0902000091
Hydrometers and Thermometers	Hydrometer, BS718 M50SP, 0.750 to 0.800, complete with C of C	0902000092
Hydrometers and Thermometers	Hydrometer, BS718 M50SP, 0.800 to 0.850, complete with C of C	0902000093
Hydrometers and Thermometers	Hydrometer, BS718 M50SP, 0.850 to 0.900, complete with C of C	0902000094
Hydrometers and Thermometers	Hydrometer jar, glass, with pouring spout, 65mm diameter by 350mm long	0902000099
Hydrometers and Thermometers	Hydrometer jar, plastic, with pouring spout, 55mm diameter by 345mm long	0902000098
Hydrometers and Thermometers	Hydrometer jar, plastic, with overspill cup, 43mm diameter by 385mm long, GTP1073	6002107300
Hydrometers and Thermometers	Thermometer ASTM12C/ IP64C, minus 20 To plus 102 degC, complete with C of C	0902000080
Hydrometers and Thermometers	Thermometer ASTM12C/ IP64C, minus 20 to plus 102 degC, blue spirit filled (non hazardous), complete with C of C	0902000080A
Hydrometers and Thermometers	Thermometer IP53C, 0 to plus 80 degC, complete with C of C	0902000100
Hydrometers and Thermometers	Thermometer IP53C, 0 to plus 80 degC, blue spirit filled (non hazardous), complete with C of C	0902000100A
Hydrometers and Thermometers	Thermometer IP49C, minus 15 To plus 40 degC, complete with C of C	0902000081
Hydrometers and Thermometers	Thermometer IP49C, minus 15 to plus 40 degC, blue spirit filled (non hazardous), complete with C of C	0902000081A
Hydrometers and Thermometers	Thermometer IP39C minus 1 to plus 38 deg C, 0.1 deg C steps 450mm long, complete with C of C	0902000084
Hydrometers and Thermometers	Thermometer ASTM63C, minus 8 to plus 32 deg C, 0.1 deg C steps 384mm long, complete with C of C	0902000087
Hydrometers and Thermometers	Protective sheath to suit ASTM12C/IP64C thermometer, Brass	0902000085
Hydrometers and Thermometers	Protective sheath to suit IP49C thermometer, Brass	0902000086
Density Calculator	Density correction calculator disc, suitable for JET A1 and Avgas	60022727EF

Category	Description	Part Number
Signs, Decals and Labels	Filter inspection label self adhesive	0906000018
Signs, Decals and Labels	Number set for filter inspection label	0906000019
Signs, Decals and Labels	Fuel retention sample label with eyelet	0906000012
Signs, Decals and Labels	Low point water purge label, white on blue, 248mm x 96mm, self adhesive	0906000013
Signs, Decals and Labels	Tank inspection /cleaning label set, 600mm x 390mm, self adhesive, c/w self adhesive numbers	0906000015
Signs, Decals and Labels	Grade label, Avgas 100LL, 115mm x 41mm, self adhesive	0906000028
Signs, Decals and Labels	Grade label, Avgas 100LL, 250mm x 89mm, self adhesive	0906000020
Signs, Decals and Labels	Grade label, Avgas 100LL, 600mm x 200mm, self adhesive	0906000042
Signs, Decals and Labels	Grade label, JET A1, 115mm by 41mm, self adhesive	0906000027
Signs, Decals and Labels	Grade label, JET A1, 250mm x 89mm, self adhesive	0906000030
Signs, Decals and Labels	Label, FSII, 89mm high, self adhesive	0906000029
Signs, Decals and Labels	Label AL48, 89mm high, self adhesive	0906000031
Signs, Decals and Labels	Grade label, Jet A1, 600mm x 200mm, self adhesive	0906000040
Signs, Decals and Labels	Label, FSII, 200mm high, self adhesive	0906000035
Signs, Decals and Labels	Label AL48, 200mm high, self adhesive	0906000032
Signs, Decals and Labels	Wing decal, Jet A1, 75mm x 65mm, self adhesive	0906000033
Signs, Decals and Labels	Wing decal, Avgas, 75mm x 65mm, self adhesive	0906000034
Signs, Decals and Labels	Hose marking/flow direction tape, Avgas, 25mm wide x 33m roll, self adhesive	0906000049
Signs, Decals and Labels	Hose marking/flow direction tape, JET A1, 25mm wide x 33m roll, self adhesive	0906000050
Signs, Decals and Labels	Pipe banding tape, black, self adhesive, 50mm wide x 33m Roll	0906000080
Signs, Decals and Labels	Pipe banding tape, white, self adhesive, 50mm wide x 33m Roll	0906000081
Signs, Decals and Labels	Hazchem label, reflective, self adhesive, JET A1, 3Y1863	0906000041
Signs, Decals and Labels	Hazchem label, reflective, self adhesive, Avgas, 3YE1203	0906000051
Signs, Decals and Labels	Fuelling in progress label, red on white 270mm x 150mm, self adhesive	0906000044
Signs, Decals and Labels	Pipe flow direction arrow, black on white, 89mm x 183mm, self adhesive	0906000025
Signs, Decals and Labels	Emergency stop label, white on red, 138mm x 60mm, self adhesive	0906000045
Signs, Decals and Labels	Engine stop decal, red on white, 90mm x 60mm, self adhesive	0906000046
Signs, Decals and Labels	Bonding point label, red on white, 76mm x 28mm, self adhesive	0906000048
Signs, Decals and Labels	Flammable liquid diamond label, white/red, 200mm, self adhesive	0906000070

Category	Description	Part Number
<b>Bonding and Earthing</b>	Aljac Continuity Tester	0100400180
<b>Bonding and Earthing</b>	Bonding cable, Copper core, clear PVC cover	0100212001
<b>Bonding and Earthing</b>	Bonding cable, Copper core, high visibility green transparent PVC cover	0100212005
<b>Bonding and Earthing</b>	Bonding clip, Raco 70mm, Brass with insulated grips	0100213001
<b>Bonding and Earthing</b>	Bonding clip, Raco 140mm, Brass with insulated grips	0100213020
<b>Bonding and Earthing</b>	Bonding clip, Superclip, Brass 170mm long	0100213018
<b>Bonding and Earthing</b>	Bonding clip, Superclip 170mm, Brass with insulated grips fitted with integral bonding plug	0100213017
<b>Bonding and Earthing</b>	Bonding plug, Stainless Steel, NATO standard	0100213004
<b>Bonding and Earthing</b>	Bonding reel, hand rewind, 15 metre capacity, no cable included	0100211004
<b>Bonding and Earthing</b>	Bonding reel, hand rewind, 40 metre capacity, no cable included	0100211010
<b>Bonding and Earthing</b>	Bonding lug, 1/2" diameter Brass	0100213003
<b>Bonding and Earthing</b>	Bonding socket 1/2" with shroud, no suzie cable	0100217005
<b>Bonding and Earthing</b>	Bonding socket 1/2" c/w 1 metre (closed) suzie	0100217010
<b>Bonding and Earthing</b>	Bonding socket 1/2" c/w 2 metre (closed) suzie	0100217020
<b>Bonding and Earthing</b>	Bonding socket 1/2" c/w 3 metre (closed) suzie	0100217030

Category	Description	Part Number
<b>Deadman Accessories</b>	Electric deadman handswitch, no cable	0100400010
<b>Deadman Accessories</b>	Deadman switch replacement Reed switch element	0100400011
<b>Deadman Accessories</b>	Coiled suzie cable (approx. 14m fully extended)	0100400100
<b>Deadman Accessories</b>	Coiled suzie cable (approx. 5m fully extended)	0100400103
<b>Deadman Accessories</b>	Coiled suzie cable (approx. 22m fully extended)	0100400102
<b>Deadman Accessories</b>	Niphan 2 pin plug (with strain relief gland fitted)	0100400311
<b>Deadman Accessories</b>	Niphan 2 pin flanged socket	0100400320

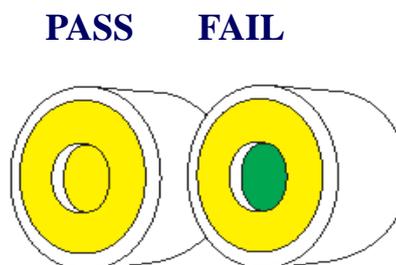
Category	Description	Part Number
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Pit flag, orange with reflective cross	5100000300
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Intake hose cover, reflective, high visibility, to suit 4" hose	5100000250
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Reflective cover for 2 inch hose	5100000350
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Reflective cover for 2.1/2 inch hose	5100000400
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Grade identification hose sleeve, JET A1, to suit 1.1/2" hose	5100000010
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Grade identification hose sleeve, Avgas, to suit 1" hose	5100000005
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Dust cap to suit bottom loading adapter (3 lug ISO45), black Urethane	56DC2.5/30
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Dust cap to suit Carter pressure refuelling nozzle, red Urethane	56SPR-C200
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Dust cap to suit Meggitt/Whittaker pressure refuelling nozzle, red Urethane	56SPR-T000
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Protection ring, black Urethane, for Carter 60427 nozzle with HEPCV	56HERV-C00
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Protection ring, red Urethane, for Carter 61428 & 64348 nozzle	56SPR-PR60
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 24", orange Urethane	56AFP-1824
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 24", red Urethane	56AFP-1824R
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 24", black Urethane,	56AFP-1824B
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 36", orange Urethane	56AFP-1836
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 36", red Urethane	56AFP-1836R
Hose Covers, Dust Caps, Protection Rings, Wing Mats	Wing protection mat for overwing refuelling, 18" by 36", black Urethane	56AFP-1836B

Category	Description	Part Number
General Equipment	Hose pressure test pump cw pressure gauge, Rigid	0905000010
General Equipment	Emcee 1152 conductivity meter	0902000400
General Equipment	Fuelling adapter wear gauge GTP-8963	6002896300
General Equipment	Disposable Nitrile gloves, large	81NIT0009
General Equipment	Disposable Gloves, Xlarge	81NIT10010
General Equipment	Hose protection bead, bolted type, 1.1/2"	15HB001038
General Equipment	Hose protection bead, bolted type, 2"	15HB001050
General Equipment	Hose protection bead, bolted type, 2.1/2"	15HB001063
General Equipment	Oil absorbent pads, 50cm x 40cm x 3mm	530OPL4843

## FUEL TESTING

### Shell Water Detector Capsules.

The Shell Water Detector capsule is the standard industry test for monitoring the level of free or dispersed water in Jet Fuel. It is used in conjunction with a syringe, which draws 5ml of the fuel through the capsule. If the paper inside the capsule does not change colour from yellow to green it means that the fuel contains less than the IATA recommended limit of 30ppm water content, and the test is classified a Pass. A strong green colour means that the fuel contains more than 30ppm of water and the test is classified Fail.



This is a Go/No Go test, the result should be either Pass or Fail as shown above. It should not be used in an attempt to quantify water levels but a slight intermediate colour change can indicate a trace of water in the product somewhere between 0 and 30ppm, and this is shown in the records as Trace if required by local regulations.

Please note, it is essential that the screw cap is tightened fully after a capsule has been removed from the tube, and that capsules are only used up to the expiry date printed on the box and the base of the tubes (normally at least 6 months from the date of sale). We have a large usage for this product and we turn our stock over once a week on average, which maximises the available storage life for the benefit of our customers.

The test can be used to check fuel samples from bulk fuel delivery vehicles, pipeline receipt points, storage tank low points, fueller/trailer tank low points, hydrant dispenser low points, and any filter sumps or sample points.

### **Shell Water Detector Capsules**

Box of 80 capsules,  
(10 tubes of 8 capsules per tube).  
Part No. 0902000110.



## Syringes.

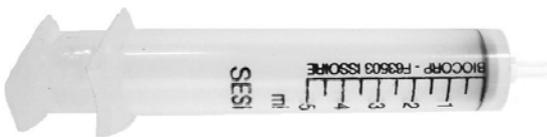
In order to perform the Water Detection test we offer a series of re-useable 5ml syringes. Low cost medical specification syringes should not be used for the test because they often have the incorrect tip size which will not fit the water detector capsule, and they may have an extremely short service life. However, although each re-useable syringe can be used to execute a number of tests, it does have a finite service life which is very dependant on the type of syringe, exact fuel specification, ambient conditions, and operating practices, hence syringes should always be considered as a consumable item. In time the seals will swell up and the Nylon itself will expand and render the syringe unserviceable. An alternative syringe is available which is made from Polyethylene. It has no rubber seal and comes with a special metal tip which is less prone to wear than the Nylon syringe and under certain operating conditions offers a longer service life. We have also developed a reverse action syringe which gives a one handed operation. The plunger is pushed (not pulled) to draw the fuel sample and this is more convenient to use when the operator is wearing thick gloves while carrying out the test.



**5 ml Nylon Syringe, reverse action**  
Part No. 0902000127



**5 ml Polyethylene syringe with metal tip**  
Part No. 0902000125



**5 ml Nylon Syringe**  
Part No. 0902000120

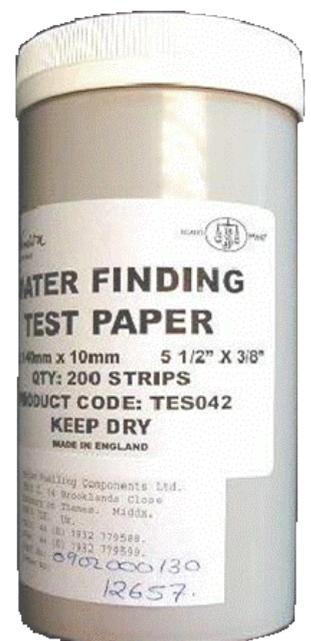
## Water Finding Paper.

This product is commonly used to detect the presence of larger quantities of free water than would be sought with Shell Water Detector capsules. It is suitable for detecting free water in small tanks and in the bottom of fuel samples. The water finding paper is coated with a brown coating which stays in place when the paper is immersed in fuel, but is removed by any water which may be present, hence exposing the white base underneath.

We stock this product in plastic tubs of 200 strips per tub, each strip measuring 140mm by 10mm, and each tub is fitted with a sealed cap to prevent water ingress and consequent deterioration of the contents.

### **Water Finding Paper**

Tub of 200 strips, each 140 mm x 10 mm.  
Part No. 0902000130



## FUEL SAMPLING EQUIPMENT

### Stainless Steel Buckets.

We offer four sizes of Stainless Steel buckets for low point flushing, purging and sampling on aviation fuel storage systems. All our Stainless Steel buckets are fitted with a 1.5 metre long static bonding lead and 75mm long solid Brass bonding clip and are graduated in litres. All buckets have a base ring except the 8 litre size.

**8 litre capacity.** Part No: 0902000002. Dimensions: 285mm neck dia. x 210mm high.

**10 litre capacity.** Part No: 0902000004. Dimensions: 300mm neck dia. x 265mm high.

**12 litre capacity.** Part No: 0902000006. Dimensions: 315mm neck dia. x 300mm high.

**15 litre capacity.** Part No: 0902000010. Dimensions: 325mm neck dia. x 340mm high.



### Glass Sampling Jars.

We offer a clear glass jar for aviation fuel sampling and it has a 3.5 litre capacity. The jar has a screw on leak proof plastic cap and permit the fuel 'clear and bright' examination and cleanliness check to be carried out. In addition, the jar can also be used for fuel retention sample storage. Our sample jars have been selected with a sufficiently wide neck opening to allow full internal cleaning. It can be supplied with a plastic coated wire carrying basket.

**3.5 litre Capacity Jar.** Part No: 0902000030. Dimensions: 130 x 130 x 200mm high, 120mm neck dia.

**Wire Carrier.** Part No: 0902000040. To suit 3.5 litre capacity jar only.



### Miscellaneous Sample Storage/Transportation.

In addition to the glass sample jars we are able to offer the following items for the storage/transportation of fuel samples.

**Sample Cans.** Tinsplate sample cans for fuel sample storage, retention and shipping (not suitable for transport by air). Available in 2.1/2 litre and 5 litre sizes, complete with carrying handle and screw cap, fitted with lugs and ears to wire/lead seal. The 2.1/2 litre size is not internally lined so must be fuel soaked or 'pickled' before use, the 5 litre size is internally lined with a clear epoxy lacquer.

**2.1/2 litre.** Part No: 0902000065 (pack of 10). Dimensions: 175 x 110 x 160mm high, 35mm cap dia.

**5 litre.** Part No: 0902000066 (sold singly). Dimensions: 175 x 110 x 290mm high, 58mm cap dia.

**16oz Oil Sample Bottle.** Part No: 0902000042 (pack of 10). Clear glass with screw cap, 0.4 litre.



### Funnels.

We offer a Stainless Steel funnel for transferring fuel. The capacity of the funnel is 3 litres.

**250mm Diameter.** Part No: 0902000013. Stainless Steel.



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# **KOLOR KUT FUEL FINDING PASTE AND WATER FINDING PASTE**

## **Introduction.**

Kolor Kut is known as a market leader in the manufacture of indicator pastes for the petroleum sector, and these pastes are used throughout the world to assist operators in the accurate detection of fuel and water levels when dipping fuel storage tanks. Fuelling Components now holds in stock the following Kolor Kut indicator pastes which are suitable for use with a wide range of hydrocarbon fuels including Gasoline, Diesel, Naphtha, Kerosene, Gas Oil, Crude Oil, Jet Fuel and Avgas.

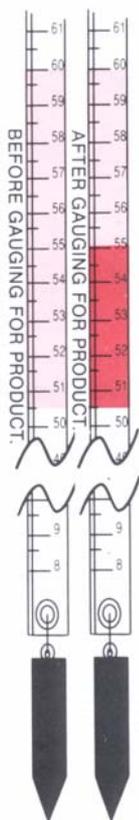
## **Fuel Finding Paste.**



Kolor Kut Fuel Finding (Ullage) paste is light pink in colour and turns deep red upon contact with most hydrocarbon fuels. It give a clear level reading on the dip rod or tape, even when evaporation at the interface would normally cause distortion of the reading. Kolor Kut Fuel Finding Paste is supplied in 2.25 oz. tubs only.

## **How to Order.**

Quote Part Number  
0905013221.



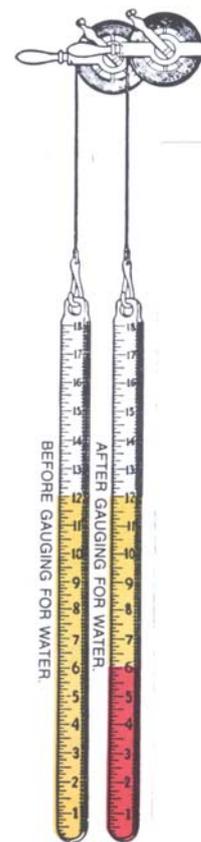
## **Water Finding Paste.**



Kolor Kut Water Finding paste is golden brown in colour and turns bright red upon contact with water. This paste will successfully gauge the water level interface in all hydrocarbon fuels. It is also commonly used to detect the presence of free water in the bottom of aviation fuel samples. Kolor Kut Water Finding Paste is supplied in 3 oz. tubes for ease of handling.

## **How to Order.**

Quote Part Number  
0905003908.



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## DENSITY AND TEMPERATURE MEASUREMENT

### Hydrometers and Thermometers.

We stock an extensive range of oil company approved and JIG compliant high quality hydrometers, thermometers and ancillaries for checking the density and temperature of hydrocarbon fuels. Thermometers are all in accordance with IP/ASTM standards, and hydrometers are all in accordance with BS718M50SP. The following table illustrates our main stock items but other ranges are available on request. A manufacturer's Certificate Of Conformity is supplied with each instrument as standard, but a full UKAS calibration certificate is available at extra cost. A UKAS calibration certificate is required when the instrument is to be used as a reference master against which working instruments are checked on site.

Thermometer UKAS Certificate. Part number 0902000083.  
Hydrometer UKAS Certificate. Part number 0902000097.

There is an increasing preference for using blue spirit to replace Mercury in thermometers. The blue spirit thermometers are non hazardous, environmentally friendly and are much easier to read than the Mercury equivalents. It is also possible to send them by courier or airfreight without special packaging and hazardous products documentation. Our blue spirit thermometers are all fully IP/ASTM approved, with the same level of certification and quality control as the equivalent Mercury instruments, and we strongly recommend their use.



Type	Range	Increments	Length	Comments	Part No
Hydrometer BS718 M50SP @ 15 degC	SG 0.775-0.825	SG 0.001	270 mm	Jet A1	0902000090
Hydrometer BS718 M50SP @ 15 degC	SG 0.700-0.750	SG 0.001	270 mm	Avgas	0902000091
Hydrometer BS718 M50SP @ 15 degC	SG 0.750-0.800	SG 0.001	270 mm		0902000092
Hydrometer BS718 M50SP @ 15 degC	SG 0.800-0.850	SG 0.001	270 mm		0902000093
Hydrometer BS718 M50SP @ 15 degC	SG 0.850-0.900	SG 0.001	270 mm		0902000094
Thermometer ASTM12C/IP64C	-20 to +102 degC	0.2 degC	425 mm	Mercury filled	0902000080
Thermometer ASTM12C/IP64C	-20 to +102 degC	0.2 degC	425 mm	Blue Spirit filled	0902000080A
Thermometer IP49C	-15 to +40 degC	0.5 degC	315 mm	Mercury filled	0902000081
Thermometer IP49C	-15 to +40 degC	0.5 degC	315 mm	Blue Spirit filled	0902000081A
Thermometer IP 53C	0 to +80 degC	0.5 degC	315 mm	Mercury filled	0902000100
Thermometer IP 53C	0 to +80 degC	0.5 degC	315 mm	Blue Spirit filled	0902000100A
Thermometer Protective Sheath	Chromium plated Brass construction, suitable for ASTM12/IP64C				0902000085
Thermometer Protective Sheath	Chromium plated Brass construction, suitable for IP49C and IP53C				0902000086

# ACCESSORIES FOR DENSITY AND TEMPERATURE MEASUREMENT

We offer a range of accessories to complement our hydrometer and thermometer stocks, as follows.

## Glass Hydrometer Jar.

65mm diameter by 350mm long with pouring spout, not graduated. Capacity 925ml.  
Part Number 0902000099.

## Plastic Hydrometer Jar.

55mm diameter by 345mm long, transparent, with pouring spout, graduated. Capacity 500ml.  
Part Number 0902000098.



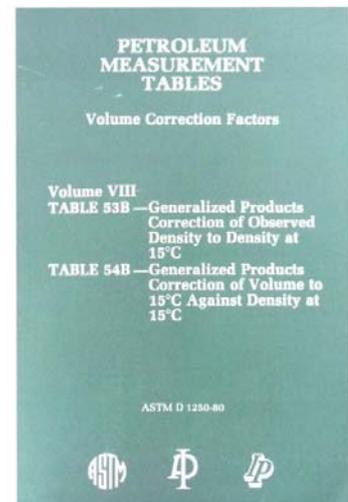
6002107300

## Plastic Hydrometer Jar.

43mm diameter by 370mm long, opaque. This unit is filled to the brim with fuel, and fuel is allowed to spill over into the catchment rim. The hydrometer reading is therefore taken at the fuel surface not through glass or plastic so avoids distortion of the reading. Capacity (full) 575ml.  
Part Number 6002107300.

## Density Correction Tables.

Petroleum Measurement Tables Volume VIII tables 53B and 54B, to allow the density readings to be corrected back to a standard temperature.  
Part Number 0904000092.



## Density Correction Disc.

This is intended as a working device to be used for day to day density correction, it performs the same function as the density correction tables but is more robust and resistant to normal operational wear and tear.  
Part Number 60022727EF.



## **EMCEE MODEL 1152 DIGITAL CONDUCTIVITY METER**

- ◆ **RUGGED CAST ALUMINIUM HOUSING**
- ◆ **LARGE DIGITAL DISPLAY**
- ◆ **RANGE FROM 0 TO 1999 pS/m IN INCREMENTS OF 1 pS/m**
- ◆ **SELF CHECK CALIBRATION**
- ◆ **DETACHABLE STAINLESS STEEL PROBE**
- ◆ **CERTIFIED INTRINSICALLY SAFE FOR USE IN ZONE 1, EEx ia IIA T4 HAZARDOUS AREAS**
- ◆ **PLASTIC SOLVENT RESISTANT CARRY CASE**



### Introduction.

Static electricity can build up in hydrocarbon fuels when they are pumped at high flow rates, particularly through line strainers and micron filters. Hydrocarbon fuels inherently have a very low conductivity which means that they retain static electricity, and so any static charge generated in the fuel will not dissipate quickly. This can lead to a static electricity discharge with the associated risk of an explosion. It is however, quite common practice to blend anti static additives into the fuel to improve the conductivity and reduce the risk of a static discharge occurring.

The acceptable conductivity of Jet Fuel is specified between 50 and 600pS/m (at 15 degC) at the aircraft wing in the Defence Standard DEF STAN 91-91 (latest edition) and the Joint Inspection Group document Aviation Fuel Quality Requirements For Jointly Operated Systems. However, in order to monitor the conductivity it is necessary to have a robust instrument which can be easily used in the field because as the fuel travels through the distribution system it is not uncommon for the conductivity to change as the levels of anti static additive become depleted.

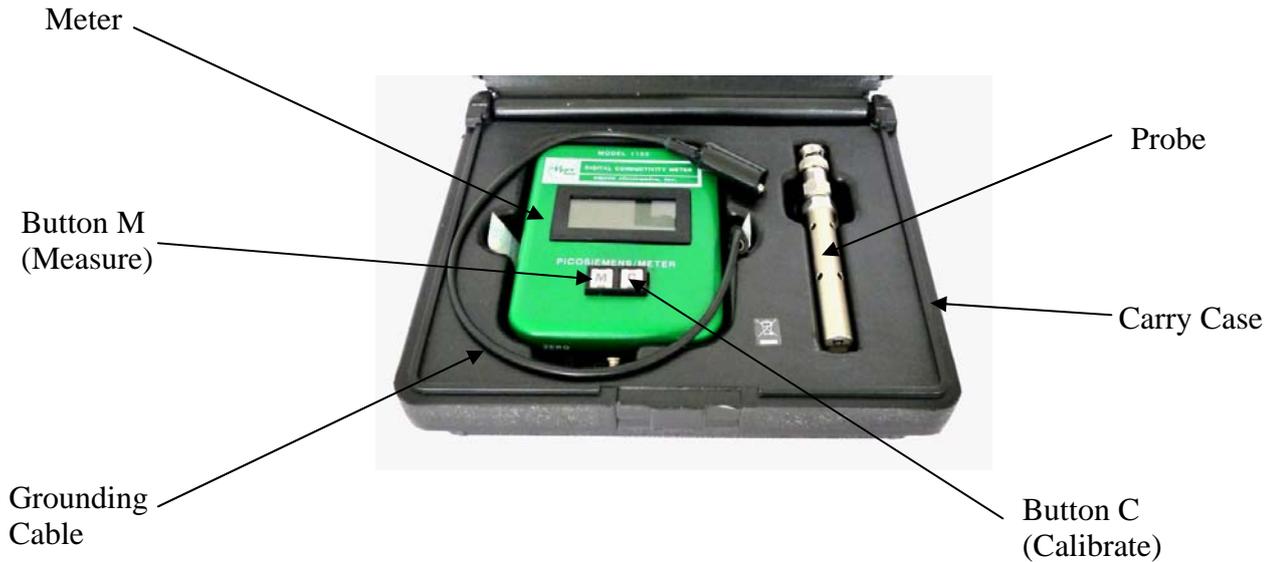
### Description.

The EMCEE Model 1152 Conductivity Meter has been designed and developed specifically to measure the conductivity of Jet Fuel in order to quantify and minimise this potential hazard. It provides the ability to measure the electrical conductivity of liquids in Picosiemens per Meter (pS/m) as defined by ASTM D 2624 with an accuracy of 2% ( $\pm 1$  pS/m) over the range of 0-1999 pS/m.

The EMCEE Model 1152 has a large digit digital display and is battery operated, it is powered by readily available standard batteries (Eveready A544 ). The robust design and the fact that it is certified intrinsically safe in accordance with ATEX EEx ia IIA T4 means that the unit can be used to check the fuel conductivity in the field or in the laboratory, hence providing a truly universal method of measuring and monitoring the conductivity of Jet Fuel. The unit is fitted with a replaceable Stainless Steel probe and a detachable grounding wire.

The EMCEE Model 1152 has a self check calibration feature to ensure that it remains accurate throughout its service life. To complete the package the EMCEE 1152 is housed in a plastic impact and solvent resistant carry case.

## EMCEE 1152 Kit.



### Operation.

Fit the Probe to the Meter and connect the Grounding Cable to the Meter and to the metal sample container (not included).

Fill the sample container with fuel and wait approximately 2 minutes for any static charges to dissipate.

Depress the Measure button (Button M) with the probe OUT of the fuel. In approximately 3 seconds the reading should be 000 plus/minus 001.

The probe is then immersed in the fluid to be tested ensuring that it covers both sets of holes.

Pressing the M button causes a small current to flow through the fuel. The capacitive effect is amplified by the electronics and is shown on the display as a conductivity reading in pS/m.



### Specification.

Range: 0-1999 pS/m

Resolution: 1 pS/m.

Accuracy: 2% of reading plus/minus 1 pS/m

Over Range Indicator: 1 on left hand side of display.

Calibration: Internal source, field adjustable.

Controls: 2 push buttons, M (measure) and C (calibration).

Display: LCD, 3 off 12mm digits 27mm high.

Grounding: Jack plug on Meter, crocodile clip on free end.

Power: 3 off Eveready A544 Batteries.

Operating Temperature: 0 to 75 degC.

Carry Case: Rigid solvent resistant moulded plastic.

Nett weight: 0.9Kg.

### How To Order.

#### **EMCEE 1152 Kit.**

Complete with a removable sensor probe, grounding cable, manual and plastic storage/carry case.

Part No. 0902000400.

**Note: Aljac offers a repair and recalibration service for EMCEE meters. Please contact us for further information.**

## FUEL RETENTION SAMPLE CONTAINERS



- ◆ **HEAVY DUTY TINPLATE CONSTRUCTION**
- ◆ **EPOXY LINED INTERNALLY**
- ◆ **TRISURE 50MM CLOSURE**
- ◆ **WIRE/LEAD SEALABLE**
- ◆ **APPROVED BY THE MAJOR FUEL SUPPLIERS**
- ◆ **UN CERTIFIED FOR TRANSPORT BY AIR**

### Introduction.

Oil company and national regulations require that aviation fuel samples are retained for a specified period of time, so that in the event of fuel quality being questioned a representative fuel sample can be subjected to a full laboratory analysis. In addition it is normal practice to carry out a laboratory analysis on 'soak test' fuel samples from newly constructed fuel storage tanks and refuelling systems.

### Description.

It is therefore essential that suitable containers are available in which to store and transport these fuel samples.

The containers must of course not affect the properties of the fuel inside but also must be of a sufficiently high quality to safely contain such a potentially hazardous material either during storage or transportation.

Our Sample Retention Containers are constructed from heavy duty tinplate/Steel and are available in two sizes, 1 litre and 5 litre capacity. The 5 litre capacity in turn is available in 2 variants of differing heights and diameters. These containers are lined internally with a highly flexible epoxy material which is tested and type approved for fuel resistance by the major oil companies, and which will not crack when the container is subjected to external impact. Tinplate/Steel containers are preferred to glass jars for sample storage because of their superior mechanical properties but also because prolonged exposure to daylight can affect the properties of the fuel sample.

All seams are either welded, soldered or double rolled and the containers are fitted with a 50mm diameter 'Trisure' closure for maximum leak tightness, which also has the provision for the closure to be wire/lead sealed. In addition the 5 litre size is fitted with a hinged carrying handle.

The containers are UN certificated for carriage by airfreight when used with the correct outer packaging, and are subjected to all the pressure and mechanical testing which accompanies this certification process.

### **Packaging.**

To complement our range of Sample Retention Containers, Aljac Fuelling Components also supplies custom made fibreboard cartons to suit our 1 litre and 5 litre container which is UN approved for transportation of the containers by air, and the carton is supplied printed with the required hazardous goods markings and UN packaging specification.

Customers should however check individual airline and national regulations to ensure that the packaging is acceptable to the carrier and to establish any additional labelling requirements. Details of the exact fuel type and of the specification of the inner packaging (1A1) are known to be required on the outside of the

carton in addition to the pre-printed markings. Vermiculite absorbent loose fill material is also available in 8 Kg bags should this be required.

### **How to Order.**

Aljac Fuelling Components holds these items in stock, so simply quote the relevant part numbers and quantities required.

1 litre Sample Retention Container:-  
0902000050.

5 litre Sample Retention Container:-  
0902000058 or 0902000060.

Transit Carton for 1 litre Sample Retention Container:- 0902000051.

Transit Carton for 5 litre Sample Retention Container:- 0902000059 (to suit 0902000058) or 0902000061 (to suit 0902000060).

Vermiculite absorbent loose fill for Transit Carton, 8 Kg pack:- 0902000062.

### **Specification.**

**1 litre Sample Retention Container,**  
**0902000050.**

Construction:-

E28 tinplate Steel cylindrical drum with flat ends, soldered seams, internally lined with epoxy lacquer, externally self colour, fitted with Trisure wire sealable 50mm closure.

Testing:- Pressure tested to 1.0 bar.

Dimensions:-

Diameter 115mm, overall height 135mm, nett weight (empty) 0.4Kg.

**5 litre Sample Retention Container,**

Construction:-

22 SWG Steel cylindrical drum with flat ends, welded side seam, end seams double rolled and solutioned, internally lined with epoxy lacquer, externally painted blue with UN packaging specification in white, fitted with hinged carrying handle and Trisure wire sealable 50mm closure.

Testing:- To UN/ICAO specification 1A1.

Dimensions:-

0902000058. Diameter 182mm, overall height 260mm, nett weight (empty) 1.05Kg.

0902000060. Diameter 210mm, overall height 220mm, nett weight (empty) 1.43Kg.

## SELF ADHESIVE GRADE DECALS

Aljac Fuelling Components is able to offer you a wide range of self adhesive grade decals from stock. They are screen printed on 0.2 mm thick self adhesive vinyl with a 7 year outdoor life. The ink used is resistant to the elements, UV light and fuel spillage. They are ideal for applying to pipelines, refuelling vehicles, storage tanks, sample containers and many other areas. Here are some examples of what we can offer, but if you require something different please contact our Sales Department.

### Jet A1 Decals.

115 x 41 mm. Part No. 0906000027. Sample lines, sample containers, dip/sample hatches.

250 x 89 mm. Part No. 0906000030. Refuelling vehicles, product recovery tanks, pipelines.

600 x 200 mm. Part No. 0906000040. Main storage tanks.



### Avgas Decals.

115 x 41 mm. Part No. 0906000028. Sample lines, sample containers, dip/sample hatches.

250 x 89 mm. Part No. 0906000020. Refuelling vehicles, product recovery tanks, pipelines.

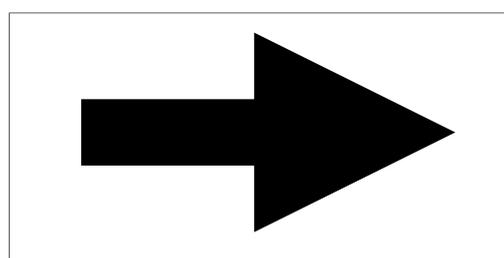
600 x 200mm. Part No. 0906000042. Main storage tanks.

Wing Decals. 75 x 65 mm. Applied to aircraft wings as an aid to the prevention of mis-fuelling with the incorrect fuel.

**Note:-** The actual Wing Decals have rounded corners to resist lifting by the air flow.

Jet A1 Wing Decal. Part No. 0906000033.

Avgas Wing Decal. Part No. 0906000034.



FSII/AL48 Decals. Positioned next to the Jet A1 Grade Decal of the relevant size as appropriate to the fuel grade.

FSII 120 x 89 mm. Part No. 0906000029.

FSII 237 x 200 mm. Part No. 0906000035.

AL48 75 x 89 mm. Part No. 0906000031.

AL48 240 x 200 mm. Part No. 0906000032.

Pipe Flow Arrow. 180 by 89 mm. Part No. 0906000025. Positioned next to the relevant 250 by 89 mm Grade Decal to indicate flow direction.



**Hose/Pipeline Identification Tape.** We also have a low cost screen printed 25 mm wide self adhesive vinyl tape which comes on a 30 metre roll. It is commonly used for grade/flow direction marking on small bore pipework systems, and cut off in a manner which leaves the correct flow arrow and fuel grade only. It is also commonly used to wrap around trigger nozzles or hoses to assist in the prevention of mis-fuelling.

Jet A1 Hose/Pipeline Identification Tape. Part No. 0906000050.

Avgas Hose/Pipeline Identification Tape. Part No. 0906000049.

**Pipe Banding Tape.** It is common practice to apply coloured banding in addition to grade markings on large diameter fuel pipelines. We have in stock 50 mm wide by 30 metres long rolls of self adhesive vinyl tape to colour band Jet A1 pipelines.

White Pipe Banding Tape. Part No. 0906000081.

Black Pipe Banding Tape. Part No. 0906000080.

**Sampling/Purging Decals.**



Sample Point 75 x 65 mm.  
Part No. 0906000014



Tank Purge 300 x 100 mm. Part No. 0906000013.

<b>TANK No.</b>	<b>01</b>
	<b>AVGAS 100LL</b>
	<b>30,000</b>
	<b>31-12-2002</b>
	<b>31-12-2002</b>
<b>GRADE</b>	
<b>CAPACITY-Ltrs</b>	
<b>DATE INSPECTED</b>	
<b>DATE CLEANED</b>	

**Tank Inspection/Cleaning Decal Set.** 600 x 390mm. Part No.

0906000015. For use on fuel storage tanks to display all of the information required. It is supplied with self adhesive numbers for tank, capacity and date. The date numbers are first applied to a white self adhesive carrier which is then applied to the main decal. This allows the dates to be changed easily without having to remove individual digits. One of our 250 x 89 mm Grade Decals is required for the Grade marking.

## FILTER MEMBRANE TESTING CONSUMABLES



### Introduction.

The ASTM specification for Aviation Turbine Fuels, D1655, calls for the fuel to be 'visually free of undissolved water, sediment, and suspended matter', and the standard tests for determining the level of dirt/particulate contamination are ASTM D2276/IP216 and D3830. A known quantity of fuel (normally 5 litres) is passed through standard 37 mm diameter discs of 0.8 micron filter paper under field conditions. The discs are contained in Tenite plastic capsules, or monitors, along with a 34 mm diameter support pad.

The Colormetric test is used as a qualitative assessment of particulate contamination. In this test a single membrane is assembled into the monitor on site, but in a clean area, and after testing its colour is rated against a standard scale to identify changes in fuel cleanliness. This test is instant and can be fully completed under site conditions. It is particularly useful in establishing trends in fuel cleanliness, so tested membranes are dried and stored for later comparison.

The Gravimetric test, is used to give a quantitative assessment of particulate contamination, and in this test two factory matched weight membranes are assembled into the monitor under clean laboratory conditions. After testing the laboratory re-weighs the two membranes and establishes the increase in weight by deducting the weight of the downstream membrane from that of the upstream membrane. This test is used infrequently to provide a quantitative indication of a suspected fuel cleanliness problem.

### Our Stock Consumables.

Aljac has in stock the following items.

#### **Colormetric Monitors**

Box of 48 uncastellated plastic monitors each loaded with a single membrane and a support pad. Equivalent to Millipore MAWP-037-PO. Part no. 6002198500

#### **Single Membranes and Support Pads**

Replacement membranes (colormetric), GTP1983, Box of 100 membranes with a diameter of 37 mm and support pads with a diameter of 34 mm, with blue paper separators, equivalent to Millipore AAWP-037-PO and Sartorius/Howden Wade P/SKP/10387. Part no. 6002198300

#### **Gravimetric Monitors**

Box with 48 plastic monitors, each loaded with a pair of matched weight membranes and a support pad. Equivalent to Millipore MAWP-037-PM. Part no. 6002198600

#### **Gravimetric Membranes (refills)**

Box with 50 pairs of matched weight membranes without plastic monitors (the monitor must be loaded under laboratory conditions). Equivalent to Millipore AAWP-037-PM. Part no. 6002198400

#### **Empty Plastic Monitors**

Box with 48 empty plastic monitors (must be fitted with membranes and pads). Part no. 6002198700

### **ASTM Color Standards Book**

Wire bound book of standard colours to rate membranes after Colormetric testing. Each page is fuel resistant and has cut outs to view and rate the membrane accurately.

Part no. 6002107401



### **Membrane Tweezers**

With rounded corners and locking device to hold the membrane securely.

Part no. 6002209900



### **Membrane Storage Folder**

Black 3-Ring folder.

Part no. 6002140000

### **Thick Manila Filing Pages**

Set of 10 for the 3-Ring folder.

Each side can hold 21 storage envelopes.

Part no. 6002133100



### **Membrane Storage Envelopes**

Pack of 500 clear plastic zip seal envelopes with write on strips for data recording to protect and store dried membranes.

Part no. 6002126700

## GAMMON CONTAMINATION TEST KITS

### Introduction.

The ASTM specification for Aviation Turbine Fuels, D1655, calls for the fuel to be ‘visually free of undissolved water, sediment, and suspended matter’, and the standard tests for determining the level of dirt/particulate contamination are ASTM D2276/IP216 and D3830. A known quantity of fuel (normally 5 litres) is passed through standard 37 mm diameter discs of 0.8 micron filter paper under field conditions. The discs are contained in Tenite plastic capsules, or monitors, along with a 34 mm diameter support pad.

The Colormetric test is used as a qualitative assessment of particulate contamination. In this test a single membrane is assembled into the monitor on site, but in a clean area, and after testing it’s colour is rated against a standard scale to identify changes in fuel cleanliness. This test is instant and can be fully completed under site conditions. It is particularly useful in establishing trends in fuel cleanliness, so tested membranes are dried and stored for later comparison.

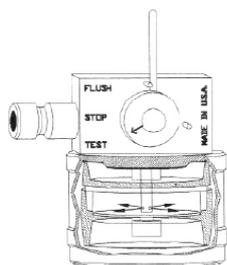
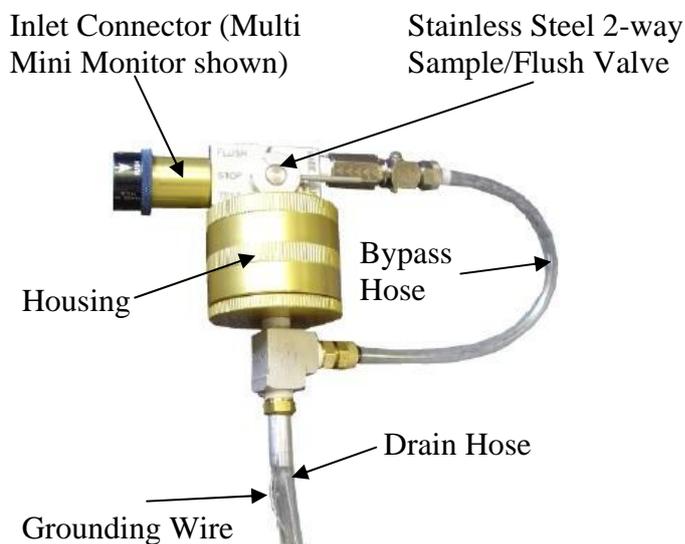
The Gravimetric test is used to give a quantitative assessment of particulate contamination, and in this test two factory matched weight membranes are assembled into the monitor under clean laboratory conditions. After testing the laboratory re-weighs the two membranes and establishes the increase in weight by deducting the weight of the downstream membrane from that of the upstream membrane.



GTP-1172 Mark II

### Description.

The Mini Monitor kit was developed specifically for aviation fuel testing using standard field monitors. It comprises an Inlet Connector which interfaces with the sampling point in the pipe-work, a Stainless Steel 2 way valve to control the Flush and Sample operations, a Bypass Hose for flushing the line contents, and a Housing which holds the pre-assembled plastic monitor. Bonding leads and clips are provided to connect to the pipework and container into which the fuel is measured.



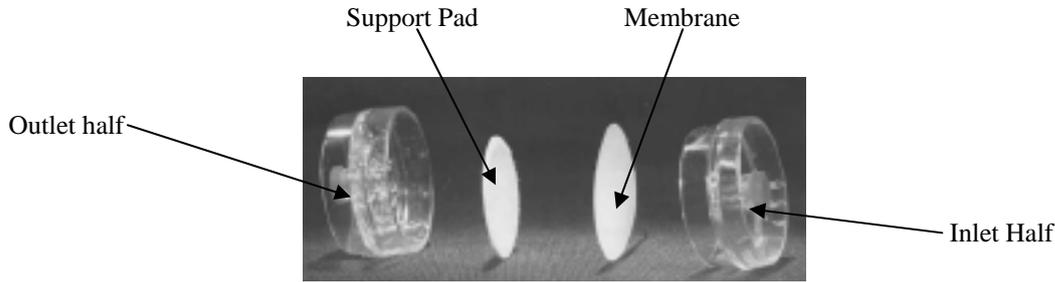
### Designed to avoid “white spot”.

All previously manufactured test kits, regardless of brand, make a white spot in the centre of the filter membrane if the inlet pressure is high and the fuel sample is contaminated.

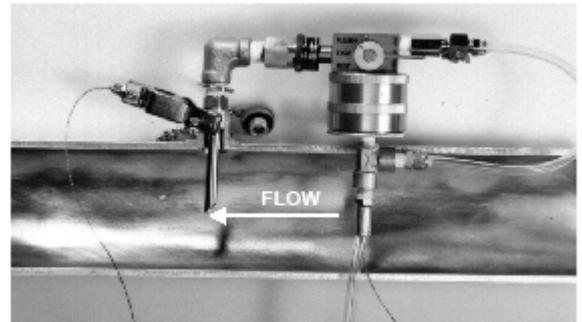
The Mark II version eliminates the white spot by uniformly dispersing the fuel.

### Method of Operation.

The Gammon Mini Monitor/Multi Mini Monitor uses standard plastic monitors as defined by the ASTM for test method D2276/IP216. The plastic monitor is assembled with the support pad located under the membrane. Use the tweezers to handle the membrane and pad so as not to contaminate them prior to the test. Push fit the inlet and outlet halves of the plastic monitor together and remove the red and blue stopper. Insert the monitor into the housing and screw together hand tight. The loaded plastic monitor is now ready for use.



Before starting set the Valve to STOP. Check the Bypass Hose connections for firm seating. Couple the Inlet Connector to the Sampling Point in the pipework. After checking all connections set the Valve to FLUSH and allow 5 litres (or other specified volume) to collect in a measuring container. Then move the Valve to TEST in order to direct flow through the filter membrane. The test volume is normally 5 litres but depends on local operating regulations, and when the specified volume has been passed through the membrane set the Valve to STOP and disconnect from the Sampling Point. After removal of the membrane and support pad the membrane colour is then rated using the GTP-1074-1 color rating booklet which is included in the kit. The darker the membrane, the dirtier the fuel. Some contracts require the weight of the contaminant to be determined. The same apparatus can be used but arrangements must be made with a laboratory.

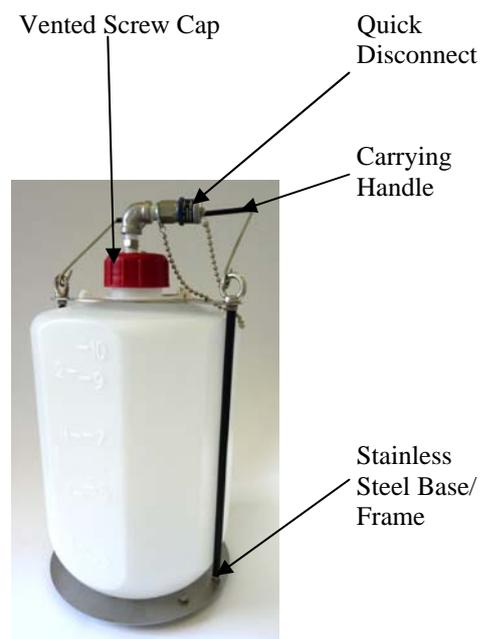


Electrical bonding is a safety requirement of ASTM Method D2276. The bonding and grounding hose assembly clips to the metal measuring container (not shown) and also to pipe fitting as shown in the photograph.

### Fuel Sampling Bottle.

The traditional method of collecting and measuring the fuel volume which has been flushed or sampled has been to use a graduated Stainless Steel bucket (bonded to the test kit). However, this is not ideal when the fuel has to be processed after completing the test. The fuel can easily spill when the bucket is moved and the bucket is open to the elements and so the fuel may become contaminated (and so not able to be returned to the fuel system). Also, the graduations on Stainless Steel buckets are sometimes not easy to read.

We have a 10 litre graduated, semi transparent, impact resistant Polyethylene Fuel Sampling Bottle to collect, measure and move the fuel in a more user friendly manner. It has a quick disconnect coupling which connects to the Gammon kit drain hose and the fuel level can be seen through the side of the bottle and easily compared with the graduations. The Bottle has a Stainless Steel base and frame which is connected to an internal Stainless Steel grounding wire. The wire collects any static charges inside the fuel itself and allows them to dissipate to ground through the frame and base. The Bottle has an integral Carrying Handle so that it can be easily moved around and a vented screw cap which can be removed to drain the fuel from the bottle.



**Fuel Sampling Bottle.** Part No. 08PP18569.

**Gammon Mini Monitor/Multi Mini Monitor Contamination Test Kit.**

The Gammon Test Kit comes in 2 variants. The Mini Monitor has a male inlet connection and is suitable for use as it stands with the Gammon, Millipore or Snaptite sampling points ONLY. However, the Multi Mini Monitor is intended for locations where a range of different sampling points are in use. It has a female self locking quick disconnect inlet connection and can be fitted with a range of reversible adapters to accommodate the sampling points on site. The available options are shown below.

**GTP-172 Mark II.  
Mini Monitor.**  
Part No. 6002017200.



**GTP-1172 Mark II.  
Multi Mini Monitor.**  
Part No. 6002117200.



**Option A**  
GTP988.  
Part No. 6002098800



Fits Gammon Jet Test QD,  
Carter, Parker/Thiem/  
Whittaker couplings.

Fits Gammon QD,  
Millipore, Snap Tite etc.

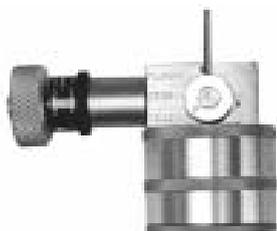
**Option B**  
GTP988-1.  
Part No. 6002098801



Same as GTP-988 except it  
fits the short (S) or AH  
Models of Gammon Jet Test  
QD, Avery Hardoll couplings.

Fits Gammon QD,  
Millipore, Snap Tite etc.

**Option C**  
Fits Flight Refuelling 4127335 and 4127365  
Adapter (Howden Wade/Thermal Controls),  
3/4 inch BSPP thread, 26.4mm diameter.  
Part No. 60021170AO

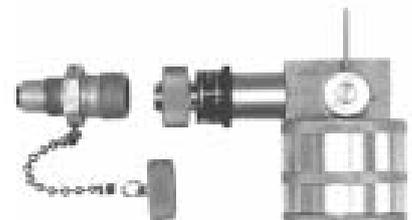


GTP-1170A



**Option D**  
Fits Flight Refuelling 4127320, 4127345 and  
4127350 Adapter (Typ Shell International), 1/2  
inch BSPP thread, 20.9mm diameter;  
Part No. 60021170B0

GTP-1170B



Fits Gammon Jet Test QD

**Option E**  
GTP988-2.  
Part No. 6002098802



Fits the short (S) or AH  
models of Gammon Jet Test QD

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## SEALS AND SEALING WIRE

Over many years, lead seals and lashed sealing wire have become standard within the fuel handling industry. They are commonly used for sealing valves on fuel depots, fuel tanker discharge points and tank top fittings such as dip tubes and inspection lids, fuel retention sample containers, and many other areas where it is necessary to demonstrate that the fuel has not been tampered with. The lashed wire is passed through the item to be secured, formed into a loop and threaded through the holes in the seal. The seal is compressed using special pliers which can also carry a discrete identifying mark for additional security, and there is then no way of opening the loop without breaking the wire or seal. Aljac Fuelling Components now holds lead seals and sealing wire in stock ready for same day despatch. The seals are of two basic configurations as shown below.

However, due to the environmental impact of lead there has been an increasing trend towards the use of plastic seals. The range is slightly more limited but we stock two basic types, the Standard type which is exactly the same as the equivalent lead seal and is used in exactly the same manner. The other type is the Griptie seal. This works on a different principle to the traditional seal types. Each seal is sequentially numbered, and the serrated stem of the seal is passed through a small opening and cannot be removed once inserted.



The following seals are available from stock in bags of 1000 seals per bag.

Part Number	Material	Seal Type	Diameter (mm)	Thickness (mm)	Hole Size (mm x mm)	Weight (Kg/1000)
0902000210	Lead	Standard	10.0	4.5	2.5 x 2.2	2.5
0902000220	Lead	Standard	12.0	5.5	3.2 x 3.4	3.6
0902000230	Lead	Standard	14.0	6.5	4.0 x 3.5	7.2
0902000211	Lead	Cross Hole	11.0	6.8	2.5 diameter	3.7
0902000270	Yellow ABS	Standard	10.0	4.5	2.0 x 1.6	0.1
0902000260	Nylon	Griptie	N/A	N/A	N/A	7.5

### Sealing Wire.

We are able to supply Copper or Galvanised Steel lashed sealing wire from stock for use with our range of lead and plastic seals. The wire is supplied wound onto a plastic bobbin, or alternatively bundles of pre cut lengths are available for the fine lash Galvanised Steel wire



Part Number	Description	Packing	Approx. Length	Wire Diameter (mm)		
				Core	Lash	Outside
0902000300	Fine lash Galvanised Steel	0.5 Kg coil on plastic bobbin	170 metres	0.50	0.30	1.10
0902000320	Fine lash Galvanised Steel	1000 x 200mm cut lengths	200 metres	0.50	0.30	1.10
0902000322	Fine lash Galvanised Steel	1000 x 400mm cut lengths	400 metres	0.50	0.30	1.10
0902000310	Medium lash Galvanised Steel	0.5 Kg coil on plastic bobbin	70 metres	0.70	0.45	1.60
0902000315	Medium lash Copper	0.5 Kg coil on plastic bobbin	70 metres	0.70	0.45	1.60

If you require other types of seals or wire please contact our Sales Department.

### Sealing Pliers.

In order to compress Standard or Cross Hole lead or plastic seals it is necessary to use special sealing pliers. The pliers are of a heavy duty construction and are fitted with replaceable plain dies as standard. Two sizes of pliers are available as appropriate to the size of the seal being compressed.

**Sealing Pliers, for 10 to 12mm diameter Standard seals.**

Part No. 0902000360.

**Sealing Pliers, for 14mm Standard seals and 11mm Cross Hole seals.**

Part No. 0902000380.



Alpha numeric characters can be engraved onto the dies on request. The characters are then transferred to the seal when it is compressed and identify which set of pliers (and so which operator) carried out the sealing operation.



### Locking Wire.

It is common practice in the aviation refuelling industry to apply Locking Wire to the securing screws of critical components in order to ensure that they are not able to come loose under vibration. This practice is always employed when securing the hose end refuelling coupling Quick Disconnects. Our locking wire is 0.7mm diameter annealed (softened) Stainless Steel and dispenses neatly from a 1/2Kg (approx) tub.

Part Number 0902000330.

### Wire Twisting Pliers.

A neat, convenient and quick way to finish twist Locking Wire is to use purpose designed Wire Twisting Pliers.

We hold pliers in stock for this purpose.

Part Number 0902000350.



# FUELSTAT MICROBIOLOGICAL CONTAMINATION TEST KIT



Rapid on-site test for the detection of *H.res.*, bacteria and other fungi in Aviation Fuel



- ◆ **IATA APPROVED.**
- ◆ **RESULT IN 10 MINUTES, NO DELAY.**
- ◆ **EASY TO PERFORM. ON SITE TEST.**

- ◆ **NO LABORATORY REQUIRED.**
- ◆ **DETECTS ONLY ACTIVE MICROBES.**
- ◆ **EASY DISPOSAL, NON HAZARDOUS.**

## Fungi and bacteria in Aviation Kerosene

It is widely recognised that micro-organisms can grow in hydrocarbon fuels by using the alkanes and fuel additives as a foodstuff, but the type of organisms and the resulting damage depends on the fuel and the additives. All contamination is important when considering fuel quality and particularly when monitoring stored fuel reserves. However, whilst a wide range of micro-organisms can be found in fuel systems and can cause damage, only a small number of specific microbes can seriously degrade fuel. They are *Hormoconis resiniae* (*H.res.*), previously known as *Cladosporium resiniae*, *Bacteria* and *Funghi*, and they tend to work together as a consortium.

The most damaging organism is the filamentous fungus, *Hormoconis resiniae* (*H.res.*).

***H.res.* is the most dangerous** because:-

1. It produces far more biomass and so is more likely to cause blockage problems.
2. It is by far the most common cause of microbial corrosion in system components and aircraft tanks.
3. It usually starts on small water droplets, it then covers the droplet, holding it in place, and continues its growth, and actually generates more water due to its metabolism. In the process, it firmly attaches itself to surfaces (including tank walls). Bacteria and yeasts require free water and are found mainly floating in the water phase. They are less likely to adhere to surfaces and will be significantly

reduced during each water drain. But *H.res.*, once established, continues to multiply in situ. High levels of bacteria and yeasts indicate that the fuel is of poor quality, and so are useful indicators, but this does not mean that they are causing any problem, and they will probably be significantly reduced at the next drain. High levels of *H.res.*, however, indicate that there is a potentially serious and long term problem.



**H.Res**

Regular monitoring of fuel system contamination for *H.res.* is important because it is the indicator species and the only organism that can stick to surfaces. It is also highly damaging to aircraft and fuel system components as explained earlier.

So Conidia Bioscience has developed the **FUELSTAT® resiniae PLUS test kit** in response to calls from operators and maintenance/repair companies for a real-time test for total microbial contamination in fuel tanks and systems.

## What is so special about our FUELSTAT® *resinae* PLUS Test Kit?

Our test provides rapid screening of water/fuel samples, giving a quick and accurate assessment of *H.res*, bacteria and other fungi in the sample. This test is more accurate than the currently used 'rapid' growth-based and ATP tests.

The kit is an immunoassay test (like a pregnancy test), and this means that we detect contamination by "finding" material that is produced by the 3 different types of contamination that grow in fuel. We do not, therefore, need to capture a part of the living organism and grow it up. This is important because *H.res* does not just float around at the water/fuel interface, it is spread throughout the tank and it sticks to the bottom or sides of the tank. There is, therefore, a better chance of finding that compound in a small sample, so the results are more accurate and consistent.

Currently available fuel tests involving total microbial counts simply tell us that there are micro-organisms present in the fuel and that they are alive. Our test goes beyond this. It detects **active** *H.res*, bacteria and other fungi and tells us not only that contamination is present and alive but also that it is growing and there is real potential for damage. The kit will ignore any fungus that has been blown in from outside or has been growing on trees or other food sources, whereas other tests will grow whatever they find in the sample, whether it came from the fuel or not. They require sterile sampling conditions, and we just require that the sampling

equipment has no residue from the last test sample.

The **FUELSTAT® *resinae* PLUS test kit** measures the amount of active growth in the sample and provides action and alert levels which are defined by IATA.

Using the **FUELSTAT® *resinae* PLUS test kit** is quick and simple and it requires little training to carry out and interpret the results. It takes only 10 minutes to complete our test whereas other tests take a minimum of 2 to 3 days to give a full picture of bacteria and fungi contamination. Because fungal spores will not even show significant growth before 4 days, a complete answer using growth techniques takes 5 to 7 days. During that time the samples have to be incubated and may have to be monitored daily. ATP based tests, while rapid, show total contamination, and do not relate to actively growing organisms. The results from most of our competitors are deduced either by comparing colours or spot numbers with a chart or, if accuracy is required, counting under a microscope. In our test you look at the six lateral flow devices on the test kit paddle and read off whether you have negligible (never say nil), moderate or heavy contamination. The levels for moderate and heavy contamination appear in the IATA guidelines.

Most competitor's kits require special handling, certainly for safe disposal. Ours (apart from the fuel itself) can be disposed of by normal methods, or recycled if you have a plastics recycling policy.

## The FUELSTAT® *resinae* PLUS Test Kit?

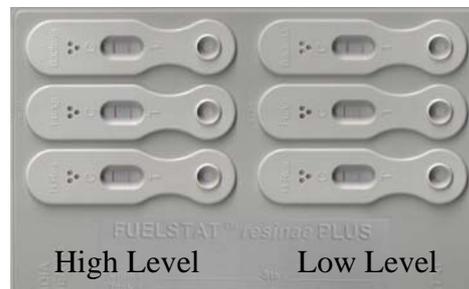
Our kit consists of the following:-

Step by step guide. Test paddle. Pipette. 175ml Bottle containing blue extraction fluid (which is water based). Dropper cap. Dessicant sachet.



The fuel or water sample is added to the Bottle and mixed. When the blue fluid has separated from the sample, 4 drops of the mixture are placed into the 6 sample wells which are set into the paddle. Within 10 minutes the results will be displayed in the viewing windows. (See Detailed Test Procedure).

## The Test Paddle.



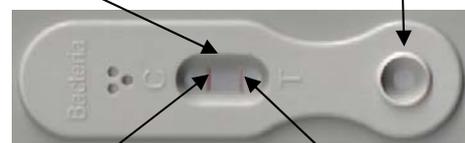
Bacteria

Fungi

H.Res

Viewing window

Sample well



Control Line

Test Line

## Detailed Test Procedure.



• Open foil pack contents



• Take a sample from the lowest point in the tank



• Once settled, is there any free water?



Water Phase Test



• If enough water is free in the sample use the pipette to fill the bottle to lower line



Mixed Water and Fuel Phase Test



• Use pipette to collect free water and put into bottle. If water does not reach lower line, fill to top line with fuel from the same sample



Fuel Phase Test

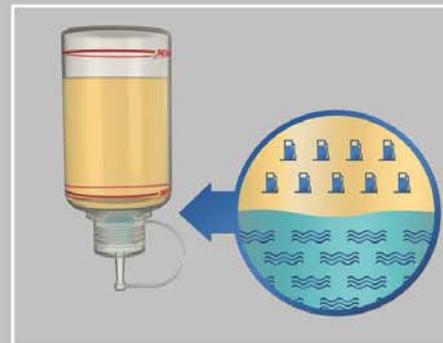


• If no water is visible in the sample, fill the bottle to the top line with fuel

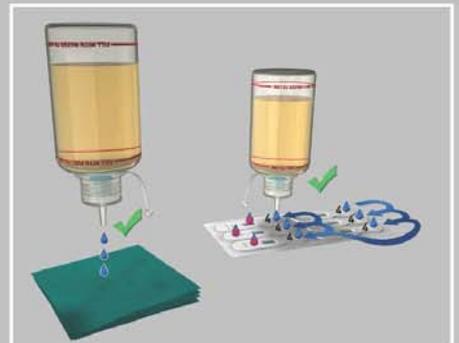


Shake for 5 seconds

• For all types of test, secure dropper cap and shake sample vigorously for 5 seconds



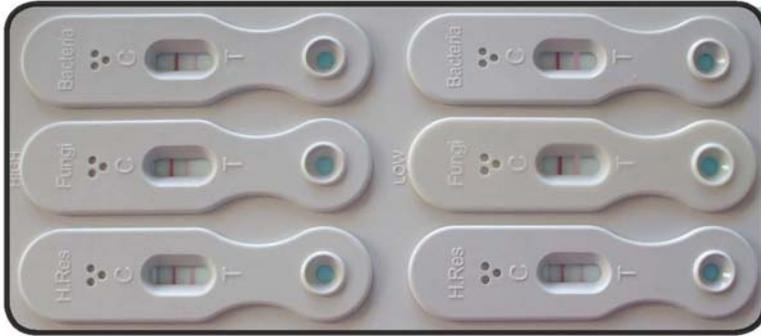
• Invert bottle and allow blue fluid to settle out of the fuel sample.  
Note: For a water phase test the blue fluid will not separate from the sample



• Allow 3 drops to spill onto a tissue to clear the dropper then carefully allow 4 drops of blue fluid into each sample well ensuring no spillage into the viewing window

• Keep the paddle flat: the blue fluid will be seen to flow along the viewing window and, after a few minutes, a dark red Control line to the left of the viewing window will appear.

## Test Results.



### Negligible Result

If all 6 Control lines and all 6 Test lines are visible, this is a Negligible result, no action required.

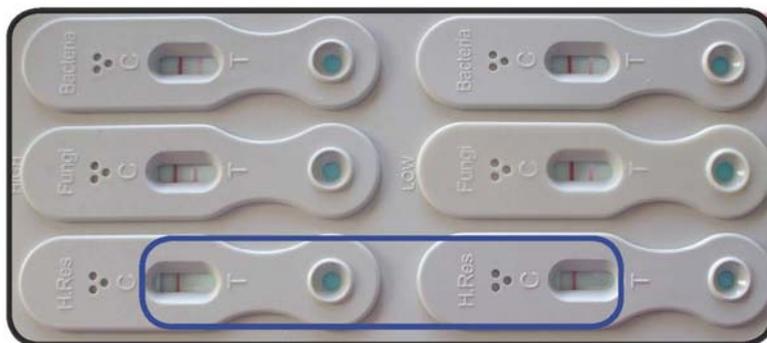
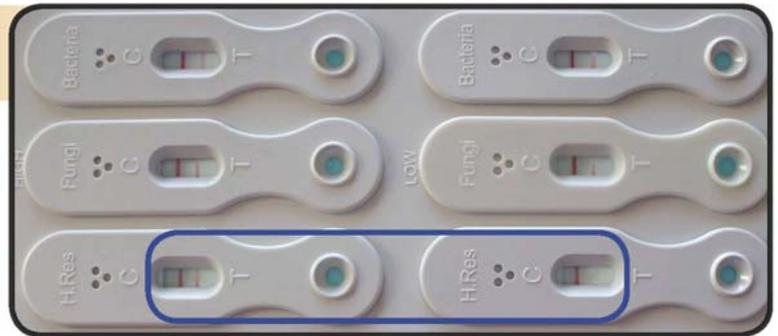
- This means that there is either no contamination or, if there is contamination, it is at such a low level that it requires no action.

### Low Positive Result

#### MODERATE CONTAMINATION

If any of LOW test Lines are not visible on the low devices, this is a Low Positive result. Here the Test Line in the H.Res field is not visible.

- This means that there is contamination present and it is at a level that requires the application of biocide.



### High Positive Result

#### HEAVY CONTAMINATION

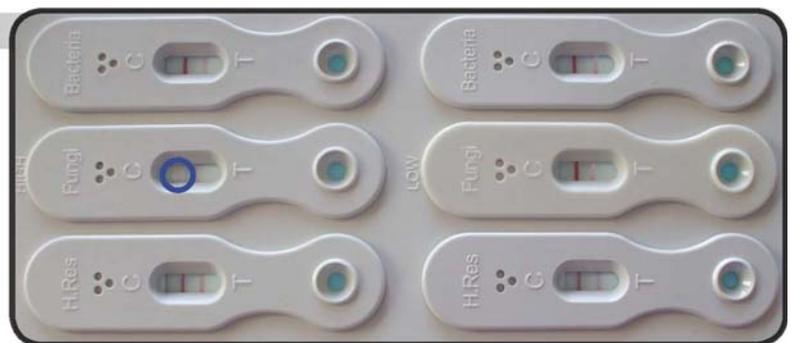
If the test result shows no Test Lines on any HIGH and their corresponding LOW devices then the test is a HIGH POSITIVE result.

- This means that there is contamination present and it is at a level that requires tank cleaning and the application of biocide.

### Test Not Valid

If there is no Control Line visible on any of the 6 devices, then the test is invalid and must be run again using a new test kit.

- Retest even if there are lines opposite the 'T' (Test Line)



## How To Order.

**Part Number: 090100012. FuelStat Resinae Plus, FHR8-2.**

**Pack quantity:** 8 tests.

### Specification.

**Kit contents:** Test Paddle, Preparation Bottle, Plastic Pipette, Instruction Leaflet.

**Packaging:** Each test is sealed in a foil pouch. 8 tests per carton.

**Test type:** Immunoassay. Utilises lateral flow

technology and antibodies to H.Res, Bacteria and Fungi.

**Test Duration:** Approximately 10 minutes.

**Maximum storage temperature:** 30degC.

**Shipping specification:** 33x23x19cm, 1.35Kg.

**Hazard Rating:** Non hazardous.

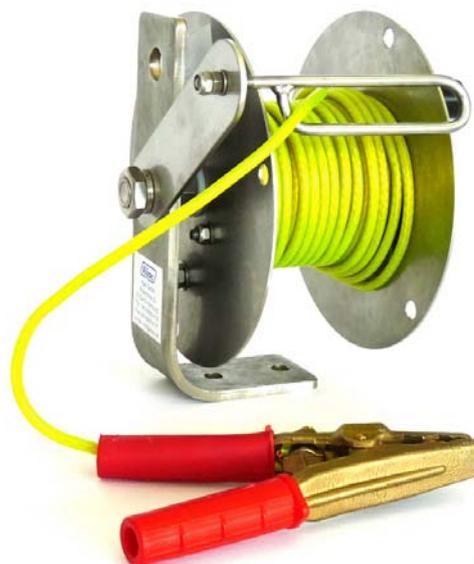
**Disposal:** Normal domestic waste or recycling.

**NATO Stock Number:** 4940-99-615-6295.

For Diesel fuel test kits please contact our Sales Department.

# BONDING CABLE REEL

- ◆ **COMPACT AND LIGHTWEIGHT**
- ◆ **ROBUST STAINLESS STEEL CONSTRUCTION**
- ◆ **IMPROVED ELECTRICAL CONTINUITY**
- ◆ **SUITABLE FOR DEPOT OR VEHICLE USE**
- ◆ **ADJUSTABLE BRAKE, NO OVER RUN**
- ◆ **OPTIONAL CABLE GUIDE**



## Introduction.

When transferring flammable liquids or powders at high flow rates it is essential that adjacent system components are electrically connected, or bonded, in order to reduce the risk from potentially explosive static electrical discharges.

Traditionally this connection has been achieved using a bonding clip and cable stowed on an electrically conductive reel.

## History.

In the past Bonding Reels were made from thick Aluminium or Brass castings, so in the event of failure or damage occurring it meant replacing a large expensive component. They relied on the hub bearing to provide the electrical circuit through the reel, but when the bearing became worn this resulted in a loss of continuity. The reeling resistance was low so during unreeling the reel continued to spin in an uncontrolled manner and deposited cable on the ground.

The 'Aljac Bonding Cable Reel' has been specifically developed to overcome these shortcomings.

## Description.

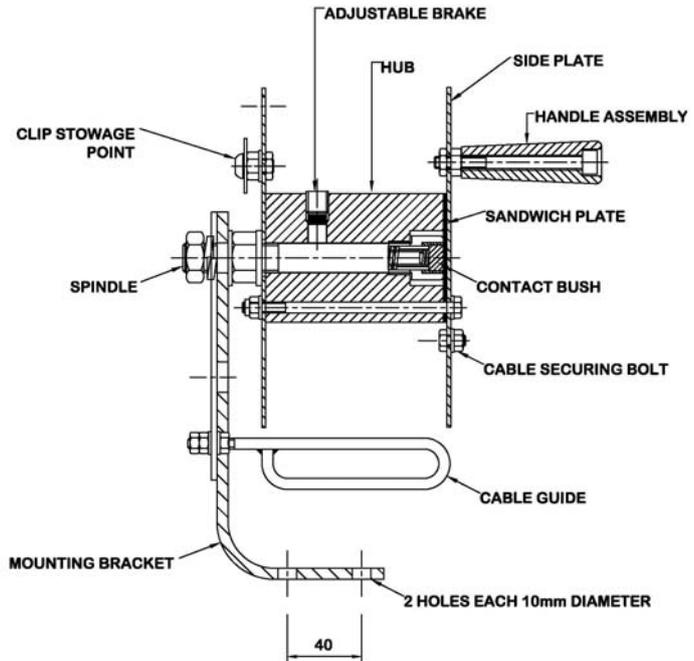
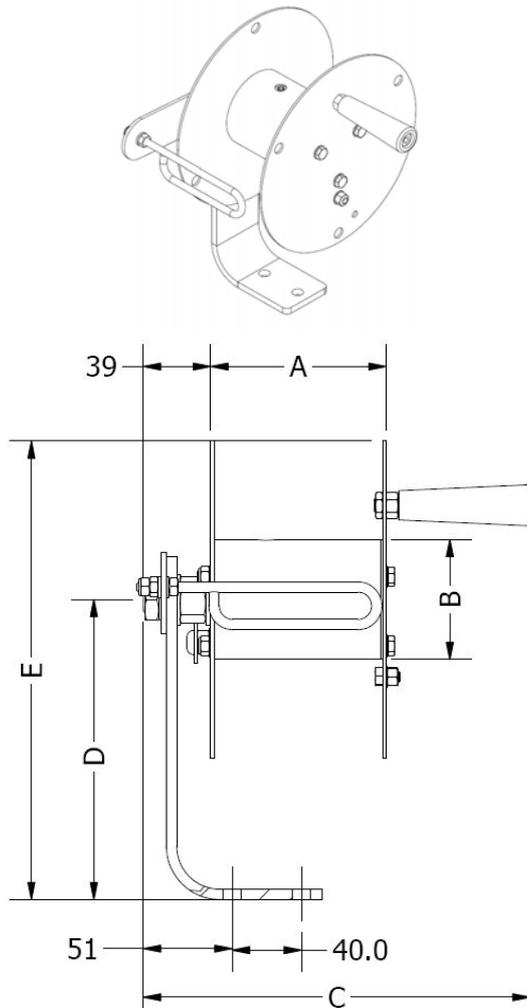
The 'Aljac Bonding Cable Reel' offers an extended operational life and it can be fully overhauled very simply. Our reel does not rely on

contact between the hub and spindle for its electrical connection, instead it uses an internal spring loaded Graphite contact bush which is connected to the spindle and bears directly on a Brass sandwich plate which is clamped to the side plate. This ensures a clean 100% contact. Because the hub is not required for continuity it is made from rigid PVC which provides a maintenance free bearing. Stainless steel is used for all other major components. A dedicated clip stowage point prevents clip loss and inadvertent unreeling during vehicular movement.

The 'Aljac Bonding Cable Reel' is available in two sizes, to accommodate up to 15 metres or up to 40 metres of cable. A heavy duty insulated Brass clip is fitted together with the required length of cable. The standard cable is transparent PVC insulated 16x14x0.15 Copper braid. The reel is fitted with an adjustable friction brake to eliminate over-run when unreeling. The reel can also be fitted with an optional adjustable cable guide which allows the cable to be pulled out at an acute angle without it fouling on the side plates.

The 'Aljac Bonding Cable Reel' has been risk assessed against the requirements of the EC directives and harmonised standards, including ATEX Directive 94/9/EC for use in Zone 1 hazardous areas, and it is CE marked.

## General Arrangement Drawing.



Dimension	Lower Mounting Position		Upper Mounting Position	
	0100211004	0100211010	0100211004	0100211010
A	73mm	101mm	73mm	101mm
B	70mm	70mm	70mm	70mm
C	193mm	223mm	193mm	223mm
D	110mm	110mm	175mm	175mm
E	203mm	203mm	268mm	268mm

Approx. Depth (including Cable Guide) 220mm for all versions.

## Applicable Standards.

Our Bonding Cable Reels have been assessed against and comply with the following standards:-  
 94/9/EC. Directive on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX).  
 2006/42/EC. Directive on machinery.  
 BS EN 13463-1:2009. Non-electrical equipment for use in potentially explosive atmospheres – Part 1: Basic method and requirements.  
 BS EN 13463-5:2011. Non-electrical equipment intended for use in potentially explosive atmospheres. Protection by constructional safety 'c'.  
 BS EN 1127-1:2011. Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology.

The reel is suitable for use in Zone 1 Category 2 (Gas and Dust) hazard areas, when installed, operated and maintained in accordance to the operating manual, and carries the following markings:

CE II 2 G c IIC T6.

CE II 2 D c.

## Specification.

**Capacity** (5.5mm outside diameter cable):  
 0100211010, 40 metres. 0100211004, 15 metres.  
**Material:** Type 304 Stainless Steel with rigid PVC hub, Graphite Contact Bush.  
**Electrical Resistance:** 0.5 Ohms max. (reel only).  
**Shipping weight** (reel only): 0100211010 2.2 Kg.  
 0100211004 1.9Kg.

## How To Order.

Part Number	Description
<b>0100211010</b>	Bonding Cable Reel, 40m, no cable.
<b>0100211013</b>	Adjustable cable guide/bracket (40m reel).
<b>0100211004</b>	Bonding Cable Reel, 15m, no cable.
<b>0100211014.</b>	Adjustable cable guide/bracket (15m reel).
<b>0100212001</b>	Bonding Cable, Copper braid, clear PVC cover, specify length.
<b>0100212005</b>	Bonding Cable, Copper braid, high visibility cover, specify length.
<b>0100213001</b>	Bonding Clip, 70mm long.

Please contact our Sales Department or Data Sheet DSS0240 for alternative cable and clip types.

# LARGE HUB BONDING CABLE REEL

- ◆ **LARGE HUB FOR LESS FLEXIBLE CABLES**
- ◆ **COMPACT AND LIGHTWEIGHT**
- ◆ **ROBUST STAINLESS STEEL CONSTRUCTION**
- ◆ **IMPROVED ELECTRICAL CONTINUITY**
- ◆ **SUITABLE FOR DEPOT OR VEHICLE USE**
- ◆ **ADJUSTABLE BRAKE, NO OVER RUN**
- ◆ **OPTIONAL CABLE GUIDE**



## Introduction.

When transferring flammable liquids or powders at high flow rates it is essential that adjacent system components are electrically connected, or bonded, in order to reduce the risk from potentially explosive static electrical discharges. Traditionally this connection has been achieved using a bonding clip and cable stowed on an electrically conductive reel.

## History.

In the past Bonding Reels were made from thick Aluminium or Brass castings, so in the event of failure or damage occurring it meant replacing a large expensive component. They relied on the hub bearing to provide the electrical circuit through the reel, but when the bearing got worn this resulted in a loss of continuity. The reeling resistance was low so during unreeling the reel continued to spin in an uncontrolled manner and put cable on the ground. The 'Aljac Bonding Cable Reel' has been specifically developed to overcome these shortcomings.

## Description.

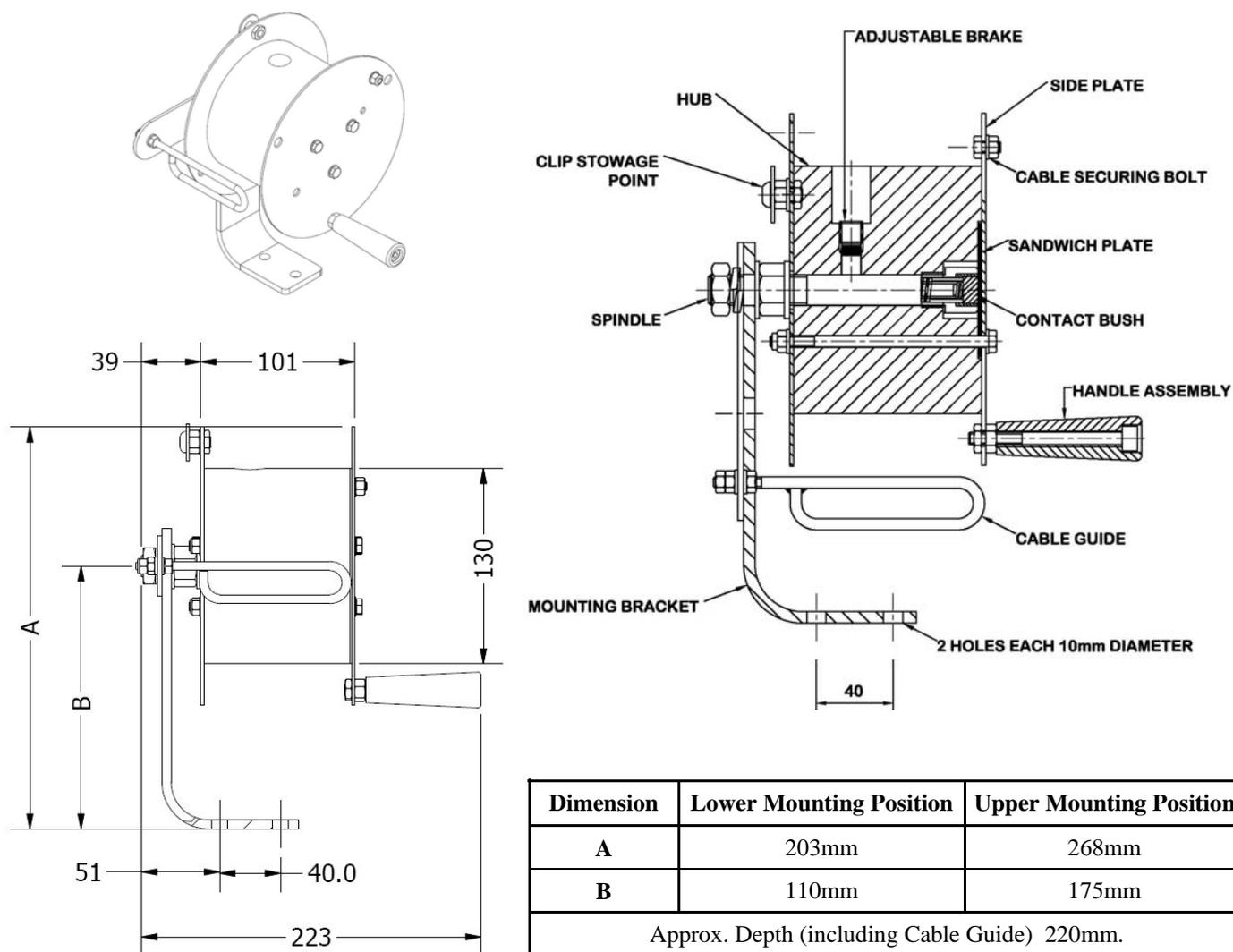
The 'Aljac Bonding Cable Reel' offers an extended operational life and it can be fully overhauled very simply. Our reel does not rely on contact between the hub and spindle for its electrical connection, instead it uses an internal spring loaded Graphite contact bush which is connected to the spindle and bears directly on a Brass sandwich plate which is

clamped to the side plate. This ensures a clean 100% contact. Because the hub is not required for continuity it is made from rigid PVC which provides a maintenance free bearing. Stainless steel is used for all other major components. A dedicated clip stowage point prevents clip loss and inadvertent unreeling during vehicular movement. The reel is fitted with an adjustable friction brake to eliminate over-run when unreeling.

The problem with our original design is that it was designed for highly flexible braided Copper cables. However, in certain regions it is common to see twisted core cable being used, which is much less flexible. When this cable is fitted to our original reel the small hub diameter causes the cable to take a permanent set into the coil shape, and consequently is not fully straight when laying on the ground, creating a trip hazard. So the new 'Large Hub Bonding Cable Reel' has been developed in order to accommodate these less flexible cable types. The reel can be fitted with an optional Cable Guide, and is fitted with a longer mounting bracket to give increased hand clearance under the handle assembly when rewinding. It will stow up to 30 metres of 4.5mm diameter cable.

The 'Aljac Bonding Cable Reel' has been risk assessed against the requirements of the EC directives and harmonised standards, including ATEX Directive 94/9/EC for use in Zone 1 hazardous areas, and it is CE marked.

## General Arrangement Drawing.



Dimension	Lower Mounting Position	Upper Mounting Position
A	203mm	268mm
B	110mm	175mm
Approx. Depth (including Cable Guide) 220mm.		

### Applicable Standards.

Our Bonding Cable Reels have been assessed against and comply with the following standards:-  
 94/9/EC. Directive on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX).  
 2006/42/EC. Directive on machinery.  
 BS EN 13463-1:2009. Non-electrical equipment for use in potentially explosive atmospheres – Part 1: Basic method and requirements.  
 BS EN 13463-5:2011. Non-electrical equipment intended for use in potentially explosive atmospheres. Protection by constructional safety 'c'.  
 BS EN 1127-1:2011. Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology.

The reel is suitable for use in Zone 1 Category 2 (Gas and Dust) hazard areas, when installed, operated and maintained in accordance to the operating manual, and carries the following markings:

CE  II 2 G c IIC T6.

CE  II 2 D c.

### Specification.

**Capacity** 0100211020:- 30 metres of 4.5mm outside diameter cable.

**Material:** Type 304 Stainless Steel with rigid PVC hub, Graphite Contact Bush.

**Electrical Resistance:** 0.5 Ohms max. (reel only).

**Shipping weight:** 2.3 Kg (reel only).

### How To Order.

Part Number	Description
<b>0100211020</b>	Large Hub Bonding Cable Reel, no cable.
<b>0100211013</b>	Adjustable cable guide/bracket.

Please contact our Sales Department or Data Sheet DSS0240 for alternative cable and clip types.

## SPRING REWIND STATIC BONDING REEL

- ◆ **AUTOMATIC REWIND AT A CONTROLLED SPEED**
- ◆ **HEAVY DUTY DESIGN, LONG SERVICE LIFE (TESTED TO 5000 CYCLES)**
- ◆ **COMPACT AND LIGHT WEIGHT**
- ◆ **FULLY ENCLOSED SPRING AND LATCH MECHANISM**
- ◆ **WEATHER RESISTANT FINISH**
- ◆ **PERMANENTLY LUBRICATED BEARINGS**



### Introduction.

It is accepted practice to bond adjacent system components when transferring flammable liquids or powders at high flow rates by using a bonding reel and cable. Spring rewind reels are favoured by the military, but have traditionally suffered from poor reliability under extreme service conditions, particularly when subjected to operational abuse.

The US Military Specifications MIL-R-83325 and A-A50696 (replaces MIL-R-83232) are therefore regarded as the definitive performance standards for spring rewind static earthing reels. Aljac Fuelling Components is now able to offer the Ametek Spring Rewind Static Bonding Reel, which meets, and indeed exceeds the requirements of the US Military Specifications.

### Description.

By using the SPIR'ATOR spring in preference to the more commonly found power type spring, our Reel is approximately 1/3 of the size and 1/2 the weight of the other reels which conform to the US Military Specifications.

The cable is pulled out against the spring and a latch mechanism locks the drum in place.

Retraction is initiated by a slight pull on the cable which releases the latch. During retraction the speed is automatically regulated to between 0.6 and 2.0 metres per second by a unique centrifugal brake device, and the design is such that it should not be necessary for the operator to attend the rewind operation. This is not a requirement of the US Military Specifications but it is an additional benefit that this reel offers over many others. However, we recommend that the operator 'walks' the cable back in as an additional safety precaution and to prolong service life.

The reel is constructed from plated Steel components with a stoved on red external paint finish for weather resistance, and the drum has a gasketed seal to protect all internal working parts from corrosion due to moisture ingress. The reel bearings are permanently lubricated.

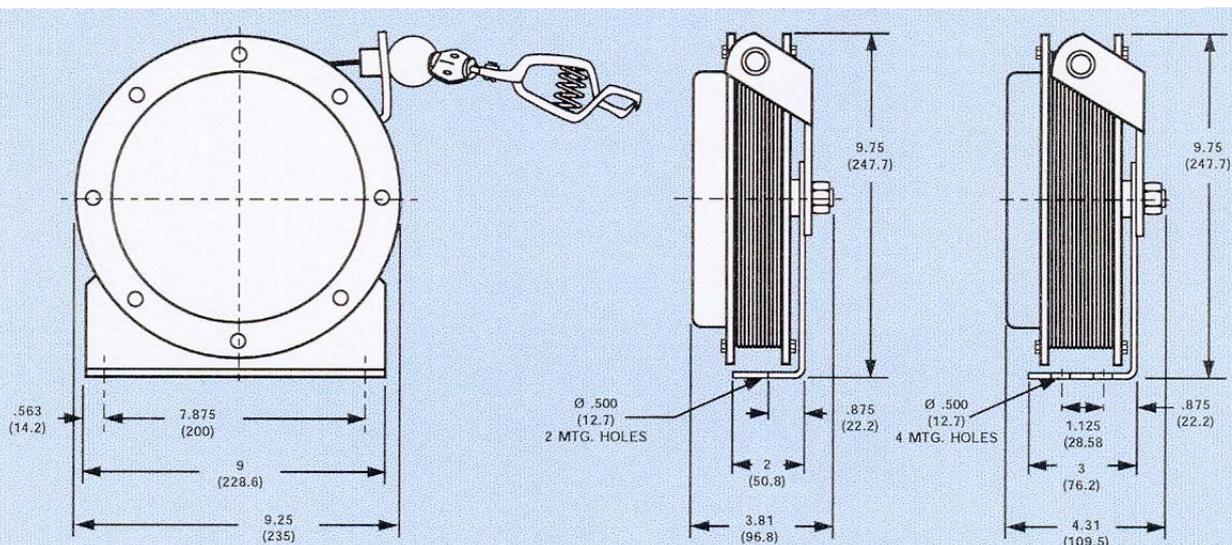
As standard the reel is fitted with clear plastic coated Galvanised Steel cable and a Mueller type clip. Three sizes of reel are available with cable lengths of 15, 22 and 30 metres. However, the reels can be supplied with no cable fitted, or with alternative cable and clip type on request. Please contact our Sales Department for details.

## Dimensional Drawing.

Inches (Millimeters)

ML2930-15 & ML2930-14

ML3416-2



## How to Order.

Model	Part Number	Cable Length	Nett Weight Approx. (Kg)
ML2930-15	0100215011	15 metres	7.0
ML2930-150	0100215010	None fitted	5.0
ML2930-14	0100215021	22 metres	9.0
ML2930-140	0100215020	None fitted	5.0
ML3416-2	0100215031	30 metres	10.5
ML3416-20	0100215030	None fitted	6.0

## Detailed Specification.

Reel Type:- Spring rewind, with hold on latch, automatic rewind speed control and adjustable cable guide.

Materials of Construction:- Plated Steel drum and mounting bracket.

Finish:- Stoved on red paint to MIL STD808, film designation DG.

Standard Cable:- 7x7 Galvanised Steel core to 2.2 mm diameter, clear plastic coated to 3.2 mm diameter.

Standard Clip:- Mueller 21C Copper, 4" size.

Electrical Resistance:- 10 Ohms maximum clip to mounting bracket with standard cable and clip.

Operating Life:- Type tested to 5000 cycles.

Cable Retraction Speed:- 0.6 to 2.0 metres per second.

Operating Temperature Range:- Minus 54 deg C to plus 52 dec C.

Storage Temperature Range:- Minus 62 deg C to plus 72 deg C.

## **HIGH CAPACITY SPRING REWIND BONDING REEL**

- ◆ **HIGH CAPACITY, ACCEPTS UP TO 36 METRES OF CABLE**
- ◆ **CONTROLLED REWIND SPEED**
- ◆ **HEAVY DUTY DESIGN, LONG SERVICE LIFE**
- ◆ **MAINTENANCE FREE CONSTRUCTION**

### **Introduction.**

For many years spring rewind bonding reels have suffered from poor reliability and have lacked resistance to operational abuse, particularly under the most severe operating conditions. In addition, they have not been able to accept large volumes of cable.

There has always been the need for this product, particularly by the military, but no reel has been able to fully overcome the traditional problems at a sensible price. Aljac Fuelling Components is now able to offer the High Capacity Spring Rewind Bonding Reel to fulfill this need.

### **Description.**

Our High Capacity Spring Rewind Bonding Reel has been designed to accommodate up to 36 metres of 5.5 mm diameter cable, as specified by the major fuel supply companies and the British Ministry Of Defence. It is of a latched design, the cable is simply pulled out to the required position and the latch holds the reel. To release the latch and initiate rewinding the cable is given an extra pull. The latch mechanism requires no lubrication and can easily be removed if the reel is to be used in a non-latching configuration.

The heart of this reel is the Stainless Steel Tensator torsion spring. This spring has a design life of 20,000 cycles and is contained in a fully

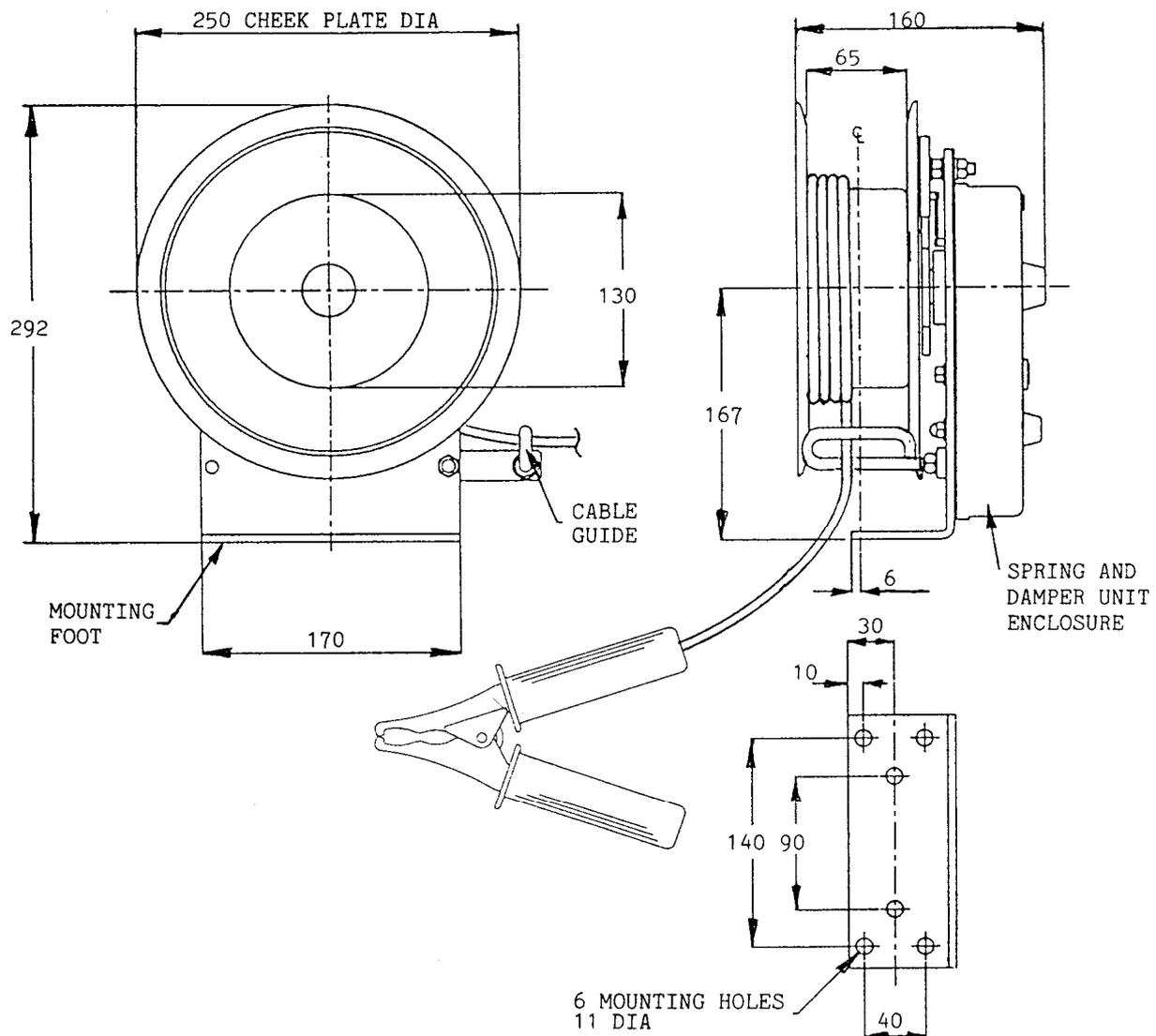


sealed housing, so no water or dirt can affect it's correct operation. The rewind speed is controlled using a Silicone fluid damping system which is inherently reliable, and is unaffected by large temperature variations. It's performance will also not deteriorate due to mechanical wear and tear. In older designs the combination of complex rewind speed control devices with the low spring quality has been the major reason for premature failure when operator abuse takes place.

The reel is completed with an adjustable cable guide to ensure that the cable is rewound accurately onto the drum.

Since it's introduction his reel has been successfully tested and approved by the British Ministry Of Defence, and has been proven in widespread service all over the world.

## Dimensional Drawing.



### Detailed Specification.

Reel Type:- Spring rewind, with latch, automatic speed control and adjustable cable guide.

Material Of Construction:- Zinc plated Steel drum and mounting bracket, cast Aluminium housing, Stainless Steel spring.

Maximum Resistance:- 0.5 Ohms (Bonding Clip to base plate when fitted with up to 40 metres of 16x14x0.15 Copper braid cable).

Minimum Operating Temperature:- Minus 40 deg. C.

### Shipping Specification.

Shipping Weight:- 10 Kg (no cable fitted)

Overall Dimensions:- 250 mm by 160 mm by 292 mm.

### How To Order.

Contact Aljac Fuelling Components and ask for part number 0100215040 for the reel without cable. A stop ball (part number 0100213025) and Cable Clamp part number (0100213026) will also be required.

### Accessories.

Aljac Fuelling Components can supply clear PVC covered and High Visibility Copper braid bonding cable, a wide variety of Bonding Clips, Bonding Plugs, and Break Away Joints for use with this reel.

Please contact our Sales Department to discuss your exact requirements.

## COPPER BRAIDED BONDING CABLE

- ◆ **LOW ELECTRICAL RESISTANCE**
- ◆ **BRAIDED COPPER CORE**
- ◆ **TRANSPARENT PVC COVER**
- ◆ **EX-STOCK DELIVERY**



### Introduction

One of the primary hazards associated with the transfer of petroleum products and bulk powders at high flow rates is the risk of sparking and resultant explosion due to the build up of static electrical charges.

Such a situation exists when loading or unloading petroleum spirit, hazardous waste or bulk flour road tankers or when refuelling aircraft. During such operations it is essential that the pipework system is electrically bonded to the tanker, or the refuelling vehicle to the aircraft, to ensure that no difference in potential exists between the adjacent system components. The cable used to achieve this is of critical importance.

### Bonding Cable.

The most widely accepted cable for static bonding consists of a 16x14x0.15 braided Copper core with a clear PVC cover material, as used by all the major oil companies for aviation refuelling throughout the world.

The use of Copper ensures the lowest possible electrical resistance of 0.007 Ohms per metre length, and the braided construction resists the tendency of the cable to kink. The clear PVC cover protects the core from abrasion, the elements and fuel spillages whilst allowing regular visual inspection to check for breaks or internal damage.

With the ever increasing importance of safety in

the workplace, we also now have a High Visibility grade available. To achieve this effect the PVC cover compound is dosed with green fluorescent pigment at a level which still maintains the transparency of the cover.

The range has been completed with the addition of a low temperature 'Arctic' grade which can be used even in the coldest climates. However, this grade cannot be supplied with a transparent cover.

All three grades are available ex stock from Aljac Fuelling Components in either 250 metre long continuous coils or in cut lengths.

### Specification.

Core Material: 16x14x0.15 single Copper braid to 3mm diameter.

Cover Material: Clear PVC, transparent Green PVC, or low temperature opaque PVC to 5mm diameter.

Electrical Resistance:- 0.007 Ohms per metre.

Nett weight: Approximately 0.06Kg/Metre.

Minimum Cold Flex Temperature:

Minus 20 deg.C for standard grades, minus 40 deg.C for Arctic grade.

### How To Order.

Simply quote the appropriate part number and specify the length required.

Clear Cover: Part Number 0100212001.

High Visibility Cover: Part Number 0100212005.

Arctic Grade: Part Number 0100212007.

## BONDING CLIPS AND ACCESSORIES



**0100213020.**  
Raco 140 mm Brass clip, insulated grips, integral cable trap feature.



**0100213001.**  
Raco 75 mm Brass clip, insulated grips, complete with cable lug, cable tie and nut/bolt. (0100213002 for clip only).



**0100213017.**  
Superclip 170 mm Brass clip, insulated grips, integral cable trap feature. With integral plug.



Bonding lug, Brass, 12 mm diameter hole, bolt to the structure or vehicle chassis.  
**0100213003. 1/2 inch diameter.**  
**0100213022. 3/4 inch diameter.**



**0100213018.**  
Superclip 170 mm Brass clip, insulated grips, integral cable trap feature.



**0100213019.**  
ALS10A Aluminium Alloy clip, to MIL-C-83413/7, with cable clamp screws (max. cable diameter 2.7 mm), jaw gap 2 mm fully closed.



**0100213014.**  
Power Connectors Staticlip II, electro plated Brass clip with cable clamp screws.



**0100213028.**  
KK100 Brass clip and plug, commonly fitted to refuelling nozzles.



**0100213004.**  
Bonding plug, Stainless Steel, with cable clamp nut, to MIL-C-83413/7 (max. cable diameter 2.7 mm).



**0100213021.**  
Briticent Gripper plated Steel clip.



**0100213023.**  
Clip break away joint, Brass, with cable clamp screws, designed for helicopter refuelling operations.



**0100213024.**  
Drum clamp, galvanised Steel, Stainless Steel point and thumb screw to connect to the rim of a 200 Litre drum, 25 mm jaw opening.

**ALL ITEMS EX STOCK !**

**Please contact our Sales Department for Bonding Reels, Bonding Cable and Continuity Testers.**

# ALJAC CONTINUITY TESTER

- ◆ **ADVANCED MICROPROCESSOR TECHNOLOGY.**
- ◆ **GO/NO GO CONTINUITY CHECK.**
- ◆ **DIGITAL RESISTANCE DISPLAY.**
- ◆ **DYNAMIC CHECKING OF BONDING REELS.**
- ◆ **SIMPLE TO OPERATE, AUTO SWITCH ON/OFF.**
- ◆ **SELF TESTS AND CALIBRATES BEFORE EVERY TEST.**
- ◆ **ROBUST AND IMPACT RESISTANT.**
- ◆ **COMPACT, LIGHTWEIGHT, PORTABLE.**
- ◆ **ATEX CERTIFIED FOR ZONE 1 OR ZONE 2 HAZARDOUS AREA USE.**



## Introduction.

Systems which transfer flammable liquids or powders must be bonded, or electrically connected in order to safely dissipate static electrical charges. However, it is important that these systems are tested regularly, because deterioration could result in a hazardous situation developing.

Traditionally, a resistance or multi function meter is used. These instruments are normally cumbersome, delicate, and should be used by skilled technicians. They do not detect the small changes in resistance which affect a bonding system and they are also not responsive enough to detect a worn bonding reel bearing or slip ring. Consequently it is unlikely that bonding systems will be checked frequently or in the correct manner. A number of specialised bonding system testers have been developed but they all have a variety of other shortcomings.

The Aljac Continuity Tester (ACT) has been specifically designed for this task ONLY, so it does not sacrifice performance in the interests of being a multi purpose instrument and it is based on the very latest microprocessor technology.

## Description.

The ACT is a foolproof Go/No Go device which can be used by non skilled personnel, and it is

controlled by a microprocessor which offers significant operational advantages.

Touching the clips together switches the ACT on. It self checks calibration and available battery power and only then allows the test to proceed. The ACT uses a dual colour light emitting diode (LED) to indicate the condition of the bonding system under test, which makes the results very simple to interpret. If the system resistance is less than the set point, the LED will flash Green (Pass). If the system resistance is more than the set point, the LED will flash Red (Fail). The default set point is 25 Ohms which is in accordance with the JIG Guidelines for aviation fuel systems, but alternative set points (if required) can be specified at the time of order. In addition, throughout the test, a two figure digital display tells the operator the actual system resistance (in Ohms).



The ACT housing is ergonomically designed to be comfortably held in the hand and is moulded from impact resistant Polyamide, so it is lightweight, robust, and is highly portable.

The ACT incorporates two sealed, non rechargeable, high capacity batteries which gives it an extended operational life, and the battery life is further enhanced by a number of power saving features. The ACT does not have a constant power usage, it checks the resistance 200 times per second. Also, the microprocessor automatically switches off the ACT after a time out period at any stage of the operation, even if the clips are left connected or touching at the end of the test.

The ACT can be supplied with a calibration certificate if required, but in any event it self checks and adjusts calibration before every test.

The ACT is ATEX certified for use in Zone 1 or Zone 2 hazardous areas, unlike many other devices which are currently in use.

A Stowage Bracket is available which can be used to neatly stow the ACT when not in use, or can hold the ACT securely during testing.

### Operation.

#### 1. Self Check/Start Up.

- a) Touch and hold the clips together. The ACT adjusts calibration and checks battery power.
- b) If display shows ER the ACT is either out of calibration or the battery is discharged.
- c) If the calibration is correct and the battery has sufficient power, the LED flashes Green and the display shows 88 (segment check). Separate the clips within 10 seconds.
- d) The LED flashes Red and the display shows HI (open circuit). The ACT is now ready to check the bonding system.

#### 2. Bonding System Test.

- a) Within 15 seconds connect one clip to a clean unpainted metal point on the system framework or vehicle chassis and connect the other clip to the system bonding clip.

b) If the LED flashes Green the system resistance is less than the set point. The bonding system is serviceable.

c) If the LED flashes Red the system resistance is greater than the set point. The bonding system is unserviceable and the problem MUST be rectified before further use.

d) The actual system resistance in Ohms is displayed throughout the test and this may be recorded.

e) The condition of the bonding reel slip ring or bearing can be checked by reeling the cable in or out with the ACT still connected. A defective reel bearing or slip ring will cause the LED to change colour from Red to Green and back again.

f) At the end of the test remove the clips. The LED flashes Red and the display shows HI (open circuit). The ACT will now time out in 15 seconds and switch off.

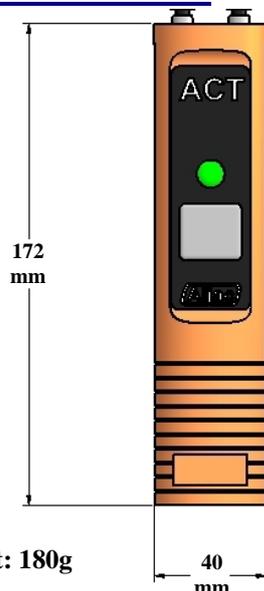
### How To Order.

**Aljac Continuity Tester:- Part No. 0100400180.**

**Stowage Bracket:- Part No. 0100400181.**

**Replacement lead/clip assy.(2 per ACT):-  
0100400182.**

### Weights and Dimensions.



**Nett Weight: 180g**

### Specification.

**Type:** Go-No Go Continuity Tester.

**Set Point:** 25 Ohms (default). Option 1 to 40 Ohms.

**Test Frequency:** 200 tests per second.

**Display Update:** Every 100 tests (0.5 seconds).

**LED:** Dual colour high intensity (Red/Green).

**Display:** Two digit 7 segment LCD, 12mm character height. Selectable on or off in software..

**Housing:** High visibility orange impact resistant PA6 Polyamide.

**Battery:** Lithium Thionyl Chloride 3.6V.

**Microprocessor:** Atmel AVR EXMEGA 16A 4U.

**Flying Leads:** 2 x 0.65m long, with plugs/clips.

**ATEX Approval:** Ex II 2G Ex ib IICT4 Gb.

**Approval Certificate:** ZELM13 ATEX 0509.

**Operating Temperature:** -10 to +45 degC.

### Ancillary Items.

Contact our Sales Department for bonding reels (hand or spring rewind), bonding cable, bonding clips, bonding lugs, NATO bonding plugs, bonding clip break away joints, and drum bonding clamps. We are also happy to advise you on the selection and operation of static bonding equipment and systems.

# LANYARD CABLE REEL

- ◆ **LARGE DIAMETER HUB TO ACCOMMODATE LESS FLEXIBLE CABLES**
- ◆ **COMPACT AND LIGHTWEIGHT**
- ◆ **ROBUST STAINLESS STEEL CONSTRUCTION**
- ◆ **PROVEN HEAVY DUTY DESIGN**
- ◆ **ADJUSTABLE BRAKE, NO OVER RUN**
- ◆ **OPTIONAL CABLE GUIDE**
- ◆ **FULLY INSULATED**



## Introduction.

Hydrant pit valves must be fitted with a method of closing the valve remotely in an emergency, which should be independent from the deadman system. A Lanyard Cable is the most common method of achieving this requirement.

## History.

In the past, Lanyard Cables were stowed on the dispenser by wrapping them around metal brackets, which could result in damage, tangling or kinking of the cable, and it also restricted the available cable length. Alternatively they were sometimes fitted to converted bonding reels which were made from thick Aluminium or Brass castings, so in the event of failure or damage occurring it meant replacing a large expensive component. The rotational resistance was low so the reel continued to spin in an uncontrolled manner during unreeling and so deposited cable on the ground. Also, there would be electrical continuity across the reel which could electrically 'ground' the dispenser through the Lanyard Cable. This represented an undesirable and uncontrolled situation and could only be overcome by insulating the reel bracket from its mounting point. The Aljac Lanyard Cable Reel has been developed from our highly successful and well proven Bonding Reel, but it has also been specifically redesigned to overcome these shortcomings.

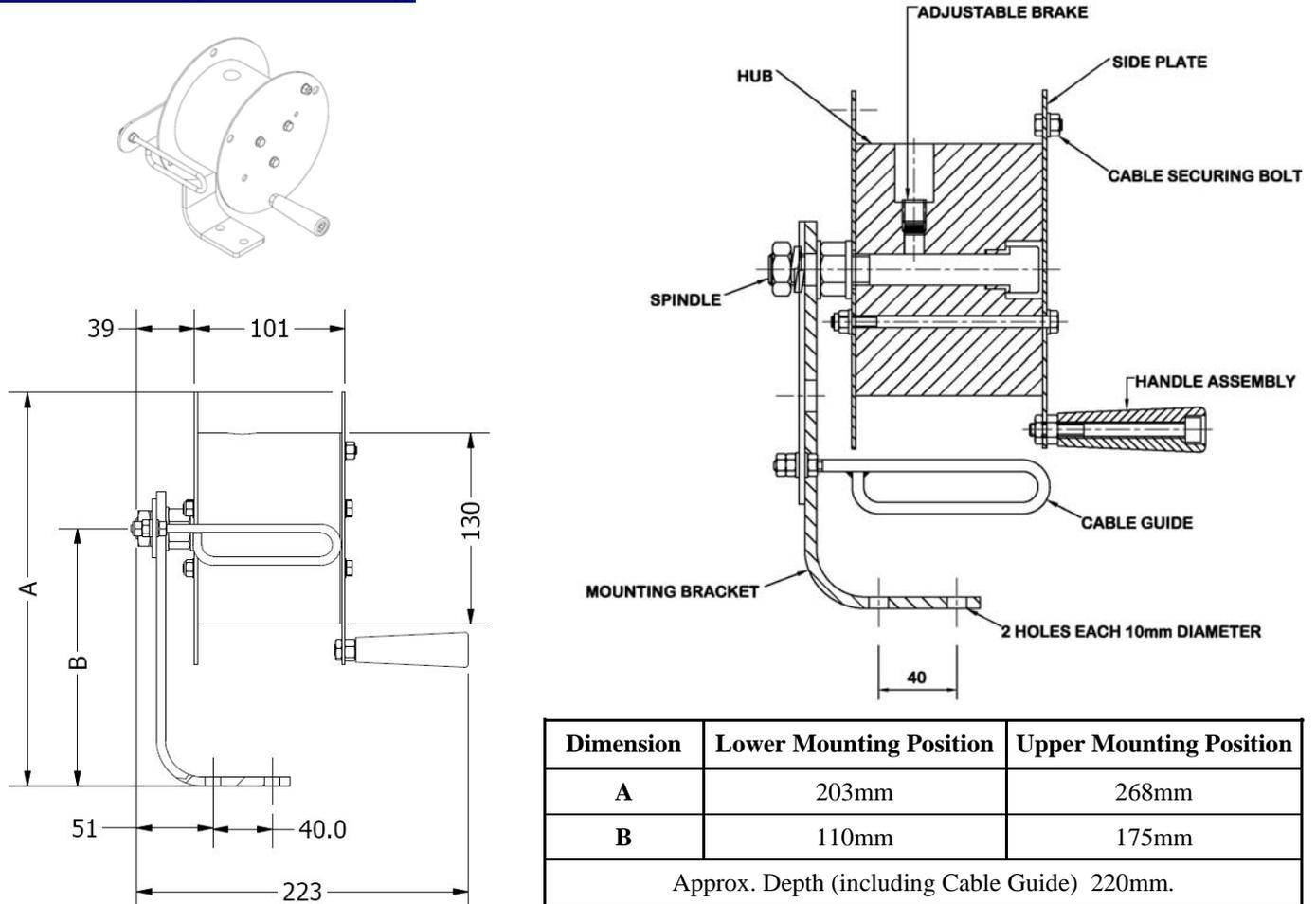
## Description.

The Aljac Lanyard Cable Reel has an extended operational life and it can be fully overhauled very simply. The hub is made from rigid PVC which provides a maintenance free bearing. This also means that the Lanyard Cable is fully insulated from the Lanyard Reel Bracket, hence preventing electrical grounding of the dispenser, without the problem of insulating the reel bracket from its mounting point. Stainless Steel is used for all other major components. The reel is also fitted with an adjustable friction brake to eliminate uncontrolled over-run when unreeling.

Our Lanyard Cable Reel accommodates the less flexible Steel cored Lanyard Cable types. The large diameter hub minimises the tendency of the cable to take up a permanent coiled shape and so allows the cable to remain flat when laying on the ground, reducing the likelihood of a trip hazard. The reel can be fitted with an optional adjustable Cable Guide which allows the cable to be unreeled at acute angles without snagging on the reel side plates.

The reel is fitted with a longer mounting bracket to give increased hand clearance under the handle when rewinding. It will comfortably stow up to 20 metres of 5.5mm diameter cable.

## General Arrangement Drawing.



### Specification.

**Capacity:-** 20 metres of 4.5mm outside diameter cable.

**Material:** Type 304 Stainless Steel with rigid PVC hub.

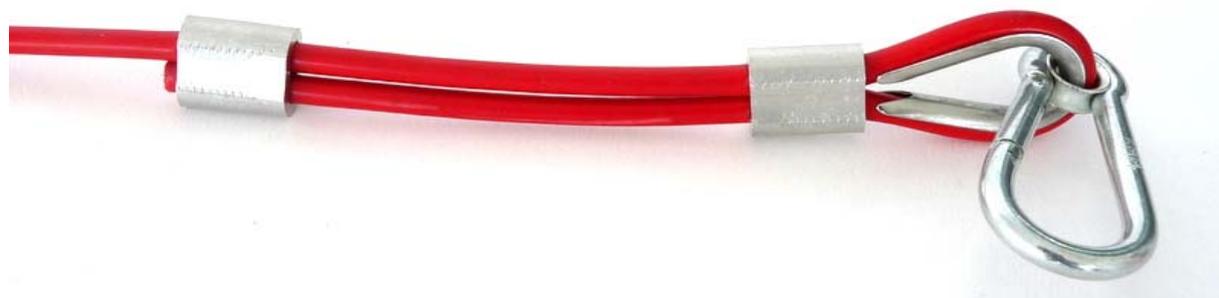
**Electrical Resistance:** Hub and Side Plates fully Insulated from the Mounting Bracket.

**Shipping weight:** 2.3 Kg (reel only).

### How To Order.

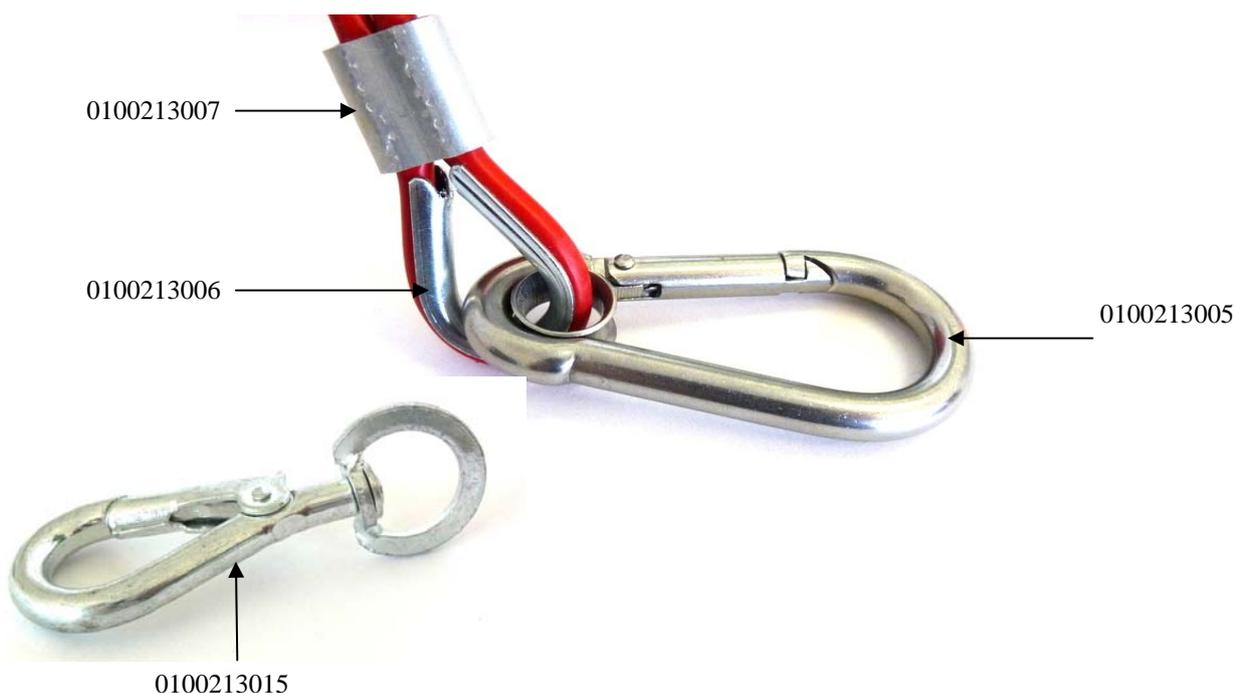
Part Number	Description
<b>0100211022</b>	Large Hub Lanyard Cable Reel, no cable.
<b>0100211013</b>	Adjustable cable guide/bracket.

# LANYARD CABLE AND CLIPS



## How To Order.

Part Number	Description
<b>0100212020.</b>	20 meter Lanyard cable assembly including 60mm long clip (as shown above).
<b>0100212002.</b>	Lanyard cable, 6x19 Galvanised Steel core with red PVC cover, per metre. Supplied in cut lengths or 300 metre drums.
<b>0100213005.</b>	Lanyard clip, Stainless Steel, 60mm closed type.
<b>0100213015.</b>	Lanyard clip, Plated Steel, 63mm swivel type.
<b>0100213006.</b>	Lanyard thimble, Stainless Steel.
<b>0100213007.</b>	Lanyard ferrule, Aluminium.



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## BASKET STRAINERS

- ◆ **CAST CARBON STEEL BODY**
- ◆ **RUGGED HIGH STRENGTH DESIGN**
- ◆ **STAINLESS STEEL HIGH CAPACITY LOW PRESSURE LOSS BASKET**
- ◆ **CHOICE OF BASKET MESH SIZES**
- ◆ **PED COMPLIANT**
- ◆ **QUICK RELEASE LID, NO SPECIAL TOOLS FOR BASKET REMOVAL**
- ◆ **SIDE DRAIN POINT**
- ◆ **O RING LID SEAL, NO GASKETS**
- ◆ **OPTIONAL DIFFERENTIAL PRESSURE TAPPING**
- ◆ **OPTIONAL AUTOMATIC AIR VENT VALVE**



### Description.

It is generally accepted that the presence of foreign matter in fluid handling systems is highly undesirable and can lead to the premature failure of critical high value items of equipment, such as pumps and meters. The installation of Basket Strainers is therefore highly recommended and widely practised in these systems. Aljac Basket Strainers have been in service all over the world for many years, protecting your critical items of fluid handling equipment.

Aljac Basket Strainers offer the end user a very low pressure loss under high flow conditions and an extended operational life. They are supplied with a quick release lid as standard, and this feature allows the basket to be removed quickly with no special tools, hence minimising the down time during basket cleaning. Basket removal is possible without the unit being fully drained. The lid is sealed with an O ring which gives the lowest possible clamping force with no gaskets required, and there is a side

drain point to allow rapid drainage of the contents.

Optional features include the fitment of a differential pressure gauge or a float operated automatic air vent valve. For aviation fuel handling systems we can epoxy line the unit internally, and for more aggressive media we can supply our Basket Strainers in type 316 Stainless Steel.

### Design Specification.

Standard:- PED/97/23/EC.

Design Pressure:- 20.0 BarG (290psig).

Test Pressure:- 29.5 BarG (428psig).

(Refer to flange tables for temperature limitations).

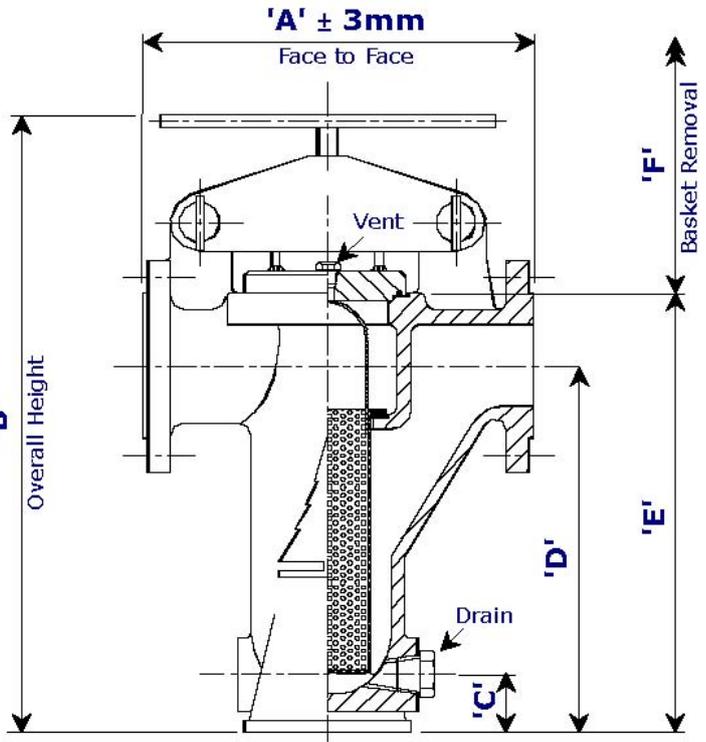
Flanges:- ANSI B16.5 150lb raised face.

External Finish:- Red oxide primer. Other paint finishes on request.

Internal Finish:- Clean and oiled as standard.

Abrasive blasted and painted with Copon EA4/EA9 white epoxy lining on request.

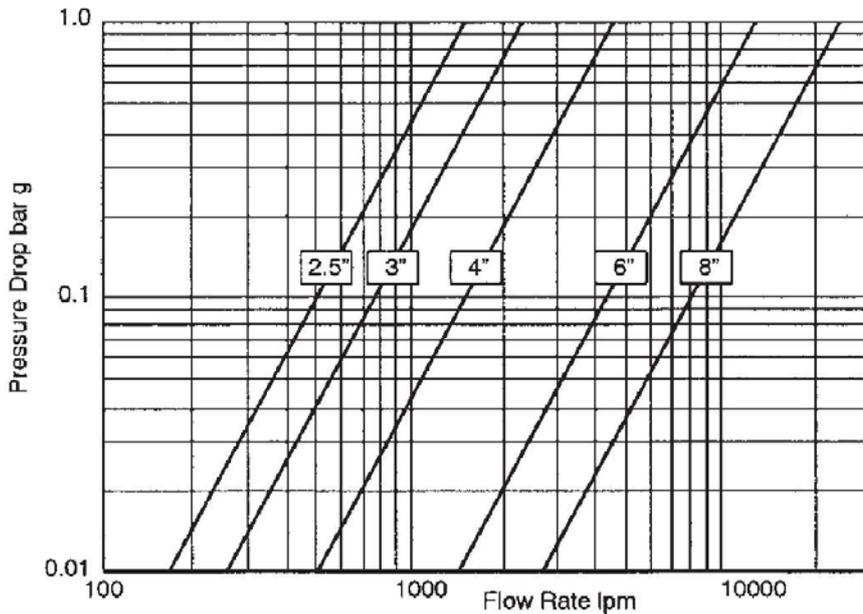
Item	Material
Strainer Body	ASTM A216 WCB
Strainer Cover	ASTM A516 Gr60/A216 WCB
Strainer Basket	Stainless Steel A316 40 mesh to 120 mesh
Cover O ring	Viton A
Vent Plug	ASTM A105N
Drain Plug	ASTM A105N
Strongback	ASTM A216 WCB
Screw Handle	ASTM A193 B7M/St. Steel handle
Quick Release Pin	BS 970 080/M40 Zinc Plated
Linch Pin	Carbon Steel Zinc Plated



Size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Basket Area (sq. cm)	Vent ("NPT)	Drain ("NPT)	Nett Weight (Kg)	Part Number.
3"	365	570	40	342	410	375	652	3/8"	3/4"	47	6003073001
4"	445	695	47	426	505	450	1088	3/8"	1"	70	6003074001
6"	600	990	95	619	734	630	2151	1/2"	1.1/2"	167	6003075001
8"	715	1190	112	787	927	800	3973	1/2"	1.1/2"	310	6003083001

**Approximate Pressure Loss.**

Based on a 80 mesh basket in clean condition with Kerosene (SG=0.800, Viscosity 2.3cSt).



# MULTI PURPOSE FILTER VESSEL

## Introduction.

Many fluid handling systems require dirt or water removal from the process stream. At low flow rates, below approximately 200 Litres/Minute, small mass produced filter vessels are used. Large flow rates, typically above 1000 Litres/Minute, are dealt with by fabricating pressure vessels to order. However, these vessels are very expensive because they are designed and built in small quantities for specific applications. Until now there has been no sensibly priced filter vessel between the two extremes.

A typical application is aircraft refuelling. In this industry dirt and water levels must be kept very low, and filtration is specified by the fuel suppliers using internationally recognised standards. The mass produced vessels are ideal for refuelling small aircraft from kerbside pumps, but are totally inadequate for refuelling larger aircraft, or for road tanker offloading or fueller loading.

We set out to design a low cost filter vessel to fill this gap in the market, and the result is our Horizontal Multi Purpose Filter (HMPF). It is aimed at into aircraft refuelling, road tanker offloading, and fueller loading at flow rates up to 500 Litres/Minute, which is typical for a small to medium sized airport fuel depot.

## General Description.

The HMPF is a horizontal Stainless Steel filter vessel designed to accept 6" outside diameter by 3.1/2" inside diameter cylindrical filter elements. Microfilter or water absorbing monitor elements can be fitted depending on the application. Our vessel has been designed from the outset with cost as one of the primary considerations, but we have incorporated high quality materials and workmanship within the vessel. Further cost reductions were achieved because we build the vessels in batches, to a standard design, and for stock.



## Main Features.

**Higher Flow Rate.** 500 Litres/Minute.

**Low Cost.** Standard vessel manufactured for stock to reduce set up costs.

**High Quality.** Type 304 Stainless Steel shell, design and construction to BS PD:5500 Cat.3.

**Horizontal Design.** Low overall height with easy access for element changing.

**Easy Installation.** Integral support feet ready to bolt down, flanged inlet and outlet for leak free sealing.

**Short Delivery Time.** Available ex stock.

**Versatile.** Can be fitted with an EI qualified microfilter or water absorbing monitor elements.

## How To Order.

Simply quote the variant required :-  
HMPF1-UK12W suitable for use with 1 off 33" long EI qualified water absorbing monitor element, (Facet, Velcon or Faudi).

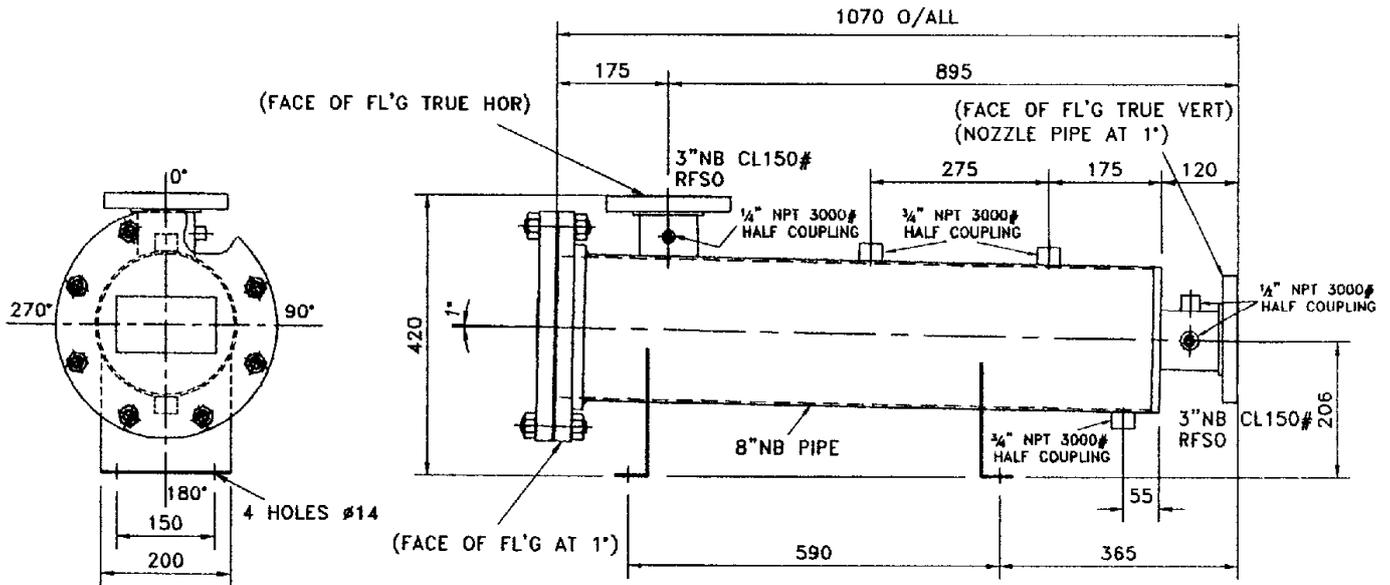
HMPF1-UK12M suitable for use with 1 off 28" long EI qualified microfilter element.

Elements are not included in the basic part number but can be supplied with the vessel.

## Options.

Stainless Steel pressure relief valve, automatic air eliminator, piston type differential pressure gauge, drain line with ball valve and Kamlok dust cap, contaminant test point (specify exact type required).

## General Arrangement Drawing.



## Detailed Specification.

Vessel Type:- Horizontal configuration with integral support feet, bolted end cover.

Working Pressure :-12.0 Bar.

Test Pressure:- 16.3 Bar.

Maximum Working Flow Rate:- 500 Litres/Minute.

Working Temperature:- -15 deg C to +60 degC.

Elements Fitted:- 1 off 6" diameter by 28" long EI qualified microfilter, or 1 off 6" diameter by 33" long EI qualified water absorbing monitor.

Design/Construction Code:- BS PD:5500 Cat. 3.

Material of Construction:- Type 304 Stainless Steel.

Finish:- External surfaces self colour with heat marks removed, internal surfaces bead blasted, all sharp edges removed.

Inlet and Outlet Connections:- Flanged 3" ANSI B16.5 150lb raised face.

Ancillary Connections:- 3/4" NPT threaded air vent, pressure relief and low point drain connections, 1/4" NPT and 1/2" NPT female threaded differential pressure gauge connections, 1/2" NPT female threaded line sample connection.

End Cover Seal:- 7mm diameter Nitrile O ring.

## Shipping Weights and Dimensions.

Nett weight:- Approximately 80 Kg (dry with no elements).

Overall Length:- 110 cm.

Overall Width:- 35 cm.

Overall Height:- 42 cm.

## ARMSTRONG AUTOMATIC AIR VENT VALVE

- ◆ **STAINLESS STEEL CONSTRUCTION**
- ◆ **FULLY SEALED, NO LEAKS**
- ◆ **PROVEN POSITIVE LEVER MECHANISM**
- ◆ **MINIMAL LIQUID CARRY OVER**

### Description.

The Armstrong 11AV automatic air vent valve has been designed to combine the durability and corrosion resistance of Stainless Steel with a reliable, proven operating mechanism to produce a highly reliable vent valve in the medium capacity air venting range.

The design of the 11AV is very simple. It employs a float which actuates a guided free floating valve. There are no pivots to wear or create friction that could interfere with the correct operation of the vent valve, and the lever guide ensures positive closure under all conditions.

As a result of many years of reliable service the Armstrong 11AV has become an industry standard where medium capacity automatic air venting from fluid is required. Aljac Fuelling Components holds the 11AV in stock with a choice of orifice sizes and working pressures, with particular emphasis on supplying the unit to vent air from filter vessels.

However, because the device is of such a universal design it can be used for a wide variety of automatic venting requirements, some of which are shown overleaf.



### How To Order.

Contact Aljac Fuelling Components and quote either of the following parts numbers depending on your requirements :-

Armstrong 11AV, 1/8" orifice size, 12 Bar working pressure. Part Number 050711AV11.

Armstrong 11AV, #38 orifice size, 18 Bar working pressure. Part Number 050711AV18.

If you require any assistance with the selection of air eliminators please do not hesitate to contact our Sales Department for advice.

**Detailed Specification.**

Materials Of Construction:-

Body, type 304L Stainless Steel.

Valve and Seat, 440F heat treated Chrome Steel.

Float and Lever, type 304 Stainless Steel.

Connections:- Inlet 3/4" BSPT female, outlet 1/2" BSPT female.

Maximum Body Working Pressure and

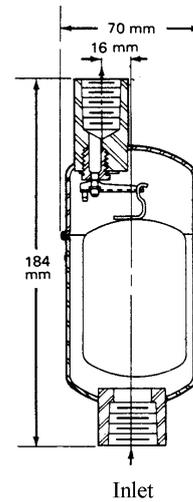
Temperature:- 34 Bar at 38degC. 30 Bar at 260degC.

Maximum Operating Pressure (Hydrocarbons):-

12 Bar for 050711AV11.

18 Bar for 050711AV18.

Nett Weight:- 0.8Kg.



**Venting Capacity.** Litres/Minute of air at standard atmospheric pressure.

Orifice Size	System Pressure (Bar)													
	0.5	1.0	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10.0	12.0	15.0	18.0
1/8" diameter	84	110	148	167	225	280	340	400	460	525	650	800	N/A	N/A
#38 drill	53	70	95	112	150	190	232	270	310	350	435	520	640	780

**Typical Alternative Applications For The Armstrong 11AV Automatic Air Vent Valve.**

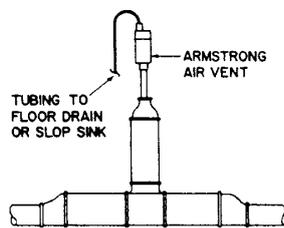


Fig. 2-1. Installation of automatic air vent on piping.

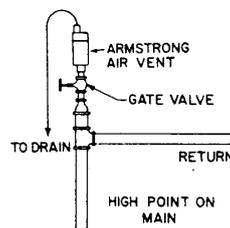


Fig. 2-2. Installation of automatic air vent on high point of system.

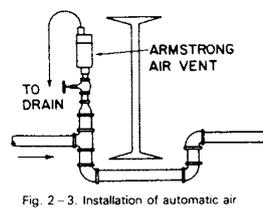


Fig. 2-3. Installation of automatic air vent on loop in piping.

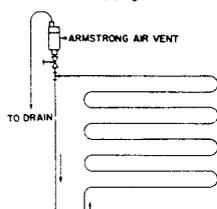


Fig. 2-4. Installation of automatic air vent on panel coil.

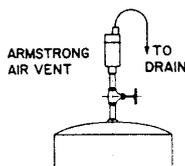


Fig. 2-5. Installation at high point of a storage or collecting tank.

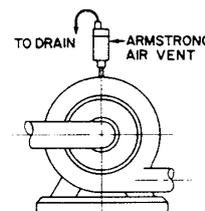


Fig. 2-6. Venting air from a centrifugal pump.

## **GAMMON DIRECT READING DIFFERENTIAL PRESSURE INDICATOR**

- ◆ **READ DIFFERENTIAL PRESSURE DIRECTLY WITHOUT CALCULATION**
- ◆ **ACCURACY 1/2PSI DIFFERENTIAL AT PRESSURES UP TO 300PSI**
- ◆ **UNAFFECTED BY PRESSURE SURGES**
- ◆ **DUAL CALIBRATION, PSI AND BAR**
- ◆ **BUILT IN GAUGE PROTECTION FILTER**
- ◆ **RUGGED CONSTRUCTION, SUITABLE FOR MOBILE AND STATIONARY USEAGE**
- ◆ **STAINLESS STEEL SCALE**
- ◆ **UPPER AND LOWER SECTIONS CAN BE ROTATED TO ALLOW CONNECTIONS EITHER SIDE**



**Standard Gauge**

**Gauge With Test Valve**

### Introduction.

Differential pressure gauges are installed on filter vessels to display the differential pressure across the filter elements. This information is used to determine when the elements are blocked and require changing, but if readings are taken regularly and displayed graphically a trend can be observed and any deviations can then be investigated fully.

### General Description.

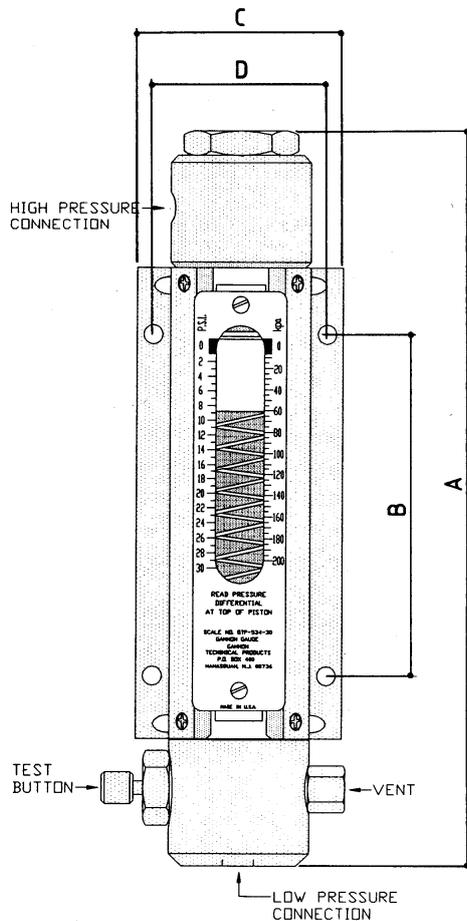
This direct reading gauge uses the simplest method of measurement available. The piston is contained in a close fitting glass tube with a spring beneath it. High pressure from the filter inlet is fed to the top of the tube and low pressure from the filter outlet is fed to the bottom of the tube. The differential pressure is read directly from the position of the top of the piston against the scale.

Because of its' simple design the calibration of this gauge is not affected by pressure surges, unlike a

“Bourdon Tube” gauge. It can easily be checked for free movement and zero error by fitting a simple 3 port valve to the low pressure side of the gauge, which is piped back to a reservoir such as the vehicle tank. The gauge has a 10 micron filter which ensures that dirt from the high pressure connection will not enter the cylinder, and an ultra-violet light shield to prevent lead oxide deposits forming when used with aviation gasoline (Avgas).

The Gammon gauge has therefore become a standard within the aviation refuelling industry where the flow rates and resultant surge pressures demand the highest equipment standards. However, the design has been improved even further with the introduction of a variant which incorporates an integral push button free movement test/thermal relief valve, as shown above. This prevents the build up of potentially damaging thermal pressures, and allows the gauge to meet the free movement test requirements of API1581.

## Overall Dimensions.



Dimension	Standard Gauge 6001044002	Gauge With Free Movement Test Valve 6001044050
A	230mm	273mm
B	124mm	124mm
C	76mm	76mm
D	63mm	63mm
Mounting Hole Diameter	7mm	7mm
High/Low Pressure Connections	1/4" BSPP female	1/4" BSPP female
Vent Connection	None	1/8" NPT female
Nett Weight	0.90 Kg	1.25 Kg.

### How To Order.

Simply quote the appropriate part number.

**Part Number 6001044002.** Standard Gauge, BSP threads, 0-30psi. (Gammon GTP-534-30A).

**Part Number 6001044050.** Gauge with push button free movement test valve, BSPP threads, 0-30psi. (Gammon GTP-534PB-30A).

We can also supply 0-15psi gauges, NPT threaded gauges, all Stainless Steel gauges, and gauges fitted with a built in differential pressure switch.

### Detailed Specification.

Material Of Construction:- Aluminium Alloy/  
Stainless Steel.

Seals:- Viton.

Maximum Working Pressure:- 300psi.

Cylinder Test Pressure:- 1200psi.

Working Temperature:- minus 40 deg C to plus

70 deg C.

Inlet and Outlet Connections:- 1/4" BSPP female.

Vent Connection (Free movement test variant only):- 1/8" NPT female.

### Accessories.

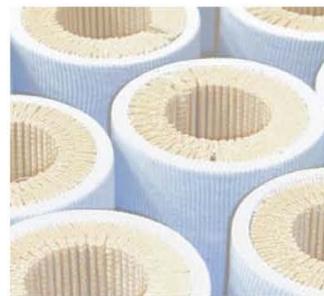
Aljac Fuelling Components can offer a full range of accessories alongside the basic gauge, including free movement test valves, isolation valves, Stainless Steel compression fittings, Stainless Steel sense tubing, and fitting kits including all of the above items.

**Retro fit kits are also now available to convert older standard gauges to the latest free movement test valve type (part number 60025528PB).**

Please discuss your requirements with our Sales Department.



quality guarantees safety





## Who we are?

The FAUDI company was founded in 1938 by Fritz Faudi and has been continuously involved in the filtration and separation of industrial liquids, gases and aviation fuels.

We are an active, world-wide company, well known in the field of aviation fuel filtration.

With 60 years of experience and modern production methods, FAUDI Aviation offers highly efficient and cost effective solutions to a range of filtration and separation problems. To help solve these problems FAUDI Aviation assembled an extremely motivated and highly experienced workforce of engi-

neers, technicians and designers to enable us to carry out projects meeting all customer requirements and standards both national and international.

FAUDI Aviation employs 40 people ready and able to assist with whatever filtration or separation problems or requirements you may have. FAUDI Aviation also benefits from having the largest, most modern civil Aviation Fuel Test Rig of its kind, enabling continued product development and dynamic testing under controlled conditions of filter elements and systems designed to meet our customers needs.

## Our strengths

- Specific know-how (API/IP Approvals, Military Approvals etc.)
- Total quality
- Customer-orientation and readiness for performance
- Competitive prices
- Delivery date loyalty
- Service orientation



## Clean and dry Aviation Fuel for safe flying

The safety of aircraft depends upon the cleanliness of its fuel. Uncontaminated aviation fuel is taken for granted. Blocked fuel lines are virtually unknown and have rarely been blamed for crash.

### What is clean dry fuel?

1. Fuel free from particulate and water contamination
2. Fuel having a clean and bright appearance



### What are most common contaminations found in Jet Fuel?

1. Water (dissolved water, free water)
2. Solids (rust, dirt)
3. Micro-organisms
4. Surfactants

### How does fuel get contaminated?

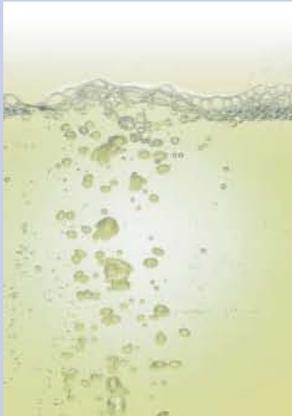
The movement of fuel from the refinery to the aircraft offers a lot of opportunities for various types of contaminants to enter the fuel system. Tankers, barges, rail and pipelines are the most common means of transporting fuel from the refinery to the terminal storage facilities.

From there to airport storage by rail, truck or pipeline. Finally, the aircraft is fuelled by refueller truck from airport storage or by hydrant cart from a hydrant system.

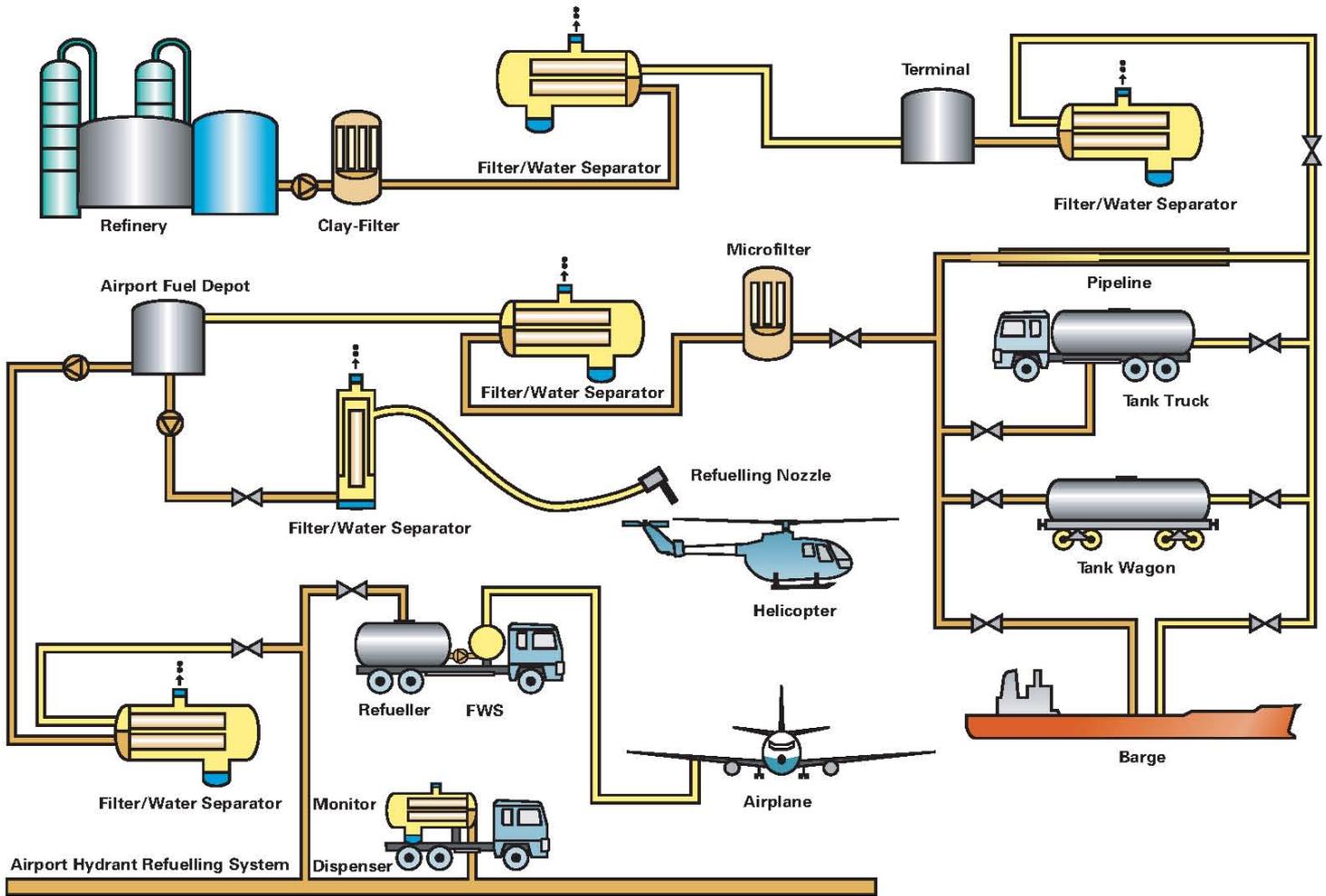
Each time the fuel is transported or stored, contamination may occur even though precautionary measures are taken.

The removal of dirt and water from a jet fuel supply is a continuous battle up to the point where fuel is burnt in the aircraft engine.

FAUDI Aviation high quality filters are a primary defence against dirt and water contamination.



# Filtering danger from Aviation Fuel



## “prevention is better than cure”

As the diagram shows, there are filter water separators, microfilters, clay filters and monitor filters at every transfer point from refinery to aircraft. This filtering process ensures that fuel is free from dirt and undissolved water which could freeze and block the supply system. It also protects parts from dirt, corrosion and the growth of micro-organisms.

# FAUDI Aviation Product range



Coalescer elements for filter water separator, 1st stage in various diameters, lengths and different designs. Separator elements for filter water separators, 2nd stage in different measurements and sizes.

## FAUDI Aviation Filter Water Separators

When high efficiency filtration and separation is required. Filter water separators are fitted with coalescer and separator elements and used on aircraft refuelling vehicles, hydrant dispensers, fixed fuelling installations and tank farms.



Replacement elements for microfilters in various dimensions and for various specifications

## FAUDI Aviation Microfilters

These high efficiency filters are used wherever there is a demand for high quality, economic and reliable filtration. They continuously remove fine particulate such as rust, dirt, sand and pipe scale from aviation fuel systems.



Various replacement elements for clay filters

## FAUDI Aviation Clay Filters

The main function of a clay filters is to remove unwanted surface active agents, colourings and other additives which may be present.



2" and 6" monitor replacement elements in different sizes

## FAUDI Aviation Monitor Filters

They are simple compact units which can be easily installed and serviced. They are developed in particular for mobile fuelling installations. Monitor elements fulfil several functions which provide an important contribution to aircraft safety. They absorb free and emulsified water to levels less than 5 ppm and remove ultrafine solid particulate and in the event of a localised slug of water safely shut down the system flow, ensuring only supplies of clean dry fuel.

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# FAUDI COALESCER ELEMENTS

◆ **TESTED AND APPROVED TO EI1581, 5TH EDITION, CAT. C, TYPE S & S-LW FOR USE ON AVIATION FUELS**

◆ **NOMINAL FILTRATION 1 MICRON**

◆ **CHANGE OUT DIFFERENTIAL PRESSURE 1.1 BAR (15 PSI)**

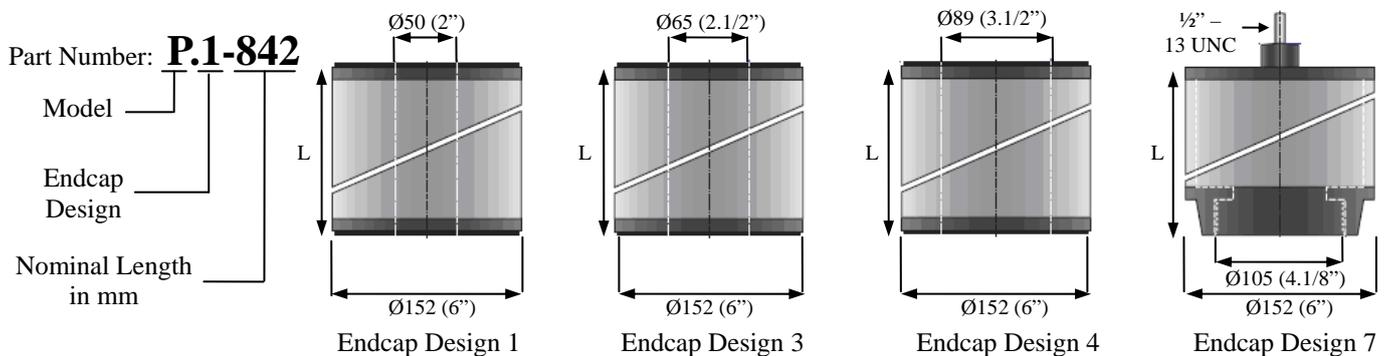


**Introduction.**

Coalescers are the first stage of filter water separators (FWS) which are used in the fuel distribution supply network. The flow direction is from in to out whereby the fuel moves through the pleated paper and any water is attracted to the polar fibres. When enough water has gathered on any one strand the flow of fuel dislodges the water which falls to the FWS sump. Water can be extremely dangerous when found in aviation fuel, coalescers are therefore a crucial part of fuel filtration.

**Description.**

The standard coalescer is constructed from an inner tube made of epoxy coated steel, a pleated paper section for filtration, a support tube, a coalescer wrap and finally a cotton sock. These layers ensure that the coalescer is sturdy and provides the best filtration possible. The end caps are made from glass fibre reinforced polyamide and are stamped according to the EI standards with date of manufacture and ID number. NBR (Buna-N) end seals are fitted.



Flat Seal (Open Ended)				Screw/Thread Based			
Nominal Length L		Endcap Design			Nominal Length L		Endcap Design
mm	inches	1	3	4	mm	inches	7
285	11		P.3-279	P.4-279			
369	14		P.3-362	P.4-362	351	14	P.7-362
473	18		P.3-467	P.4-467			P.7-467
565	22		P.3-559	P.4-559	565	22	P.7-559
733	28		P.3-727	P.4-727	705	27	P.7-727
848	33	P.1-842	P.3-842	P.4-842	834	33	P.7-842
971	38		P.3-965	P.4-965	965	38	P.7-965
1099	43		P.3-1093	P.4-1093	1114	43	P.7-1093
1428	56		P.3-1422	P.4-1422	1418	56	P.7-1422

# FAUDI SEPARATOR ELEMENTS

- ◆ TESTED AND APPROVED TO EI1581 5TH EDITION, CAT. C, TYPE S & S-LW FOR AVIATION FUELS
- ◆ TESTED AND APPROVED TO EI1581 3RD EDITION GROUP II CLASS A, B & C FOR AVIATION FUELS
- ◆ EFFECTIVE WATER BARRIER
- ◆ PERMANENT AND REUSEABLE

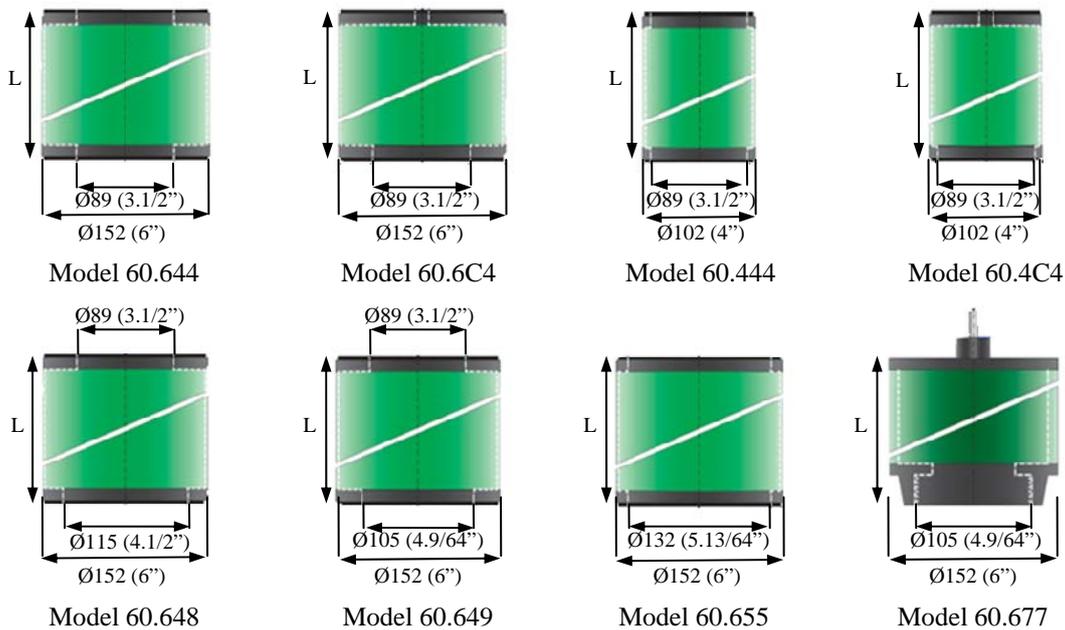


## Introduction.

Separators are the second stage of filter water separators (FWS) which are used in the fuel distribution supply network. The flow direction is from out to in whereby they act as an effective water barrier. The fuel moves through hydrophobic material but the water collects on the surface until the droplets formed are large enough to fall to the sump of the FWS. The design of the covering material also stops the small water particles that may have not been collected at the coalescer stage.

## Description.

Separators are constructed from an epoxy coated steel inner tube which is then covered with a separator screen. This screen can be made from either a Teflon coated Stainless Steel mesh or a synthetic plastic mesh. The end caps are made from glass fibre reinforced polyamide and are stamped according to the EI standards with date of manufacture and ID number. NBR (Buna-N) end seals are fitted.



Part Number: **60.644-565/D**

**Type**  
 60 Aviation Fuels

**Outer Diameter**  
 4 4" (100mm)  
 6 6" (152mm)

**Top End Cap**  
 3 Inner Ø 40.5mm  
 4 Inner Ø 89mm  
 5 Inner Ø 132mm  
 7 Closed with bolt 1/2" UNC  
 C Closed with hole Ø 13mm

**Additions**  
 D Teflon coated Stainless Steel mesh  
 P Synthetic mesh (plastic)

**Length L in mm**

179	235	279	300	362	407	430	526	565
600	626	700	727	756	820	842	900	965
1012	1093	1130	1204	1226	1244	1422		

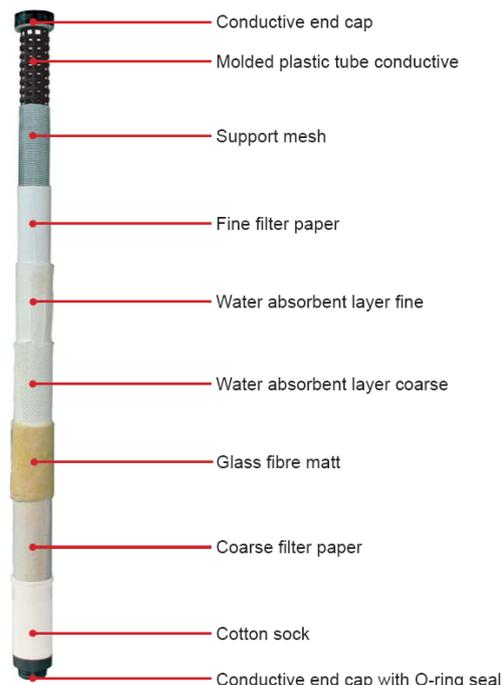
**Bottom End Cap**  
 3 Inner Ø 40.5mm  
 4 Inner Ø 89mm  
 5 Inner Ø 132mm  
 7 Screw thread  
 8 Inner Ø 115mm  
 9 Inner Ø 105mm

# FAUDI 2" MONITOR ELEMENTS

- ◆ **TESTED AND APPROVED TO EI1583 6TH EDITION**
- ◆ **ZERO SAP AND LESS THAN 15PPM OF FREE WATER IN THE FUEL**
- ◆ **CONDUCTIVE END CAPS AND CENTRE TUBE TO REDUCE STATIC CHARGE ACCUMULATION**

**Introduction.**

2" Monitor elements are fitted in filter monitor vessels that are installed on aircraft refuelling tankers, hydrant dispensers and other mobile refuelling equipment. They are specifically designed to act as the final barrier between the aircraft and either the hydrant pipeline or refuelling tanker. If water comes into contact with the monitor elements the SAP will swell and not allow any more fuel or water to pass through. This will cause the differential pressure to rise and terminate the refuelling operation.



**THIS ELEMENT IS NOT SUITABLE FOR USE WITH AVIATION FUELS CONTAINING ANTI-ICING ADDITIVES**

Part Number: **M.2-770/6B**

Model

Overall length in mm

EI 1583, 6th edition

Type	Flow Rate		Nominal Length		Interchangeable with	
	l/min	US GPM	mm	inch	Velcon	Facet
M.2-134/6B	19	5	134	5	CDF-205x	FG-205x
M.2-261/6B	38	10	261	10	CDF-210x	FG-210x
M.2-387/6B	57	15	387	15	CDF-215x	FG-215x
M.2-515/6B	76	20	515	20	CDF-220x	FG-220x
M.2-642/6B	95	25	642	25	CDF-225x	FG-225x
M.2-770/6B	115	30	770	30	CDF-230x	FG-230x

# FAUDI 6" MONITOR ELEMENTS

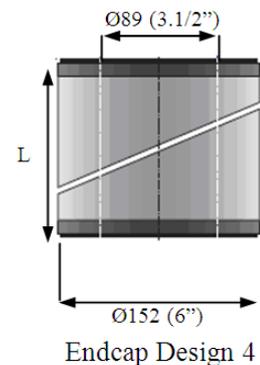
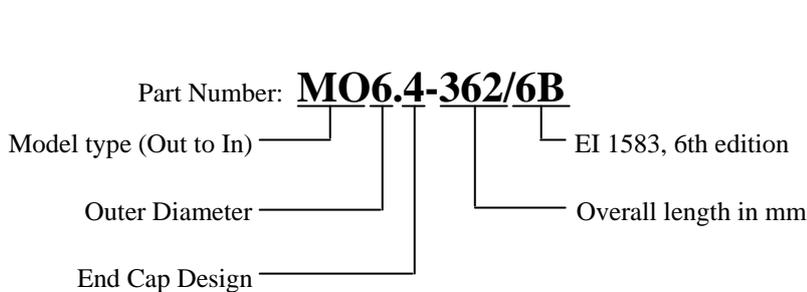
- ◆ TESTED AND APPROVED TO EI1583 6TH EDITION
- ◆ LOW STARTING DIFFERENTIAL PRESSURE
- ◆ INCREASED DIRT HOLDING AND WATER ABSORBING CAPACITY
- ◆ INTERCHANGEABLE WITH ALL EI1583 6TH EDITION APPROVED MONITOR ELEMENTS
- ◆ IMPROVED CONDUCTIVITY

## Introduction.

6" Monitor elements are fitted in filter monitor vessels that are installed on aircraft refuelling tankers, hydrant dispensers and other mobile refuelling equipment. They are specifically designed to act as the final barrier between the aircraft and either the hydrant pipeline or refuelling tanker. If water comes into contact with the monitor elements the SAP will swell and not allow any more fuel or water to pass through. This will cause the differential pressure to rise and terminate the refuelling operation. The 6 inch monitors are preferable over the 2 inch version as they have a larger filtration area. This allows a higher dirt holding and water absorbing capacity which will in turn extend the life of the element.



**THIS ELEMENT IS NOT SUITABLE FOR USE WITH AVIATION FUELS CONTAINING ANTI-ICING ADDITIVES**



	Model	Flow Rate		Nominal Length		Interchangeable with	
		l/min	US GPM	mm	inch	Velcon	Facet
Flat Seal Open Ended	MO6.4-279/6B	160	42	279	11	ACO-61101P	FG-O-611
	MO6.4-362/6B	212	56	362	14	ACO-61401P	FG-O-614
	MO6.4-559/6B	365	96	559	22	ACO-62201P	FG-O-622
	MO6.4-727/6B	464	123	727	28	ACO-62901P	FG-O-628
	MO6.4-842/6B	557	147	842	33	ACO-63301P	FG-O-633
	MO6.4-1093/6B	756	200	1093	44	ACO-64401P	FG-O-644

For different lengths and threaded base end caps please contact our Sales Department.

## FAUDI VFC FILTER WATER SEPARATOR VESSEL

- ◆ **TESTED AND APPROVED TO EI1581 5TH EDITION, CATEGORY C, TYPE S & S-LW AND CATEGORY M, TYPE S**
- ◆ **COMPACT DESIGN FOR INSTALLATION WHERE SPACE IS LIMITED**
- ◆ **TWO SIZES TO COVER FLOW RATES AS LOW AS 71 LITRES/MINUTE**
- ◆ **QUICK RELEASE COVER**



**Introduction.**

Filter Water Separators (FWS) are used to remove water from fuel. The traditional FWS vessel layout uses separate coalescer and separator elements mounted alongside each other, however, this traditional layout is often too large for applications where the flow rate is very low and the available space is limited. For such applications the VFC vessel is perfect! The small housing contains a single combined coalescer/separator element where the separator stage is fitted inside the coalescer. The housing and element are fully qualified to EI1581 5th edition and are available for both commercial aviation duties, and for military aviation applications where high additive levels are present. In addition, versions for use with Diesel fuel are available. The Faudi elements can also replace Facet or Velcon elements in similar competitors vessels. The VFC vessel is fitted with a differential pressure indicator, a drain valve and a manual air vent valve as standard, and the body can be easily separated from the cover, which allows the element to be removed quickly. Please contact us if you require any further details or a quotation.

**Vessel dimensions are identical to the VFM vessel.**

VFC-1/254-10	Micron Rating (μ)	Maximum Flow Rate (l/min)				Maximum Differential Pressure	
		Kerosene		JP4, JP5, JP8	Diesel	Bar	Psi
		Cat C, Type S	Cat C, Type S-LW	Cat. M, Type S			
Coalescer/Separator Type							
CS6-254-1	1	71	89	-	29	1.1	15
MCS6-254-1	1	-	-	52	-	1.1	15

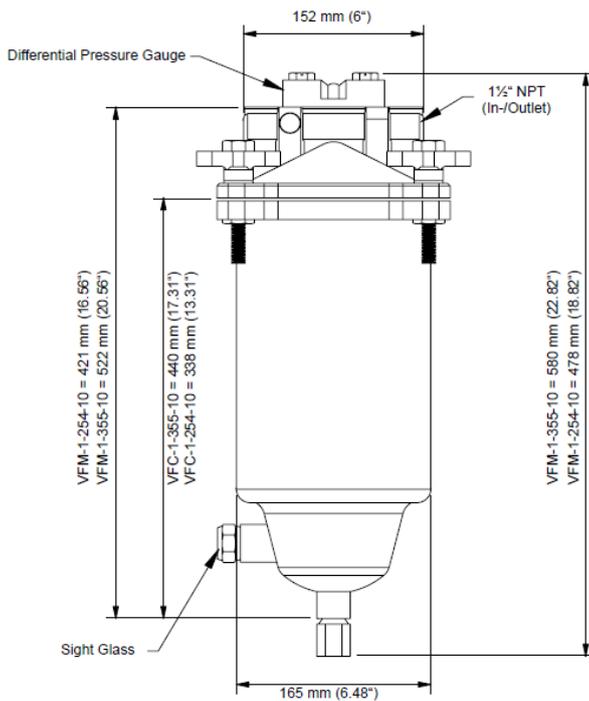
VFC-1/355-10	Micron Rating (μ)	Maximum Flow Rate (l/min)				Maximum Differential Pressure	
		Kerosene		JP4, JP5, JP8	Diesel	Bar	Psi
		Cat C, Type S	Cat C, Type S-LW	Cat. M, Type S			
Coalescer/Separator Type							
CS6-355-1	1	110	136	-	45	1.1	15
MCS6-355-1	1	-	-	74	-	1.1	15

# FAUDI VFM FILTER MONITOR VESSEL

- ◆ TESTED AND APPROVED TO EI1583 6TH EDITION
- ◆ COMPACT DESIGN FOR INSTALLATION WHERE SPACE IS LIMITED
- ◆ TWO SIZES TO COVER FLOW RATES AS LOW AS 149 LITRES/MINUTE
- ◆ QUICK RELEASE COVER



**THIS ELEMENT IS NOT SUITABLE FOR USE WITH AVIATION FUELS CONTAINING ANTI-ICING ADDITIVES**



## Introduction.

Filter Monitors are used as the last defence against water entering the aircraft. When wet fuel passes into the monitor the Super Absorbent Polymer will expand and the element will block, stopping the fuel flow. In the past filter monitors have been too large for applications where the flow rate is very low and the available space is limited. For such applications the VFM vessel is perfect! The small housing contains a single element that slides easily into position and is qualified to EI1583 6th edition for both sizes. The Faudi elements can also replace Facet or Velcon elements in similar competitors vessels. Please contact us if you require any further details or a quotation.

VFM-1/254-10	Micron Rating	Maximum Flow Rate	Maximum Differential Pressure		Equivalent Elements	
			Bar	Psi	Velcon	Facet
MO6.01C1-254-1/6B	1	149	1.5	22	ACO-60901L	FGO-609-2

VFM-1/355-10	Micron Rating	Maximum Flow Rate	Maximum Differential Pressure		Equivalent Elements	
			Bar	Psi	Velcon	Facet
MO6.01C1-355-1/6B	1	221	1.5	22	ACO-61201L	FGO-612-2

# UNDERWING TO OVERWING ADAPTER

- ◆ **COMPACT AND LIGHTWEIGHT**
- ◆ **ROBUST ALUMINIUM ALLOY CONSTRUCTION**
- ◆ **HARD WEARING ALUMINIUM BRONZE FRONT SECTION**
- ◆ **SHOCK RESISTANT EASILY REPLACEABLE HANDLES**
- ◆ **OPTIONAL 1.1/2" OR 2.1/2" BSPP CONNECTION THREAD**



## Introduction.

On occasions it is necessary to temporarily extend the refuelling hose during aircraft pressure refuelling operations, but it is essential that this is accomplished with minimal fuel spillage.

The requirement may be to simply provide extra hose length, or to allow a system which is set up for pressure refuelling to be able to temporarily carry out open line overwing refuelling. To meet this need Avery Hardoll developed the underwing to overwing adapters FCMY266 and FCMY267.

These units consisted of an ISO45 male half with handles fitted, and with either a 1.1/2" or 2.1/2" BSPP male thread. The existing pressure coupling could then be connected to the FCMY266 or FCMY267 which in turn could be fitted with an extension hose either terminating in a further pressure refuelling coupling or an open line overwing trigger nozzle.

Unfortunately these adapters have now been discontinued by Avery Hardoll but Aljac Fuelling Components has produced its own versions of them. In addition, we have available a version with a

2.1/2" BSPP female thread, and we are able to supply dust caps to suit

Our adapters are manufactured in high strength Aluminium Alloy and are furnished with a hard wearing High Tensile Aluminium Bronze ISO45 front section. The handles are robust castings which provide excellent drop resistance and are easily replaceable by removing two screws.

## How To Order.

Simply quote the following part numbers:-

**42FCMY2660.** Adapter, ISO45 by 1.1/2" BSPP male thread, replaces Avery Hardoll FCMY266.

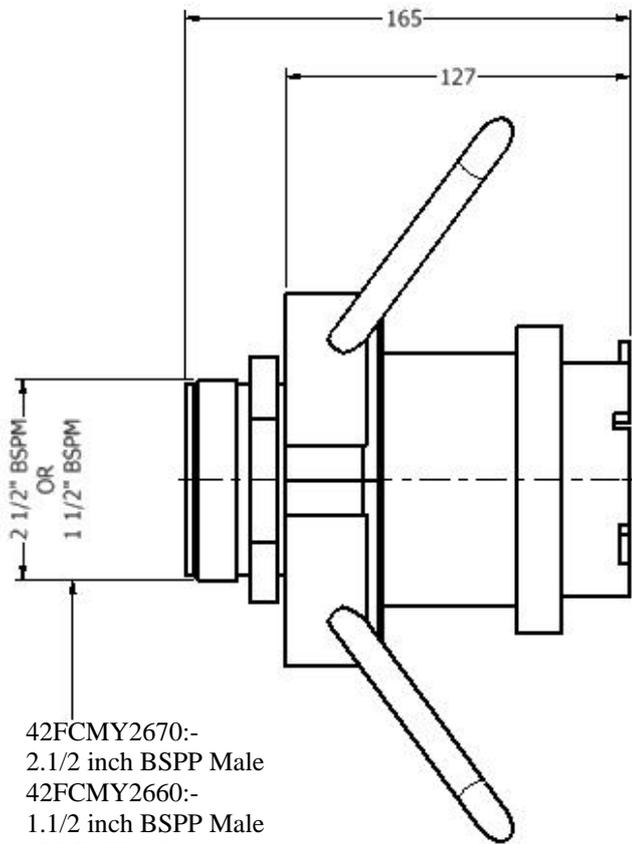
**42FCMY2670.** Adapter, ISO45 by 2.1/2" BSPP male thread, replaces Avery Hardoll FCMY267.

**42FCMY2600.** Adapter, ISO45 by 2.1/2" BSPP female thread.

**42FCMY122M2.** Dust cap, ISO45, Aluminium.

**56DC2.5/30.** Dust cap, ISO45, black Urethane.

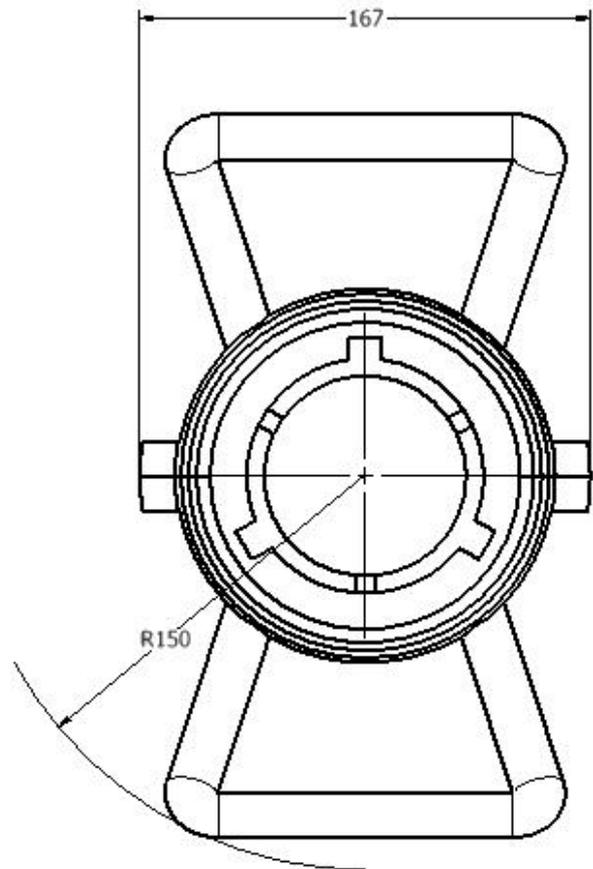
## Overall Dimensions.



42FCMY2670:-  
2.1/2 inch BSPP Male  
42FCMY2660:-  
1.1/2 inch BSPP Male  
42FCMY2600:-  
2.1/2 inch BSPP Female

## Specification.

Nett Weight: 2.5Kg (not including dust cap).  
Overall Dimensions: 165 x 167 x 300mm.  
Maximum Working Pressure: 10.5 Bar.



## Materials Of Construction.

Body: Forged Aluminium Alloy.  
Handles: Cast Aluminium Alloy.  
ISO45 Connector: High tensile Aluminium Bronze.  
Seals: Viton.

## EATON'S CARTER AVIATION REFUELLING EQUIPMENT RANGE

The following Carter ground fuelling products from Eaton are available either in stock or within short delivery times, along with an extensive stock of spare parts to support them.

### Refuelling Nozzles.

We offer into-plane refuelling nozzles in accordance with the SAE AS5877 specification which are compatible with ISO R45 and NATO Stanag 3105 aircraft refuelling connectors. Accepted by the major fuel suppliers and air forces throughout the world, the 60427, 64348, 64200 and 64250 refuelling nozzles are available with stick and ring handle options, vacuum relief valves, bonding cables, and with a range of inlet swivels, quick disconnects, dry breaks and ball valves for strainer inspection. We can supply pressure control valves with various set pressures and both BSPP and NPT female threaded inlets can be provided. Military specification nozzles are also available.



### Hydrant Couplers.

The 64900 and 64910 Hydrant Couplers fully meet the operational and test requirements of the API/EI1584 specification (3rd edition) for 4" hydrant system components, and all are fitted with a collar lock. They are available in a basic 90 degree swivel configuration, fitted with an air set pressure control/deadman valve or fitted with an electrically controlled pressure control/deadman valve which is suitable for use with Digital Pressure Control systems. Connection options are either 4" BSPP or NPT female thread and a trolley option can be provided. For lower flow rate applications a 3 inch pressure control module is available.



### Inline and Pump Bypass Valves.

The 64500 range of 3 inch and 4 inch Inline and Pump Bypass Control Valves utilise a direct operating design concept with a control module being added to the basic valve. This control module provides finer control and eliminates exterior tubing from the valve. Adjustment is simple because no complex servos are involved and the bleed point is located on the control block which allows air to be bled from the valve very easily. The control modules used on equivalent 3 inch and 4 inch valves are identical, and most of the seals in the main body of the 3 and 4 inch valves are identical. This maximises spare parts commonality and minimises the spare parts required for maintenance. Standard end connections are ANSI 150lb flanges but Victaulic adapters are also available. Both the inline and pump bypass variants are available with air reference pressure control or electrical solenoid control, and versions are available which can be used with digital pressure control systems.



### Venturis and Compensators.

The 60559 4 inch Pressure Loss Compensator is uniquely designed with features not available in other compensators or venturis. Simplicity of operation, low pressure loss, wide compensation pressure range and compact design make the 60559 Pressure Loss Compensator ideally suited for all refuelling vehicle applications.

The range of traditional venturis includes 3 inch (64086), 4 inch (64085), 4 inch x3 inch (64088) and 6 inch (64193) sizes. All venturis are available with either Victaulic or TTMA flanged ends and an optional pitot tube.

### Hydrant Pit Valves.

The 60554/61654 Hydrant Pit Valve family meets all the requirements of the API/EI1584 specification (3rd edition) for 4" hydrant system components, including the latest specified breakaway and strength levels.

The lower valve assembly contains an isolation valve which will allow the removal and servicing of the upper valve assembly and the pilot valve while the pit valve is still installed on the hydrant. The upper section (API adapter) is now furnished with a replaceable part that contains the interface with the hydrant coupler. This minimizes replacement parts expense and allows for easy replacement of the wearing surfaces. The 60554 is flanged 4 inch ANSI 150lb and can be fitted with an adapter to 6 inch ANSI 150lb. The 61654 is flanged 6 inch ANSI 150lb as standard. Both valve types can be supplied with a lanyard operated pilot valve, an air operated pilot valve or a dual air/lanyard pilot valve. We also offer a pilotless pit valve, where the major operating part of the pilot valve is incorporated within a quick disconnect actuator located on the hydrant dispenser air hose (Remote Pilot Valve), which reduces maintenance costs. Lanyard, air or dual air/lanyard operated Remote Pilot Valves are available.





### Tank Bottom Loading Systems.

Eaton's Carter bottom loading system is based on a fluid powered concept with no pneumatics or electrics required, and only fluid pressure is used to operate the system when tank loading. Bottom loading control is accomplished automatically, so when the tank liquid level reaches the pre-set level sensor the bottom loading valve closes. Our bottom loading system can operate correctly with any type of refuelling pump, positive displacement or centrifugal, without inadvertently opening.



Bottom Loading Valves are available in 3 inch, 4 inch and 6 inch sizes with flanged or Victaulic inlet connections (depending on the valve size), and can be configured for bottom loading only, or for bottom loading and offloading.



The 64079 Level Sensor has no wearing parts hence it lasts indefinitely, and vibration will have no effect on the sensor, unlike float valves.

### Tank Vent Valves.

The 64078 and 64159 Vent Valves are designed for venting vapour during bottom loading and for allowing inward air flow during refuelling.

The 64078 is air operated and has a double sealed externally vented actuating piston which prevents fuel incursion into the air system, and it can be interlocked with the tank bottom loading valve. The 64159 is connected directly to the tank bottom loading valve using a mechanical link. Both vent valves use a bonded poppet seal which assures leak free operation and minimal maintenance cost. They have a cracking pressure of 3 psi (0.297 Bar) and are fully open at 5 psi (0.345 Bar). The 64078 is completely interchangeable with the Meggitt F646 or F646B (but the interlock port in our Vent Valve is standard at no extra cost). The 64159 is completely interchangeable with the Meggitt F646A.



The 64167 and 64168 Vent Valves are 3 inch diameter inward opening, and they comply with the rollover requirements of the US DOT 406 and 407 specifications. In the past, both mechanical and air operated vent valves were outward opening and were susceptible to uncontrolled opening in the event of a tanker rollover. The 64168 is opened mechanically by a rod connected to the tank bottom loading valve and the 64167 is pneumatically operated. Both vent valves will deal with the effects of fuel flow rates generated by 6 inch pipework systems. Vapour recovery hoods with two outlets are fitted as standard.



### Aviation Adapters and Ground Units.

Eaton's Carter 2½ inch ISO45 aircraft type bayonet refuelling adapters connect to underwing nozzles or 2½ inch hydrant couplers. They are available with 3 inch or 4 inch ANSI 150lb flanges (64040 or 61409), 3 inch or 4 inch TTMA flanges (61528 or 61272), and 2½ inch NPT or BSPP threads (6958). The bayonet adapter is also available as a stand alone module without a housing (61529). These adapters are used for recirculation test or bottom loading points on refuelling vehicles, for connection to low flow rate hydrant systems, or for use as tank farm pumping system test adapters. Convenient bosses are available to mount pressure gauges or sampling ports on many models. Plastic or metal sealing caps are also available.



### API Adapters.

The 61526 4 inch API adapter connects to API 1584 compliant hydrant or bottom loading couplers and has an Aluminium body. It is flanged 4 inch ANSI 150lb flat face, and is designed to be used for bottom loading refuelling vehicles or for use as tank farm pumping system test adapters.



### Unisex Couplings.

Unisex couplings are designed in accordance with A-A-59377 (supersedes MIL-C-53071) and are completely interchangeable with similar 2 inch couplings made by Eaton Aeroquip. Unisex couplings, as the name implies, are designed to connect with each other, allowing for the connection of hose assemblies regardless of the end fitting. Our Unisex couplings incorporate a dust seal between the connected units which protects the adjoining surfaces, and they are easily repairable. The basic Unisex coupling has various accessories and inlet options available to suit system requirements, and are Tan colour as standard, with Green as an option. The 64319 series is un-valved and the 64320 series includes a ball valve.

### CCR and HIFR Nozzles.

The 64048 Pressure Fueling Nozzles and 64017 Closed Circuit Refueling (CCR) Nozzles are designed to connect to vehicles, helicopters and ground units that have receptacles in accordance with U.S. Army drawing C13219E0479 or equivalent. The nozzles provide a “tight fill” capability and limit system pressure. A positive interlock system is included so the nozzle will not open unless connected and closes automatically when disconnected. They are lightweight, rugged, and meet manual handling standards.

The 64048 Pressure Fueling Nozzles are used for Helicopter In-Flight Refuelling (HIFR), and are designed to connect to helicopters and perform hot refuelling operations while hovering above US Naval and other ships. The nozzle will limit the pressure at the helicopter adapter to 45 psi (3.10 Bar) regardless of inlet pressure, and meets the latest US Navy requirements in accordance with the Aircraft Refueling NATAOPS Manual, NAVAIR 00-80T-109 and Helicopter Procedures for Air Capable Ships, NAVAIR 00-80T-122

The 64017 Closed Circuit Refueling (CCR) Nozzles are designed to connect to vehicles, helicopters and ground units. The nozzle will limit the pressure at the helicopter/vehicle adapter to 15 psi (1.03 Bar) regardless of inlet pressure, and meets the latest U.S. Army MIL-PRF-52747F requirements (supersedes MIL-N-53094). Arctic versions are also available.



## Emergency Break Away Couplings.

Emergency Breakaway Couplings are available for use with 2, 2½, 3 and 6 to 7 inch hose sizes. They are manufactured from Stainless Steel and Aluminium Alloy and all have a very low pressure loss.

### **Model 64024**

The 64024 is a 2 inch Unisex Breakaway Coupling designed to provide emergency breakaway when the hose attached to the coupling is subjected to a side load of 200 pounds (90 kg) or more. It is manufactured in accordance with MIL-R-53076.



### **Model 64121/64226**



These couplings will separate when a pre-determined force is applied in an angular direction up to 45° from the axis of the coupling. The separation is a clean and dry break, keeping spillage to a minimum, and they are repairable (with one set of spare shear pins being carried on-board each unit). Seals are suitable for aviation jet fuels.

The 64121 can be used in 1 or 2 inch systems. 2 inch female NPT threaded inlets and outlets available as standard, with the option of BSPP. Model 64226 is the larger version for use in 2½ or 3 inch systems with 2½ inch NPT male or female threaded inlets and outlets available as standard. Many combinations of threads and flanges (including ANSI or special flanges) on the inlet and outlet ends are available to special order.

### **Model 64227**

The 64227 is a 3 inch coupling with 3 inch male or female NPT threaded inlets and outlets available as standard. The unit separates with double dry break and can be reconnected without the use of tools or replacement parts. Many combinations of threads and flanges (including ANSI or special flanges) on the inlet and outlet ends are available to special order. Different seals can be fitted to suit the product used.



### **Model 64191**



The 64191 Emergency Breakaway Fuelling Coupling was developed in conjunction with the Canadian Navy to eliminate fuel spillage at sea. The coupling meets or exceeds all of the requirements of the new NATO replenishment at sea coupling specification and is the replacement for the existing NATO “B” breakable spool. The 64191 is designed to be used with abeam, astern “lay on deck” and with Hudson Reel standard 6 or 7-inch hose. When a pulling force of approximately 1100 pounds (5 kN) is applied, the coupling will automatically disconnect and dry break on both sides with less than 100cc of fuel spillage. The coupling is light in weight and is easily connected or disconnected by one person without the need for special tools.

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## HAMMONDS ADDITIVE INJECTION EQUIPMENT

- INJECTION RATIOS FROM 0.1 TO 4000PPM
- FLOW RATES FROM 25 TO 30,000 L/MIN
- LINE SIZES FROM 1.1/2" TO 20" DIAMETER
- NO EXTERNAL POWER REQUIRED
- FLOW PROPORTIONAL INJECTION
- UP TO 4 DIFFERENT ADDITIVES PER UNIT
- RANGE OF BODY MATERIALS AND SEALS
- SIMPLE TO CALIBRATE



### Introduction.

Additives have to be injected into jet fuel, gasolines and other petroleum products at various stages of the distribution and supply chain. Some are added at the refinery but others become necessary at a later stage, either to compensate for additive depletion, to modify the fuel to a customers specification or because of compatibility issues with other fuel system components.

Hammonds additive injection units have a proven track record with a large number of military and commercial users worldwide so we can offer a unit for the majority of applications. As the units are self-powered, they can be installed in any part of the plant or pipeline system without the need for an air or electrical supply, making them the perfect choice for use in remote locations, hazardous areas and for vehicle or trolley mounting.

### General Description.

The Hammonds injection unit is based on a fluid motor powered by product flow in the pipeline. This fluid motor is mechanically connected to up to four injection pumps either directly or through fixed or variable ratio gearboxes. The mechanical interface between fluid motor and pump ensures that as the product flow increases or decreases the speed of the pump also increases or decreases. Once the correct injection ratio is set it will remain correct even as product flow changes and when flow stops, injection stops.

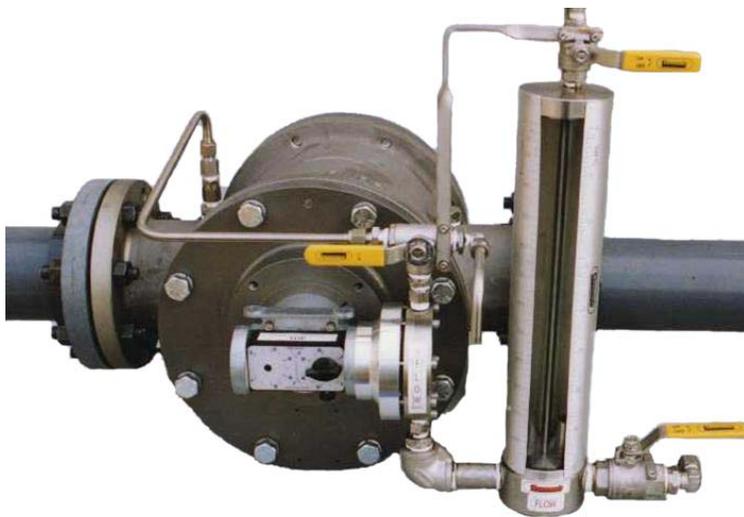
The fluid motor may either be a simple turbine or a unique positive displacement design, and the pumps can be either piston, diaphragm or rotary. Fluid motors can be Aluminium alloy, Carbon or Stainless Steel and are easily installed between flanges in the piping system downstream of the product delivery pump. The additive is normally injected at the fluid motor but may also be injected remotely.

In addition to stand-alone units we can supply fully assembled and tested packages with additive reservoirs, hoses, couplings and flow metering if required.

# TYPICAL APPLICATIONS

## Static Dissipator (Stadis 450) Injection Into Jet Fuel Pipeline.

- Cost effective turbine drive unit for applications with constant flow over long batches. Fabricated housings for high pressure applications.
- Small piston type injection pump to overcome pipeline pressures.
- Piston pump driven through reduction gearbox gives long service life.
- High calibration resolution, typically as low as 0.1 ppm is possible. This allows very accurate adjustment of conductivity figures.
- Simple to install and low cost of ownership.



## Dye Injection At Vehicle Loading Gantry.

- Accurate positive displacement fluid motor giving consistent injection rates even while the flow ramps up and down.
- Reliable diaphragm pump for higher injection ratios.
- System will maintain calibration within 5% of set point over full range of flowrates.
- Integral calibration jar facilitates calibration checks during normal system operation.

## Anti Icing Additive (FSII) into Jet Fuel on a Fueller Vehicle.

- Positive displacement fluid motor allows calibration for underwing and overwing fuelling on a single system.
- The system can be set up with multiple pumps for additional additives, for example a typical Military application may require FSII, CI and SDA on a single system.
- Solenoid valves can be installed to allow operators to select additive only for specific customers.
- The injection point can be inserted downstream of the filter allowing the fluid motor and pump to be installed upstream of the filter if there are space constraints on a vehicle.



## Accessories.

The following accessories can be supplied with Hammonds additive injection units.

**Additive Meter.** Installed in the additive injection line. Measures the additive volume and displays it locally on a mechanical register or digital display. The digital display can also be remote mounted.

**Sight Flow Indicator.** Installed in the additive supply line to the injection pump. Gives a visual indication of additive flow for operator peace of mind.

**Suction Calibration Gauge.** Installed in the additive suction line. Permits accurate calibration checking of additive ratio by comparison of an additive volume with a metered fuel reading.

**Remote Panel.** Installed at the fuelling vehicle operating panel. Gives a visual indication of additive flow and allows remote control of additive injection.

**Additive Reservoirs.** Available in various standard volumes or custom built for specific requirements. Supplied loose for vehicle installation or available with support frames. A full range of level indicators, isolating valves, air dryers and other accessories are available.

## Installation.

Hammonds injectors can be installed in almost any location. There is no restriction on mounting the unit adjacent to valves, bends or similar fittings. However, care must be taken with the orientation of drive shafts and bearings, full guidance will be provided by Aljac Engineers.

The injection unit comes as standard with the injection point into the fluid motor. Where there are space constraints the fluid motor and additive pump can be installed anywhere in the system as long as it is downstream of the pump. The injection point can be installed at a suitable location elsewhere in the system, for FSII this would typically be downstream of the filter.

The additive supply reservoir should be located as close to the injection pump as possible, ensuring additive pipework is of sufficient size to prevent pump cavitation. The injection pump can operate with a slight negative fluid head but this can slow down the priming process and make calibration checks more difficult. We always recommend a positive fluid head where possible.

## How To Order.

There are many options available in both turbine and positive displacement style fluid motors and the wide range of additive pumps available can provide injection ratios from 0.1ppm to 4000ppm at varying operating pressures. In addition, different customer or location requirements will mean that different accessories are required.

For these reasons it is not possible to provide standard solutions, we believe it is important to look at each individual requirement and develop the best solution for each application.

In order to achieve this we need as much information as possible. Please call our office to discuss your requirements or preferably complete the form on the following page and email it to our Sales Department. sales@aljac.com.

# ADDITIVE INJECTION APPLICATION SHEET

Email the form below to sales@aljac.com or complete the interactive form at www.aljac.com

Date :-		Project Title :-		
Your Company Details :-				
Your telephone number/email address :-				
<b><u>Product Information</u></b>				
Product To Be Treated :-			Viscosity :-	
Flow direction	Left to right	Right to left	Vertical up	Vertical down
<b><u>Installation Information</u></b>				
Product line size :-		Connections :-		
Operating Flowrate :-				
Maximum Flowrate :-		Minimum Flowrate :-		
Maximum Line Pressure :-				
Operating Pressure :-				
Operating Temperature :-				
<b><u>Operation Information</u></b>				
Continuous Flow :- Yes / No				
Batch Flow :- Yes / No		Batch Volume :-		
Type of installation :- Fixed / mobile/ batch loading, Please describe:-				
Estimated hours of use per day:-				
<b><u>Additive Information</u></b>				
Additive # 1 :-		Injection Ratio (ppm) :-		
Additive # 2 :-		Injection Ratio (ppm) :-		
Additive # 3 :-		Injection Ratio (ppm) :-		
Additive # 4 :-		Injection Ratio (ppm) :-		
<b><u>Other Information</u></b>				
Hazardous area certification required Y/N		What standard?		
CE Marking required Y/N				
Material certification required Y/N		What standard?		
Special testing requirements, Please list:-				
Any other information which may be of use or any accessories required:-				

## PACKAGED ADDITIVE INJECTION SYSTEMS

### Introduction.

Aljac Fuelling Components manufactures a range of packaged additive injection systems based on Hammonds injection units which have a proven reputation for reliable long term operation with both commercial and military customers. The Hammonds units do not require any external power supply so they are the ideal choice for use in self contained systems such as these. Systems can be manufactured to individual customer specifications or we can offer you a system based around one of our standard designs.

### HC Cart - Additive Injection Trolley.

The HC cart is a stand alone injection system designed to connect into a fuelling system where it is inappropriate to permanently install a system in the pipework.

Typical applications would be anti-icing additive for light aircraft and helicopters at small airfields, biocide injection at aircraft maintenance companies or even testing of new additives where a customer wants to demonstrate cost savings through additive use prior to investing in infrastructure.

The HC cart is a standard chassis which can be fitted with a range of fluid motors and additive pumps, accessories and additive reservoirs. This allows a complete bespoke system to be supplied in a short leadtime and without incurring the expense of a custom designed system.

The system can be fitted with inlet and outlet connections or couplings. Various hose diameters and lengths can be provided to suit individual applications.

### Skid mounted additive injection systems.

Aljac Fuelling Components can install any additive injection system into custom fabricated frames to suit specific customer requirements. Pipespools can also be provided in accordance with existing site pipework specifications and the complete system can be pre-painted and tested.

This service allows a system to be installed between existing flanged connections on customer sites without the need for hot work during installation.

Accessories and controls can be pre-installed onto skid frames including flow meters, control panels and alarms, all of which reduces the time and therefore cost of the site installation work.

All systems can be supplied fully assembled, pressure tested and flow tested. Aljac Fuelling Components operates a 3D design system so all installation drawings can be provided quickly and easily for approval.

Third party inspections can be accommodated and factory acceptance tests can be arranged. All systems can be supplied with relevant local approvals including ATEX, PED and CE marks.



## Towable Additive Injection Systems.

Aljac Fuelling Components can install additive injection units with all necessary accessories onto trailers to meet customer needs.

Any system can be installed on a trailer but typically 3" and 4" systems are most common. These systems are often used for aircraft fuelling operations and for fueller loading at the gantry.

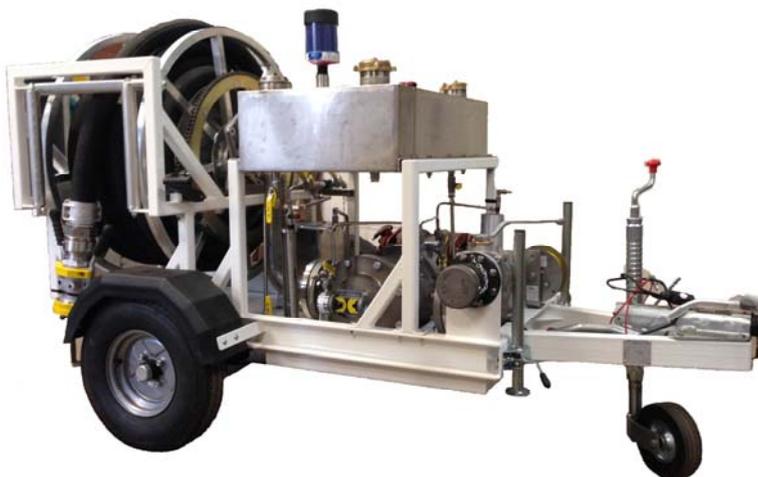
They are a cost effective solution for locations which have existing infrastructure but without additive injection capability.

The most common application is for injection of Fuel System Icing Inhibitor, Corrosion Inhibitor and Static Dissipator to convert commercially available Jet fuel into a Military specification fuel.

Trailers are often supplied to Military organisations who utilise civilian facilities or who need to satisfy NATO requirements for fuelling capability.

### **Available options:**

- 3" system - 50 to 1000 litres per minute
- 4" system - 200 to 2500 litres per minute
- Additive reservoirs in various sizes to suit application
- Hose reels
- Hose stowage brackets for shorter hoses
- Inlet and outlet couplings or nozzles to suit aviation applications
- API inlet and outlet adaptors to suit road loading applications
- Sample points with flush tanks
- Full Euro approved road going trailers
- Slow speed airfield only use trailers



Trailer systems go through a rigorous design process to ensure that the system is fully compatible with the customers operational needs and that they meet any necessary regulations.

Trailer systems are supplied fully assembled and pressure tested as standard and full calibration tests on Aljac's test rig can be completed prior to delivery.

Full training in operation and maintenance can be provided either at customer premises or Aljac's test facility.

## Frame Mounted Injection Systems.

Additive injection systems can be mounted in small, lightweight frames for applications where transportability is of paramount importance.

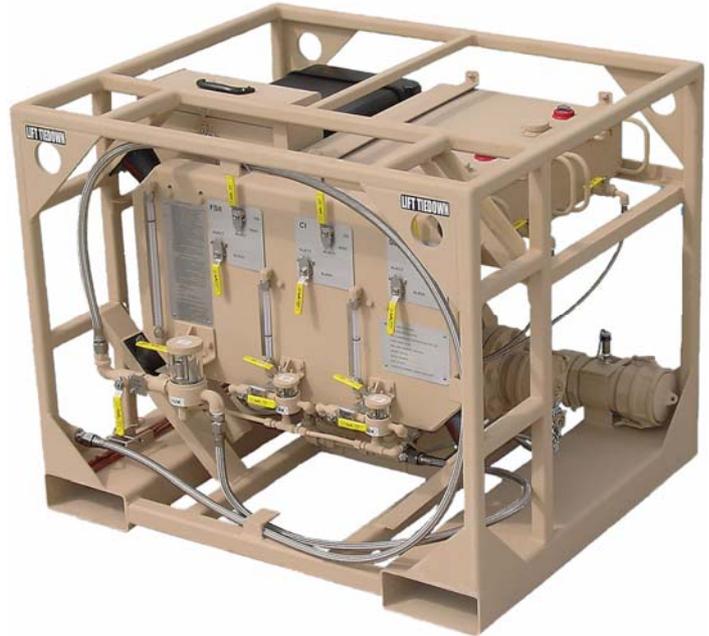
These systems can be supplied as a simple injector with separate accessories to make transportation as easy as possible, or accessories such as small additive reservoirs can be mounted in the frames.

Separate hose assemblies can be supplied in lengths and diameters to suit the application and dry break connectors can be installed on the hoses and injector for ease of use. Hoses can be supplied in their own transport bags.

A full range of connection options are available from standard industrial type dry breaks to aviation standard ISO 45 type connectors. Simple threaded or Kamlok connections can also be provided.

Drop tubes or lances for connection to additive drums can be provided, these can be stowed within the system frame along with additive connection hoses for instances where additive reservoirs are not being used.

Full document packages and training can be provided.



## Additional Services.

Aljac Fuelling Components can provide a comprehensive range of support services to support you during implementation of additive injection activities.



These include:-

- Site Survey.
- Engineering design work.
- Operational recommendation.
- Risk assessments.
- Staff operational and maintenance training.
- Calibration services.
- Maintenance work.

## How To Order

There are many options available both in the additive injection system itself and in the manner in which it is packaged.

For these reasons it is not possible to provide standard solutions, we believe that it is important to look at each individual requirement and develop the best solution for each application.

In order to achieve this we need as much information as possible. Please call our office to discuss your requirements or preferably complete the form on the following page and email it to our Sales Department. [sales@aljac.com](mailto:sales@aljac.com)

# ADDITIVE INJECTION APPLICATION SHEET

Email the form below to sales@aljac.com or complete the interactive form at www.aljac.com

Date :-		Project Title :-		
Your Company Details :-				
Your telephone number/email address :-				
<b><u>Product Information</u></b>				
Product To Be Treated :-			Viscosity :-	
Flow direction	Left to right	Right to left	Vertical up	Vertical down
<b><u>Installation Information</u></b>				
Product line size :-		Connections :-		
Operating Flowrate :-				
Maximum Flowrate :-		Minimum Flowrate :-		
Maximum Line Pressure :-				
Operating Pressure :-				
Operating Temperature :-				
<b><u>Operation Information</u></b>				
Continuous Flow :- Yes / No				
Batch Flow :- Yes / No		Batch Volume :-		
Type of installation :- Fixed / mobile/ batch loading, Please describe:-				
Estimated hours of use per day:-				
<b><u>Additive Information</u></b>				
Additive # 1 :-		Injection Ratio (ppm) :-		
Additive # 2 :-		Injection Ratio (ppm) :-		
Additive # 3 :-		Injection Ratio (ppm) :-		
Additive # 4 :-		Injection Ratio (ppm) :-		
<b><u>Other Information</u></b>				
Hazardous area certification required Y/N		What standard?		
CE Marking required Y/N				
Material certification required Y/N		What standard?		
Special testing requirements, Please list:-				
Any other information which may be of use or any accessories required:-				

## MASTER METER SYSTEMS

### Introduction.

Aljac Fuelling Components Ltd manufacture a range of master meter systems using a positive displacement type bulk meter from Isoil Impianti. Isoil have been manufacturing bulk meters at their plant near Bergamo in Italy since 1970 and their meters have a proven reputation for reliability and accuracy. They are used around the world at aviation fuel and other bulk fuel facilities for custody transfer of hydrocarbon products.

Bulk meters used for custody transfer of products must be calibrated at least every 12 months or after significant maintenance on the meter. This is a time consuming process and expensive if it is sub-contracted to a specialist third party company.

**Owning your own master meter can improve flexibility, reduce down time and save money.**

Systems are available in 3 different sizes providing accurate calibration from 100 litres per minute through to 4000 litres per minute.

Aljac can offer a standard design system or we can custom design to a customers exact requirements. Please contact the Aljac sales team at sales@aljac.com with your requirements.

### Standard Mechanical Master Meter

- 6 point calibration in accordance with EI HM16 requirements for a single fuel grade.
- Veeder Root counter, calibrating mechanism with Vernier unit drum and rate of flow indicator.
- Linearity (accuracy): 0.2% (+/- 0.1%) or better.
- Repeatability: 0.02% or better.



### Standard System

- Isoil Master meter available in 3", 4" or 6" sizes fitted with a mechanical register, a rate of flow indicator and a Vernier unit drum.
- Single or double inlet and outlet connections, fitted with male ISO 45 type aviation couplings.
- Flow control valve and isolating valve.
- Pressure relief valve.
- Pressure gauge 100mm dial.
- Temperature gauge.
- Manual drain valves.
- Bonding reel fitted with 15 metres of bonding cable, and heavy duty bonding clip.
- Full operating and maintenance manual.
- Standard documents include material certificates, meter calibration certificate, warranty certificate, pressure test certificate.



## Available Options

- Inlet and outlet connections: Connections can be changed to industrial dry break couplings, threaded adaptors, API style couplings, Kamlok couplings or simple flange connections to suit your requirements.
- Trolley: The complete system could also be mounted onto a simple skid, a two wheeled towable trailer or a two wheeled towable trailer with full EU approval for use on European roads.
- Hoses: The system can be supplied with interconnecting hoses, these could be aviation fuelling hoses in accordance with ISO1825 (EN1361) and fitted with all necessary clamps and connections. Composite type hoses can also be provided. The hoses can be fitted with a range of interconnecting couplings to your site requirements, these could include aviation type nozzles, industrial type dry break couplings, threaded adaptors, Kamlok couplings or simple flanges. Stowage arrangements can be provided for hoses on the trolley or trailer.
- Display: The mechanical Veeder Root readout can be replaced with a pulse transmitter and a Vega T combined power supply and display unit providing Batch Volume (resettable) in Litres. Flow rate in Litres/Minute and Totaliser (non resettable) in Litres. Alternative units of measurement are programmable.
- Power supply: If the electronic Vega T display is selected it can be supplied with a simple flying lead for connection to the site power supply or a battery can be provided mounted in an ATEX approved box.
- Calibration factors: The standard system is tested at 6 flowrates and calibration factors are provided, additional calibration factors can be provided if required. It is standard to provide calibration factors for a single product, calibration factors for additional products can also be provided.
- Ancillary items: Additional items such as a vacuum relief valve, stainless steel flush tank or a protective storage cover can also be provided.



If you would like further information please contact our Sales Department at [sales@aljac.com](mailto:sales@aljac.com)

# ELAFLEX AIRCRAFT REFUELLING HOSE

## Introduction.

It is essential that the hoses used to refuel aircraft are of the highest quality due to the critical nature of the application. The refuelling hose has a direct impact on fuel quality and operational safety, as well as being a major influence on your operational costs. These hoses are all subject to approval by the major fuel suppliers AFTER they have been tested to the international standards ISO 1825 (EN1361) and EI1529 7th edition. Following laboratory testing the hose then has to undergo an extensive field trial period.

## General Description.

Elaflex HD-C is a soft wall textile reinforced hose, and is approved by the major oil companies and air forces. It is recommended for all aircraft refuelling applications including reel hoses, platform (deck) hoses, hydrant dispenser inlet hoses, and fueller loading hoses. It can be used for Jet Fuel and Aviation Gasoline, and it is suitable for the majority of defuelling operations but not for exceptionally high defuelling rates.

HD-C hose is manufactured by the Continental Rubber Company, who only market their aviation refuelling hose through their branded dealer, Elaflex, and it has been the market leader for many years.

## Why Choose Elaflex HD-C ?

Because it is the market leader. Elaflex hose has been PROVEN in service over many years. There are numerous approved hoses but only one market leader, Continental/Elaflex.

## Consider The Following Advantages:-

- ⇒ **Reliability.** No quality problems such as cover delamination, blistering, or inconsistent wall thickness.
- ⇒ **Long Life.** Excellent abrasion resistance. Elaflex hoses commonly last for 10 years.
- ⇒ **Easy Handling.** Lightweight and flexible, even at low temperatures.



- ⇒ **Kink Resistance.** An important safety consideration, and even if kinking does occur Elaflex hoses resist layer separation.
- ⇒ **Standard Hosetails/Clamps.** Hoses with inch bore sizes or differing wall thickness can cause problems when end fittings are exchanged in the field.
- ⇒ **Recent Manufacture.** Because this hose is the market leader stock turns over very quickly, which is important because there is a maximum permitted storage life of 2 years.
- ⇒ **Short Delivery Time.** Elaflex hose is available from stock.

## The Latest Development. NEON.

As you would expect from the market leader, Elaflex are constantly improving their product, and the latest development concentrates on hose visibility. In low light conditions hoses can present a very serious trip hazard, and are also very vulnerable to damage from airfield vehicles. So Continental have produced the Neon hose, where the bands (or spiral on the HD100-C) are formed from a light emitting material. This makes the hose

much more visible in low light conditions as shown in this picture. We recognise this as an important safety advance so HD-C Neon is now our preferred stock hose.



### The Aljac FCL Service.

Aljac Fuelling Components now distributes all sizes of Elaflex HD-C hose from stock with the exception of 19mm and 32mm, which is available to special order. To complement our hose we also stock a full range of approved bolted or pinned Aluminium hose clamps and bright tin plated Brass hosetails. We will supply hose in coils or cut lengths, and can supply hosetails and clamps either fitted to the hose, or loose. Our staff have been trained to fit hose ends in accordance with ISO 1825 (EN1361) and EI1529 7th edition.

As standard all hoses and hose assemblies are supplied with our Certificate Of Conformity. This certifies that the ends have been correctly fitted (if fitted by AFCL), and permits all of the parts to be traced back to the point and date of manufacture. If required we can pressure test the assembled hose using Jet A1 as the test media, but an additional charge will be made.

The combination of Elaflex and Aljac Fuelling Components provides our customers with the world's leading hose brand supported by the most complete supply and testing service.

### Dimensional Data.

Hose Type	Inside Diameter (mm)	Wall Thickness (mm)	Outside Diameter (mm)	Minimum Reel Diameter (mm)	Allowable Vacuum (Bar)	Approx Weight (Kg/m)	Part Number
HD-19C	19.0	6.0	31.0	200	-0.6	0.60	12BDVC0019
HD-25C	25.0	6.0	37.0	200	-0.5	0.80	12BDVC0025
HD-32C	32.0	6.0	44.0	225	-0.4	1.00	12BDVC0032
HD-38C	38.0	6.5	51.0	270	-0.3	1.20	12BDVC0038
HD-50C	50.0	8.0	66.0	400	-0.2	1.90	12BDVC0050
HD-63C	63.0	8.0	79.0	600	-0.15	2.40	12BDVC0065
HD-75C	75.0	8.0	91.0	600	N/A	2.80	12BDVC0075
HD-100C	100.0	8.0	116.0	N/A	N/A	3.70	12BDVC0100

### Technical Details.

#### Specification.

Aircraft refuelling hose, ISO 1825 (EN1361) type C and EI1529 7th edition, German Military Standard VG95955 Type D, TRbF 131.2, NFPA 407, AS2683.

#### Approvals.

BP, Shell, Esso (Exxon), Mobil, Gulf, Petrofina, Total, major air forces.

#### Construction.

Black NBR (Nitrile) smooth bore seamless fuel resistant tube. Two off synthetic textile reinforcing braids with non metallic ultra conductive intermediate layer. CR Neoprene black semi conductive abrasion, oil and weather resistant cover.

#### Properties.

Electrical resistance less than 1000 Ohms per metre.

Working temperature minus 30 degC to plus 70 degC.

Working pressure 20 Bar.

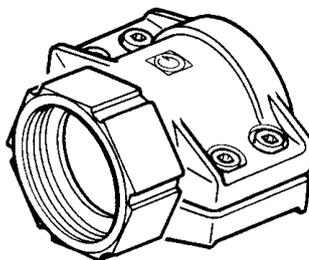
Test Pressure 40 Bar.

Burst pressure greater than 80 Bar.

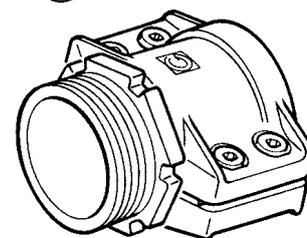
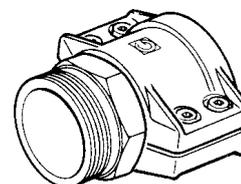
# SAFETY CLAMP HOSE END FITTINGS

## Introduction.

When you need a re-useable, secure method of terminating a high pressure hose, the safety clamp system is an ideal solution. The system has been designed for use with modern braided hoses such as Gossler, Elaflex and Semperit, and is also suitable for use with hoses of a similar construction and dimensions from other manufacturers. The system is now widely used in critical high pressure applications such as the chemical industry and aircraft refuelling.



Female threaded hose end



Male threaded hose end

## General Description.

The safety clamp system consists of a forged hosetail matched to the hose inside diameter, in conjunction with a forged Aluminium two piece bolted clamp. The clamp assembly grips the outside of the hose when the bolts are tightened and this provides the 'pull off' resistance, so it is critical that the clamp is correctly matched to the outside diameter of the hose.

This system has the unique combination of high working pressure in conjunction with assembly and disassembly under field condition using standard tools.

## How To Order.

First of all select the hosetail diameter and thread size from the tables overleaf, and secondly select the correct clamp size for the hose, paying particular attention to the hose outside diameter.

Any item on the list should be available from stock, but if you do not see what you want please contact our Sales Department. Our stock range is constantly expanding, and we can offer other variants to special order, for example Stainless Steel hosetails, NPT threads etc. We also stock a wide range of reducers to step up or down in thread size.

## Fitting Service.

We can fit the hose ends for you if purchased with one of our hoses. Our staff have been trained by the hose manufacturers in accordance with standard ISO 1825 (EN 1361)/ EI 1529, and the assembled hose will be supplied with a Certificate Of Conformity. If the hose ends are not fitted by Aljac Fuelling Components the following Fitting Notes **MUST** be strictly applied.

## Fitting Notes.

Safety clamp hose end fittings must be fitted by correctly trained personnel as specified in standard ISO 1825 (EN 1361)/ EI 1529, and strictly in accordance with the manufacturers recommended procedure (available on request). It is essential that the assembled hose is pressure tested before being put into service.

## Technical Details.

**Specification:-** DIN2817, German Military Standard VG85328.

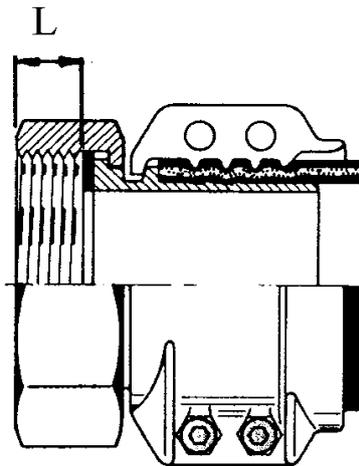
**Maximum Working Pressure:-** 25 Bar.

**Proof Test Pressure:-** 40 Bar.

**Threads:-** BSPP parallel to ISO 228. Male threads fixed, female threads with swivel nut.

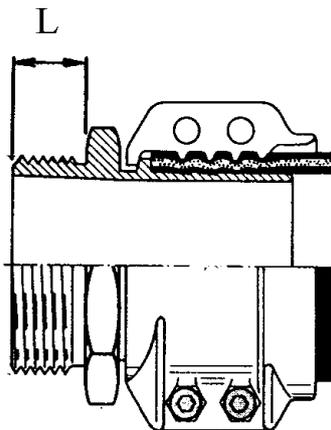
**Materials:-** Clamps forged Aluminium Alloy, hosetails forged Brass (bright tin plated), thread sealing washer Vulkollan (female threaded hosetails only).

**Female Threaded Hosetails With Swivel Nut and Vulkollan Seal.**



Hose Diameter (mm)	Thread Size (BSPP Female)	Thread Length L (mm)	Part Number
19	3/4"	10.0	13AVTF1919
19	1"	10.0	13AVTF2519
25	1"	10.0	13AVTF2525
25	1.1/2"	14.5	13AVTF3825
32	1.1/2"	10.5	13AVTF3832
38	1.1/2"	14.5	13AVTF3838
38	2"	15.5	13AVTF5038
50	2"	16.0	13AVTF5050
50	2.1/2"	14.5	13AVTF6350
63	2.1/2"	14.5	13AVTF6363
63	3"	13.5	13AVTF7563
75	3"	14.0	13AVTF7676
100	4"	21.0	13AVTF0000

**Male Threaded Hosetails.**



Hose Diameter (mm)	Thread Size (BSPP Male)	Thread Length L (mm)	Part Number
19	3/4"	13.0	13AVTM1919
19	1"	14.0	13AVTM2519
25	1"	14.0	13AVTM2525
25	1.1/2"	18.0	13AVTM3825
32	1.1/2"	18.0	13AVTM3832
38	1.1/2"	20.0	13AVTM3838
38	1.1/2"	32.0	13AVTM3938
50	2"	20.0	13AVTM5050
50	2.1/2"	27.0	13AVTM6350
63	2.1/2"	25.0	13AVTM6363
75	3"	25.0	13AVTM7676
100	4"	31.5	13AVTM0000

**Hose Clamps.**

Hose Diameter (mm)	Hose Outside Diameter (mm)		Part Number	Hose Diameter (mm)	Hose Outside Diameter (mm)		Part Number
	Minimum	Maximum			Minimum	Maximum	
19	30	33	13AVC00119	50	63	67	13AVC00150
25	36	39	13AVC00125	63	78	82	13AVC00163
32	43	46	13AVC00132	76	89	93	13AVC00176
38	50	53	13AVC00138	100	114	119	13AVC00111
38	57	60	13AVC00139	100	118	122	13AVC00110

# HOSE PRESSURE TEST PUMP

- **ROBUST IMPACT PROOF CONSTRUCTION**
- **LIGHTWEIGHT AND PORTABLE**
- **FUEL COMPATIBLE**
- **TWO STAGE OPERATION**
- **FULL SET OF ADAPTERS AVAILABLE**



## Introduction.

Flexible hoses are the weak link in any fluid delivery system, and can fail due to deterioration or damage. It is therefore now standard practice to pressure test flexible hoses at their maximum design pressure on a regular basis, normally every 6 months. Regular testing minimises the risk of failure, and this risk is particularly severe when the hoses carry dangerous or flammable liquids at high pressures and flow rates, for example, in aviation refuelling systems.

Aljac Fuelling Components now offers a simple to operate cost effective means of carrying out hose pressure testing, the Ridgid Test Pump.

## Description.

We selected the Ridgid Pump because it is impact resistant and uses a lightweight plastic reservoir, making the unit both highly portable and durable. It has an integral pressure gauge, and a unique pressure retaining feature which locks pressure in the hose without the need to close a separate valve.

The pump operates in two stages, rapid filling is carried out by using the full stroke of the handle, while final pressurising is achieved using a shorter stroke. The unit also incorporates a twin

filter system which prevents contamination of the fluid within the hose, this is particularly important for clean duties such as aviation refuelling hoses. All seals are fully resistant to hydrocarbon fuels as well as water.

We can supply threaded reducers to allow connection to a wide range of hose end fittings, and also a dummy aircraft tank unit to connect directly to the end of an aviation refuelling coupling.

## Specification.

Type:- Ridgid 1450.  
Maximum Pressure:- 50 Bar.  
Piston Volume:- 37.7 Cubic Centimetres.  
Outlet connection:- 1/2" BSPP female.  
Reservoir Capacity:- 13.6 Litres.  
Maximum Working Temperature:- 50 deg. C.  
Overall Dimensions:- 710mm long by 220mm wide by 240mm high.  
Nett Weight:- 6.4 Kg.

## How To Order.

Simply Quote Part Number 0905000010 for the basic pump. If you require adapters please consult our Sales Department stating the thread sizes and if they are male or female.

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## **HYDRANT PIT AND DISPENSER INLET HOSE VISIBILITY**

### **Introduction.**

A number of incidents in recent years have demonstrated the need to increase the visibility of the hydrant pit and dispenser inlet hose, particularly during night time refuelling. Collisions between aircraft servicing vehicles and hydrant pits or inlet hoses are becoming more common, both in darkness and in daylight, in good or poor weather conditions. In the event of the dispenser inlet system sustaining major damage from such a collision, high pressure Jet fuel could be released at a high flow rate, and one day this could have catastrophic effects, including fire and loss of life.

The current level of risk coupled with an increasing number of near misses prompted the Joint Inspection Group (JIG), to issue a Safety Bulletin entitled 'Hydrant Pit Identification', which identified a number of key actions to improve pit and hose visibility. In order to meet this need Aljac Fuelling Components has developed the following pieces of equipment.

### **Intake Hose Covers and Pit Flags.**

Our intake hose covers and pit flags are manufactured from the highest quality reinforced vinyl, they are double thickness and stitched with Nylon thread. The base material is bright orange and fade resistant for good daytime visibility. The ultra high reflective strip material gives excellent night time visibility and is plastic encapsulated to ensure long life.

We have used high quality materials throughout these products because the working conditions are so arduous. As a result our intake hose covers and pit flags last longer and perform better than traditional pennant type flags and chevron type intake hose covers. This is particularly evident when they are exposed to abrasion and degradation from road dirt, vehicle pressure wash systems and severe climatic conditions.

**QUESTION. Are your dispensers as visible as this one at dusk when it is raining ?**



### **Intake Hose Covers.**

Our intake hose covers have the following advantages:-

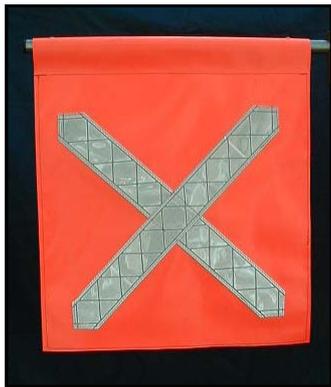
***Secure.*** Fastened using Velcro and press studs.

***Easy Removal.*** Essential for hose inspection, not affected by grit and corrosion.

***Dual Size.*** Twin rows of Velcro and press studs allow the cover to be fitted to a hose or boom, under or over the sense lines. The end of the cover can be cut off if the smaller position is required.



**High Visibility Pit Flag.**

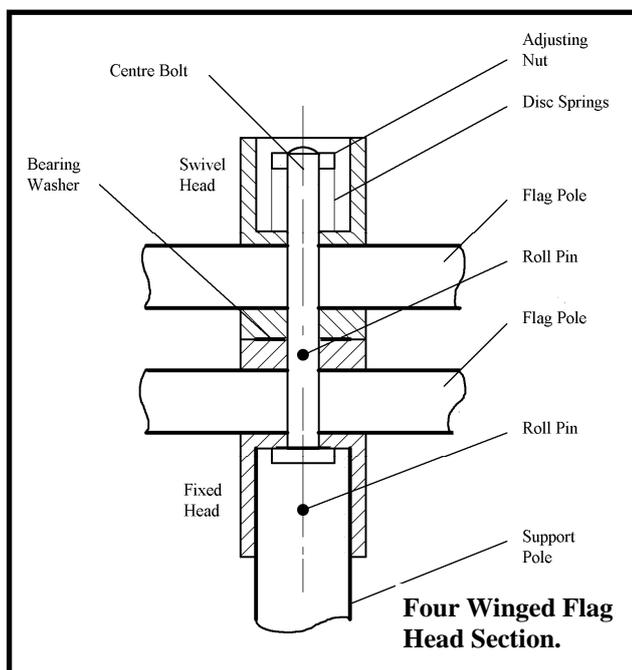
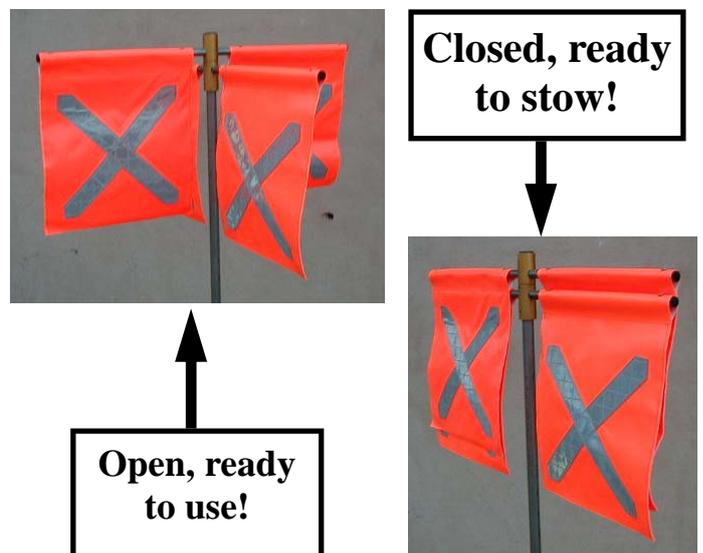


Our pit flags are suitable for use in place of the traditional pennants on conventional flag poles, or in conjunction with our new Four Winged Flag. They have the following advantages over traditional pennants :-

- Modern Design.** Fully in accordance with the principles of the new JIG Safety Bulletin.
- Secure.** Metal eyelets to fasten to the flag pole and prevent tearing, open ended loop to prevent wear on the end of the flag.
- Multi Purpose.** Suitable for use with conventional flag poles and new four winged designs up to 35mm diameter.
- Highly Visible.** Bright orange background and highly reflective crosses, out performs the materials suggested in the JIG Safety Bulletin.
- Longer Lasting.** Top quality materials and workmanship ensure extended service life with minimal deterioration.

**Four Winged Flag.**

One of the key needs identified in the JIG Safety Bulletin was for a Four Winged Flag. It was considered sufficiently important to be classified as a minimum requirement for hydrant pit identification. It has to be highly visible from any direction in the day or night, and set at a height which allows it to be seen from the cab of airport ground support vehicles. We fully support the concept of the Four Winged Flag, but there have been a number of practical problems such as the weight, the short service life (in some cases as little as 2 weeks), and difficult stowage on the vehicle. By consulting the refuelling companies at the major UK airports we have overcome these problems to make our Four Winged Flag operationally acceptable. It uses a unique swivel head design as shown below.



Our Four Winged Flag has the following advantages :-

- Simple design.** No catches or complicated mechanisms to fail.
- Adjustable.** Our swivel head can be adjusted to set the operating torque to the level which suits you, and to compensate for wear.
- Lightweight.** We have simplified the head design and used thin wall Stainless Steel tube for the poles to reduce the weight.
- Easy Stowage.** Our design folds flat to a Tee shape for stowage in a tube type holder or U bracket.
- Maximum Flag Life.** The flags hang vertically without folding when the unit is stowed.
- Durable.** There are no protruding parts to suffer impact damage.
- No Sharp Edges.** Tube ends are fitted with moulded plastic plugs to the reduce risk of operator injury.

### Detailed Specifications.

#### Intake Hose Covers.

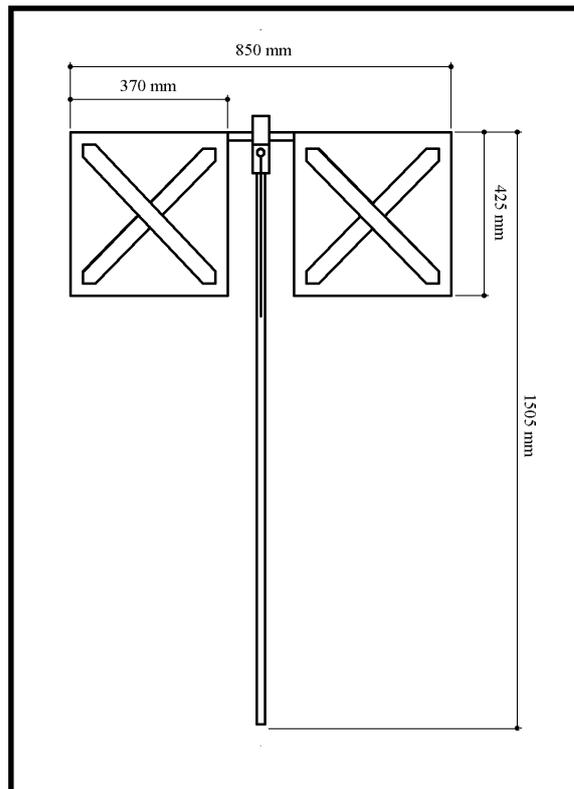
Base Material. Double thickness fabric reinforced vinyl, bright orange, stitched with Nylon thread.  
Reflective Material. Plastic encapsulated, 50mm wide, 3 strips.  
Overall Sizes. 330mm wide, 550mm long (fully opened out).  
Securing Method. 3 press studs with 50mm wide Velcro strips.  
Net Weight. 300 Grams.

#### Four Winged Flag.

Materials.  
Head Aluminium Alloy, anodized Gold.  
Flag Poles type 304 Stainless Steel 3/4" diameter by 16 SWG welded tube.  
Support Pole type 304 Stainless Steel 1" diameter by 16 SWG welded tube.  
Bearing Washer Nylon, moulded PVC tube end plugs, Stainless Steel Centre Bolt.  
Overall Sizes. As drawing.  
Net Weight. Approximately 4 Kg (flags fitted).  
Flags Secured by 4mm diameter Aluminium pop rivets, 2 off per flag.  
Torque Adjustment. M10 Nylok nut on Stainless Steel spring washers.  
Shipped with Support Pole/Roll Pin loose to reduce shipping volume.

#### Pit Flags.

Base Material. Double thickness fabric reinforced vinyl, bright orange, stitched with Nylon thread.  
Reflective Material. Plastic encapsulated, 50mm wide, one cross on each side.  
Overall Sizes. 370mm wide, 430mm long (when not fitted to flagpole).  
Securing Method. 2 off 5mm diameter metal eyelets.  
Flagpole Diameter. 35mm maximum.  
Net Weight. 250 Grams.



### How To Order.

Contact Aljac Fuelling Components and ask for the appropriate part numbers.

Description.	Part Number
Intake Hose Cover	5100000250
High Visibility Pit Flag	5100000300
Four Winged Flag Head , no Flags, no Support Pole (order separately)	5200000200
Four Winged Flag Support Pole	5200000300
Hose Clamp Flag Holder	5200000100

### Accessories.

We are constantly developing accessories to accompany this range of products. Please contact our Sales Department for the full range or if you need any advice on the use or application of these products.

We can supply Hose Clamp Flag Holders, modification kits to allow a Mounting Bracket to be attached to Meggitt Avery Hardoll and Eaton Carter intake couplers, and we can advise on stowage brackets to allow the Four Winged Flag to be carried on your dispensers.

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## HOSE SLEEVES AND HOSE PROTECTION



Hose visibility is an essential element of a safe aviation refuelling operation. Dispenser intake hoses must be highly visible to minimise the risk of damage from surrounding vehicles, and high visibility of refuelling hoses can be crucial in preventing 'drive aways' with the couplings connected to the aircraft.

Our hose sleeves are manufactured from the highest quality reinforced vinyl, they are double thickness and stitched with Nylon thread. The base material is bright orange and fade resistant for good daytime visibility. The ultra high reflective strip material gives excellent night time visibility and is plastic encapsulated to ensure long life. We have used high quality materials throughout these products because the working conditions are so arduous. This is particularly evident when they are exposed to abrasion and degradation from road dirt, vehicle pressure wash systems and severe climatic conditions.

**Double Security:** Fastened using Velcro and press studs.

**Easy Removal:** Essential for hose inspection.

### **Reflective sleeve for 100 mm Intake hose.**

Double Velcro and press studs allow mounting above or below the fuel sense and air line. The excess material can be cut off when the smaller diameter is required.

Orange with 3 reflective strips,

Width: 330 mm

**For 4 inch intake hose**

Part no. 5100000250



### **Reflective sleeve for 63 mm hose.**

Velcro and press stud fastener. Orange with 1 reflective strip,

Width: 130 mm

**For 2.1/2 inch hose**

Part no. 5100000400



### **Reflective sleeve for 50 mm hose.**

Velcro and press stud fastener. Orange with 1 reflective strip,

Width: 130 mm

**For 2 inch hose**

Part no. 5100000350



### Hose Protection.

Hose wear from abrasion is the most common cause of aviation refuelling hoses being replaced before the expected 10 year operational life. In addition, hose visibility is a critical element in a safe aircraft refuelling operation. So we have a solution which combines the answers to both potential problems with our hose protection bead kits. We offer two variants, the bolted version and the wrap around version. The variant which best suits the application is determined by the hose diameter, stowage method, and degree of protection required. Both are made from highly durable high visibility vinyl and are available from stock.



#### **Hose protection bead,**

With bolts, yellow.

1.1/2 inch Part no. 15HB001038

2 inch Part no. 15HB001050

2.1/2 inch Part no. 15HB001063



#### **Hose protection bead kit,** **Orange.**

1.1/2 inch Part no. 15HB000038

2 inch Part no. 15HB000050

2.1/2 inch Part no. 15HB000063

4 inch Part no. 15HB000100

### Grade Identification Sleeves.

It has been accepted for some years that improvements needed to be made in order to reduce the number of incidents involving refuelling light aircraft with the incorrect fuel grade. Selective filler points/nozzle spouts and wing marking stickers have been introduced along with a number other measures, but as an additional reminder for the operator we have developed our Grade Identification Sleeves. They are screen printed with the relevant fuel grade identification on coloured vinyl and are secured onto the refuelling hose immediately upstream of the trigger nozzle.



#### **Hose cover,**

1.1/2 inch JET A-1

Part no. 5100000010



#### **Hose cover,**

1 inch AVGAS 100LL

Part no. 5100000005

## THE CROCODILE HYDRANT PIT COUPLER LIFTER



The new “Crocodile” is an input coupler lifting device designed to effortlessly raise and lower the input coupler into position onto the hydrant pit valve.

Bending and lifting input couplers can be a hazardous exercise, with the inherent risk of strain being transferred to the operator’s back. These health and safety issues are now fully addressed by the Crocodile.

The Crocodile addresses the problem with an air operated lifting mechanism, providing support to the intake coupler and hose. Designed in conjunction with into-plane service providers this innovative backsaving device has been affectionately named the Crocodile, reflecting its shape and design. Like a crocodile, it is tough and built for longevity.

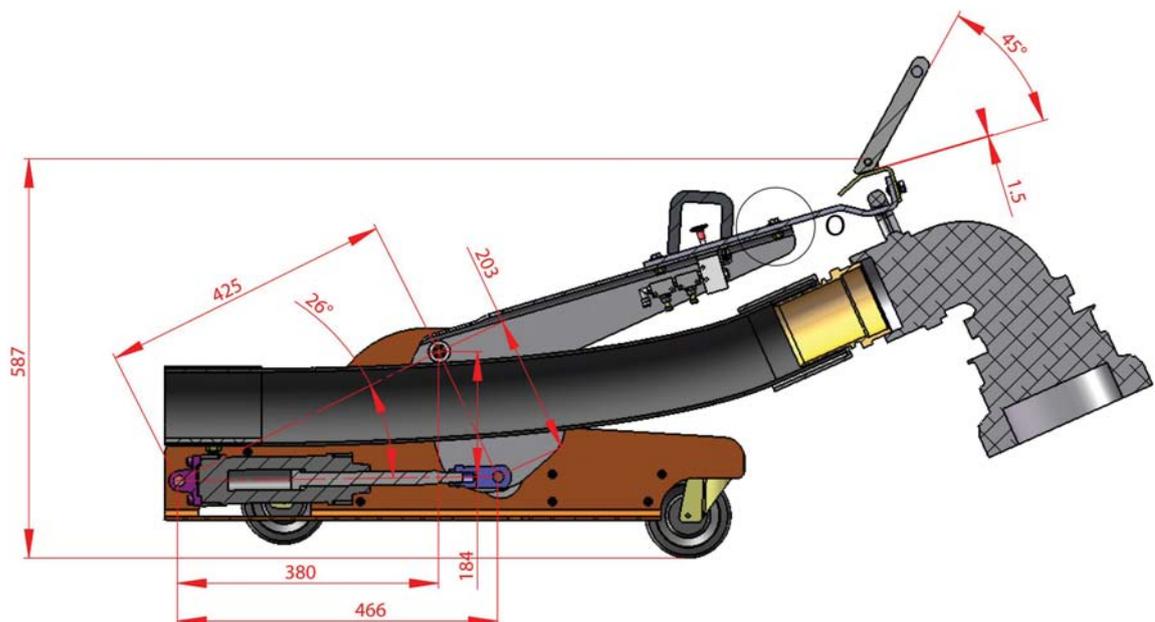
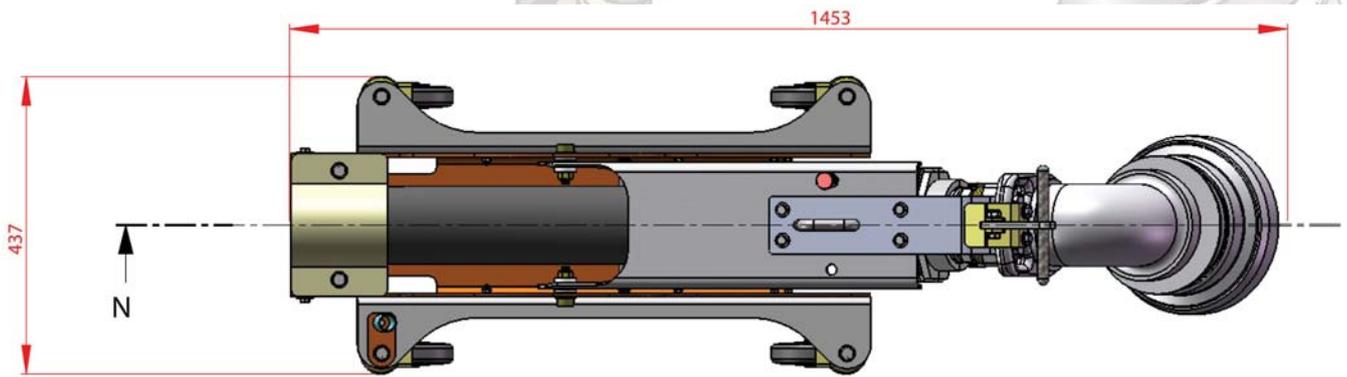
It does not compromise the 4,000lb-5,000lb breakaway force requirement of API 1584, 3rd edition.

**Part Number: 5070000100**



## The Crocodile comes with the following features:

- ◆ Four wheels for stability and easier maneuverability.
- ◆ Improved weight reduction for easier lifting by personnel. Increases operator comfort and safety, and so minimizes Health and Safety issues.
- ◆ Meets the required free length of hydrant hose attached to the coupler, complying with API 1584 3rd edition coupler requirements.
- ◆ Improves lowering into the pit and maintains the coupler level when lowering onto the hydrant pit valve.
- ◆ Integral hydrant pit flag holder.
- ◆ Push/pull button operating control.



## ELECTRIC DEADMAN HANDSWITCH

- ◆ **COMPACT AND LIGHTWEIGHT**
- ◆ **ROBUST HEAVY DUTY DESIGN**
- ◆ **TOTALLY SEALED**
- ◆ **EFFECTIVE CABLE STRAIN RELIEF**



### Introduction.

Intrinsically safe electric control of a pneumatically operated valve is now the most widely used method of controlling aircraft refuelling from either bowzers, hydrant dispensers, or fixed systems. This method is also increasingly used to control tanker loading and offloading operations. Simply holding the handswitch allows the operation to commence and continue, while releasing the handswitch invokes the 'deadman' principle and will close down the operation, terminating flow. Because the handswitch is the point of control, it must be reliable, and yet sufficiently robust to survive the most arduous operating conditions. A failure could have catastrophic consequences.

### The Handswitch.

Aljac Fuelling Components offers you a lightweight Polypropylene handswitch which is comfortable for the operator to hold for long periods, and yet robust enough to survive in the hostile operating environment.

The handswitch is based on a magnetic reed switch housed in a hermetically sealed glass phial which in turn is encapsulated inside an easily removeable element. The body of the handswitch is fully sealed against water, fuel, dirt or dust ingress to IP67 standard and has an integral cable strain relief feature WHICH WORKS. The cable

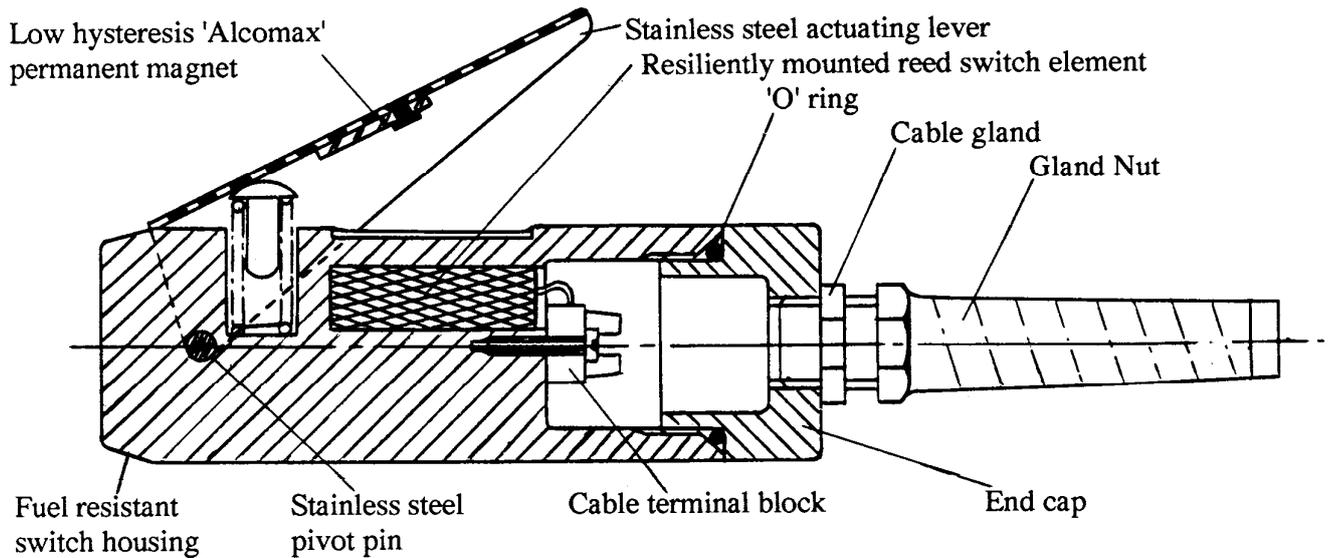
will not pull out of the switch if it is fitted correctly, as shown overleaf. The reed switch is operated by a positively retained permanent magnet fitted to a Stainless Steel trigger, which is secured to the main switch body by a Stainless Steel pin.

Cable termination is inside the body and uses a two way screwed terminal block, and we can supply the handswitch either with or without cable fitted. The free end of the cable can be terminated in your own junction box or with a weatherproof Niphan 2 pin Plug and Socket. A full range of operating spares is also available from stock.

### How To Order.

Simply Quote the following part numbers.  
Electric Deadman Handswitch, no cable. Part Number 0100400010.  
Coiled Suzie Cable (approx. 5m metres fully extended). Part Number 0100400103.  
Coiled Suzie Cable (approx. 14m metres fully extended). Part Number 0100400100.  
Coiled Suzie Cable (approx. 22m metres fully extended). Part Number 0100400102.  
Niphan Plug with Strain Relief Gland. Part Number 0100400311.  
Mating Niphan 2 Pin Flanged Socket. Part Number 0100400320.

### Sectional Drawing.

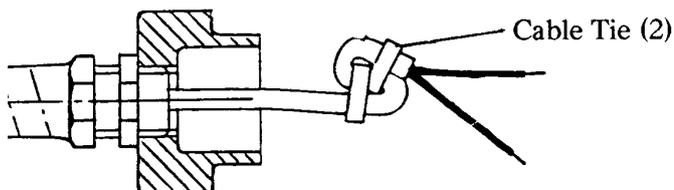


### Cable Installation.

1. Unscrew the End Cap and pass the cable through the Gland/End Cap, do not tighten the Gland Nut yet.
2. Cut the cable sheath back by approximately 40 mm and bare the ends for connection to the Terminal Block. Use 2 off cable ties to double knot the cable as shown below.
3. Carefully unscrew the Terminal Block and withdraw the Reed Switch element from the Housing.
4. Connect the cable to the Terminal Block and replace the Reed Switch Element and Terminal Block into the Housing. Tighten the Fixing Screw.
5. Make sure the Gland Nut is fully loose. While preventing the cable rotating relative to the Housing, tighten the End Cap sufficient to prevent it being unscrewed by hand.
6. Tighten the Gland Nut and check the Deadman Handswitch for correct operation.

**Note. For dismantling always loosen the Gland Nut FULLY before unscrewing the End Cap so that the cable does not rotate relative to the Housing.**

### Cable Strain Relief Method.



### Detailed Specification.

Nett Weight: 250g (Deadman Handswitch only).  
Contacts: Normally open, 15A rated.  
Switching Current: 0.5A max (AC or DC).  
Switching Voltage: 200V DC or 125V AC max.  
Switching element hermetically sealed and potted, so no approvals are required for use as an intrinsically safe switch .  
Cable Gland: To suit cable 5-10 mm diameter.

**WARNING. This Switch is for use in intrinsically safe current limited circuits only. If it is installed or tested in higher Voltage or Current applications the Reed Switch contacts will be welded together and warranty claims will not be accepted.**

# DEADMAN CABLES AND SPARE PARTS

## Deadman Cable Specification.

Twin 0.75 sq mm 24 x 0.2 stranded copper conductors, black/red PVC covered, with internal fillers and identifiers, Orange PU covered to 6mm outside diameter. Working temperature range minus 20 degC to plus 70degC.

## Deadman Suzie Spiral Cable, 5 metres.

1.1m closed length with 200mm straight tails, approximately 5 metres fully extended, 23mm coil outside diameter.

Part no. 0100400103

## Deadman Suzie Spiral Cable, 14 metres.

2.5m closed length with 200mm straight tails, approximately 14 metres fully extended, 23mm coil outside diameter.

Part no. 0100400100

## Deadman Suzie Spiral Cable, 22 metres.

4.7m closed length with 200mm straight tails, approximately 22 metres fully extended, 23mm coil outside diameter.

Part no. 0100400102

**NOTE. THIS CABLE HAS A HEAT SHRINK SLEEVE FITTED BUT THE CABLE IS CONTINUOUS, THERE IS NO JOIN.**

## Deadman Cable, Straight (Not Coiled).

Part no. 0100400101. Sold per metre length.

## Niphan Plugs and Sockets.

Industrial metal cased plugs and sockets, bright Zinc plated Brass, weatherproof to IP66.

**Niphan plug + strain relief gland (highly recommended).** Part no. 0100400311

**Niphan 2 pin flanged socket.** Part no. 0100400320



## Electric Deadman Handswitch Spare Parts .



Magnet set,  
Part no. 0100400012



Spring,  
Part no. 0100400015



Plastic button,  
Part no. 0100400014



Reed Switch,  
Part no. 0100400011

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## **DELTA WIRELESS DEADMAN SYSTEM**

- ◆ **FREE MOVEMENT AROUND THE REFUELLING AREA, NO SUZIE CABLES**
- ◆ **ATEX APPROVED TRANSMITTER**
- ◆ **REMOTE EMERGENCY STOP FEATURE**
- ◆ **ROBUST ERGONOMIC HANDSWITCH**
- ◆ **UNAFFECTED BY STRAY RADIO SIGNALS**
- ◆ **OPTIONAL DEADMAN TIMER**



### **Introduction.**

For many years it has been standard practice to employ a deadman system for aircraft refuelling, which automatically stops the flow of fuel when the operator releases a hand held switch. The switch is normally electric and is fed through a current limiting device via an extendable coiled suzie cable.

However, there are shortcomings with this system. The suzie cables are not always long enough for stand off refuelling, and therefore tend to be over stretched. This results in premature breakdown of the core which normally causes the system to fail closed, but there have been incidents where the result has been a short circuit, rendering the deadman system permanently operational, even when the switch is released. Also, it is now becoming more common for the refuelling operator to operate the aircraft fuel control panel whilst refuelling. This can require even longer suzie cables for stand off refuelling, or the use of a second suzie cable/switch mounted on the vehicle elevating platform when underwing refuelling wide bodied aircraft.

There is now a system available which helps overcome these problems, the Delta Wireless Deadman System.

### **Description.**

The Delta Wireless system uses a transmitter (the handswitch), to send a coded digital signal to a receiver unit inside the vehicle cab, which in turn controls the vehicle deadman system.

The signal is digital and transmits on an intermittent timeshare basis, and the receiver and handswitch are coded together. This combination of features allows the unit to operate without interference from stray radio signals or from adjacent wireless deadman systems.

The handswitch is ergonomically designed and is extremely robust and light in weight. It is fitted with a rechargeable battery with capacity for about 12 hours continuous operation, and incorporates a transmission indicator light and a low battery warning light, which tells the operator when he has 15 minutes battery life remaining. When the refuelling is finished the handswitch is stowed onto the receiver unit, at which point the battery is automatically recharged, initially at a high rate and thereafter on trickle charge. The charging contacts are current limited so it is not possible to generate a spark or shock from them, and they are also protected against short circuit. The action of stowing the handswitch automatically sends a signal to the vehicle brake interlock system. It is therefore impossible to drive the vehicle away unless the handswitch is stowed so it cannot be inadvertently left at the aircraft.

A deadman timer feature is included as standard, with separate warning light and sounder outputs, although the timer can be disabled if not required. The receiver unit is fitted with an Emergency Stop button, which is also used for coding the handswitch to the receiver and to initiate a boost charging cycle should it be necessary.

However, the Delta system has some additional features which have not been available up until now. It has a remote Emergency Stop button which is accessed by lifting the handswitch trigger. By pressing this button the operator can close down the complete vehicle deadman system, and also remotely stop the engine. This is a significant safety improvement because in the event of serious vehicle problem developing, for example an engine fire, the operator would not want to return to the vehicle to press the local emergency engine stop button. With the Delta system he does not need to.

There is also an additional button (extra feature) on the handswitch, which can be used for a number of purposes, such as remote engine speed control or

remote hose reel rewind.

The Delta Wireless system gives the operator much more freedom to move around the refuelling area, and the range can be adjusted and set so that the system closes down if he goes too far away, which complies with the JIG Guidelines.

The transmitter also has full ATEX approval for use in hazardous areas, which is not available on many of the existing wired systems.

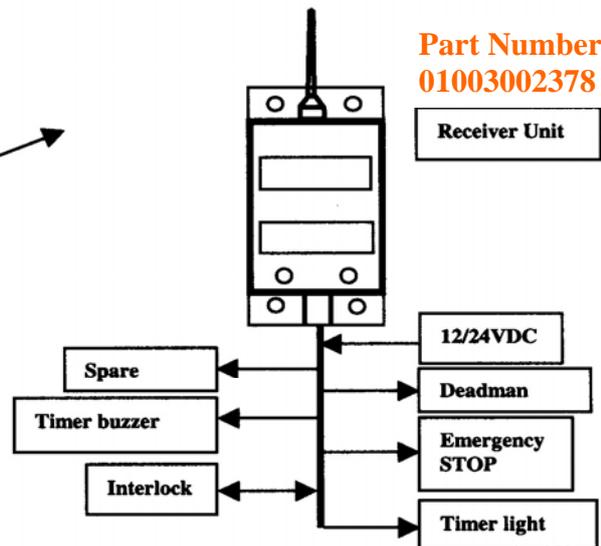
Aljac Fuelling Components is now able to offer you the Delta Wireless Deadman System from stock, and we are also able to provide you with a comprehensive support service, including spare parts, technical advice, and installation.

### System Layout.



**Part Number 0100301835**

Transmitter Unit



**Part Number 01003002378**

Receiver Unit

### Technical Information.

Type: Low power wireless timeshare transmission system, licence free operation, transmitter and receiver coded together, FSK modulation.

Operating Frequency: Global 2.4GHz.

Transmission Speed: Max 4800 bits/sec.

Operating Range: Adjustable up to approx. 30m.

#### Receiver.

Aerial: External 14.5cm long, BNC connector.

Power Supply: 11-27V DC, auto shut down over 30V DC.

Power Consumption: 62mA standby, 112mA during full charging.

Outputs: Deadman, switch stowage, timer warning light (intermittent), buzzer (constant), normally closed output (opens when Stop button pressed), extra function.

Transmitter Charging: Front panel station, time regulated 50mA constant charging current.

Controls: Push button for emergency stop, coding and boost charging.

Indicators: Green Power On light, Yellow Charging

light.

Housing: ABS Polycarbonate IP52, Stainless Steel mounting plate.

Dimensions: 160mm by 80mm by 60mm deep.

Weight: 0.7 Kg.

#### Transmitter.

Output power: 8 to 10 mW.

Aerial: Internal.

Power Supply: 3.6V NiMH battery, 170 mAh, rechargeable through contacts.

Charging: Constant current charging 50 mA, time controlled by receiver, contacts protected against short circuit.

Charging Temperature Limits: 0 to 50 degC.

Control Buttons: Deadman (operated by Stainless Steel trigger), Emergency Stop, Extra Function.

Indicators: Red Active Transmission light diode, Yellow Low Battery light diode.

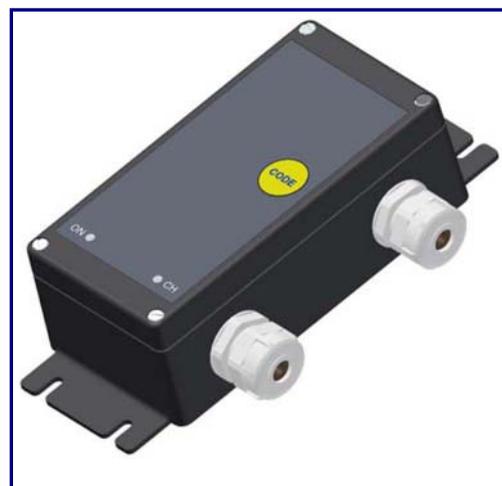
Housing: Polyamide 6, IP66.

Dimensions: 40mm diameter, 170mm long.

Weight: 0.3Kg including battery.

# DEADMAN/FILTER DIFFERENTIAL PRESSURE PROTECTION SYSTEM

- ◆ **DEADMAN AND FILTER DIFFERENTIAL PRESSURE PROTECTION IN ONE SYSTEM**
- ◆ **DEADMAN ONLY, OR FILTER DIFFERENTIAL PRESSURE PROTECTION ONLY, OR BOTH**
- ◆ **DEADMAN SHUT DOWN WHEN HIGH FILTER DIFFERENTIAL PRESSURE OCCURS**
- ◆ **DEADMAN TIMER**
- ◆ **EASY TO INSTALL AND OPERATE**
- ◆ **OPERATIONAL STANDARDISATION FOR NEW AND EXISTING VEHICLES.**



## Background.

There are a number of Deadman systems, and also some dedicated filter Differential Pressure (DP) protection systems available. However, the DP protection systems which have been developed both monitor and correct the DP. The Aljac system is a combined system, so it can either be used as a Deadman system, or a simple DP protection system, or a combined Deadman and DP protection system.

The need for automatic DP correction is the subject of much debate, but it is universally accepted that the operator cannot consistently monitor the filter DP during a refuelling operation. In the event of a water slug passing into the filter monitor elements they will block very quickly causing a rapid rise in the filter DP with little or no warning. When this occurs it is very unlikely that the operator will be close enough to the DP Gauge to take action and shut the system down quickly. Also, after a rise in filter DP the operator can 'cheat' the system and reduce the DP by reducing the system flow rate. This is a very dangerous situation because although the filter DP can be reduced in this manner, the elements themselves will still remain blocked and the risk of element rupture will remain.

Although filter DP Switches are available, until now little consideration has been given to using the output from the DP Switch in the optimal manner. Also, new vehicles can be fitted with a system relatively easily, but retro fit to existing vehicles on site is not so easy, and if this task is carried out with insufficient consideration it is possible that the final system may not be satisfactory. It is also likely that there will be no standard operating mode if there is a mix of converted and new vehicles at a location, and this will lead to confusion among the operators.

## The Aljac Differential Pressure Protection System.

Our system has been designed for operation as a combined DP Protection and Deadman system, or as a Deadman system only, or as a DP Protection system which can be easily retro fitted alongside any existing deadman system.

So:-

Connecting a Deadman Switch gives Deadman only.

Connecting a DP switch gives DP protection only.

Connecting a Deadman Switch and DP Switch gives Deadman and DP Protection.

See schematic diagram.

### Deadman System Features.

**Full Operational Control.** Remote control of the refuelling operation with a Deadman Handswitch and coiled Suzie Cable.

**Time Out.** Warning every 1.1/2 minutes, times out and closes down the Deadman System unless the Deadman Handswitch is released and immediately reactivated within 30 seconds. This prevents system abuse by jamming the Deadman Handswitch closed.

**Deadman Warning Lamp Output.** Lamp 'On' when the Deadman System is activated, flashes during the Time Out period when reactivation is required.

**Sounder Output.** Constant output during the Time Out period to warn the operator of impending system shut down, unless the reactivation sequence is performed.

**Remote Override.** Automatically overrides the Deadman System when the trigger nozzle is unstowed (for dual pressure/overwing refuelling systems).

**Remote Emergency Stop.** Engine stop or full system shut down when activated (subject to exact installation details).

### DP Protection System Features.

**High Filter DP Protection.** Activated by a signal from the DP Switch. Cuts power to the DP Output terminal. This terminal is used to power a solenoid

actuated valve in the Deadman air system.

**System Lock Out.** Once the system is activated, when the high DP signal is removed (falling DP when flow decreases) the Deadman System remains fully locked closed.

**DP Warning Lamp Output.** Lamp 'On' to tell the operator that the system has closed down due to high filter differential pressure.

**Reset/Override Switch.** Key operated switch remotely located in the cab. Used to reset/override the system applying a 0 Volt signal. Switch operation On and then Off to reset. If the Switch remains in the On position the DP Protection System is overridden. Override is required in order to carry out the DP Gauge full scale deflection test. The DP Warning Lamp will flash to warn the operator that the DP Protection System is overridden.

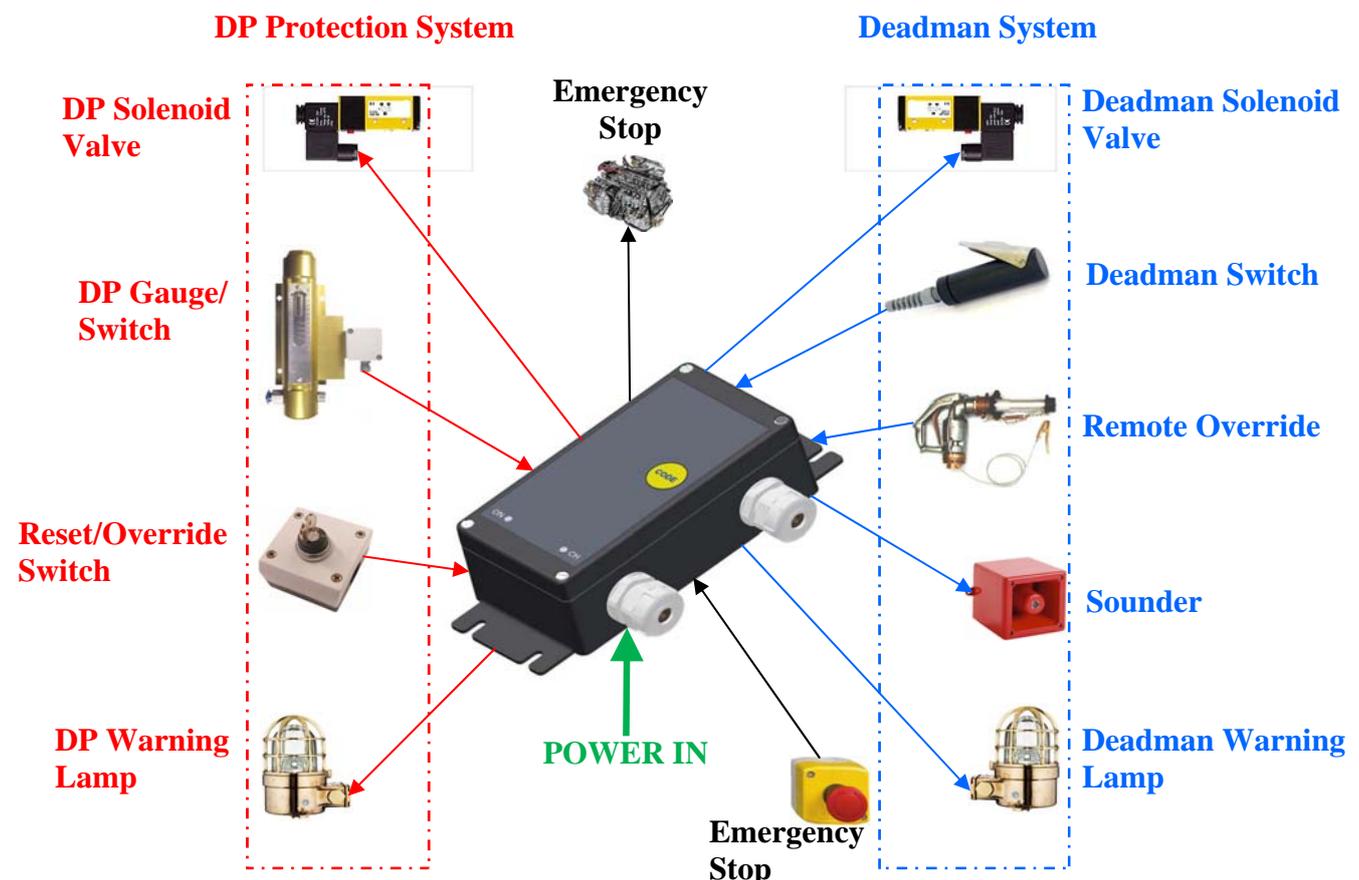
**Operational Security.** The DP Protection System **CANNOT** be overridden by operating the vehicle Deadman Override switch.

**Fail Safe Design.** The DP Protection System automatically closes down if the cable to the DP Switch is broken or disconnected.

### Combined Deadman and DP Protection System.

When there is a high filter DP the combined system cuts power to main Deadman Output terminal and also to the DP Protection System Output terminal. All other features are as described above.

### Schematic Diagram.



**How To Order.**

Aljac Combined Deadman and DP Protection system. Part number 0100302358.

**Accessories.**

- Deadman switch, coiled suzie cable, plug, socket.
- Deadman warning lamp, green.
- DP warning lamp, red.
- Sounder.
- Emergency Stop switch.
- Solenoid operated 3/2 pneumatic valve.
- Key operated reset/override switch.
- Gammon DP Gauge with switch fitted.
- Gammon DP Gauge Switch retro fit kit for fitment to any existing Gammon DP Gauge.

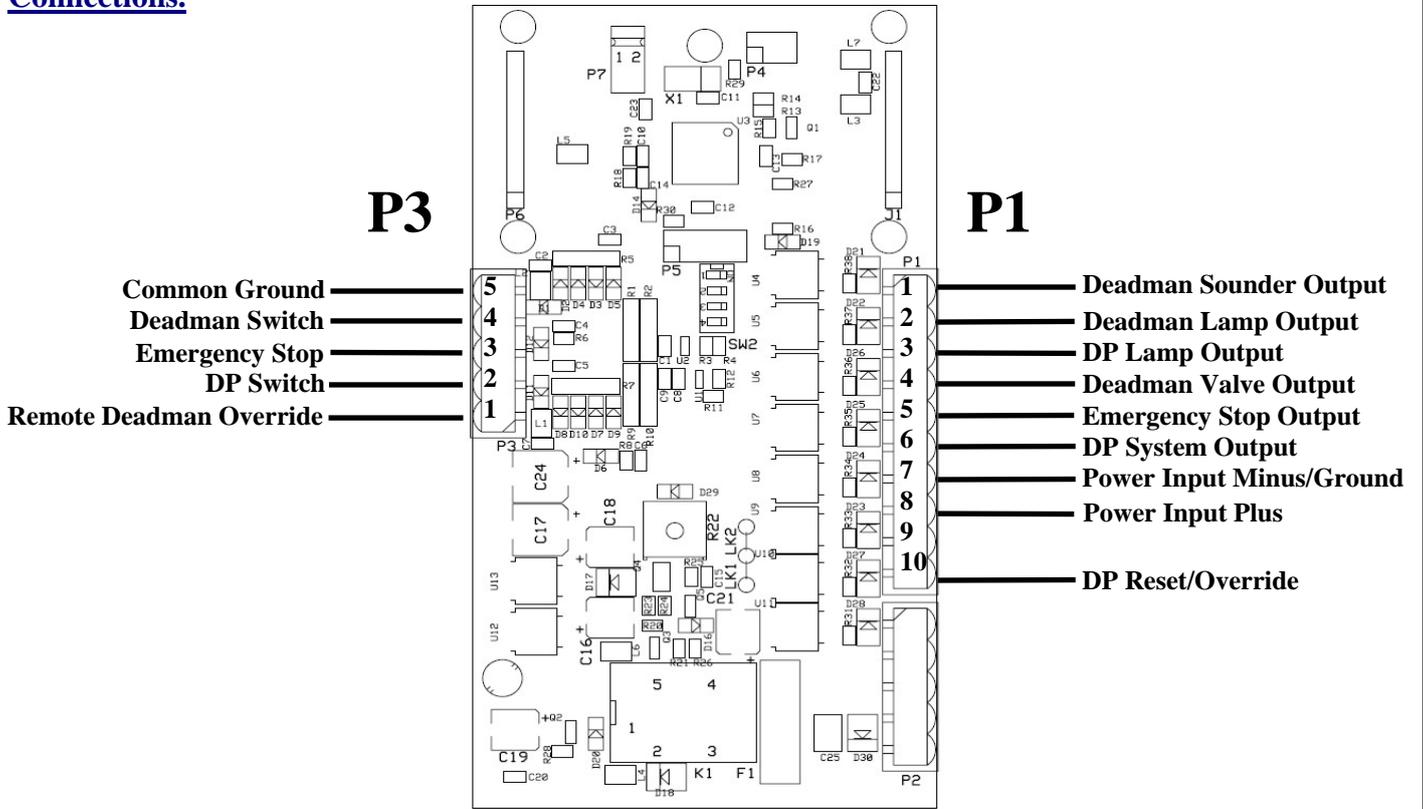
**Dimensional Data.**

Dimensions 205x110x57mm. Nett Weight 335g.

**Technical Specification.**

- Power supply: Between 11V to 27V DC.
- Output voltage: As supply voltage.
- Maximum output current: 3.5A per terminal.
- Maximum total load: 5A.
- Maximum potential between minus pole and ground: 50V DC/AC peak.
- Deadman and DP Switch Supply: 5 Volts DC, current limited to 0.5mA.
- Time Out: Warning starts at 1.1/2 minutes, system shut down in 30 seconds if not reactivated.

**Connections.**



P1	SIGNAL	P3	SIGNAL
1	Sounder Output.	1	Remote Deadman Override. Active at 0 Volts.
2	Deadman Lamp Output.	2	DP Switch. Current limited supply.
3	DP Lamp Output.	3	External Emergency Stop Input. Active at 0 Volts
4	Deadman Valve Output.	4	Deadman Switch. Current limited supply.
5	Emergency Stop Output.	5	Deadman Switch, DP Switch/Common Ground.
6	DP Protection System Output.		
7	Power Supply Minus/Ground.		
8	Power Supply Plus.		
9	Not Used.		
10	DP Reset/Override Switch. Active at 0 Volts.		

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## 4 LITRE CLOSED CIRCUIT SAMPLER

- ◆ **FULL VISUAL AVIATION FUEL CHECKING IN A CLOSED SYSTEM**
- ◆ **NO FUEL SPILLAGE**
- ◆ **EASY DETECTION OF DIRT AND WATER**
- ◆ **NO SAMPLE CONTAMINATION**
- ◆ **EASY TO CLEAN**
- ◆ **DIRECT DRAINAGE UNDER GRAVITY**
- ◆ **WATER DETECTION, DENSITY AND TEMPERATURE CHECKING OPTIONS**



### Introduction.

The accepted method of checking the cleanliness of aviation fuel is the 'clear and bright' test, where fuel is swirled around in an open bucket or clear glass jar and visually inspected. However, this procedure carries the risk of sample contamination from the elements or from dirty sample points. There is also a high probability of fuel spillage and contact with operations staff, which is unacceptable. The Aljac Closed Circuit Sampler (CCS) has been developed to overcome these problems and actually improves sampling procedures, and as a result it is now in widespread use with refuelling companies all over the world.

### Description and Operation.

The Aljac CCS consists of a clear glass tube fitted to a white epoxy coated conical base to assist in the detection of dirt and water, and with a hinged vented cover. The base incorporates a tangential inlet port to promote vortexing of the incoming fuel, and a close coupled Stainless Steel drain valve. The inlet port should be connected to the sample points using small bore tubing (typically 10mm diameter), and we recommend fitting spring close inlet valves close to the CCS to control the filling operation, which we can also supply. The drain port should be

connected into the hydrant dispenser dump tank, depot product recovery system, or storage tank using 20mm inside diameter pipework. It is recommended that the CCS is located such that gravity drainage is possible. If not, we are able to supply a rotary pump and non return valve to drain the CCS.

When fuel is drawn into the CCS under pressure from the sample points the tangential inlet port promotes vortexing of the incoming fuel. This concentrates any contamination in the centre of the base, making detection very easy. After the fuel has been visually inspected the drain valve is opened to release the sample. Internal cleaning of the Aljac CCS is easily accomplished through the hinged lid.

A number of options are also available. Hydrometer and thermometer pockets for density and temperature checks can be provided in conjunction with a removeable inner lid. It is also possible to carry out the Shell Water Detector or Exxon Hydrokit test on the fuel sample using an option which can either be fitted to the inner lid (internal), or to a self sealing valve in the inlet port (external). The Aljac CCS is available with BSPP or NPT threads.

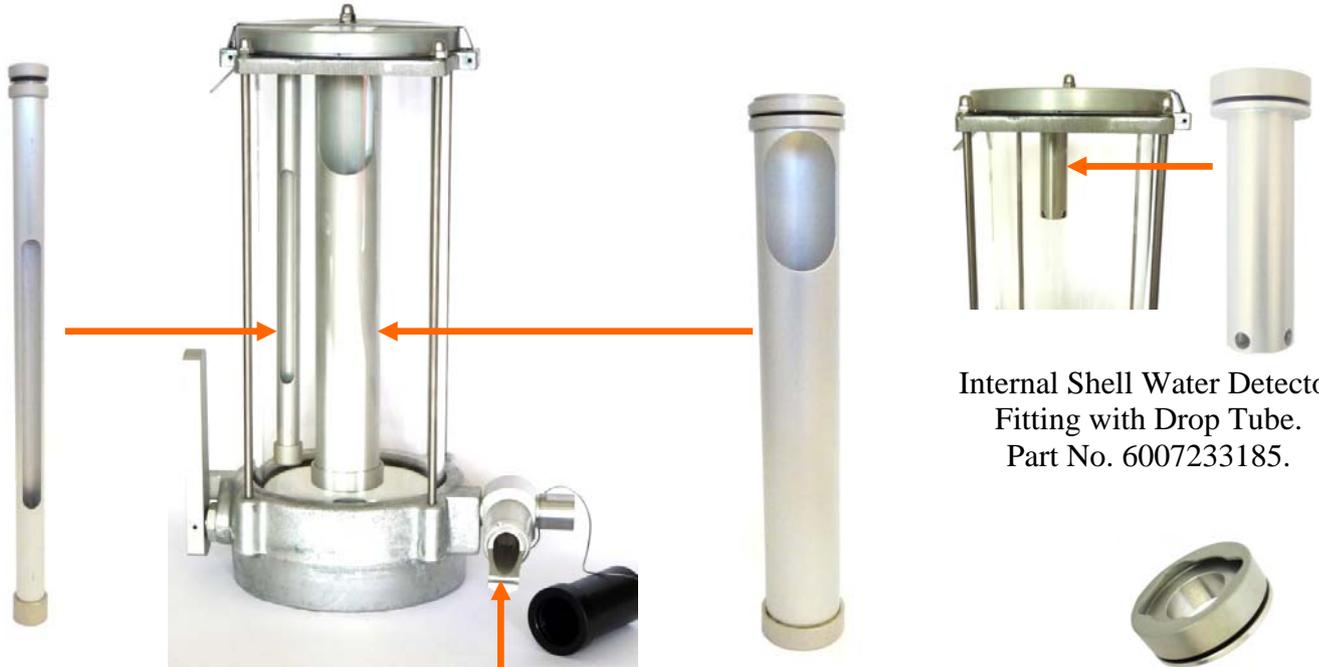
### The Capsule Catcher.

Our Sampler is fitted with a Capsule Catcher inside the drain valve. It prevents any SWD capsules which have been inadvertently dropped into the sampler from passing into the drain pipework. It does so without disrupting the vortex flow pattern of fuel entering the sampler, and also allows the sampler internals to be easily cleaned. The Capsule Catcher can also be retro fitted to existing Aljac Samplers.



Capsule Catcher as retro fit to existing Aljac Samplers  
Part No. 6007233264.

### Options.



Thermometer Tube.  
Part .No. 6007233167.

External SWD Fitting. Part No. 60072331212 or 6007233213

Hydrometer Tube.  
Part No. 6007233166.

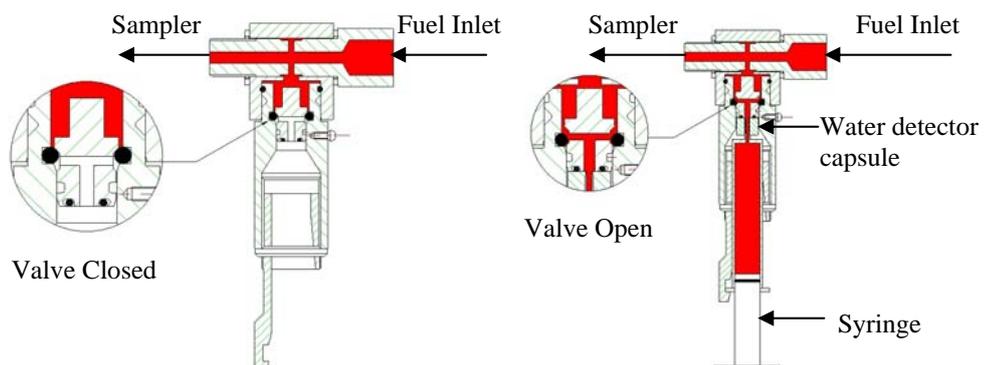
Internal Shell Water Detector Fitting with Drop Tube.  
Part No. 6007233185.

Internal Shell Water Detector Fitting.  
Part No. 6007233168.

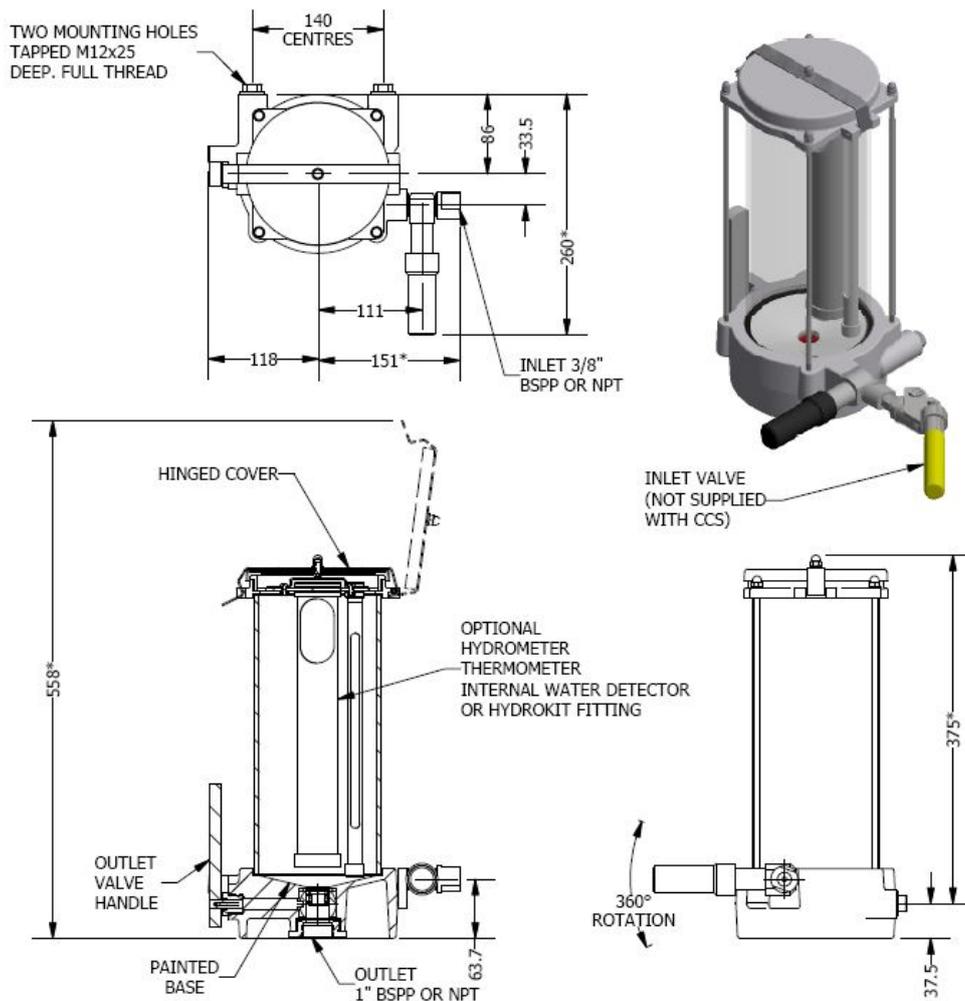
### External SWD Fitting Operation.

The External SWD fitting was designed to allow the SWD test to be carried out without opening the sampler lid and so exposing the fuel sample to possible contamination. The External SWD is fitted to the inlet connection of the sampler and incorporates a piston valve. When the assembled syringe/capsule is inserted into the External SWD Fitting the action of doing so causes the front edge of the capsule to push open the piston valve, and allows fuel to flow to the capsule, as shown below. The syringe can be operated as normal to draw fuel through the capsule.

External Shell Water Detector Fitting, BSPP.  
Part No. 6007233212 or 6007233213



## General Arrangement Drawing.



### ALJAC CLOSED CIRCUIT SAMPLER (CCS)

(DIMENSIONS SHOWN THUS \* ARE APPROXIMATE ONLY)

## Detailed Specification.

**Working Capacity:** 4 Litres.

**Materials:** Borosilicate glass tube, cast Aluminium base and upper section, base white epoxy lined internally.

**Connections:** Inlet 3/8" BSPP or NPT female threaded, outlet 1" BSPP or NPT female threaded, **Mounting**

**Holes:** M12 female threaded.

**Overall Dimensions:** 412 mm high (lid closed), 269 mm wide (with SWD fitting), 260 mm deep.

**Nett Weight:** 5 Kg (empty).

## Standards.

The equipment has been subjected to a full risk assessment which included the requirements of the EC directives and harmonised standards. In accordance with European legislation, it has been concluded that the equipment should not carry a CE mark.

## How To Order.

Contact our Sales Department and quote the part number.

Description	Part Number BSPP threads	Part Number NPT threads
Basic Model	6007233001	6007233021
Basic Model +Internal Velcon Hydrokit Fitting	6007233002	6007233026
Basic Model + Internal Shell Water Detector Fitting	6007233003	6007233025
Basic Model + Internal Velcon Hydrokit Fitting + Hydrometer and Thermometer Tubes	6007233004	6007233024
Basic Model + Internal Shell Water Detector Fitting + Hydrometer and Thermometer Tubes	6007233005	6007233022
Basic Model + Hydrometer and Thermometer Tubes	6007233016	6007233023
Adds External Shell Water Detector Fitting	6007233212	6007233213
Adds External Velcon Hydrokit Fitting	6007233203	6007233204
Capsule Catcher for retro fit	6007233264	6007233264
Adds 3/8" Apollo Spring Close Fill Valve	06076502P01	0607650201

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## **AIR POWERED INTERNAL SWD FOR 4 LITRE SAMPLER**

- ◆ **REMOTE PUSH BUTTON OPERATION**
- ◆ **MINIMAL OPERATOR FUEL EXPOSURE**
- ◆ **REDUCED SYRINGE CONSUMPTION**
- ◆ **PRECISE SAMPLE VOLUME**
- ◆ **ACCURATE SWD RESULT**



### **Introduction and Existing Procedures.**

Since the introduction of the Aljac 4 Litre Sampler there have been various approaches to the problem of carrying out the water detector test.

Initially, the lid was opened and the syringe/capsule was dipped into the fuel just as it had been with traditional open sample jars, but this compromised the closed sampling concept and negated some of the advantages of it. The procedure was refined with the development of the Internal SWD fitting which simplified the method of manipulating the syringe and but was still not ideal.

This was followed by the development of the External SWD fitting which is located on the inlet of the sampler and removed the need to open the lid because with this method the syringe/capsule was used to open an internal self sealing poppet valve to allow fuel into the capsule/syringe and carry out the test. However, this procedure has also proved not to be a totally problem free. In this device the capsule is not actually immersed in the fuel, and this has a number of drawbacks. There is a small dead volume of fuel within the

poppet valve which can trap water and give a false (poor) result. It is also possible to draw air into the syringe if the seal between the capsule and poppet valve surface is not 100% perfect (which is very difficult to achieve). The problem is further compounded because during this test method the syringe is nearly horizontal so it is impossible to judge the actual volume of fuel in the syringe against the graduations. Therefore, in practice it is common for less than 5ml of fuel to be taken which will give an inaccurate SWD test result. In addition the poppet valve can leak due to wear or contamination and result in a fuel leakage.

We developed our Air Powered SWD to offer a new approach to the whole procedure.

It is clear that the most representative SWD test is obtained by the capsule being immersed directly into the main fuel sample, there is then no issue with dead volumes and unrepresentative fuel properties. It is also desirable to make the whole test more user friendly and reduce the consumption of syringes. So we set out with these objectives in mind when we developed our Air Powered SWD.

### Description and Operating Method.

Our Air Powered SWD consists of a graduated plastic tube which is permanently fixed to the sampler hinged lid, close coupled to a vacuum generator which creates a vacuum in the tube when air pressure is applied to the 6 mm inlet connection.

The sampler is filled with fuel as normal, the lid is opened, a water detector capsule is fitted to the end of the graduated plastic tube and the lid is closed so that the water detector capsule is below the surface of the fuel inside the sampler. Air is fed to the vacuum generator from the vehicle air system through a hold open 3/2 pneumatic valve (lever or push button operated, spring return). This creates a vacuum inside the graduated plastic tube and draws fuel through the capsule. When the required 5ml of fuel has passed through the capsule into the tube the air supply is removed by releasing the pneumatic valve. The operation takes approximately 20 to 30 seconds. The sampler lid is then opened and the capsule is removed and checked. The lid is closed and the jar emptied as normal, the fuel in the plastic tube then drains into the sampler under gravity.

Our new approach has a number of advantages. The capsule is immersed directly in the fuel so there is no dead volume and the test is truly representative. The lid is only open momentarily to fit and remove the capsule from the syringe so there is minimal operator exposure to the fuel and minimal possibility of fuel contamination from the elements. In addition, because the plastic tube does not rely on seals and pistons to draw the fuel volume it very seldom need replacing, so there is no ongoing syringe consumption.

The operator just has to operate a button or lever to carry out the test which is much easier than manipulating a syringe when wearing thick gloves. It was also found that as the fuel level rises in the plastic tube, the fuel/air interface has no bubbles present so it is much easier to judge the true fuel volume than it is when using a conventional syringe, especially when the syringe is horizontal as in the External SWD procedure.

Our new development has been highly successful and it is either available as an option fitted to new Aljac 4 Litre samplers, or as a retro fit kit for fitment to existing Aljac samplers already in service.

We are also able to supply the ancillary items as an installation kit (See Typical Installation Schematic).

### Standards.

The equipment has been subjected to a full risk assessment which included the requirements of the EC directives and harmonised standards. In accordance with European legislation, it has been concluded that the equipment should not carry a CE mark.

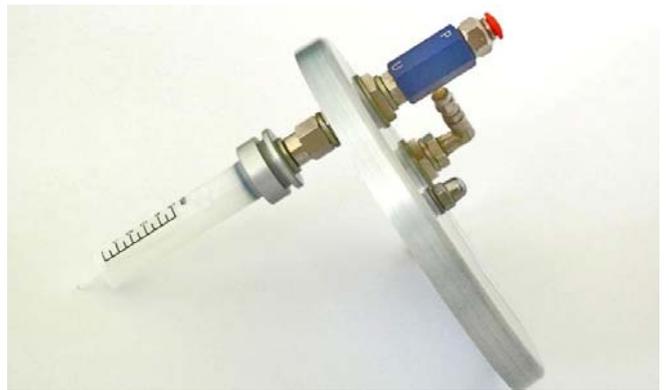
### How to Order.

**Air Powered SWD as Option.** Part No.6007233252.

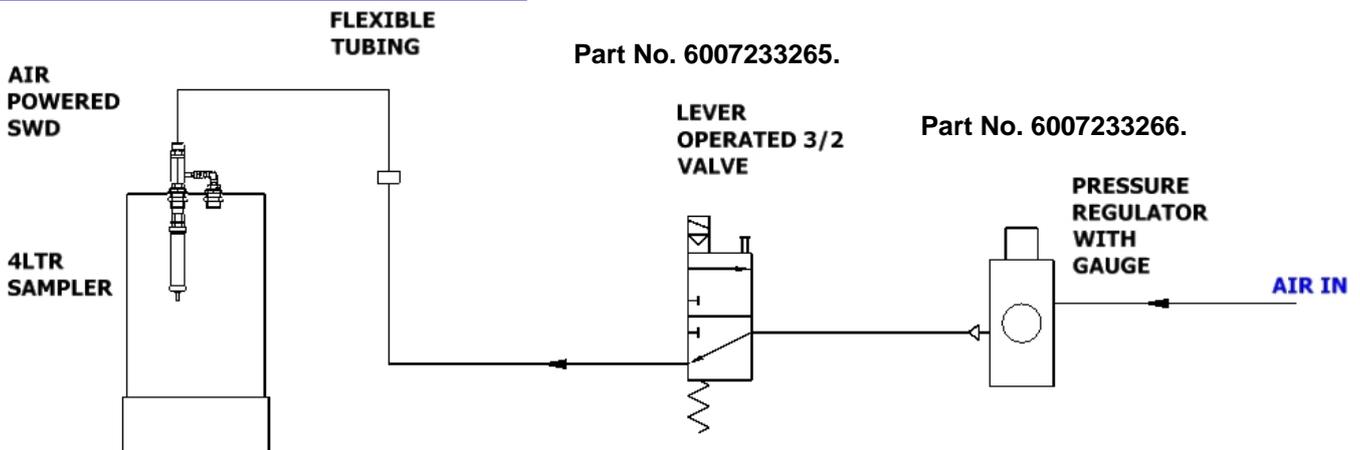
**Air Powered SWD Retro Fit (including Sampler Lid).** Part No. 6007233253.



**Graduated Plastic Tube Retro Fit Assembly** (replaces original glass tube). Part No. 6007233259.



### Typical Installation Schematic Diagram.



## 20 LITRE CLOSED CIRCUIT SAMPLER

- ◆ **FULL VISUAL AVIATION FUEL CHECKING IN A CLOSED SYSTEM**
- ◆ **INCREASED CAPACITY FOR LARGER VOLUME OR COMPOSITE SAMPLES**
- ◆ **NO FUEL SPILLAGE**
- ◆ **EASY DETECTION OF DIRT AND WATER**
- ◆ **NO SAMPLE CONTAMINATION**
- ◆ **EASY TO CLEAN**
- ◆ **DIRECT DRAINAGE UNDER GRAVITY**
- ◆ **WATER DETECTION, DENSITY AND TEMPERATURE CHECK OPTIONS**



### Introduction.

Since its introduction in 1982 the Aljac 4 Litre Closed Circuit Sampler has displaced the traditional open bucket or glass jar method of carrying out the 'clear and bright' quality check on aviation fuel. However, although a 4 Litre sample is ideal for refuelling vehicles where single point samples are taken via short small bore sample lines, a larger sample volume is needed where the pipework volume would be flushed into a bucket prior to the glass jar sample, or where composite samples are required. The sampling of multi compartment road tankers or rail tank cars, or medium capacity storage tanks are typical examples, so we developed our 20 Litre Closed Circuit Sampler (CCS) which retains all of the novel features of the 4 Litre unit.

### Description and Operation.

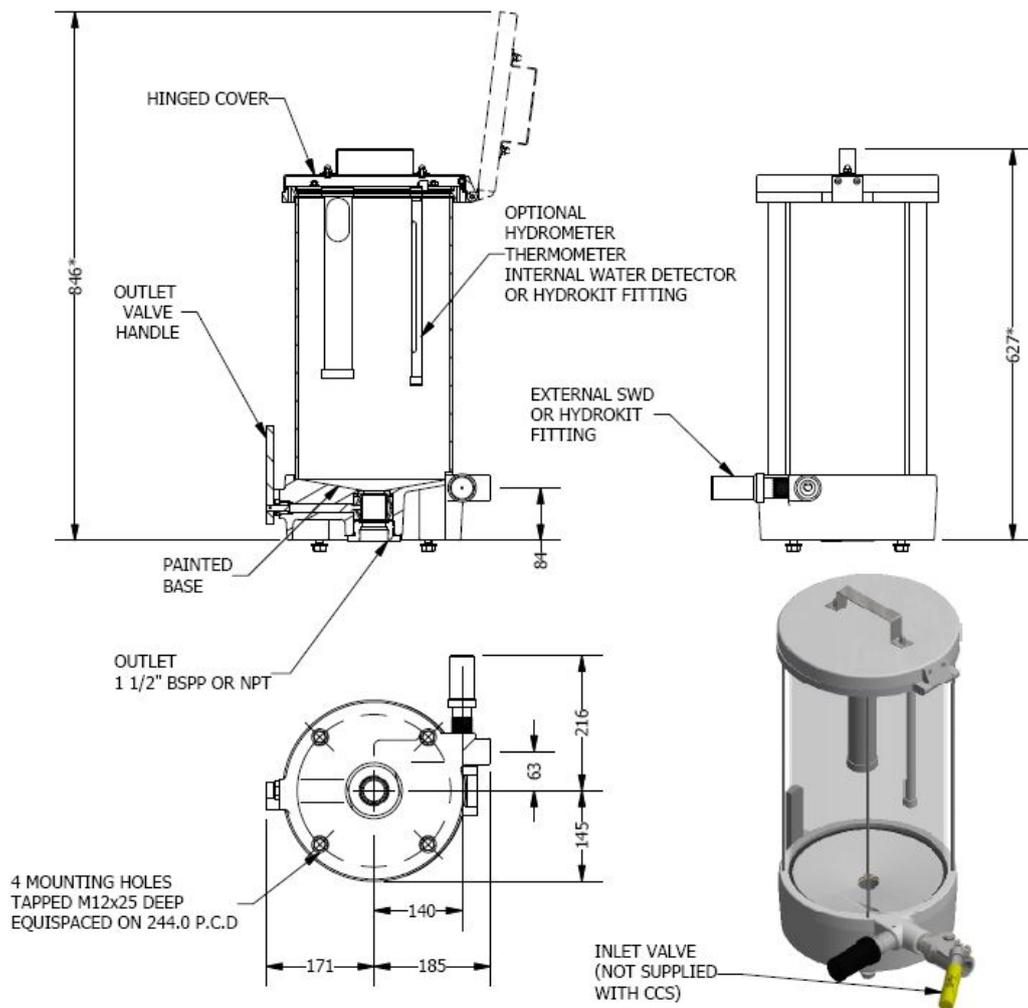
The Aljac 20 Litre CCS consists of a clear glass tube fitted to a white epoxy coated conical base to assist in the detection of dirt and water, and with a hinged vented cover. The base incorporates a tangential inlet port, and a close coupled Stainless Steel drain valve. For our 20 Litre CCS we recommend that the inlet port is connected to the sample points using 20mm diameter pipework to

maximise the flow rate, and that the filling operation is controlled using 3/4" spring close valves. The drain port should be connected to the depot product recovery system, or storage tank using 40mm diameter pipework. The 20 Litre CCS should ideally be located to allow gravity drainage, but if not, we can supply a semi rotary pump and non return valve to drain the CCS.

When fuel is drawn into the CCs under pressure from the sample points the tangential inlet port promotes vortexing of the incoming fuel. This concentrates any contamination in the centre of the base, and makes detection very easy. The integral drain valve is opened to release the sample after completion of the visual inspection. Internal cleaning of the Aljac CCS is easily accomplished through the hinged lid.

Hydrometer and thermometer pockets for density and temperature checks can be provided in conjunction with a removable inner lid. The Shell Water Detector or Velcon Hydrokit test can either be fitted to the inner lid (internal), or to a self sealing valve in the inlet port (external).

**General Arrangement Drawing.**



**ALJAC 20L CLOSED CIRCUIT SAMPLER (CCS)**

(DIMENSIONS SHOWN THUS \* ARE APPROXIMATE ONLY)

**Detailed Specification.**

**Working Capacity:** 20 Litres.

**Materials:** Toughened glass tube, cast Aluminium base and upper section, base white epoxy lined internally.

**Connections:** Inlet 3/4" NPT female threaded, outlet 1.1/2" NPT female threaded.

**Mounting Holes:** 4 holes M12 female threaded on 244 mm PCD.

**Overall Dimensions:** 627 mm high (lid closed), 356 mm wide, 361 mm deep (with external Shell Water Detector or Velcon Hydrokit fitted).

**Nett Weight:** 15 Kg (empty).

**Standards.**

The equipment has been subjected to a full risk assessment which included the requirements of the EC directives and harmonised standards. In accordance with European legislation, it has been concluded that the equipment should not carry a CE mark.

**How To Order.**

Contact our Sales Department and quote the part number.

Description	Part Number NPT threads
Basic Model	6007263001
Basic Model + Internal Velcon Hydrokit Fitting	6007263002
Basic Model + Internal Shell Water Detector Fitting	6007263003
Basic Model + Internal Velcon Hydrokit Fitting + Hydrometer and Thermometer Tubes	6007263004
Basic Model + Internal Shell Water Detector Fitting + Hydrometer and Thermometer Tubes	6007263005
Basic Model + Hydrometer and Thermometer Tubes	6007263016
Additional External Shell Water Detector Fitting	6007233214
Additional External Velcon Hydrokit Fitting	6007233206
Additional 3/4" Apollo Spring Close Fill Valve	0607650401

## HIGH CAPACITY CLOSED CIRCUIT SAMPLERS

- ◆ FULL VISUAL CHECK IN A CLOSED SYSTEM
- ◆ SUITABLE FOR TANK FARM USE
- ◆ 80 LITRE AND 160 LITRE CAPACITIES
- ◆ STAINLESS STEEL CONSTRUCTION
- ◆ LIFT AND TURN LID MECHANISM
- ◆ WATER DETECTION, DENSITY AND TEMPERATURE CHECK OPTIONS
- ◆ CLOSE COUPLED OUTLET BALL VALVE
- ◆ SPRING CLOSE INLET AND SAMPLE VALVES



### Introduction.

For many years the Aljac range of Closed Circuit Samplers have led the way in the examination and quality checking of aviation fuel within a closed system. The benefits of Closed Sampling such as environmental acceptability, operational efficiency and safety, and minimal loss of product, have become widely recognised by fuel handling companies across the world. Our High Capacity Closed Circuit Samplers have been developed from our 4 Litre and 20 Litre units specifically for use in tank farms and other locations where large volume drain samples are required, and they share many of the innovative design features of their smaller cousins.

### Ancient History.

Traditionally, the low points of large fuel storage tanks have been water purged and sampled by flushing fuel into a Stainless Steel bucket, followed by sampling into an open glass jar. The procedure evolved further when we developed our 4 Litre Closed Circuit Sampler. With this system, the flush volume is fed into a Stainless Steel side tank, followed by the glass jar sample being drawn into a 4 Litre Closed Circuit Sampler. This system has continued in use until the development of our High Capacity Closed Circuit Sampler.

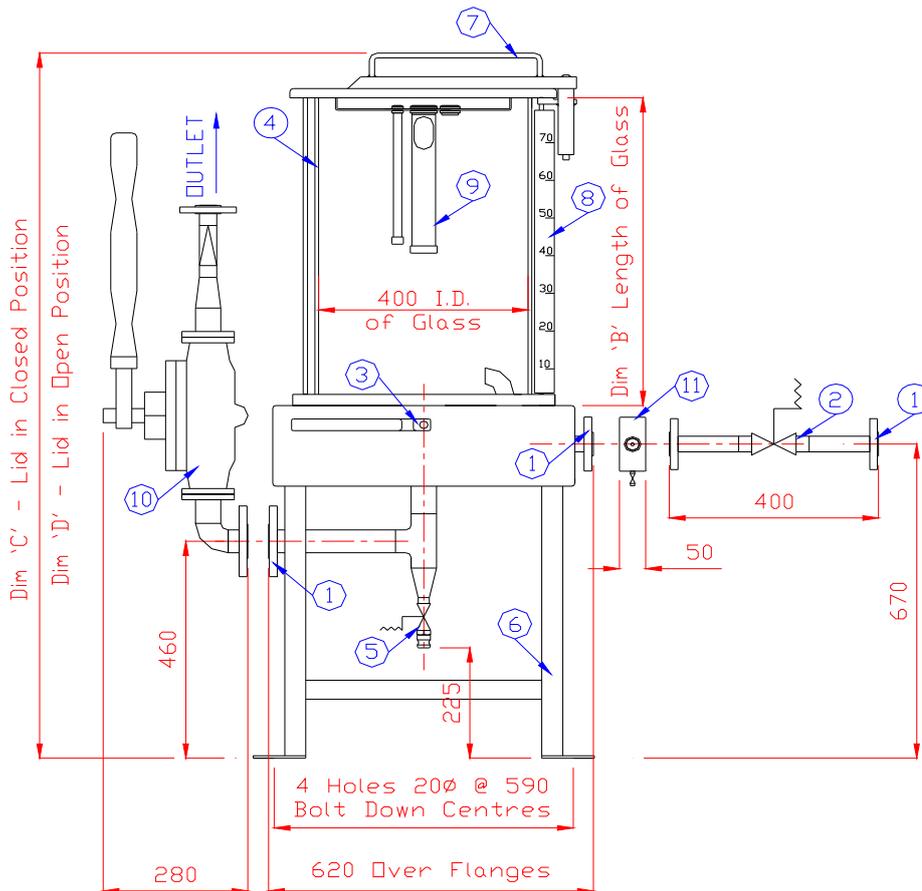
### The Aljac High Capacity Closed Circuit Sampler.

Our High Capacity Closed Circuit Sampler replaces both the Stainless Steel tank and the 4 Litre Sampler. It is connected directly to the main tank sample line, and the contents of both the sample line and tank low point are flushed into the glass vessel at a high flow rate through the spring close inlet valve. This allows the fuel velocity to be maximised and purges the low point more efficiently. It also ensures that any dirt and water will be seen, not just flushed into a side tank and ignored.

The unit has a polished Stainless Steel base incorporating a close coupled ball valve, which in conjunction with the tangential inlet and resultant fuel vortexing ensures that any contamination is highly visible to the operator. The unit is also available with hydrometer and thermometer pockets inside the glass tube for density/temperature checking, and with Shell Water Detector or Velcon Hydrokit test points fitted to the inlet pipework.

The inlet and outlet are flanged and there is a sample point in the outlet pipework fitted with a spring close ball valve. The complete unit is mounted onto a Stainless Steel support frame.

## General Arrangement Drawing.



## Parts List.

1. Inlet flanged 1" ANSI 150lb RF, outlet flanged 1.1/2" ANSI 150lb RF.
2. Conbraco 1" spring closed inlet ball valve.
3. Integral close coupled 1.1/2" bore outlet valve.
4. Borosilicate glass tube, 400mm inside diameter.
5. Conbraco 1/2" spring closed manual sample valve with Kamlok drain point and cap.
6. Stainless Steel support frame.
7. Easy access lift and turn lid.
8. Graduated scale (option).
9. Hydrometer and thermometer tubes (option).
10. Semi rotary emptying pump with non return valve (option).
11. External Shell Water Detector or Velcon Hydrokit fitting (option).

## Overall Dimensions.

Capacity	Dimension B	Dimension C	Dimension D	Shipping Weight
80 Litres	640 mm	1500 mm	1525 mm	160 Kg approx.
160 Litres	1280 mm	2140 mm	2165 mm	175 Kg approx.

### Detailed Specification.

**Working Capacity:** 80 Litres or 160 Litres.

**Material Of Construction:** Toughened Borosilicate Glass tube. Stainless Steel support frame, base, top section, inlet and outlet pipework.

**Inlet Connection:** Flanged 1" ANSI B16.5 150lb raised face.

**Outlet Connection:** Flanged 1.1/2" ANSI B16.5 150lb raised face.

**Inlet Valve:** Conbraco Apollo 1" Stainless Steel spring closed ball valve.

**Manual Sample Valve:** Conbraco Apollo 1/2" Stainless Steel spring closed ball valve with Kamlok male fitting and dust cap.

**Bolting Down Points:** 4 holes 20mm diameter.

### How To Order.

Specify the size, 80 Litres (p/no. 6007333201) or 160 Litres (p/no. 6007333301), and call up any of the following options:-

Hydrometer and thermometer pockets, p/no. 6007333603.

Shell Water Detector, p/no 6007333601, or Velcon Hydrokit point, p/no 6007333602, fitted to the inlet pipework.

Semi rotary manually operated emptying pump and non return valve, p/no 6007333605.

Graduated Stainless Steel scale, p/no 6007333606.

If there are any features or additional items which you require, or if we can assist you with the design of your closed sampling system please contact our Sales Department.

## MOBILE PRODUCT RECOVERY TANK

- ◆ **STAINLESS STEEL CONSTRUCTION**
- ◆ **FULLY MOBILE**
- ◆ **STABLE AND MANOEUVRABLE**
- ◆ **ZERO FUEL WASTE**
- ◆ **FAST PAYBACK**
- ◆ **150 LITRE OR 400 LITRE CAPACITY**
- ◆ **WIDE RANGE OF OUTLET OPTIONS**



### Why Product Recovery?

Aviation fuel storage and dispensing systems must be regularly checked for water and dirt accumulation, but the problem is, what do you do with the fuel samples?

There are a number of undesirable solutions, such as burning, spreading over the ground, disposal in drainage systems, downgrading to heating oils or disposal as hazardous waste. However, these solutions are either environmentally unfriendly or a waste of money, or both. The most efficient solution is to return fuel samples into the main fuel system, but contaminated fuel samples should not be returned to any part of the fuel system unless the contaminant has been completely settled out and removed.

Aljac Fuelling Components can offer you the correct piece of equipment to meet this need, the AFCL Product Recovery Tank (PRT).

### Description.

Our PRT has been developed with fuel quality and ease of operation as the primary design criteria. The PRT is based on a self-supporting 2mm thick Stainless Steel tank. It has a double taper base sloping to a low point at one end. The maximum use has been made of folded radiused corners to minimise the number of welds, however, all welds are ground flush internally to allow drainage to the

1/2" diameter Low Point, and this also permits easy internal cleaning.

The PRT has a full area Access Cover secured by four hand tighten star knobs which allows it to be removed quickly and easily, and also provides full access to the tank internals for cleaning. Within the Access Cover is an opening which is covered by a Hinged Lid, and the opening contains an easily removable 100 mesh Strainer which is set into the tank by 100mm, allowing fuel samples to be poured into the tank rapidly from a bucket or jar. The Strainer can be fully dismantled if gauze replacement is ever required. The PRT is fitted with a free vent with a filter which prevents contaminant ingress.

The PRT is fully mobile, highly manoeuvrable and very stable when part or completely full. It is fitted with fixed centre wheels at one end and swivel castor wheels at the steering end. All wheels are 200mm diameter to allow the PRT to ride the bumps in most depot surfaces, and the castored wheels are each fitted with a foot operated parking brake.

The PRT has been designed to accommodate the maximum number of outlet options. It can also be fitted with emptying/filling pumps, closed sampling systems and inlet/outlet hoses with appropriate stowage brackets.

The unit is supplied self colour bead blasted externally with welding heat marks removed from the internal surfaces. The PRT is fully labelled with fuel grade stickers (JET A-1 or Avgas).

Two sizes are available, 150 litres for the small/medium sized airports and 400 Litres for the larger fuel depots.

### Operation.

Successive fuel samples are poured into the PRT over a period of time through the Strainer, which removes any large scale contamination. The fuel is then allowed to settle fully and the Low Point is purged to remove settled out dirt and water, which will collect there by virtue of the double taper base design. The fuel is then returned to the main fuel system using the specified outlet option(s).

### Specification.

**Design:** Self supporting monocoque construction, double taper tank base sloping to a low point. Fitted with a Hinged Lid, Strainer and full area Access Cover. Free vented, vent fitted with a filter.

**Capacity:** 150 Litres or 400 Litres (useable).

**Tank Material:** Type 304 Stainless Steel, self colour, bead blasted externally, all welds ground flush internally with heat marks removed.

**Access Cover Seal:** Nitrile 'O' ring, 4mm diameter.

**Strainer:** 100 mesh Stainless Steel, supported by a Stainless Steel frame.

**Running Gear:** Pressed Steel wheels, solid rubber tyres, 200mm diameter. 2 off fixed centres, 2 off swivel castors with foot operated parking brake.

**Low Point Drain:** Ball valve with Aluminium Kamlok male fitting with cap/keep chain, ½" nominal bore.

**Testing:** Leak tested under full tank head.

**Marking:** Full grade labelling Jet A-1 or Avgas.

**Outlet Connection:** TW1 flange drilling to accommodate options listed.

**Spare Connections:** 2 off ¾" BSPP female (normally plugged).

**Nett Shipping Weight** (no options fitted): 85Kg. (150 Litre), 125Kg (400 Litre).

### How To Order.

Quote Part Number:-

**0903000010.** Basic 150 litre capacity PRT.

**0903000100.** Basic 400 litre capacity PRT.

Add any of the following outlet options :-

**0903000011.** Gravity outlet point with ¾" valve and Kamlok male fitting/cap. Can not be used with 0903000013, 0903000016 or 0903000019.

**0903000012.** Suction outlet point fitted with internal pipework, ¾" valve and Kamlok male fitting/cap.

**0903000013.** Large bore suction outlet fitted with 1.1/2" bore internal pipework and an aviation tank unit/cap to connect a pressure refuelling coupling and 'defuel' the PRT into a bowser. Can not be used with 0903000011, 0903000016 or 0903000019.

**0903000015.** On board outlet hose, 1" type C by 2.5 metres long, with ball valve and Kamlok ¾" or 1" female fitting/plug at each end. Can be used with 0903000011, 0903000012 or 0903000019. The tank is fitted with hose stowage brackets.

**0903000016.** Large bore suction outlet fitted with 1.1/2" bore internal pipework, ball valve and suction hose connection/cap (specify connection type 2", 2.1/2", or 3" BSPP or 3" Kamlok male) The suction hose is not included. Can not be used with 0903000011, 0903000013 or 0903000019.

**0903000017.** Dummy aviation tank unit set inside the Hinged Lid above the Strainer to allow connection of a pressure refuelling coupling and drainage of the hose prior to hose end strainer checking.

**0903000018.** Float operated level gauge fitted to the Access Cover.

**0903000019.** Hand pump emptying option (50 Litres/Minute), fitted with a Stainless Steel suction hose, non return valve and isolation ball valves. Use in conjunction with 0903000015. Can not be used with 0903000011, 0903000013 or 0903000016.

If you require an outlet system or connection which is not listed, or alternatively a closed sampling system, please contact our Sales Department for a quotation. Our PRT will probably be able to accommodate your special requirements with little or no modification to the standard tank construction!

Available Options.

**Strainer Basket  
(Fitted as standard)**



**0903000017**



**0903000018**



**0903000012**



**0903000019**



**0903000011**



**0903000015**



**0903000013**



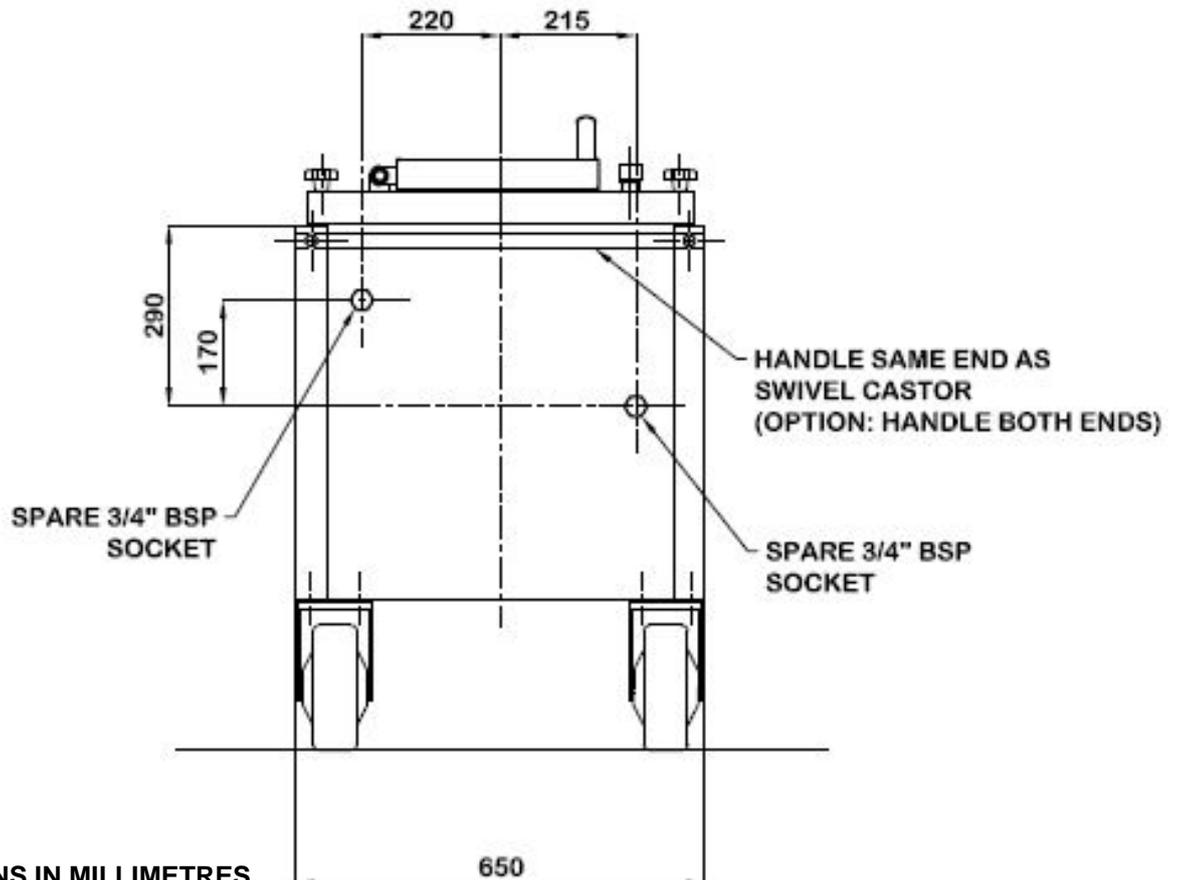
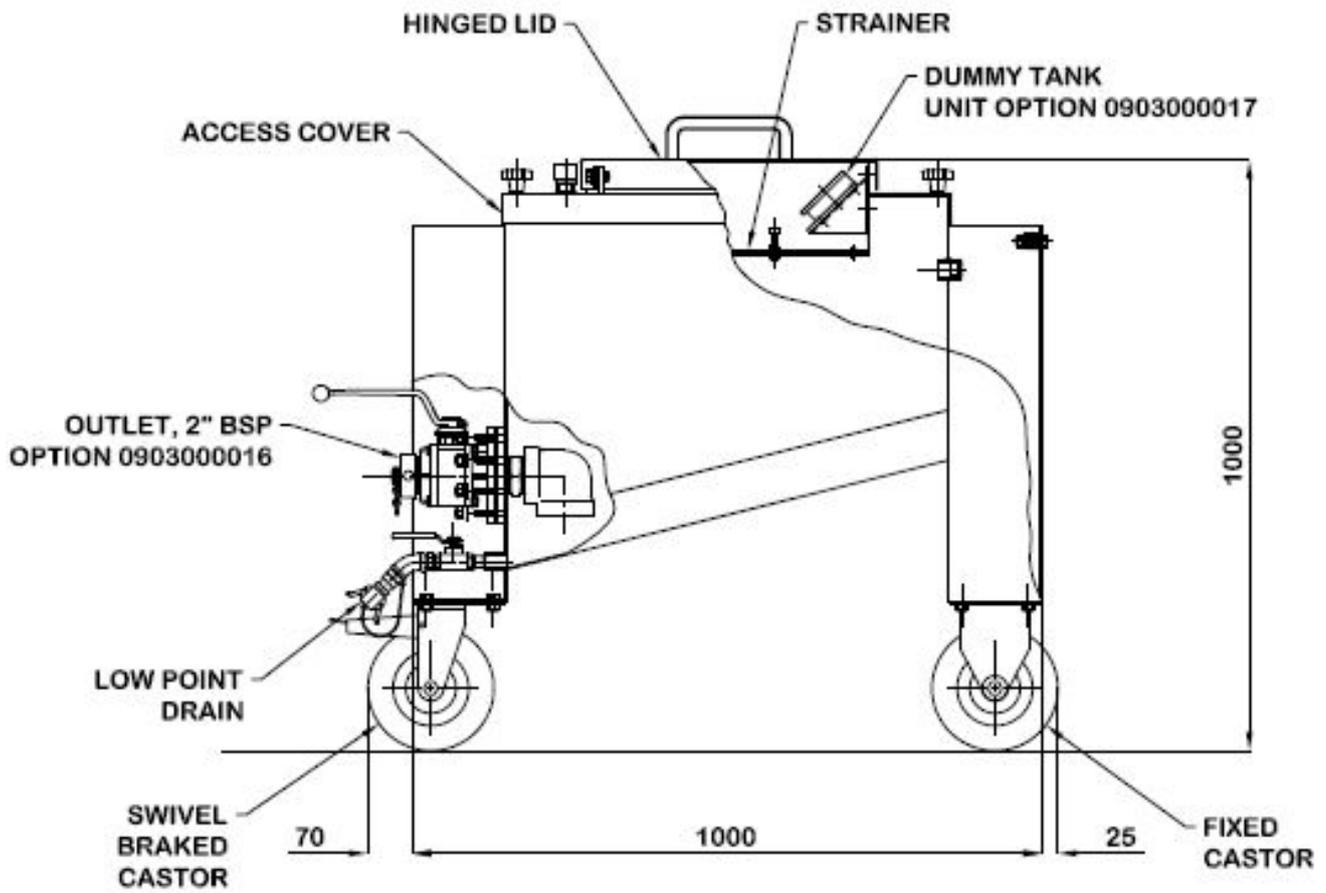
**0903000010/0903000100**  
**Basic PRT**



**0903000016**

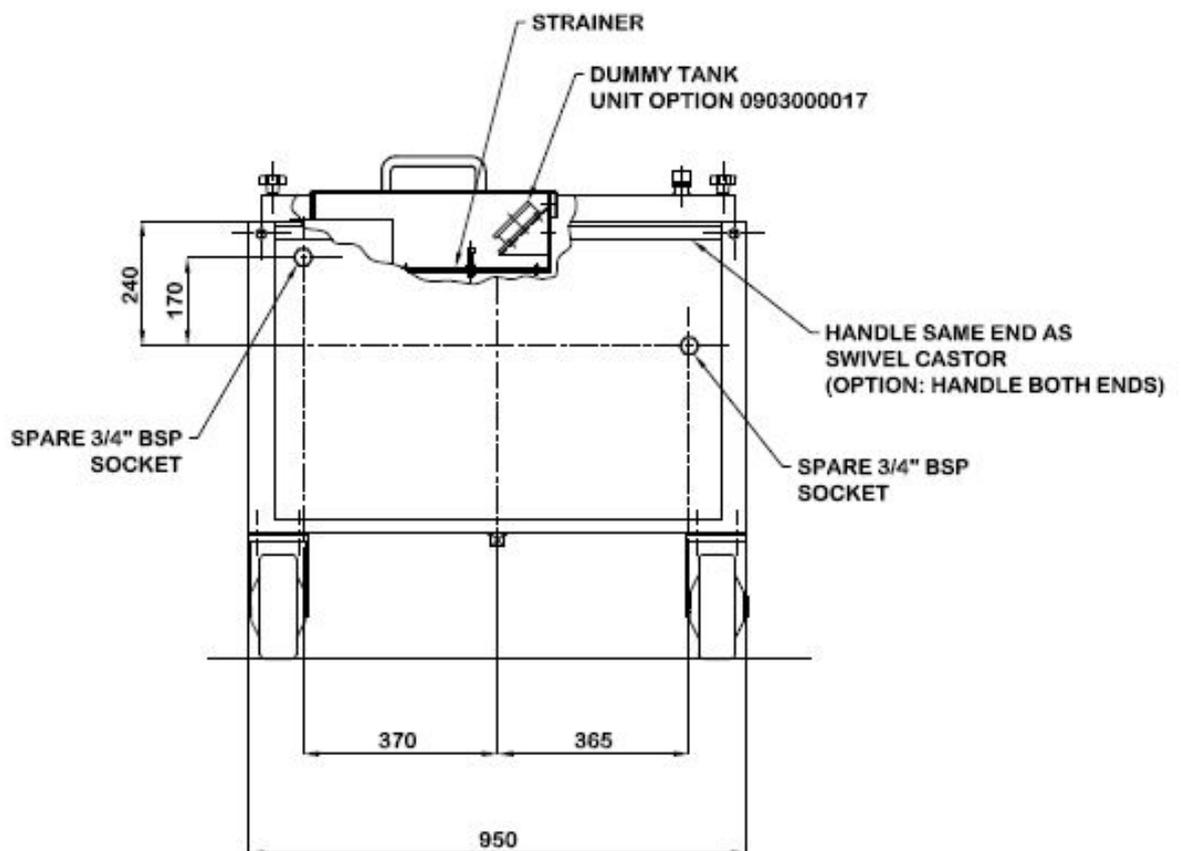
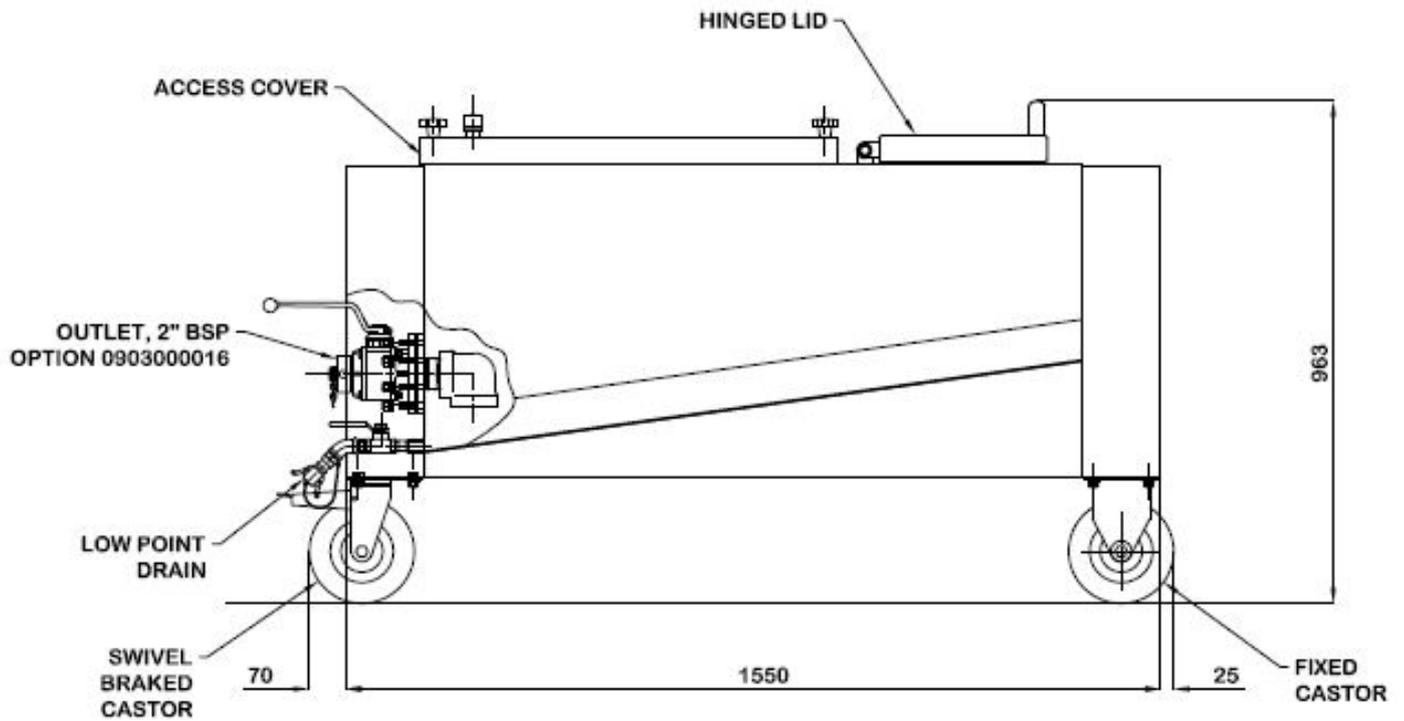


General Arrangement Drawing. 150 Litre Capacity PRT.



ALL DIMENSIONS IN MILLIMETRES.

General Arrangement Drawing. 400 Litre Capacity PRT.



ALL DIMENSIONS IN MILLIMETRES.

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## AIRCRAFT REFUELLING NOZZLES



**ZVF40**

### ZVF40. Specification

**Type.** Aviation refuelling 1.1/2" trigger nozzle for use with Avgas or Jet A1, with integral sight glass and internal check valve.

**Operation.** Manual deadman lever with notches in the guard for operator assistance (these cannot be used to latch the nozzle open), no high level cut off.

**Flow Rate.** Up to 400 Litres/Minute.

**Maximum Working Pressure.** 10 Bar.

**Materials Of Construction.** Aluminium body and guard, Brass inlet swivel, Stainless Steel and Acetal internals, Nitrile/Vulkollan seals.

**Inlet Connection.** Swivel type, threaded 1.1/2" BSPP male (BSPP female as an option).

**Nett Weight.** Approx. 4.0 Kg with spout fitted.

**Accessories** (to be ordered separately). Bonding cable and clip, 1.2m or 2.0 metres long.

Quick release spouts, 32 mm and 38 mm bore circular section for Avgas, collar type and oval section type for Jet A1 selectivity. Each spout is fitted with a 100 mesh strainer and an anti splash bump protector.

Dust cap with spring loaded keep chain to suit the spout fitted.



**ZVF25**

### ZVF25. Specification.

**Type.** Aviation refuelling 1" trigger nozzle for use with Avgas or Jet A1, with internal check valve and 25 mm bore spout with 100 mesh strainer.

**Operation.** Manual deadman lever, no high level cut off.

**Flow Rate.** Up to 140 Litres/Minute.

**Maximum Working Pressure.** 5 Bar.

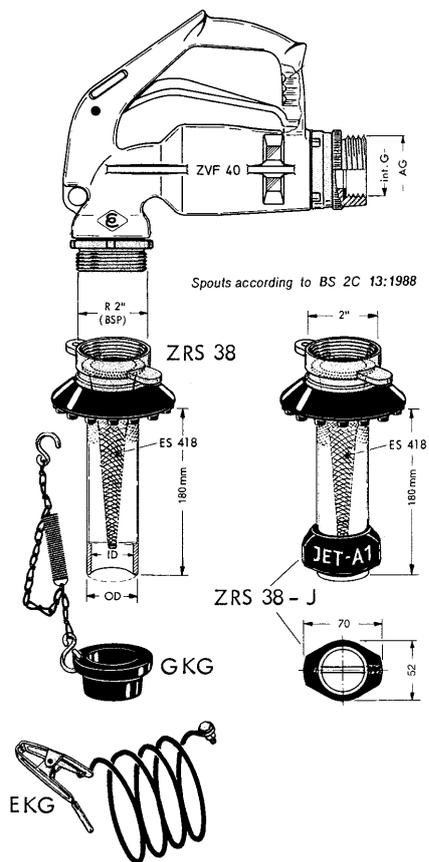
**Materials Of Construction.** Aluminium body, guard and inlet swivel, Stainless Steel and Acetal internals, Nitrile and Vulkollan seals.

**Inlet Connection.** Swivel type, threaded 1" BSPP male (BSPP female as an option).

**Nett Weight.** Approx. 1.3 Kg with spout fitted.

**Accessories** (to be ordered separately). Bonding cable and clip, 1.2m or 2.0 metres long. Alternative spout, collar type for Jet A1 selectivity.

Dust cap and spring loaded keep chain.



**ZVF40. How To Order.**

Quote part number 160ZVF40.1 for the basic nozzle, accessories must be ordered separately from the following list.

ZRS32 Spout, 38 mm outside diameter, 16000ZRS32.

ZRS38 Spout, 44 mm outside diameter, 16000ZRS38.

ZRS38J Spout, 44 mm outside diameter with 70 mm wide collar, 16000ZRS38J1.

ZRS38J Spout, 70 mm wide oval design, 16000ZRS38J.

GKG32 Dust Cap for ZRS32, with spring loaded keep chain, 16000GKG32 .

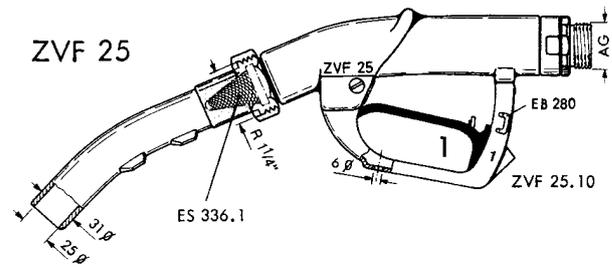
GKG38 Dust Cap for ZRS38, with spring loaded keep chain, 16000GKG38.

GKG38J Dust Cap for ZRS38J, with spring loaded keep chain, 1600GKG38J.

EKG plastic coated Stainless Steel bonding wire and Brass clip/plug.

1.2m long, 160EKG1200.

2.0m long, 160EKG2000.



GKG 25

SG 1"

**ZVF25. How To Order.**

Quote part number 1600ZVF25.10 for the basic nozzle with spout, accessories must be ordered separately for the following list.

GKG Dust Cap with spring loaded keep chain, 16000GKG25.

EKG plastic coated Stainless Steel bonding wire and Brass clip/plug.

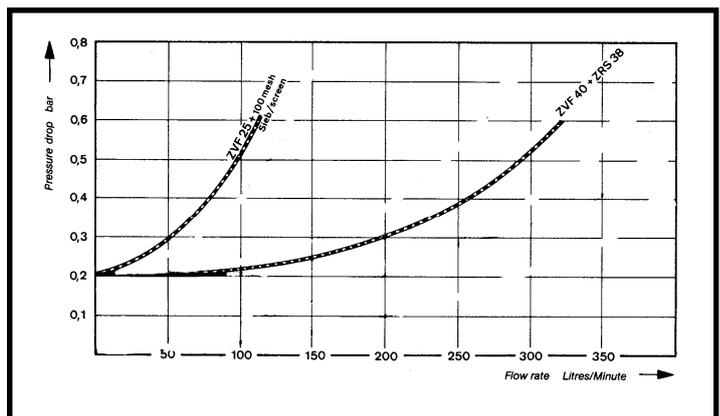
1.2m long, 160EKG1200.

2.0m long, 160EKG2000.

SG1" Sight Glass, threaded 1" BSPP male by 1" BSPP female, 160000SG1.

Jet A1 selective spout instead of standard 25 mm spout, 16000ER339.

**ZVF25/ZVF40 Pressure Loss.**



## AUTOMATIC REFUELLING NOZZLES



**ZVA SLIMLINE**



**ZVA25**

### ZVA Slimline. Specification

**Type.** Automatic 3/4" refuelling trigger nozzle.

**Operation.** Automatic venturi type high level cut off (patented), fitted with latched lever, and internal check valve.

**Flow Rate.** Up to 50 Litres/Minute.

**Working Pressure.** 0.5 to 4 Bar.

**Materials Of Construction.** Aluminium body and guard, Stainless Steel inlet swivel, Stainless Steel, Brass and Acetal internals, Nitrile/Vulkollan seals, oil resistant PVC scuff guard.

**Inlet Connection.** Swivel type, threaded 1" BSPP female.

**Nett Weight.** Approx. 1.1 Kg with spout fitted.

**Accessories** (to be ordered separately).

Bonding cable and clip, 1.2m or 2.0 metres long.

Inlet sight glass and Stainless Steel 100 mesh strainer.

**Approvals.** Meets the safety and Weights and Measures requirements of all European and most international markets, as well as TRbF 513, German approval 08/PTB Nr. III B/S 1080.

### ZVA25. Specification.

**Type.** Automatic 1" refuelling trigger nozzle.

**Operation.** Automatic venturi type high level cut off (patented), fitted with latched lever, and internal check valve.

**Flow Rate.** Up to 140 Litres/Minute.

**Working Pressure.** 0.5 to 3.5 Bar.

**Materials Of Construction.** Aluminium body and guard, Brass inlet swivel, Stainless Steel, Brass and Acetal internals, Nitrile/Vulkollan seals, oil resistant PVC scuff guard.

**Inlet Connection.** Swivel type, threaded 1" BSPP female.

**Nett Weight.** Approx. 1.5 Kg with spout fitted.

**Accessories** (to be ordered separately).

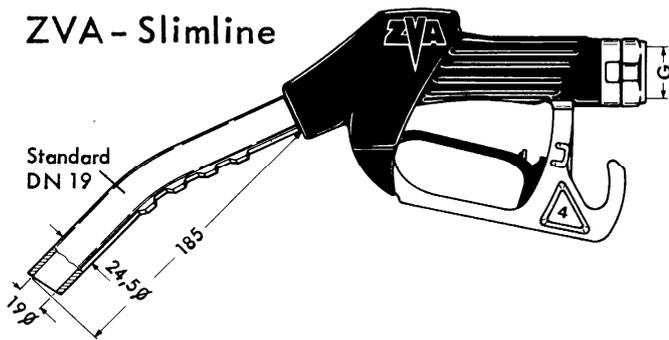
Bonding cable and clip, 1.2m or 2.0 metres long.

Inlet sight glass and Stainless Steel 100 mesh strainer.

Dust cap and spring loaded keep chain.

**Approvals.** Meets the safety and Weights and Measures requirements of all European and most international markets, as well as TRbF 513, German approval 08/PTB Nr. III B/S 1080.

## ZVA - Slimline

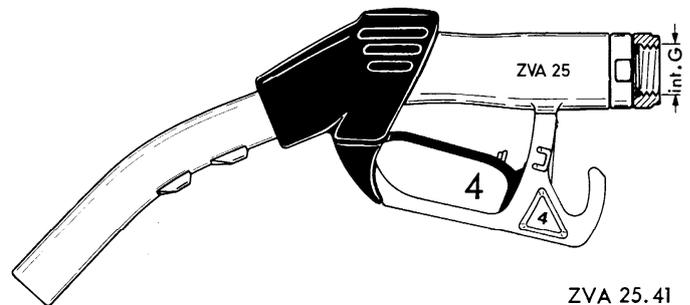


### ZVA Slimline. How To Order.

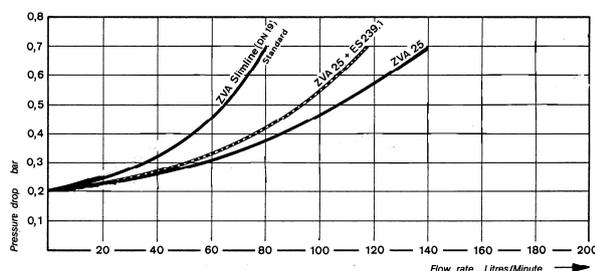
Quote part number 160ZVASTD for the basic nozzle, accessories must be ordered separately from the following list.  
 EKG plastic coated Stainless Steel bonding wire and Brass clip/plug.  
 1.2m long, 160EKG1200.  
 2.0m long, 160EKG2000.  
 SG1" Inlet Sight Glass, threaded 1" BSPP male by 1" BSPP female, 1600000SG1.  
 ES239.1 100 mesh Stainless Steel strainer, for use with inlet sight glass, 160ES239.1.

### ZVA25. How To Order.

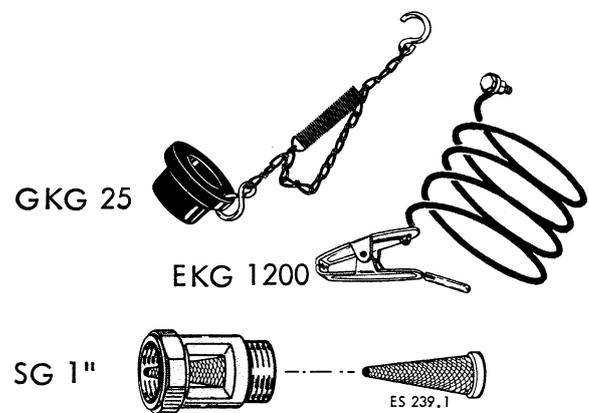
Quote part number 1600ZVA25.41 for the basic nozzle with spout, accessories must be ordered separately from the following list.  
 GKG Dust Cap with spring loaded keep chain, 16000GKG25.  
 EKG plastic coated Stainless Steel bonding wire and Brass clip/plug.  
 1.2m long, 160EKG1200.  
 2.0m long, 160EKG2000.  
 SG1" Inlet Sight Glass, threaded 1" BSPP male by 1" BSPP female, 1600000SG1.  
 ES239.1 100 mesh Stainless Steel strainer, for use with inlet sight glass, 160ES239.1.



### ZVA Slimline/ZVA25 Pressure Loss.



### ZVA Slimline/ZVA25 Accessories.



## WING MATS

### Wing mats.

Our wing mats are designed to protect the aircraft wing from damage by the hose and nozzle during overwing refuelling. They are manufactured from thick durable Urethane, which is fuel and ultraviolet light resistant, weatherproof, non-marking and non-abrasive. The mats are also heavy enough so that they will not become displaced in windy conditions. They are available in a range of colours but our normal stock colour is high visibility Orange. However, in order to reduce the risk of supplying the incorrect fuel grade (mis fuelling), we also stock Red (for Avgas) and Black (for Jet A1). Using the appropriate colour for the fuel being dispensed causes the refuelling operator to think about the fuel grade required, and any third parties (including the pilot) could also be more aware of the grade of fuel being delivered.



**Size: 460 x 610mm, opening diameter 127mm.**

Part no.

56AFP-1824 (Hi-Vis Orange)

56AFP-1824B (Black)

56AFP-1824R (Red)



**Size: 460 x 920 mm, opening diameter 127mm.**

Part no.

56AFP-1836 (Hi-Vis Orange)

56AFP-1836B (Black)

56AFP-1836R (Red)



### Overwing Refuelling Tags, Mis Fuelling Prevention.

When refuelling light aircraft the pilot is often not present which increases the risk of supplying the incorrect grade of fuel (mis fuelling). In order to reduce this risk, and at the request of one of the major fuel suppliers, we have developed a Refuelling Tag. After completion of each refuelling the appropriate Tag is filled in by the refuelling operator and tied to the controls of the aircraft. When the pilot return to the aircraft it is then absolutely clear to him which grade of fuel has been delivered before he attempts to move the aircraft.

**Jet A1 Refuelling Tag.** Pack of 50.

Part no. 0906000133.

IN ACCORDANCE TO YOUR INSTRUCTIONS AND THE FUEL GRADE LABEL ON THE AIRCRAFT, YOUR AIRCRAFT HAS BEEN FUELLED WITH _____ LITRES OF _____		AIRCRAFT REG _____
_____		TIME _____
<b>JET A-1</b>		RECEIPT NO _____
_____		FUELLED BY _____

**Avgas Refuelling Tag.** Pack of 50.

Part no. 0906000134.

IN ACCORDANCE TO YOUR INSTRUCTIONS AND THE FUEL GRADE LABEL ON THE AIRCRAFT, YOUR AIRCRAFT HAS BEEN FUELLED WITH _____ LITRES OF _____		AIRCRAFT REG _____
_____		TIME _____
<b>AVGAS</b>		RECEIPT NO _____
_____		FUELLED BY _____

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## TW FLEXIBLE EXPANSION JOINTS

- ◆ **PROVIDES FLEXIBILITY IN THE PIPEWORK SYSTEM**
- ◆ **ALLOWS FOR PIPEWORK EXPANSION, VIBRATION AND MISALIGNMENT**
- ◆ **SUITABLE FOR PRESSURE OR SUCTION DUTY**
- ◆ **ELECTRICALLY CONDUCTIVE**
- ◆ **CAN BE FITTED BETWEEN TANK AND PIPEWORK**



### Introduction.

In fluid handling systems it is often necessary to make allowance for pipework expansion, vibration and slight misalignment. This is particularly recommended where a large flexibly mounted component, such as a storage tank, or a vibrating mass, such as a pump or hose reel, is connected to the system. This flexibility is normally achieved by fitting a flexible expansion joint.

### Description.

The Elaflex TW Flexible Expansion Joint consists of a flexible centre section mounted between two flanges. The inner liner is Nitrile rubber which resists all light hydrocarbon products with less than 50% aromatics content, furnished with an electrically conductive Chloroprene cover for static charge dissipation. The flanges are forged Aluminium in accordance with the TW pattern which is commonly used on road tanks. Other flange configurations are available to special order, please consult our sales department.

The TW Flexible Expansion Joint can be connected to the mating flanges without the use of additional gaskets due to the overlapping profile of the rubber section. It is suitable for use in

pressure or vacuum applications, however, if it is used under high vacuum conditions we recommend that a Stainless Steel Vacuum Support Ring is fitted.

Aljac Fuelling Components holds stock of complete assemblies from 50 mm to 150 mm diameter, and also replacement centre sections.

### Technical Specification.

Type. Elaflex TW Flexible Joint, Yellow ring.

Construction. Seamless Nitrile rubber liner, rubberised Nylon reinforcing layer, Chloroprene CR cover, forged Aluminium flanges, Stainless Steel Vacuum Support Ring (optional).

### Properties.

Electrical Resistance: Between one thousand and one million Ohms.

Maximum Working Pressure: 10 Bar.

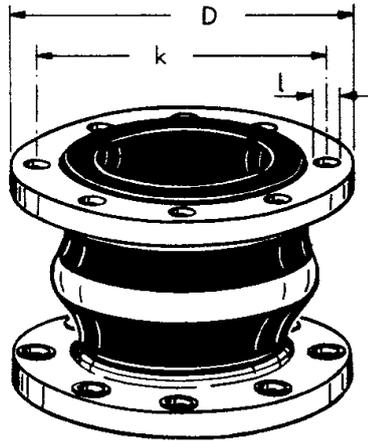
Test Pressure: 16 Bar.

Maximum Working Temperature: 90 Deg C.

### How To Order.

Select the size and duty and contact Aljac Fuelling Components with the relevant part number from the table overleaf.

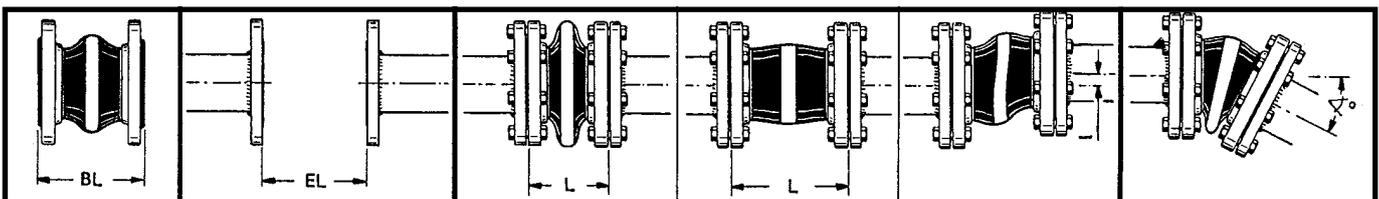
**Dimensions.**



**WARNING.** It is essential that the system builder observes the correct installation methods and follows the manufacturers installation recommendations. Copies are available on request.

Description	Size (mm)	Part Number	Flange Dimensions (mm)			Weight (Kg)	Maximum Vacuum (m water)
			D	k	l		
ERV50, without Vacuum Support Ring	50	70ERV050TWY	154	130	8 x 11.5	1.20	4
ERV50 with Vacuum Support Ring	50	70ERV050TWY1	154	130	8 x 11.5	1.25	10
ERV80, without Vacuum Support Ring	80	70ERV080TWY	154	130	8 x 11.5	1.35	4
ERV80 with Vacuum Support Ring	80	70ERV080TWY1	154	130	8 x 11.5	1.40	10
ERV100, without Vacuum Support Ring	100	70ERV100TWY	174	150	8 x 14.0	1.65	3
ERV100 with Vacuum Support Ring	100	70ERV100TWY1	174	150	8 x 14.0	1.70	10
ERV150, without Vacuum Support Ring	150	70ERV100TWY	240	176	12 x 14.0	3.30	-
ERV150 with Vacuum Support Ring	150	70ERV150TWY1	240	176	12 x 14.0	3.36	7

**Installation and Allowable Movement.**



Free Length (mm)	Flange Face to Face Installation Length (mm)		Allowable Movement In Service (mm)			Angular Rotation (degrees)	Size (mm)
	Minimum	Maximum	Minimum Length	Maximum Length	Maximum Lateral Offset		
130 +5 -0	120	135	100	160	+30 -30	+30 -30	DN50
130 +5 -0	120	135	100	160	+30 -30	+30 -30	DN80
150 +5 -0	140	155	115	180	+30 -30	+20 -20	DN100
150 +5 -0	140	155	115	180	+30 -30	+20 -32	DN150

# **APOLLO BRONZE DEADMAN BALL VALVE**

◆ **SPRING CLOSE OPERATION**

◆ **BRONZE CONSTRUCTION**

◆ **COMPACT ECONOMICAL DESIGN**

◆ **ROBUST SPRING RETURN UNIT**

**Introduction.**

With the increased need for operational safety and environmental awareness, in many applications the risks associated with inadvertently leaving a ball valve fully or partially open are now unacceptable. The “Deadman” operating principle is therefore required, where releasing the ball valve handle automatically causes the valve to close.

This has traditionally been achieved by fitting a clock type torsion spring box to a standard ball valve via tailor made mounting brackets, and has presented a number of problems. The torsion spring is prone to failure when abused, and the combination with a standard ball valve requires an excessive operating torque which in turn imparts unusual pipework loadings. Also, because the valve and spring return units have been designed in isolation, the brackets are usually complex and themselves prone to failure. The overall system is expensive and bulky, with the spring return unit often costing more than the valve itself.

However, a practical and inexpensive alternative solution is now available.



**The Apollo Deadman Ball Valve.**

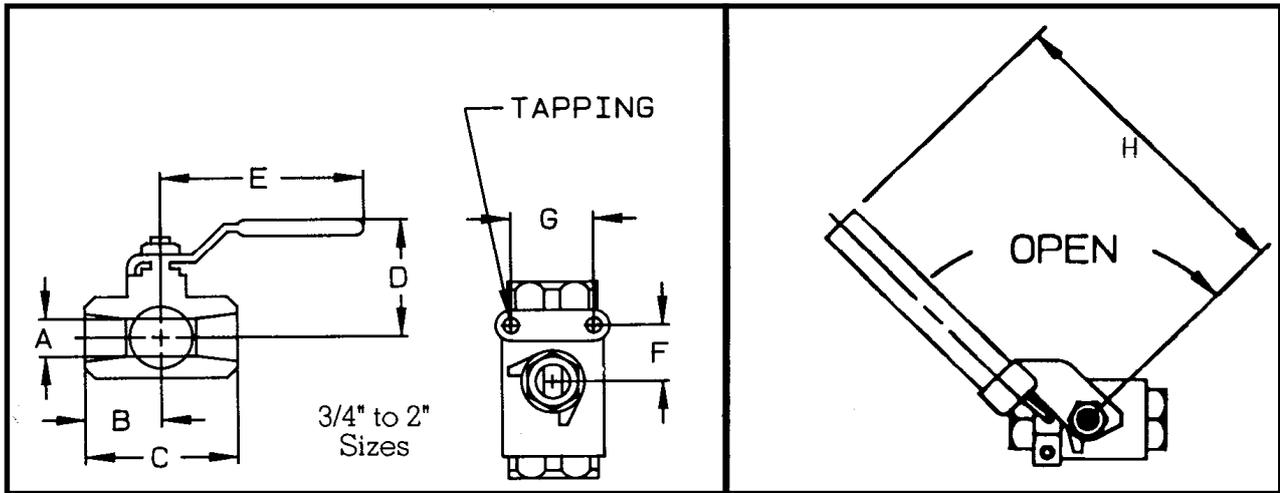
The Apollo Deadman Handle and Series 71 Ball valve have been designed in parallel to produce a workable solution to the problems outlined.

The Series 71 Ball valve is constructed from Bronze with a Brass ball and stem, the seats and seals are reinforced PTFE. The ball is Chrome plated and the stem is of a blow out proof design. The end connections are threaded NPT female. However, the valve also has an integral mounting pad to secure the Deadman Handle directly, without the need for complex, expensive, and unreliable brackets.

The Deadman Handle is of all Stainless Steel construction and utilises an adjustable compression spring fitted inside the handle itself., and the spring load can be quickly set on site to give the optimum operating torque. The handle is plastic covered and is 25 mm in diameter to give comfortable hand grip and easy operation.

The combination of handle and valve amounts to the most reliable, most compact and most cost effective answer to the Deadman Ball Valve requirement.

**Layout.**



**Overall Dimensions.**

Size	Dimensions (mm)								Cv	Part Number	
	A	B	C	D	E	F	G	H		(NPT ends)	(BSPP ends)
1\4"	9.4	26.2	52.3	44.5	98.3	12.7	28.5	177.8	6.8	0607150101	-
3\8"	9.4	26.2	52.3	44.5	98.3	12.7	28.5	177.8	6.8	0607150201	-
1\2"	12.7	28.4	57.2	46.0	98.3	12.7	28.5	177.8	9.8	0607150301	06071503P01
3\4"	17.3	38.1	76.2	53.8	123.7	22.1	34.8	177.8	25	0607150401	06071504P01
1"	22.1	42.7	85.6	57.2	123.7	22.1	34.8	177.8	35	0607150501	06071505P01
1.1\4"	25.4	50.8	101.6	66.6	139.7	23.6	38.1	228.6	47	0607150601	-
1.1\2"	31.8	55.4	111.0	77.5	203.2	23.6	38.1	228.6	81	0607150701	06071507P01
2"	38.1	69.9	139.7	82.3	203.2	23.6	38.1	228.6	105	0607150801	06071508P01

**Technical Specification.**

Two piece reduced bore ball valve, blow out proof stem, adjustable gland packing.  
 600psi WOG rating.  
 NPT female end connections.  
 Spring closed design.  
 Valve body material Bronze B584-C84400.  
 Ball and stem material Brass B16, ball Chrome plated,  
 Ball and stem seals Reinforced PTFE.  
 Deadman handle components all Stainless Steel.

# APOLLO STAINLESS STEEL DEADMAN BALL VALVE

## ◆ SPRING CLOSE OPERATION

## ◆ STAINLESS STEEL CONSTRUCTION

## ◆ COMPACT ECONOMICAL DESIGN

## ◆ ROBUST SPRING RETURN UNIT

### Introduction.

With the increased need for operational safety and environmental awareness, in many applications the risks associated with inadvertently leaving a ball valve fully or partially open are now unacceptable. The “Deadman” operating principle is therefore required, where releasing the ball valve handle automatically causes the valve to close.

This has traditionally been achieved by fitting a clock type torsion spring box to a standard ball valve via tailor made mounting brackets, and has presented a number of problems. The torsion spring is prone to failure when abused, and the combination with a standard ball valve requires an excessive operating torque which in turn imparts unusual pipework loadings. Also, because the valve and spring return units have been designed in isolation, the brackets are usually complex and themselves prone to failure. The overall system is expensive and bulky, with the spring return unit often costing more than the valve itself.

However, a practical alternative solution is now available.



### The Apollo Deadman Ball Valve.

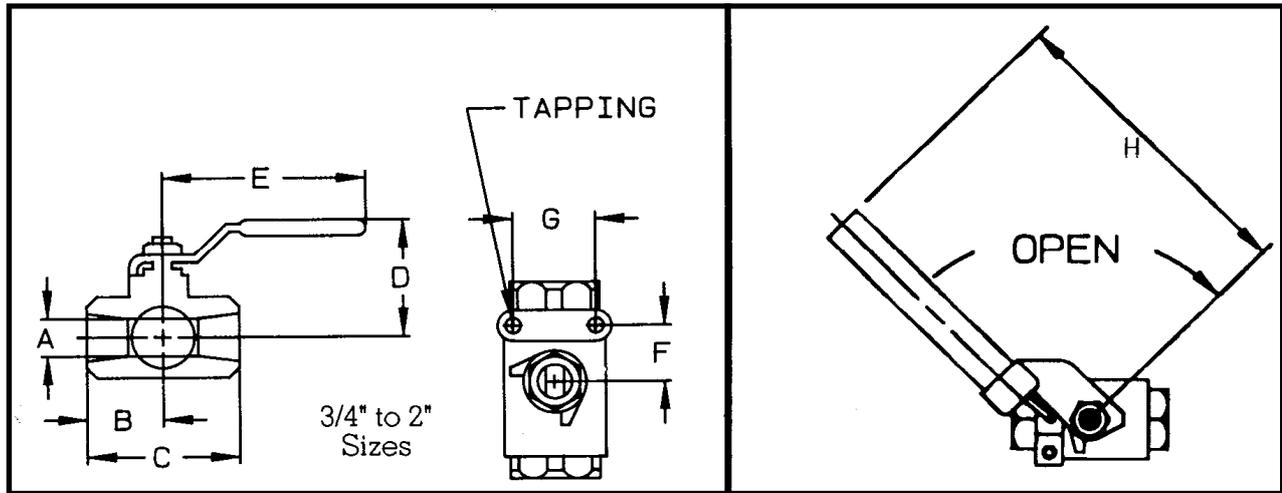
The Apollo Deadman Handle and Series 76 Ball valve have been designed in parallel to produce a workable solution to the problems outlined.

The Series 76 Ball valve is constructed from investment cast Type 316 Stainless Steel and meets the requirements of NACE MR-01-75, the seats and seals are reinforced PTFE. The end connections are threaded NPT or BSPP female. However, the valve also has an integral mounting pad to secure the Deadman Handle directly, without the need for complex, expensive, and unreliable brackets.

The Deadman Handle is of all Stainless Steel construction and utilises an adjustable compression spring fitted inside the handle itself, and the spring load can be quickly set on site to give the optimum operating torque. The handle is plastic covered and is 25 mm in diameter to give comfortable hand grip and easy operation.

The combination of handle and valve amounts to the most reliable, most compact and most cost effective answer to the Deadman Ball Valve requirement.

**Layout.**



**Overall Dimensions.**

Size	Dimensions (mm)								Cv	Part Number	
	A	B	C	D	E	F	G	H		(NPT ends)	(BSPP ends)
1\4"	9.4	26.2	52.3	44.5	98.3	12.7	28.5	177.8	6.8	0607650101	06076501P01
3\8"	9.4	26.2	52.3	44.5	98.3	12.7	28.5	177.8	6.8	0607650201	06076502P01
1\2"	12.7	28.4	57.2	46.0	98.3	12.7	28.5	177.8	9.8	0607650301	06076503P01
3\4"	17.3	38.1	76.2	53.8	123.7	22.1	34.8	177.8	25	0607650401	06076504P01
1"	22.1	42.7	85.6	57.2	123.7	22.1	34.8	177.8	35	0607650501	06076505P01
1.1\4"	25.4	50.8	101.6	66.6	139.7	23.6	38.1	228.6	47	0607650601	06076506P01
1.1\2"	31.8	55.4	111.0	77.5	203.2	23.6	38.1	228.6	81	0607650701	06076507P01
2"	38.1	69.9	139.7	82.3	203.2	23.6	38.1	228.6	105	0607650801	06076508P01

**Technical Specification.**

Two piece reduced bore ball valve, blow out proof stem , adjustable gland packing.

2000 psi WOG rating.

NPT or BSPP female end connections.

Spring closed design.

Valve body , ball, stem and handle material type 316 Stainless Steel.

Ball and stem seals Reinforced PTFE.

## SIGHT FLOW INDICATORS

TO VISUALLY CHECK FLOW, COLOUR AND CONDITION OF LIQUIDS

- ◆ **STAINLESS STEEL FLAP AND SCALE (STYLE F)**
- ◆ **PTFE SPINNER (STYLE S)**
- ◆ **CE MARKED AND PED COMPLIANT**
- ◆ **PRESSURES UP TO 40 BAR**
- ◆ **TEMPERATURES UP TO 250°C**
- ◆ **SHORT LEAD TIMES**
- ◆ **DESIGNED AND MANUFACTURED IN THE UK**

Style S



### Application

These sight glasses are used to check for the presence of liquid in a piping system. There are three variants, style P, style S or style F. They can be used in vertical or horizontal lines and the integral drip lip in the style P unit makes it ideal for leak detection. The highly visible PTFE spinner in the style S unit is used to check the flow of a liquid in a pipeline, and the flap in the style F unit can be used for flow rate monitoring.

Style F



### Available Options

**Body:-** It is possible supply sight glasses in special materials such as super duplex or low Carbon Steels. Sight glasses conforming to NACE MR0175 can be produced.

**Glass:-** High pressure toughened soda lime to BS3463 rated to 40 bar, toughened borosilicate to BS3463 or DIN7080 rated up to 16 bar. The high pressure range uses powder coated mild steel covers as standard. Stainless steel covers are available as an option.

**Spring:- (style F only):-** For high flow rates and vertical pipelines the flap can be spring loaded, this option gives three times the normal flow range.

### Quality

All flow indicators are manufactured to the highest standards and the quality system is independently audited by BSI and certified to ISO 9000. The indicators are fully PED compliant and can be CE marked where required. Full material traceability is maintained. Material certificates and pressure test certificates can be supplied on request.

### Construction

The bodies can be cast Carbon Steel or 316 Stainless Steel. The glass windows are held in place by Stainless Steel covers and screws, and sealed with PTFE gaskets, giving superior protection. For ease of maintenance the glasses can be individually removed and replaced. For standard applications the indicator is fitted with toughened soda lime glass discs to BS3463 rated to 16 Bar.

The sight glasses can be supplied with the ends threaded female NPT, BSP parallel or taper. Standard flanges are ANSI 150, ANSI 300 and PN16, but special flanges and socket weld ends can also be supplied.

Style P



## Specification Code and Part Number

### CODE

### DESCRIPTION

S	Stainless steel body BS 1504 316 C16
C	Carbon steel body BS 1504 161 GR480
P	Plain
F	Flap
S	Spinner

### Glass Material & Pressure Range

-	Toughened soda lime glass to BS3463 rated to 16 bar (standard)
H	Toughened soda lime glass to BS3463 rated to 40 bar
B	Toughened borosilicate glass to BS3463
HB	Toughened borosilicate glass to DIN 7080

### Approx. Flow Rate (style F)

### Min Flow (style S)

	Indicator Size	Scale Reading	Litres/minute					
			2	4	6	8	10	
015	15mm	½"	3.0	4.5	5.5	8.0	20.0	3.5
020	20mm	¾"	3.0	5.0	6.0	9.5	20.0	4.2
025	25mm	1"	3.5	6.0	8.0	13.0	30.0	7.0
040	40mm	1½"	8.5	12.5	16.7	25.0	55.0	17.0
050	50mm	2"	11.0	18.0	25.0	38.0	70.0	25.0
080	80mm	3"		29.0	46.0	64.0	118.0	230.0 60.0
100	100mm	4"	53.0	86.0	127.0	188.0	400.0	100.0
150	150mm	6"		Given on request				250.0
200	200mm	8"		Given on request				500.0

### End Connections

A	ANSI 150
C	ANSI 300
N	PN16
1	BSP
2	BSPT
3	NPT
4	Socket Weld

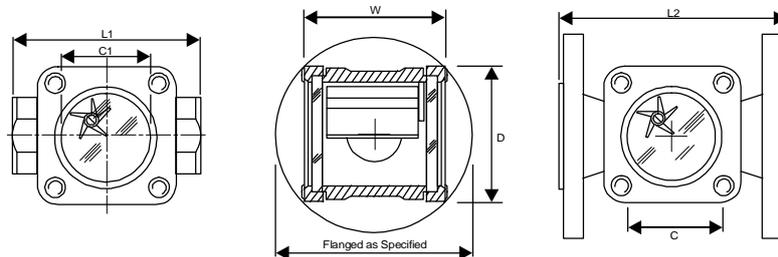
**Example: CF H 025A. Carbon Steel Style F (with flap), toughened Soda Lime glass (40 Bar), flanged 1" ANSI150lb**

### Materials of Construction

Covers (Standard) - Stainless Steel BS 1504 304 C15  
 (High Pressure) - Powder coated mild steel  
 Internal Gasket - PTFE  
 External Gasket - Klingersil C4400

Edge Protector - Klingersil C4400  
 Fasteners (Standard) - A2 Stainless Steel  
 (High Pressure) - High tensile steel

### Dimensions



NOMINAL BORE	LENGTH L1	LENGTH L2	WIDTH W	DEPTH D	CLEARVIEW C
15/20mm	85	130	63	60	42
25mm	95	140	72	66	48
40mm	120	180	102	84	62
50mm	150	220	118	106	77
80mm	N/A	260	160	170	100
100mm	N/A	260	196	170	100
150mm	N/A	360	304	220	150
200mm	N/A	360	N/A	220	150

# MIDAS FUEL SELECTIVE VALVE

- ◆ **PREVENTS DELIVERY OF THE INCORRECT FUEL INTO THE STORAGE TANK**
- ◆ **FULLY AUTOMATED, INTELLIGENT CONTROL AT THE FILLING POINT**
- ◆ **POSITIVE SHUT OFF**
- ◆ **STAND ALONE, SELF POWERED**
- ◆ **ROBUST CONSTRUCTION**



## The problem.

For many years the major fuel suppliers have been acutely aware of the risks associated with loading the wrong grade of fuel onto aircraft because aircraft misfuelling has serious consequences. A turbo prop aircraft which requires Jet Fuel will continue to operate (albeit very inefficiently) if it is refuelled with Avgas. However, an Avgas piston engined aircraft will not run at all if it is refuelled with Jet Fuel, and so this situation carries the biggest risk because it could cause engine failure in flight.

Aircraft refuelling operators are normally very knowledgeable about the fuel grade required for various aircraft types, however, certain aircraft look very similar to each other but require different fuel. Many precautions have been taken in order to minimise the probability of aircraft misfuelling at the aircraft wing, including a joint initiative between the fuel suppliers and the aircraft manufacturers to set 'grade selective' fuelling nozzle and filling orifice sizes, decals stuck to the aircraft wing which state the fuel grade, refuelling nozzle colour coding, hose end wraps which state the fuel grade, colour coded wing protection mats, and tie on tags for the aircraft control column. Aljac Fuelling Components supplies all of the above products, but still there is the risk of misfuelling due to human error.

In addition, there is also a major area of risk when a bulk delivery is made to a refuelling depot which contains both Avgas and Jet Fuel storage tanks. These deliveries are sometimes driver controlled so they are made when no depot staff are in attendance, and it is quite possible that the incorrect fuel could be delivered into the storage tank. Under such circumstances this incorrect fuel could then be loaded directly onto an aircraft, or into a refuelling vehicle which will in turn refuel an aircraft. In this situation, all of the above mentioned safeguards which have been applied on the refuelling vehicle or the aircraft would be redundant and completely ineffective.

## History.

A number of attempts have been made to solve this problem over many years, most of them involving a pilot operated control valve which is fitted to the fuel storage tank inlet point. Density sensitive pilots using floats have been the most common method of identifying the fuel grade being supplied, but up until now none of these systems have been found to be sufficiently reliable to gain widespread acceptance, which of course is not surprising given the crude nature of the technology itself. However, alternative more advanced technologies have now evolved to the point where they can be utilised to dramatically improve this

potentially hazardous situation.

### Introducing MIDAS.

The problem of misfuelling does not only exist in aviation refuelling, it is also a problem when refuelling cars and trucks. MIDAS was developed as a safeguard against delivering the incorrect fuel into forecourt fuel storage tanks, and it has been very successful in differentiating between petrol (gasoline) and diesel fuel. It is already fitted to a large number of installations all over the world and its usage is becoming increasingly widespread as it gains acceptance by the major fuel suppliers. So if MIDAS can differentiate between petrol and diesel fuel, logically it should also be able to differentiate between Avgas and Jet Fuel, **AND IT CAN.** Aljac is now able to offer you MIDAS to protect your aviation fuel system against delivery of the incorrect fuel.

MIDAS is the Misfuel Identification and Avoidance System, and it is fitted to the fuel storage tank filling point to protect against the incorrect fuel being delivered into that tank.

MIDAS consists of a housing containing a butterfly type Valve which is driven open/closed by a low current high torque DC electric motor, a Battery Pack and a Sensing Cell and Float. A Control Unit is also fitted which contains a microprocessor, status indicator LEDs, a sounder and a wireless interface. The Sensing Cell and Float is the heart of the unit because it checks the incoming fuel and feeds data (which includes specific gravity, refractive index and temperature) to the microprocessor, which then uses algorithms to produce a rating number for the fuel. If the rating number does not correlate with that for the correct fuel (within a tolerance band) MIDAS will prevent the incorrect fuel from passing into the storage tank.



**Control Unit**

### Installation and operation.

MIDAS uses a series of electronic Keys which communicate with the Control Unit using a wireless infra-red link. The Keys are motion activated in order to maximise battery life, so to communicate with MIDAS it is only necessary to shake the relevant Key and to hold it label down adjacent to the Control Unit.

When a fuel delivery is to be made, the driver



**Operator Key**

connects the delivery hose and activates MIDAS with the Operator Key. All three LEDs will flash and there will be three tones from the sounder which indicates that the MIDAS is now active. After completion of the diagnostic phase the green LED will flash every 2 seconds to indicate that MIDAS is ready to accept fuel. The tanker valve(s) can then be opened, but if fuel is not supplied within 5 minutes MIDAS will enter the hibernation state again, and must then be re-activated by using the Operator Key. After fuel is introduced the Valve will partially open for 5 minutes in order to allow the air out of the system and introduce fuel to the Sensing Cell. MIDAS will then check if the fuel is correct or incorrect.



**Valve part open**

### Correct fuel.

If the fuel is correct MIDAS will enter the 'approved fuel' condition. The sounder will emit a double tone and the Valve will open fully which allows the fuel delivery to proceed. MIDAS continues to monitor the fuel every 0.6 sec for the full duration of the fuel delivery and the green LED will continue to flash every 2 seconds. At the end of the fuel delivery the Float senses that fuel is no longer present and MIDAS will enter the 'drain down' phase. The Valve will partially close, the sounder will emit a double tone, the red LED will flash every 2 seconds, and MIDAS will remain in this condition for 5 minutes in order to allow the driver to drain the hose.



**Valve fully open**



**Green LED**

After draining the hose down it can be disconnected and MIDAS will re-enter the hibernation state.

### Incorrect fuel.

If the fuel is incorrect MIDAS will enter the 'misfuel' condition'. The Valve will close fully, the sounder will emit intermittent tones for 30 seconds and the red LED will flash rapidly for 2.1/2 minutes. It will then be necessary to use the Override Key which is kept in the office by the supervisor. When this Key is presented to the Control Unit the Valve will open for 30 seconds (default) to allow the driver to drain the hose. The tanker must then be taken away.



**Red LED**



**Override Key**

The use of the Override Key and the Valve open time can be adjusted in the software to suit the client's preference.

### **Critical failure.**

If a problem is detected during the diagnostic phase the Valve will remain fully closed, the sounder will emit intermittent tones and the amber LED will flash for 2.1/2 minutes. MIDAS cannot then be used until the fault is corrected.

### **Low battery power.**

If less than 80% of battery life is detected during the diagnostic phase the amber LED will flash alongside the green LED for 30 secs at the start of the delivery. At less than 90% of battery life a 'critical failure' condition will be generated (as described above).

### **Features.**

MIDAS is fail safe. It stays closed in the event of the incorrect fuel being delivered, or low battery power, or a fault developing, and due to the low power requirement and simple design the unit requires minimal maintenance. The Battery Pack will typically last approximately 5 to 7 years (based on two deliveries per day), and can be replaced very easily.

### **Shipping Specification.**

Overall dimensions, 231mm high x 214mm wide x 206mm deep. Nett weight, 13Kg (all excluding flanged adapters).

### **Specification.**

**Description:** Butterfly Valve driven by a low power high torque motor. Sensing Cell and Float system. Control Unit with microprocessor, infra-red wireless link, Red/Green/Amber indicator LEDs and a sounder.

**Materials of construction:** LM25 Aluminium alloy body. 304 Stainless Steel covers, Valve disc and stem. PTFE Valve seat. Stainless Steel Float and mechanism.

**External surface finish:** Chromate pre-treatment with a Polyester paint finish.

**Maximum working pressure:** 10.5 Bar.

**Test pressure:** 21 Bar.

**Operating temperature range:** -40degC to +60degC.

**End connections:** Flanged with 4xM12 threaded holes on a 145mm square pattern, 207mm face to face. Supplied complete with bolts and Viton gasket. Various flanged and threaded connecting adapters are available to order (including 3 inch and 4 inch ANSI150lb).

**Mounting orientation:** Horizontal, vertical or any intermediate orientation. Note:- The mounting

In the event of maintenance being required a hand held Datatec unit is available for calibration, parameter changes, data capture, event logging and fault diagnosis by the service engineer.



**Datatec unit**

MIDAS is approved to ATEX Zone 1 (Europe), TR-CU GOST-R (Russia) and IEC Ex (International). It has also been tested to FM (United States) and CSA (Canada).

Because MIDAS is programmed to only accept the desired fuel grade, it has the added advantage that it will also sense the presence of water, so it is impossible to put bulk water into the fuel storage tank.

Although MIDAS has been designed to be the first line of defence against the incorrect fuel grade being delivered into your fuel storage tanks, it also has many other potential applications within the fuel supply system. Please tell us if you require this technology to solve a problem for you!

orientation must be advised at time of order placement.

**Power supply:** 10.8 Volts 14 Ah High Energy replaceable Lithium Thionyl Chloride battery pack.

**Battery life:** Approximately 5 to 7 years based on two deliveries per day.

**Cable gland entries:** M20 fitted with blanking plug. Ex d rated cable glands must be used (not included).

### **Applicable Standards.**

Hazard classification: Ex d[ia Ga] IIB T4 Gb.

Approvals: ATEX, Sira 12ATEX1292X. IECEx, SIR 12.0131X.

### **How to order.**

Quote the following part numbers:-

**MIDAS valve: MIDVEX01.**

**Operator Key: MIDVEXMC003.**

**Override Key: MIDVEXMC004.**

**Datatec Unit: MIDVDATMC001.**

Please specify:-

End connections and mounting orientation.

The fuel to be accepted, Jet A-1 or Avgas. MIDAS will then be programmed to accept **ONLY** the specified fuel grade.

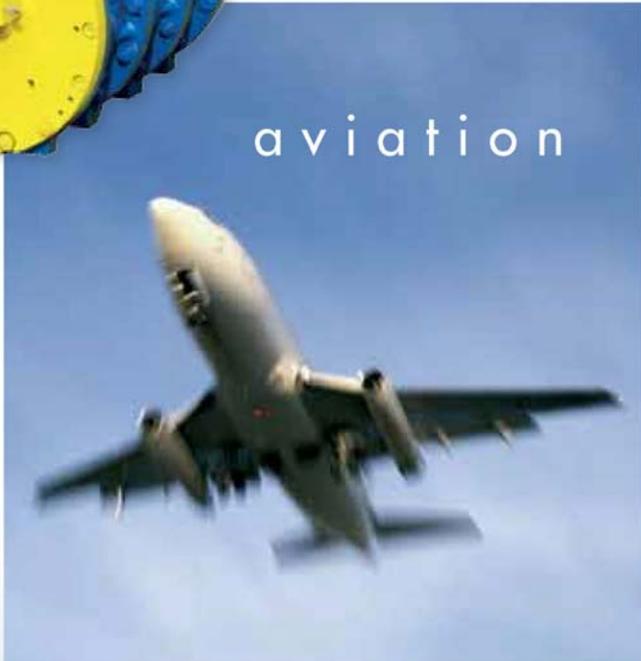
**SO NO INCORRECT FUEL DELIVERIES.**

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**Aljac**

**ISOIL**  
I M P I A N T I



aviation

**Fuel metering systems**



DSS1210-10



metering solutions for:

### The solutions that count...

...this statement defines the values, driving force and motivation behind Isoil Impianti spa, which is of the utmost importance to our company's future.

- **We** aim to provide enhanced solutions and service, to meet the ever changing demands of our customers and of the petrochemical Industry.
- **We** want to provide our customers with pioneering systems, measuring solutions and service, incorporating the latest technologies.
- **We** want to supply our customers with solutions which will integrate with measurement automation and control systems.
- **We** want to establish long lasting relationships with our customers based on mutual trust and understanding.

These are our goals. This commitment involves and unifies everyone in our company.

### Area of activity

Isoil Impianti is active in specific downstream oil&gas industries and our metering solutions are dedicated to the following markets:

- **A**viation fuel systems for both civil and military use
- **R**efinery and terminals truck, train and ship fuel loading and unloading including pipeline metering
- **O**n board trucks for oil distribution discharge metering
- **F**uel for marine use, on board or off board metering

All our systems are designed to fulfill the actual legislation for custody transfer use according to OIML, MID and a large number of local approvals.





t e r r i t o r i e s

**Isoil Impianti** is certified to ISO 9001:2008 quality standards and operates through a network of subsidiaries and representatives in key locations around the world.



m a r k e t s

Our company is committed to expanding its presence throughout the world, offering its experience, gained in almost fifty years of operation and development. Aware of the importance of service in providing quality customer support, we are constantly selecting and training new agents and distributors, working with them and assisting them to grow, in order to offer our customers the best possible service and after sales support. Thanks to these continuing efforts, Isoil has become the partner of most leading oil companies worldwide.



# Hydrant and dispenser vehicle

Our metering system is one of the most popular vane meters for vehicles loading fuels into airplanes everyday in many airports worldwide.



Meters on board





### Ground installation

Our metering systems are used to fill helicopters, refuelling trucks and small aircraft at many locations including civil airports, offshore platforms and military bases.



Meters on site





## Calibration service

Metior is the ISOIL division for calibration activities.

The laboratory has been accredited by the Italian authority as number 108, in conformity with ISO/IEC 17025. Calibration activities are for PD meters and calibrated tanks (proving tanks).

Besides on site calibration, Metior offers field calibration with its own calibrated tanks and Master Meters.

ISOIL  
I M P I A N T I

Calibration





## Additive Injection

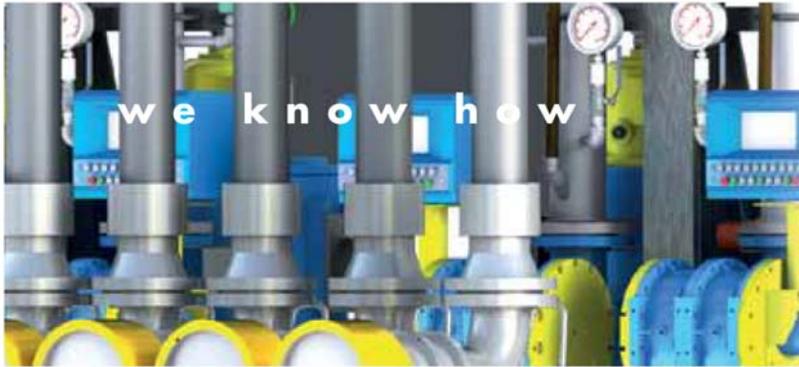
Our additive systems are used in aviation and downstream applications which use anti-static and corrosion inhibitor and they are also used for fuel enhancement additives such as octane improvers.

ISOIL  
IMPIANTI

Additive Injection



we know how



**More than 40 year experience** allows us to understand and solve customer's needs and requirements for light petroleum measurement. By understanding customer's procedures, we can provide turn key solutions that do not interfere with the daily operations, enhancing measuring and movement efficiency and control. This includes the latest (and more restrictive) safety procedures.

**As a full package solution provider**, we can design, build, test and commission advanced metering systems. Our turn key solutions include skid mounted systems, that can be tested and commissioned at our production facility, allowing fast and trouble free on site installation with minimum inconvenience to existing operations.



**Isoil Impianti has full certification** for Explosion Proof Devices (ATEX), Pressure Equipment (PED) and Metrological Certification (MID). We have Weights & Measures Office certification for China, Russia, South Africa, Kazakistan and many other countries.

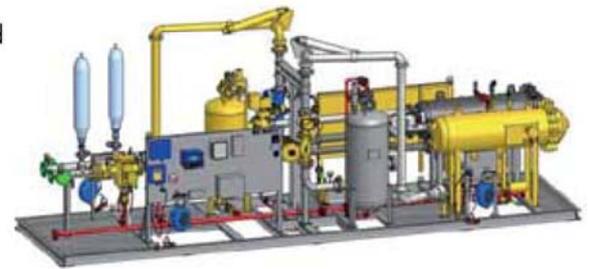
With such certification and with our independent certified calibration laboratory, we are the right partner to provide appropriate, reliable and cost effective metering system solutions.

All our meters are tested according to the Aviation JIG specification.

**With technology packages** such as 3D Autocad, trained and experienced engineers and certified sub-suppliers, Isoil Impianti makes solutions to meet the customer requirements by working together as a team.

Isoil Impianti has recently designed, built and commissioned several skids for truck and train loading, additive injection and bio-diesel applications.

We also supplied several software solutions for supervision, control and automatization of oil movement products in several oil terminals and airports both in Italy and in foreign countries.



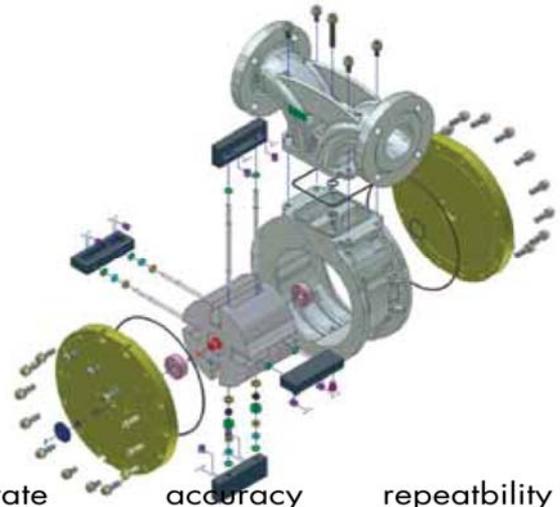
Our PD meters have an excellent accuracy and repeatability.

For a mechanical head a calibration mechanism with a micrometer adjuster is used to accurately set the position of the calibrating curve.

If an electronic VEGA counter is used, the calibration is obtained changing its K-factor.

With this dynamic calibration system it is possible to correct the linearity of the meter error curve, hence obtaining the minimum error at all flow rates.

Thanks to high accuracy our PD meters are often used as Master Meters to calibrate others meters of different brands and types.

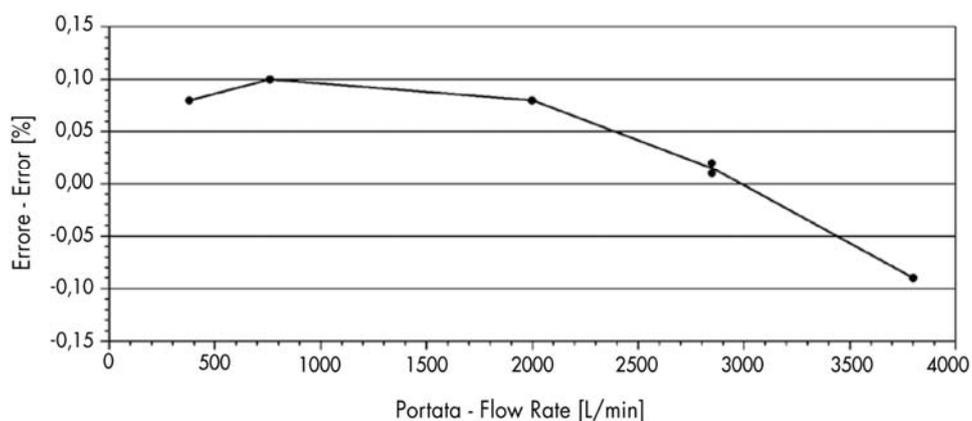


model	size	flow rate	accuracy	repeatability
<b>SBM32</b>	1½"	30 - 350 l/min	±0.2%	±0.04%
<b>SBM75<sup>(1)</sup></b>	2"	50 - 500 l/min	±0.15%	±0.02%
<b>SBM150</b>	3"	100 - 1300 l/min	±0.1%	±0.01%
<b>BM200<sup>(1)</sup></b>	3"	100 - 1500 l/min	±0.1%	±0.01%
<b>BM400<sup>(1)</sup></b>	4"	200 - 2600 l/min	±0.1%	±0.01%
<b>BM600<sup>(1) (2)</sup></b>	6"	300 - 4000 l/min	±0.1%	±0.01%
<b>LBM1000</b>	8"	700 - 7850 l/min	±0.15%	±0.02%
<b>LBM3000</b>	10"	1500 - 15700 l/min	±0.15%	±0.02%

(1) Available also in stainless steel  
(2) Alluminium manifold

All meters are supplied with thier own calibration certificates according to JIG calibration criteria, an example is in the table below.

flow rate	meter reading	proving tank reading	error %	note
380	5004	5000	0,08	
760	5002	4997	0,10	Test at 20% of Q max
2000	4999	4995	0,08	
2850	5000,5	5000	0,01	1st test at 75% Q max
2850	5001	5000	0,02	2nd test at 75% Q max
3800	4999,5	5004	-0,09	



Some examples of our meters



1 1/2" SBM32 with mechanical register



2" SBM75 with flow rate indicator



2" SBM75 MK2 stainless steel with EM6422 pulse emitter



3" SBM150 Aluminium meter body with EM6422 pulse emitter



3" BM200 with Vega T electronic register



4" BM400 with Vega T electronic register



4" BM400 with Vegall electronic register



6" BM600 with EM6422 pulse emitter



10" double case meter LBM3000 with Vega II register



### Electronic register

Vega T

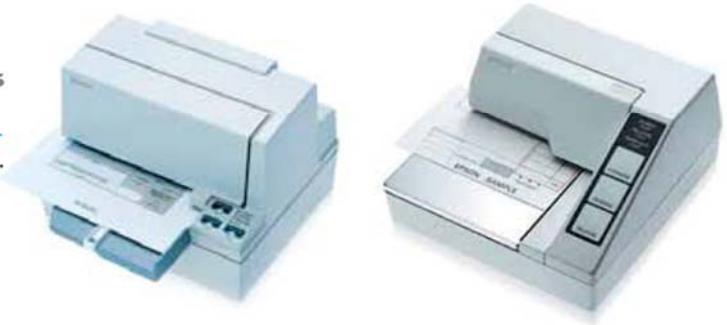
Light compact case.  
 Remote mounting  
 Totalizer, temperature compensator, preset register, error meter linearization.  
 Host computer and printer communication.  
 ATEX approved.  
 24 Vdc or 110 Vac or 230 Vac power supply.



### Electronic ticket printers

#### ST series

Electronic single ticket printer for safe areas. Used in conjunction with single Vega head. RS232 serial port communication (RS422 or RS485 with converter).



### Badge / Card reader

#### RF-ID

- Transponder reading without display and keyboard.
- Compact execution.
- ATEX version.



### Remote display / rate of flow indicator

#### LFD and ROF

LFD-6 Large Figure Display is a remote EX proof totalizer with high efficiency LED display. ATEX approved. ROF is a mechanical rate of flow indicator to mount directly on the meter.



**Pulse emitters**EM345, EMT1,  
EM6422

EM345 to mount inside V/R register.  
Intrinsically safe execution.  
EM T1 to mount inside V/R register,  
Ex-d execution.  
EM6422 to mount on the meter shaft.  
Ex-d execution.

**Mechanical ticket printers**

V/R 7498-7951

Standard Veeder Root mechanical ticket printer.  
Zero start or accumulative.

**Additive injection system**  
FlexiMix

System for single or multiple additives.  
Stainless steel piping and components.  
Complete with gear meter.  
Min. injection 5 cc.  
ATEX approved.  
Additive systems for anti-icing, anti-corrosion  
and anti-static.

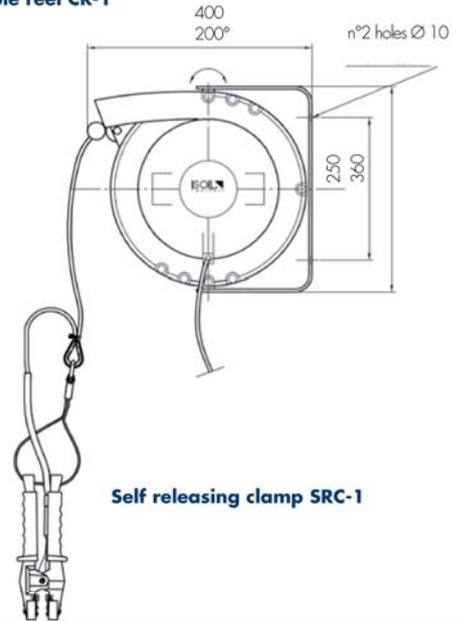


**Grounding systems**  
MT30

Grounding system for loading / unloading tank trucks with non-conductive liquids (e.g. hydrocarbon or solvents). ATEX approved.  
Capacitive & resistive working principle.  
High efficiency LED signalling with relay outputs.  
Programmable via transponder.  
Complete with self-releasing clamp, cable and cable roller.



**Cable reel CR-1**



**Self releasing clamp SRC-1**



**Diaphragm control valve**  
ISOVALVE

Size from 3" to 10".  
Carbon steel body.  
Opening and closing in two stage or digital (Multistep),  
flowrate control, pressure control and non return.



### Pneumatic or mechanical preset valve

V705, V705/P, MPV

Size 2", 3" and 4" as standard.  
Aluminium body.  
Two stage closure and check function.  
Mechanical execution with V/R counter linkage.  
Pneumatic execution for electronic register linkage.



### Mechanical preset register

V/R 7889

Standard Veeder Root mechanical preset register.  
No power supply required.  
Mechanical linkage to the preset valve.  
Pneumatic or electrical switches.



### Strainers and strainers air eliminators

SFDA and FDA

Strainers. Standard sizes from 2" to 10".  
Carbon Steel or Stainless Steel body, Stainless Steel basket from 40 to 100 mesh. Typically used to protect the PD meters.  
Air eliminators. Standard sizes from 2" to 10" with float operated air eliminator.  
Used to remove entrained air from the fuels.



### Master Meter

When calibrating meters a good alternative to the calibrated tanks is the Master Meter.

The Master Meter is very carefully calibrated to calibrated prover tanks and can therefore can be used to calibrate working flow meters by comparison. It is supplied with several calibration points and with specific diagram. To aid mobility the Master Meter can be trolley mounted, with the option of hoses and couplers.

