



# Aviation Spare Parts Catalogue

## Hosereels & Fittings

Elaflex Aviation Hose  
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Gammon Hose Quick Disconnect  
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Aviation Hosereel Drum Style - HPNP Series  
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## Nozzles & Accessories

OPW295SA & SAJ Aircraft Nozzles  
Elaflex Nozzle Bowser  
Nozzle Overwing  
Carter Nozzle Underwing - 64348  
Carter Nozzle Underwing - 64250  
Carter Hose End Control Valves (HECV)  
Carter Dry Break Quick Disconnect  
Nozzle Stowage

## Bottom Load Accessories

OPW EuroLine Series Foot Valve  
Normec Internal Footvalve  
Carter Bottom Loading Adaptor

## Hydrant

Carter Hydrant Coupler 4 Inch - 64910  
The "Crocodile" Input Coupler Lifter  
Carter Hydrant Pit Valve - 60554  
Hydrant Pit  
Hydrant Pit - HPA100  
Hydrant Pit - HPA150  
Hydrant Pit - HPA200  
Hydrant Pit - HPA250  
Tether

## Valves

Non-Return Valves - NRV80  
Carter In-line Pressure Control Valve (PCV)  
Stainless Steel Flanged Ball Valves  
Small Isolation Ball Valves  
Apollo Valve  
Tank Compartment Internal Drain Valve  
ATS Tank Sump

## Fuel Sampling

Epoxy Lined Container  
Collector Tank  
Millipore Adaptor  
Aljac Sampler

## Gauges

Gammon Differential Pressure Gauges  
Pressure Gauges

## Meters & Pumps

Avery Hardoll BM Series Meter  
Avery Hardoll Electronic Meter Controller  
Sampi Meters  
Sampi Meters - SM 5  
Sampi Meters - SM 30  
Pulser - ERP200  
Electronic Meter Register - DFV Series  
Junction Box - EJB101  
Isoil Digital Display - LFD-6  
Gorman Rupp Pump 2"  
Gorman Rupp Pump 3"  
Portable Aviation Drum Pump

## Overfill Protection

Liquip Detection Probes - LDP Series  
Probe Holders  
Mini Monitor

## Accessories

Filter Standard Sensing Assemblies  
Velcon Small Filter Housings - VF-31E, VF-61, VF-609  
ILS400 In-line Suction Strainer  
Basket Strainers  
Elaflex Rubber Expansion Joints  
Swivels  
Camlocks  
Static Reel - SR Series  
Aljac Continuity Tester  
Smartwire PLC  
Power Conditioner  
Deadman Assemblies  
Platform Wand Assembly  
Decals & Signage  
Spill Management Products  
Platform Ladders  
Wing Mats  
Stainless Steel Buckets  
Fire Extinguisher Holder  
Stainless Steel Safety Lock Wire  
Water Finding Paste  
Fuel Finding (Ullage) Paste  
Density Calculator



## *Hosereels & Fittings*

## Elaflex Aviation Hose

Yellow band aircraft refuelling hoses, suitable for all aviation gasoline and jet fuels (JET A1), anti-icings fluids and motor oils.

Elaflex standard type "HD-C" with two textile braids. Light weight, flexible hose for all pressure purposes.

NOTE: Not for suction. Burst pressure > 80 bar / 1200psi.  
The hose does not kink with a permanent pressure of at least 0.5 bar

Temperature range: -30° up to +70° Celsius  
Electrical resistance: Between 103 and 106 Ohm  
Lining: Nitrile rubber (NBR) seamless tube, antistatic, no fuel solubility.  
Reinforcement: Textile braids without metallic strands.  
Cover: Chloroprene (CR), electrically conductive, ozone and flame resistant, highly abrasion resistant

Approved to EN1361 (European) , AS2683 (Australian) and API1529 (American) Standards.

Specified by almost all major oil companies.



Type HD-C  
EN 1361 - type C



## Ordering Information

Part No:	Size ID		OD mm	Working Pressure bar	Max. Vacuum bar	Min reel diameter mm	Approx. Weight kg / m
	inches	mm					
3343	1	25	37	20	0.5	200	0.8
3344	1 1/4	32	44		0.4	225	1.0
3345	1 1/2	38	51		0.3	270	1.2
3346	2	50	66		0.2	400	1.9
3347	2 1/2	63	79		0.15	600	2.4
3348	3	75	91		-	600	2.8
3349	4	100	117		-	900	3.7

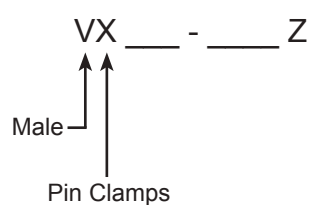
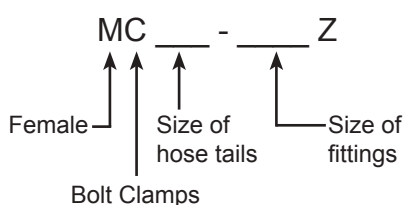
# Elaflex Hose Fittings

Male & female threaded couplings in brass nickel plated with Quick Clamp Type in either pin or bolt style to international standards. Working pressure up to 25 bar.

Supplied separately or part of complete tested hose assembly.

These hose clamps and hose tails are used on most if not all LIQUIP aviation fuelling vehicles and other special fuel handling equipment or vehicles.

## Ordering Information



**Example:** MC 25 - 1 Z  
VX 25 - 1.25 Z

1" hosetail x 1" female BSPP with bolt clamp  
1" hosetail x 1 1/4" Male BSPP with pin clamp



Spannloc Hose Clamp  
(Bolt type)



Spannfix Hose Clamp  
(Pin type)



Male Fitting



Female Fitting

FITTINGS		
Hose Tail + Bolt Clamps (Spannloc)		
FEMALE	MALE	
MC 25 - 1 Z	VC 25 - 1 Z	
- 1.25 Z	- 1.25 Z	
MC 32 - 1.25 Z	VC 32 - 1.25 Z	
- 1.5 Z	- 1.5 Z	
MC 38 - 1.5 Z	VC 38 - 1.5 Z	
- 2 Z	- 2 Z	
MC 50 - 2 Z	VC 50 - 2 Z	
- 2.5 Z	- 2.5 Z	
MC 63 - 2.5 Z	VC 63 - 2.5 Z	
- 3 Z	- 3 Z	
MC 75 - 3 Z	VC 75 - 3 Z	
MC 100 - 4 Z	VC 100 - 4 Z	

FITTINGS		
Hose Tail + Pin Clamps (Spannfix)		
FEMALE	MALE	
MX 25 - 1 Z	VX 25 - 1 Z	
- 1.25 Z	- 1.25 Z	
MX 32 - 1.25 Z	VX 32 - 1.25 Z	
- 1.5 Z	- 1.5 Z	
MX 38 - 1.5 Z	VX 38 - 1.5 Z	
- 2 Z	- 2 Z	
MX 50 - 2 Z	VX 50 - 2 Z	
- 2.5 Z	- 2.5 Z	
MX 63 - 2.5 Z	VX 63 - 2.5 Z	
- 3 Z	- 3 Z	
MX 75 - 3 Z	VX 75 - 3 Z	
MX 100 - 4 Z	VX 100 - 4 Z	

## Hose Swivel

These Liquip Hose Swivels are typically used on overwing nozzles (i.e. the Liquip AVN040 / 042 overwing nozzles).

These swivels are nickel-plated brass. All threads are BSPP. A stainless steel version is available upon special request.

### Ordering Information

Part No	Size
TS57-0026	1" M x 1" F
TS57-0058	1 1/2" M x 1 1/2" F
TS57-0054	2" M x 2" F
TS57-0059	1 1/4" M x 1 1/4" F
TS57-0005	2 1/2" M x 2 1/2" F



# Gammon Hose Quick Disconnect

Fast change from Overwing to Underwing nozzle with no spill

**FAST OPERATION** Connect or disconnect in seconds, without tools. To connect, pull back sleeve, push connector into coupler and release sleeve. To disconnect, pull back coupler sleeve and connector halves separate. Valve opens automatically when halves are connected.

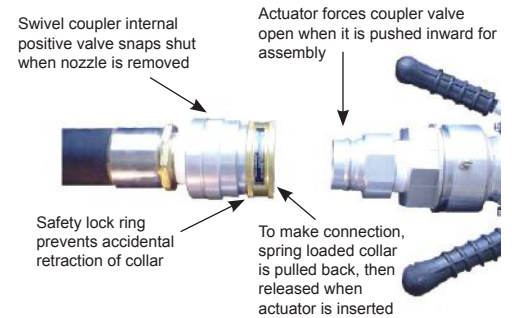
**DEPENDABLE OPERATION** The ball-lock mechanism is the simplest, most reliable type in use, providing positive connection under constant or surge flow - even excessive shock. Ball bearing sleeve lock permits 360 swivel action, preventing build-up of hose torque. Hardened stainless steel balls give extra long service. Stainless steel ball race resists wear for longer life.

Molded U-Packer seal provides contact over several times the normal O-ring sealing area. Its design embodies a self-energising feature that gives a positive seal at all pressures. This seal is capable of sealing under side loads and will tolerate small scratches and some dirt without leakage.

**TIGHT SEAL DISCONNECT** The poppet has a metal-to-metal stop to control compression on the valve o-ring seal. Seal is recessed and wedged in coupler body to keep it in place. The stop also prevents poppet blow-out.

## LOW PRESSURE DROP DESIGN

1 1/2" size: 2.6 psi @ 189.3 lpm  
2" size: 2.9 psi @ 379.5 lpm



All couplers and actuators are made of aluminium, unless stated otherwise. **NOT** designed for suction service.

## Ordering Information

Part No	Size
8732	Coupler 1 1/2" BSP Female
8733	Actuator 1 1/2" BSP Male
8734	Dust Cap to suit Actuator
GTP-1506-40	Seal Kit suit 8732 Coupler

N.B. For all other sizes, please contact our sales department



## Hose Beads

### Increase the life of your aviation hose

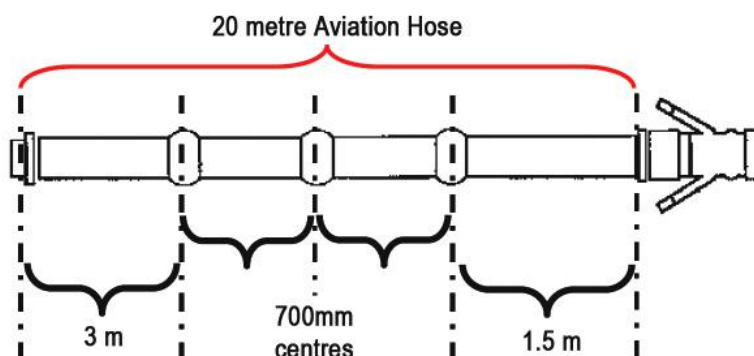
Replacing aviation hose can be costly. Fitting hose beads saves the hose from rubbing along the tarmac, minimising wear and abrasion damage. The bead allows for relatively effortless manoeuvring of the hose and also acts as a hose marker at night.

The 2-piece yellow plastic beads bolt together around the hose and Liquip suggest a bead is fitted every 700 mm run of hose.



### Spacings

20 metre Hose	Reel gooseneck to first bead centre	Hose bead spacing (centre-centre)	Last bead centre to nozzle	Qty of beads / 20m
Recommended	3m	700 mm	1.5 m	32



### Ordering Information

Part No	Size
HB1.25Z	suit 32mm ID hose
HB1.5	suit 38mm ID hose
HB50	suit 50mm ID hose
HB2.5Z	suit 63mm ID hose
CHA100-1Z	suit 4" code hose

## Hose Reflective Cover

### Be Seen! Be Safe!

Liquip Input Hose Covers help prevent incidents occurring around dispenser inlet hoses, particularly during night refuelling. The "Flame Orange" reflective material with two yellow stripes ensure increased visibility. Installation and removal is easy as the covers are fastened using Velcro.

### Ordering Information

Part No	Size
9485	Suit 4" ID hose
ZZ0408	Suit 3" ID house



# Aviation Hosereel Drum Style - HPNP Series

## High pressure hose reel suitable for petroleum products

The HP series of hose reels are a generation of reels for high pressure use and available with hand or hydraulic rewind and in different sizes. Sealing is by lip seal and all models incorporate a lock assembly. Ball bearings look after rotation, with end thrust being taken care of by heavy-duty circlips and thrust washers. All components are easily replaced and all wetted surfaces are nickel plated for longer life.

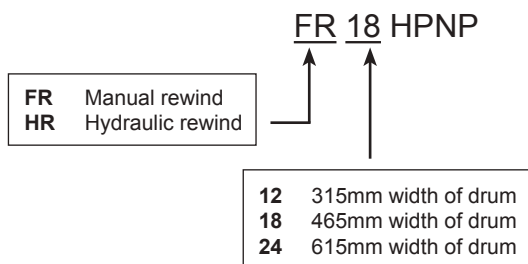
Stainless steel inlet flange, nickel plated gooseneck with 1 1/4" MBSP.

### Technical Specifications

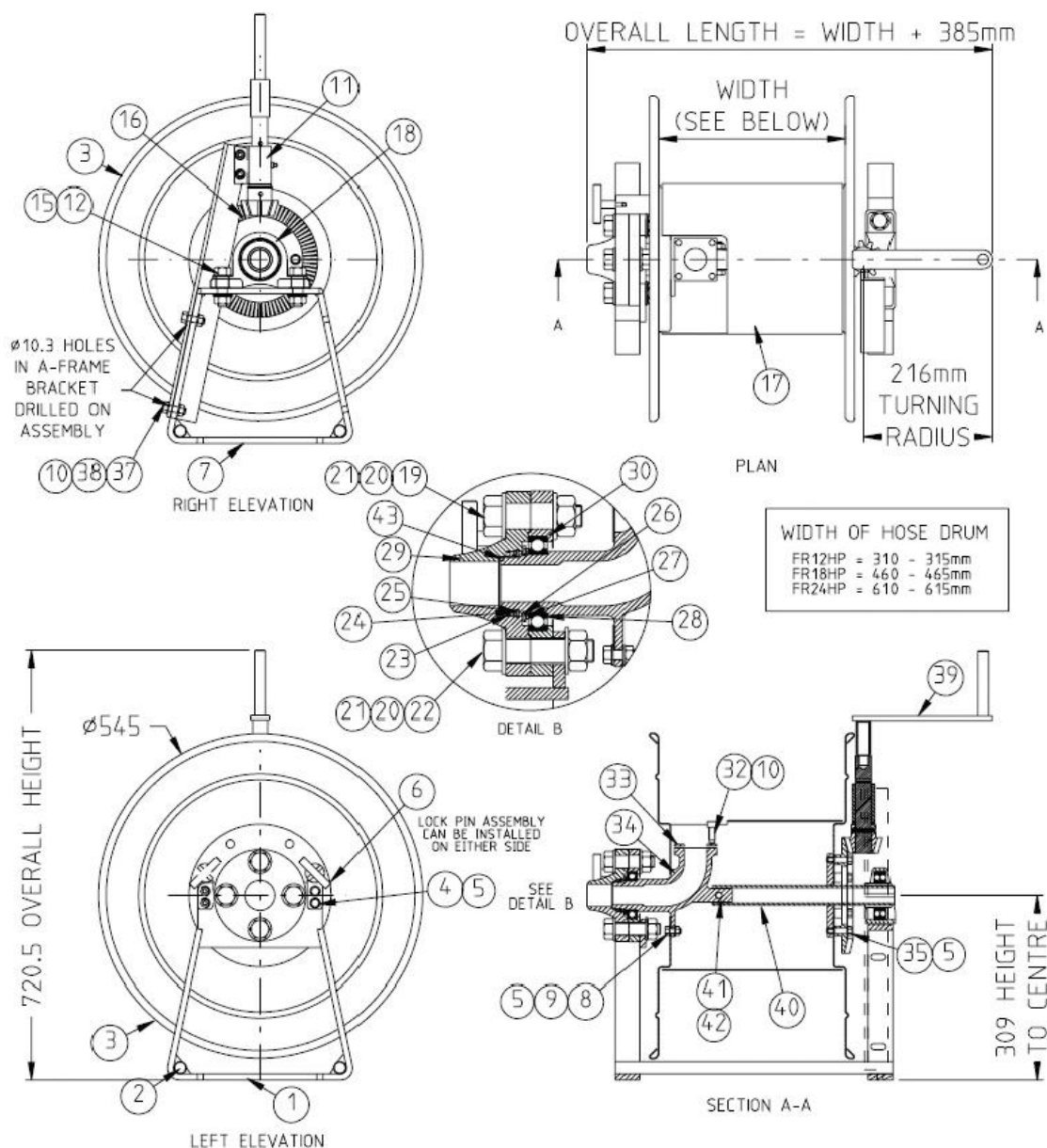
<b>Sizes</b>	Hose size - 25mm, 32mm and 38mm diameter Rewind type - Manual or hydraulic Drum width - 300mm, 450mm or 600mm Anti-rotation lock to prevent hose unravelling
<b>Pressure</b>	Rated to 2100 kPa
<b>Servicing</b>	Quarterly grease plumber block bearing Annually remove and repack bearing on the inlet side of the reel
<b>Mounting</b>	4 x M10 bolts
<b>Materials</b>	Stiffened steel cheek plates, extremely sturdy thick wall manifold with added strength from steel inner drum, steel base frame and self aligning bearing. Polyurethane seals.
<b>Options</b>	Hot dip galvanised version 1 1/2" N/P FBSP gooseneck Rollers and guides

# Aviation Hosereel Drum Style - HPNP Series

## Ordering Information

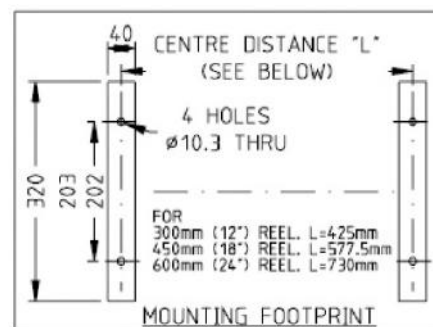


**NOTE:** Electric available as an assembly  
(Refer to Hosereels Assemblies)



# Aviation Hosereel Drum Style - HPNP Series

## HPNP Hosereel Parts List



Parts that differ only shown						
	FR12HP	FR18HP	FR24HP			
Item	Part No	Part No	Part No	Description	Material	Qty
1	R12HP-7	-	-	A Frame and Bearing Mounting Bracket Assembly	Mild Steel	1
2	R12HP-33	R18HP-33	R24HP-33	A Frame Spacer Bar	Mild Steel	2
3	R12HP-8	-	-	Hosereel End Spinning	Mild Steel	2
4	0011	-	-	Bolt Hex Head	M/Steel Z/P	3
5	0108	-	-	Washer Spring	M/Steel Z/P	11
6	R12HP-10	-	-	Lock Pin Assembly	Mild Steel	1
7	R12HP-6	-	-	A Frame Bearing Side	Mild Steel	1
8	0012	-	-	Bolt Hex Head	M/Steel Z/P	3
9	0149	-	-	Nut Nyloc	M/Steel Z/P	3
10	0109	-	-	Washer Spring	M/Steel Z/P	6
11	FR12HP-23	-	-	Front Rewind Bracket Assembly	M/Steel Z/P	1
12	4803	-	-	Bolt Hex Head	M/Steel Z/P	2
13						
14	R12-11	-	-	Gooseneck Assembly 1 1/2" BSPT Male	M/Steel	1
15	0154	-	-	Nut Nyloc	M/Steel Z/P	2
16	FR12-5	-	-	Crown Gear	Aluminium	1
17	R12-32	R18-32	R24-32	Hose Drum	M/Steel	1
18	4523	-	-	Bearing Pillow Block	HT/Steel	1
19	4810	-	-	Bolt Hex Head	M/Steel Z/P	1
20	4345	-	-	Washer Spring	M/Steel Z/P	4
21	0799	-	-	Nut	M/Steel Z/P	4
22	0876	-	-	Bolt Hex Head	M/Steel Z/P	3
23	4516	-	-	Seal U Style	Polyurethane	1
24	R12HP-9	-	-	Ring Backing Seal	M/Steel Z/P	1
25	4339	-	-	Circlip Internal	HT/Steel	1
26	4338	-	-	Circlip External	HT/Steel	1
27	R12HP-22	-	-	Ring Backing Bearing	M/Steel Z/P	1
28	4515	-	-	Bearing Deep Groove Ball	HT/Steel	1
29	R12HP-13	-	-	Retainer Seal	M/Steel Z/P	1
30	R12HP-12	-	-	Retainer Bearing	M/Steel Z/P	1
31						
32	0719	-	-	Capscrew	M/Steel Z/P	4
33	0664	-	-	Gasket	Neo-Cork	1
34	R12-36	-	-	Manifold	SG Iron	1
35	0015	-	-	Setscrew Hex Head	M/Steel Z/P	6
36	0715	-	-	Capscrew	M/Steel Z/P	2
37	0022	-	-	Setscrew Hex Head	M/Steel Z/P	2
38	0130	-	-	Nut	M/Steel Z/P	2
39	R12-26	-	-	Rewind Handle Assembly	Mild Steel	1
40	R12HP-11	R18HP-11	R24HP-11	Bearing Support Pipe	Mild Steel	1
41	4879	-	-	Bolt Hex Head	M/Steel Z/P	1
42	4981	-	-	Nut Nyloc	M/Steel Z/P	1
43	4547	-	-	O-Ring	Viton	1
44	4549	-	-	Seal U Style	Nitrile	Optional

# Aviation Hosereel Drum Style - AHR250D Series

## Drum style hose reel suitable for aviation fuels

A convenient method of storing a quantity of fuel delivery hose. When the fill point is located at varying location the required length of hose can be dispensed and rewound by electric, hydraulic or manual means.

Liquip's sturdy aluminium AHR250D Drum style hose reel range adapts to a variety of drive mechanisms.

**EASY OPERATION** Just unhook nozzle and dispense hose to the required location. To rewind hose a manual handle, electric motor or hydraulic motor is used. The hose nozzle storage can be fitted with interlocks to help prevent drive away accidents and product spills.

## Technical Specifications

<b>Sizes</b>	Hose size - 1", 1 1/4", 1 1/2", 2" & 2 1/2" Rewind type - Manual, electric or hydraulic Drum width - 300mm, 450mm, 600m or 950mm An optional A-Frame is available.
<b>Pressure</b>	Rated to 2100 kPa
<b>Servicing</b>	Annually remove and repack bearings on each side of the reel
<b>Mounting</b>	4 x M12 bolts Inlet flange is to suit 75mm (3") TTMA - 8 off 3/8" BSW x 25mm deep blind threads on a 124mm PCD

# Aviation Hosereel Drum Style - AHR250D Series

## Ordering Information

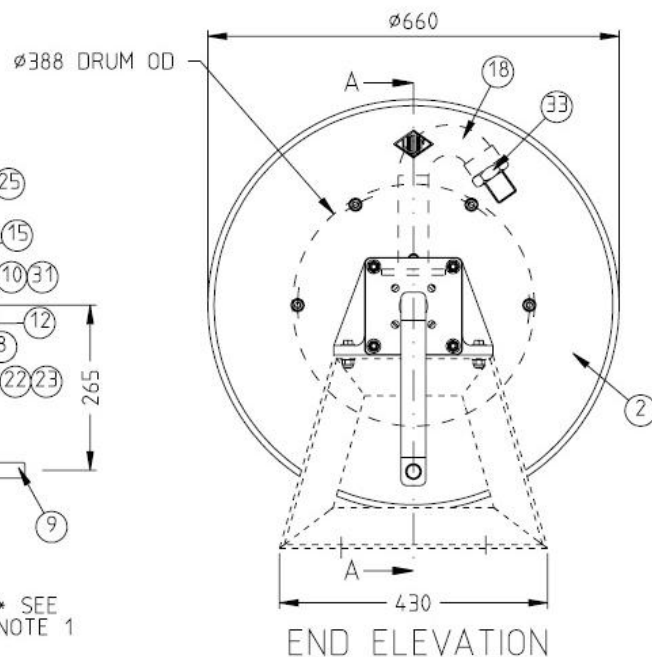
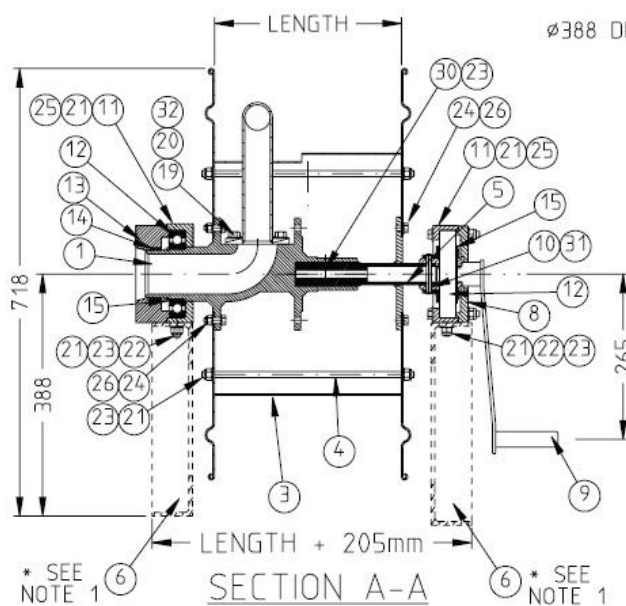
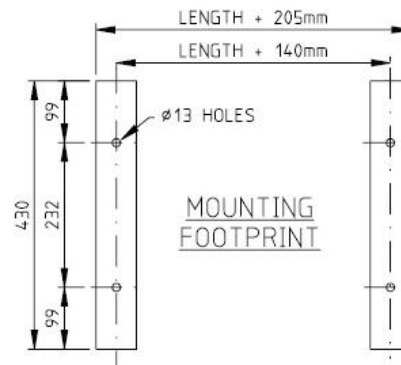
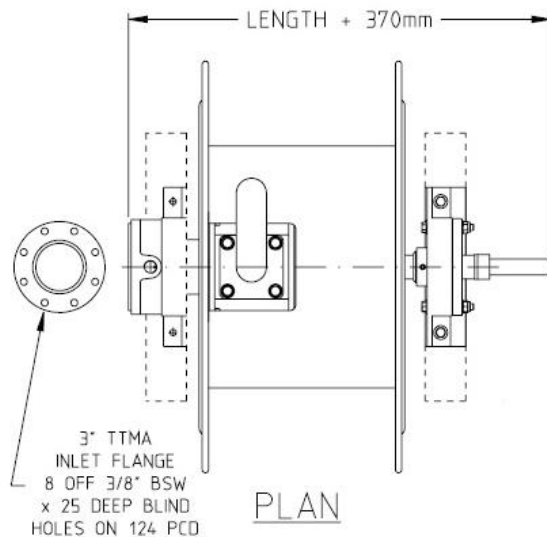
AHR250D - 50 - M - 60

38 - 1 1/2" BSPP Gooseneck  
50 - 2" BSPP Gooseneck  
63 - 2 1/2" BSPP Gooseneck

30 - 300mm Hose Drum Width  
45 - 450mm Hose Drum Width  
60 - 600mm Hose Drum Width  
95 - 950mm Hose Drum Width

M - Manual Rewind  
H - Hydraulic Rewind  
E - Electric Rewind

**NOTE:** Electric available as an assembly



# Aviation Hosereel Drum Style - AHR250D Series

## AHR250D Hosereel Parts List

Item	Part No	Description	Material	Qty
1	AHR250-1	Manifold Hosereel	Aluminium	1
2	AHR250D-2	Cheekplate	Aluminium	2
3a	AHR250D-3-30	Drum (300mm wide)	Aluminium	Table
3b	AHR250D-3-45	Drum (450mm wide)	Aluminium	Table
3c	AHR250D-3-60	Drum (600mm wide)	Aluminium	Table
3d	AHR250D-3-95	Drum (950mm wide)	Aluminium	Table
4a	AHR250D-4-30	Tie Rod (340mm long)	Steel	Table
4b	AHR250D-4-45	Tie Rod (490mm long)	Steel	Table
4c	AHR250D-4-60	Tie Rod (640mm long)	Steel	Table
4d	AHR250D-4-95	Tie Rod (990mm long)	Steel	Table
5a	AHR250D-5-30	Shaft Extension (262mm long)	Steel	Table
5b	AHR250D-5-45	Shaft Extension (412mm long)	Steel	Table
5c	AHR250D-5-60	Shaft Extension (562mm long)	Steel	Table
5d	AHR250D-5-95	Shaft Extension (912mm long)	Steel	Table
6	AHR250D-6	A-Frame (Inlet Side)	Steel	Option
8	AHR250-13	Mounting Plate	Aluminium	1
9	AHR250D-9	Rewind Handle	Steel	Table
10	AHR250-19	Adaptor Bearing	Aluminium	1
11	AHR250-2	Bearing Housing	Aluminium	2
12	5715	Ball Bearing	Steel	2
13	AHR250-3	Seal Housing	Aluminium	1
14	0127	O-Ring	Viton	2
15	4585	Circlip	Steel	2
18a	AHR250D-6-38	Gooseneck 38mm	Steel	Table
18b	AHR250D-6-50	Gooseneck 50mm	Steel	Table
18c	AHR250D-6-53	Gooseneck 63mm	Steel	Table
19	0022	Setscrew	Steel	4
20	0109	Washer Spring	Steel	4
21	0102	Flat Washer	Steel	36
22	0062	Bolt	Steel	4
23	0150	Nut Nyloc	Steel	25
24	0011	Setscrew	Steel	12
25	0031	Bolt	Steel	8
26	0101	Washer Flat	Steel	12
30	0066	Bolt	Steel	1
31	6676	Spring Pin	Steel	1
32	4281	Gasket Gooseneck 1.6mm Thick	Klingerite	1
33a	AHR250D-15	Nipple Reducing 1 1/2" BSP to 1" BSP	Steel	Table
33b	AHR250D-16	Nipple Reducing 1 1/2" BSP to 1 1/4" BSP	Steel	Table
33c	AHR250D-17	Nipple Straight 1 1/2" BSP	Steel	Table

## Aviation Hosereel Cartwheel Style - AHR250 Series

### Cartwheel style hosereel suitable for aviation fuels

The AHR250 series covers a large number of sizes, variations and options.

Generally the reel is available in either open frame design or with side infill panels. The reels are available in various diameters and widths to accommodate a large range of hose diameters and lengths, with or without hose beads / protection rings.

A typical complete assembly also incorporates a hose guide or "chute" and nozzle stowage, to which interlocks are usually added to help prevent drive away accidents and product spills. Rewind options are hydraulic motor, electric motor or hand / manual rewind.

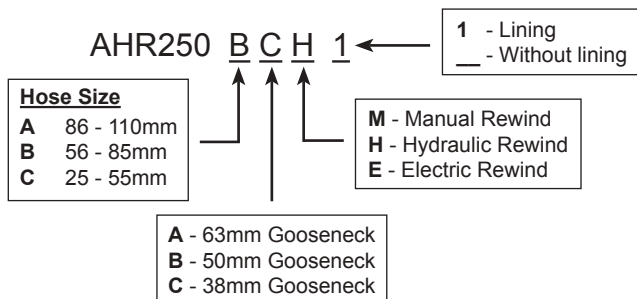
**EASY OPERATION** Just unhook nozzle and dispense hose to the required location. To rewind hose a manual handle, electric motor or hydraulic motor is used. The hose nozzle storage can be fitted with interlocks to help prevent drive away accidents and product spills.

### Technical Specifications

<b>Sizes</b>	Hose size - 1", 1 1/4", 1 1/2", 2" & 2 1/2" nominal bore Rewind type - Manual, electric or hydraulic Cartwheel lining for hoses with wear beads. Please refer to ordering information for more options. Custom design is available.
<b>Pressure</b>	Rated to 2100 kPa
<b>Servicing</b>	Annually remove and repack bearings on the inlet side of the reel
<b>Mounting</b>	Support frame not supplied. Inlet flange is to suit 75mm (3") TTMA - 8 off 3/8" BSW x 25mm deep blind threads on a 124mm PCD
<b>Weight</b>	37kg
<b>Materials</b>	Aluminium cart wheels and drum, nickel plated steel gooseneck and viton seals

# Aviation Hosereel Cartwheel Style - AHR250 Series

## Ordering Information

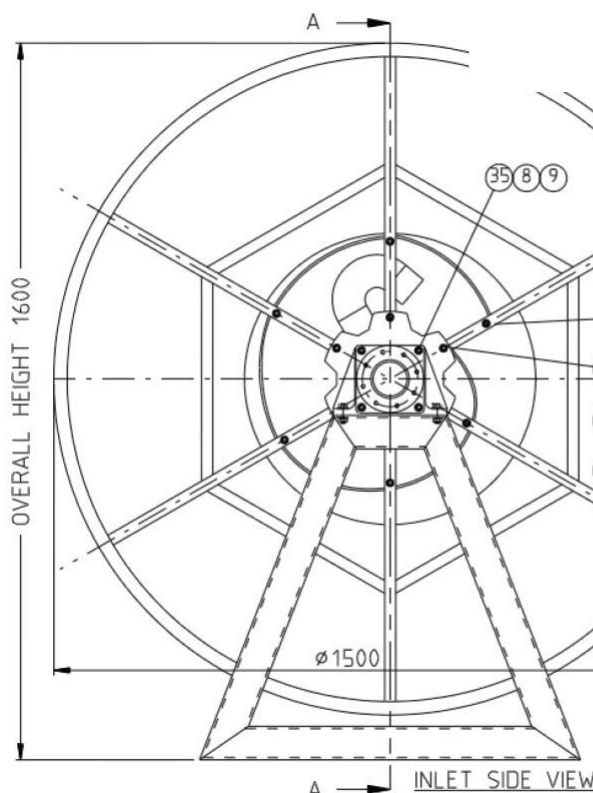
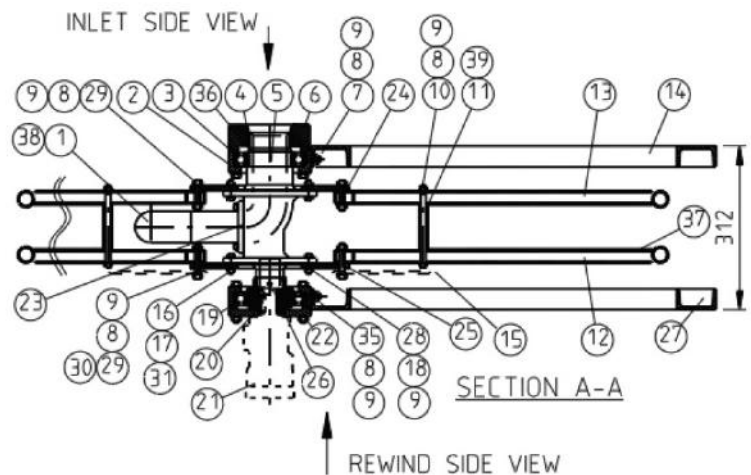
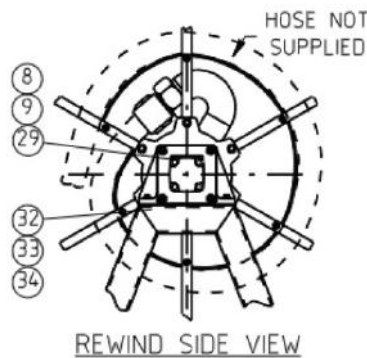


**NOTE:** Electric available as an assembly

**AHR250A** Hosereel suits hose sizes from diameter 86mm to 110mm and will accept 2" (50mm) and 2 1/2" (63mm) hoses with hose beads

**AHR250B** Hosereel suits hose sizes from diameter 56mm to 85mm and will accept 1 1/4" (32mm) and 1 1/2" (38mm) hoses with hose beads, or 2" (50mm) and 2 1/2" (63mm) hoses without hose beads

**AHR250C** Hosereel suits hose sizes from diameter 25mm to 55mm and will accept 1 1/4" (32mm) and 1 1/2" (38mm) hoses without hose beads



**AHR250A**  
SUIT HOSE SIZES  
ø86mm - ø110mm

**AHR250B**  
SUIT HOSE SIZES  
ø56mm - ø85mm

**AHR250C**  
SUIT HOSE SIZES  
ø25mm - ø55mm

SOLD PARTLY ASSEMBLED  
TO MAKE RIGHT HAND,  
REMOVE CARTWHEELS,  
TURN MANIFOLD ONLY 180°  
AND REPLACE CARTWHEELS  
(GOOSENECK & CARTWHEELS  
REMAIN THE SAME)

# Aviation Hosereel Cartwheel Style - AHR250 Series

## AHR250 Hosereel Parts List

Item	Part No	Description	Material	Qty AHR250A	Qty AHR250B	Qty AHR250C
1a	AHR250-6	Gooseneck 2 1/2" BSPP (63mm dia hose)	Steel	1	-	-
1b	AHR250-6-50	Gooseneck 2" BSPP (50mm dia hose)	Steel	-	1	-
1c	AHR250-6-38	Gooseneck 1 1/2" BSPP (25-38mm dia hose)	Steel	-	-	1
2	AHR250-2	Bearing Housing	Aluminium	2	2	2
3	5715	Ball Bearing	-	2	2	2
4	0127	O-Ring	Viton	2	2	2
5	AHR250-1	Manifold	Aluminium	1	1	1
6	AHR250-3	Seal Housing	Aluminium	1	1	1
7	0062	Bolt Hex Head	Steel	4	4	4
8	4392	Nut Half Nyloc	Steel	30	30	30
9	0102	Flat Washer	Steel	64	64	64
10a	AHR250-35	Bolt Special 195mm long	Steel	6	1	-
10b	4907	Bolt Hex Head	Steel	-	6	1
10c	0059	Bolt Hex Head	Steel	-	-	6
11a	AHR250-39A	Snail Drum 110mm wide	Aluminium	1	-	-
11b	AHR250-39B	Snail Drum 80mm wide	Aluminium	-	1	-
11c	AHR250-39C	Snail Drum 55mm wide	Aluminium	-	-	1
12	AHR250-9	Cartwheel Assembly (Right Hand)	Aluminium	1	1	1
13	AHR250-9	Cartwheel Assembly (Left Hand)	Aluminium	1	1	1
14	-	Right Side Support	Steel	1	1	1
15	1261	Sprocket	Steel	Not Supported		
16	0056	Setscrew Hex Head	Steel	12	12	12
17	0149	Nut Nyloc	Steel	12	12	12
18	0022	Setscrew	Steel	4	4	4
19	AHR250-19	Adaptor Bearing - Hyd Drive	Aluminium	1	1	1
20	AHR250-11	Adapting Bush	Steel	1	1	1
21*	1295	Hydraulic Motor Danfoss Hosereel	-	Not Supported		
22	AHR250-13	Hydraulic Motor Mounting Plate	Aluminium	1	1	1
23	4281	Gasket	Klingerite	1	1	1
24a	AHR250-5	Cast Aluminium Cheek Plate	Aluminium	-	2	-
24b	AHR250-8	Cast Aluminium Cheek Plate - Offset	Aluminium	2	-	2
25	AHR250-36	Bolt Special 225mm long	Steel	1	-	-
26	6676	Pin Selox	Steel	1	1	1
27	-	Left Side Support	Steel	1	1	1
28	0109	Washer Spring	Steel	4	4	4
29	0025	Setscrew Hex Head	Steel	12	12	12
30	4995	Setscrew Hex Head	Steel	Not Supported		
31	0101	Washer Flat	Steel	24	24	24
35	0031	Bolt Hex Head	Steel	8	8	8
36	4585	Circlip External	-	2	2	2
37	AHR250-34	Cartwheel Lining (optional)	Aluminium	4	4	4
38a	0439	Nipple Reducing 1 1/2" BSP x 1 1/4" BSP Hexagon	Steel	-	-	As Req'd
38b	0445	Nipple Reducing 1 1/2" BSP x 1" BSP Hexagon	Steel	-	-	As Req'd
38c	0472	Nipple 1 1/2" BSP Hexagon	Steel	-	-	As Req'd

\* For Hydraulic Rewind Only. Must be ordered separately

# Hosereel Assemblies - Electric Rewind

## Designed for ease of operation in a dangerous environment

Designed to electrically rewind aviation hose safely in a dangerous environment. This unit will require the operator to provide significantly less force in unwinding the hose than any of its chain driven predecessors, thus significantly reducing the potential for back injury to the operator.

Operation of the unit is simply a matter of pushing the start/stop switch to rewind the hose. The ramp up feature on the inverter allows the motor some time to go from rest to full speed, so fine control is available over the final portion of the hoses journey by toggling the switch to "inch" the hose in.

### Features

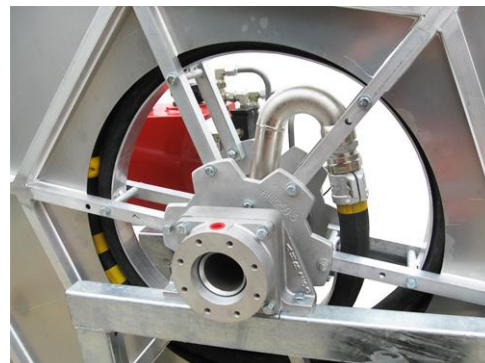
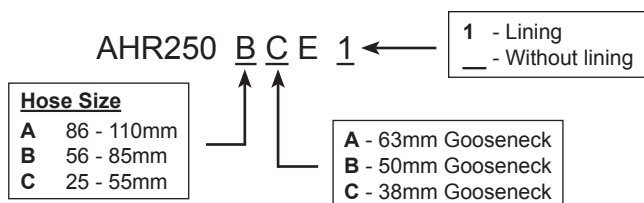
- The frame is fabricated from steel, is hot dip galvanised and designed to accommodate all components.
- Drive is provided by a 3 Phase, 1.1Kw, Class 1, Zone 1 explosion proof ex-d electric motor and runs through a single-to-three phase variable speed inverter. This provides greater flexibility in speed control. The unit is preset by Liquip. It is capable of "ramping up" to operating frequency, and "ramping down" from operating frequency. These parameters are completely controllable via the keypad located on the front of the inverter.
- Power is transmitted to the reel by an anti-static timing belt. This eliminates the need for a chain drive; therefore no metal-to-metal contact is present. This eliminates the possibility of a spark caused by chain lash etc.
- The anti-static belt eliminates the potential for static caused by belt slippage or sideways float. The belt is tensioned automatically by a spring-loaded tensioner, eliminating the need for constant adjustments.
- To minimise the possibility of catching fingers in the belt drive, the unit may be purchased specifying either a hinged full cover or a belt guard. The hinged cover features a polycarbonate window in the top, and hose roller guides in the front. It covers the entire unit when lowered. The belt guard is a removable profiled guard designed to sit over the driven sprockets and the timing belt. The rest of the unit remains uncovered.



# Hosereel Assemblies - Electric Rewind

## Ordering Information

### CATHERINE STYLE



### DRUM STYLE

AER18-HPNP

12	315mm width of drum
18	465mm width of drum
24	615mm width of drum



Large diameter cartwheel hosereels for single wrap hoses with or without hose beads. 38mm or 50mm male BSP thread for hose connection. Check plate diameter made to order, customer to specify required hose size and length and our Engineering Department will specify the right size reel to suit.

Note: The drive for these units will be a 3 phase 1.1kW, Class 1, Zone 1 explosion proof ex-d electric motor driving a hydraulic pump with its own hydraulic reservoir and check valve. This will in turn drive a hydraulic motor via a pressure and return line to the pump.





## *Nozzles & Accessories*

# OPW 295SA & SAJ Aircraft Nozzles

The OPW 295SA and SAJ Aircraft Nozzles are used for overwing aircraft refuelling.

## Features & Benefits

- Aluminum Body – lighter weight, easier to maneuver.
- Dual Poppets – easy-to-open nozzle against high inlet pressures.
- Color-Coded Composite Lever Guards – helps distinguish between AVGAS and Jet A. Easily replaced in lever guard kit.
- Vinyl-Coated Lever – insulates fingers against cold.
- Dust Cap – keeps spout free from dirt and stops fuel drippage when connected.
- Adjustable Dash Pot – permits adjusting the main poppet closure rate over a wide range of flows to overcome line shock with minimum afterflow.
- Right Angle Design – provides larger lever area for better grip and easier control.
- Easily replaced spout – the spout is easily threaded into the body. Replacement spouts are readily available from OPW.
- Built-In Swivel – eliminates twisting and kinking of the hose. This swivel is electroless nickel-plated and has full-bearing surfaces.
- Unique Jet Aircraft Spout Design of 295SAJ – to help prevent inadvertent fueling of piston engine aircraft with turbine fuel.
- Ground Wire Assembly – included on all aviation nozzles.

## Technical Information

### Materials

Body: Cast aluminum

Main Stem: Stainless steel

Stem Seal: Buna-N O-Ring

Disc: Viton®

Spout: Aluminum

### Threads

NPT Female Threads at Inlet End of 295SA – accepts all 1", 1-1/4" or 1-1/2" male connections.

NPT Female Threads At Inlet End Of 295SAJ – accepts all 1-1/2" male connections.

### Design working pressure

110 psi (7.58 bar) maximum pressure.

### Strainer

100 Mesh Strainer – prevents foreign matter from entering fuel tank; easy to remove and clean.

## Ordering Information

Part No.	Inlet Thread			Spout O.D		
	in.	mm	lbs.	kg	in.	mm
295SA-0135	1	25	4.6	2.1	1	25
295SA-0136	1¼	32	4.5	2	1	25
295SA-0137	1½	38	4.5	2	1	25
295SA-0138	1½	38	5.1	2.3	1½	41
295SAJ-0200	1½	38	5.6	2.5	2½	54
295SAC-0156*	1¼	32	4.5	2	1	25
295AC-0157*	1½	38	4.5	2	1	25
295AC-0158*	1½	38	5.15	2.3	1½	41
295SACJ-0200*	1½	38	5.65	2.6	2½	54

\*Check Valve



295AJ-0200



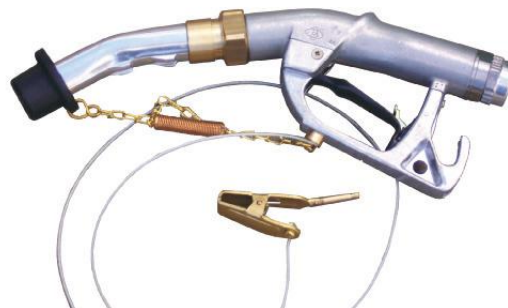
295SA-0135

## Elaflex Bowser Nozzle

The ZVF25 1" refuelling nozzle has been the bench-mark nozzle for aviation refuelling for decades. With an internal check valve, 100 mesh strainer and integral inlet swivel.

Maximum flow rate:	140 litres / minute
Working pressure:	up to 3.5 bar (50 psi)
Spout:	27 Ø - 1" BSP female inlet
Operation:	Manual shut-off
Materials:	Aluminium body, guard and inlet swivel, stainless steel and acetal internals, Nitrile and Vulkollan seals

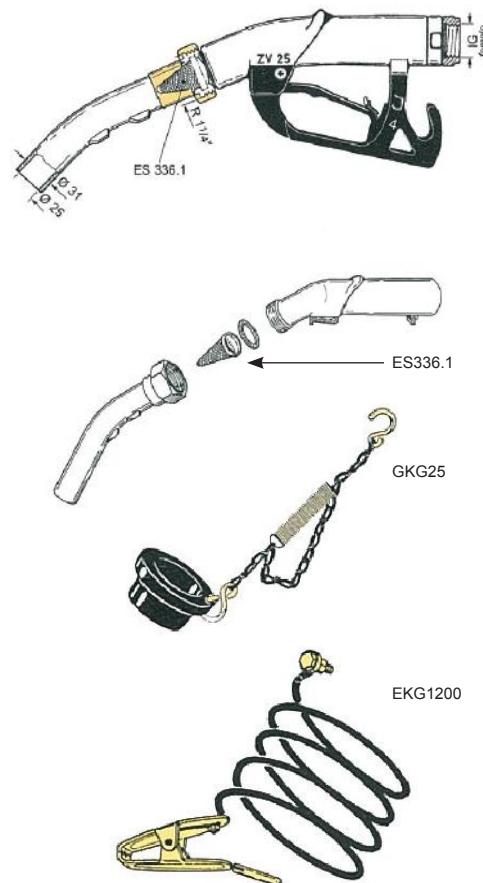
Ideal for fuels up to 50% aromatics, alcohols up to 15%, Jet fuels and Diesel  
**(NOT suitable for viscous oils)**



### Ordering Information

Complete Nozzle	
Part No	Description
ZVF25.41	Includes dust cap & spring loaded chain, swivel, strainer and 1.2m bonding cable & clip

Spare Parts	
Part No	Description
EA075.1	Inlet swivel
ES336.1	Strainer (100 mesh)
GKG25	Dust cap & spring loaded chain
EKG1200	Bonding cable (1.2m) and clip



# AVN042 Aviation Overwing Fuelling

The Liquip AVN042 has been designed as an easily operated nozzle for (overwing) delivery of aviation fuels. Unlike normal nozzles, it is equipped with "power assist" dashpot operation, making it as light as a service station bowser nozzle. The body, handle and trigger are made from heavy duty, lightweight aluminium. The handle and trigger are easily replaceable and the body has wear ribs to protect when dragged.

- The Spout Adaptor will accept any of the four (4) available spouts.
- Optional Inlet Swivel.
- Seals are compatible with all Jet and aviation fuels.
- 



## Operation

Pressure-balance design provides for small and constant finger force on the trigger regardless of the pump pressure. The Trigger opens a valve in order to deliver product. The bullet-shaped internal seal opens first, allowing the pressure inside the nozzle to equalise, making it easy to then open the product seal. Such ease of operation permits accurate, fine top-up without any surging and splashing.

## Technical Data

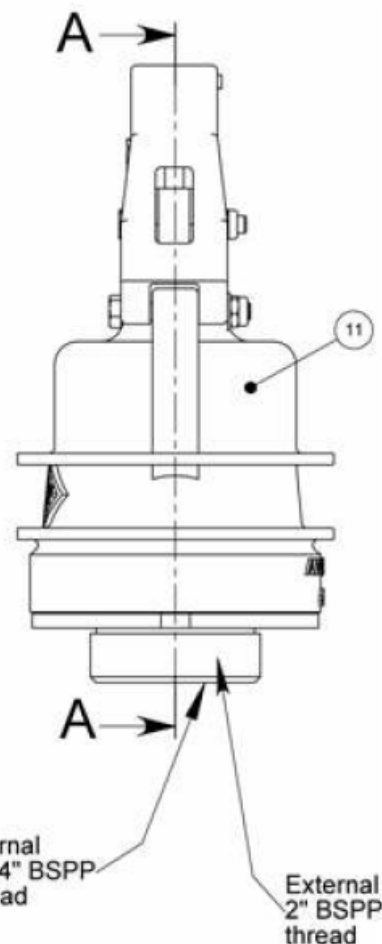
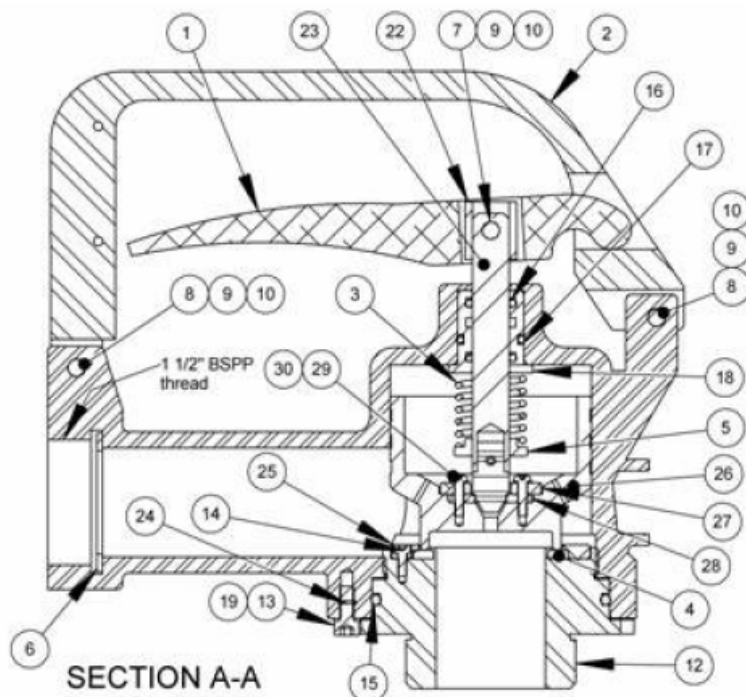
SPECIFICATIONS:	Trigger force constant 60N at midpoint. 38mm (1 1/2") diameter flow through. Only 50kPa pressure drop at 300 L/min with 32mm spout.
WEIGHT:	2.5kg with 32mm spout.
MOUNTING:	38mm (1 1/2" BSPP female thread) inlet.
MATERIALS:	Aluminium body, handle, trigger and adaptor outlet. Stainless Steel shaft, pin and spring. Viton and Polyurethane seals.
DISMANTLING:	Remove capscrew (item 13), unscrew outlet adaptor (item 12). This will give access to all internals.
ADJUSTMENT:	None.
ASSOCIATED EQUIPMENT:	See next page.

## Ordering Information

PART NO:	DESCRIPTION
AVN042	Aviation Overwing Fuelling Nozzle

# AVN042 Aviation Overwing Fuelling

## AVN042 FUELLING NOZZLE



ITEM	PART No	DESCRIPTION	Default /QTY.	MATERIAL
1	AVN040-5	TRIGGER NOZZLE	1	ALUMINIUM
2	AVN040-4	HANDLE	1	ALUMINIUM
3	6152	COMPRESSION SPRING	1	ST STEEL
4	7517	SEAL PRODUCT OUTLET	1	VITON
5	AVN030-8	RETAINER SPRING NOZZLE	1	ALUMINIUM
6	GD38	SEAL INLET NOZZLE	1	POLYURETHANE
7	6617	BOLT METRIC	1	STEEL
8	6603	BOLT METRIC	2	STEEL
9	5267	WASHER FLAT	3	STEEL
10	4400	NUT HALF NYLOC	3	STEEL
11	AVN040-1	BODY NOZZLE	1	ALUMINIUM
12	AVN040-9	ADAPTOR FOR SPOUT NOZZLE	1	ALUMINIUM
13	0704	CAPSCREW METRIC	1	STEEL
14	6602	CAPSCREW METRIC	3	ST STEEL
15	3042	O-RING	1	VITON
16	0244	O-RING	2	VITON
17	0278	O-RING	1	VITON
18	ARO100-4	AIR RAM SHAFT BUSH	1	ACETAL
19	6498	WASHER SPRING	1	STEEL
20	7940	CAP	1	PVC
21	5695	CAP	1	PVC
22	7233	DAMPENER RUBBER	1	NEOPRENE
23	AVN042-10	SHAFT AND TIP ASSY	1	ST STEEL/ACETAL
24	3360	LOCTITE	1	LOCTITE
25	AVN040-6	RETAINER SEAL NOZZLE AVIATION	1	ALUMINIUM
26	AVN040-3	PISTON NOZZLE	1	ALUMINIUM
27	AVN042-1	RETAINER FOR SEAL	1	ALUMINIUM
28	7556	SEAL IN POPPET	1	VITON
29	6526	SCREW METRIC	4	ST STEEL
30	6527	WASHER SHK-PRF INT	4	ST STEEL

X201005

Issue: C

# AVN042 Aviation Overwing Fuelling

## Accessories

Part No: AVN042

### SPOUTS

ER250	25mm (reduced) spout
ER495	32mm aluminium spout
ER583	38mm aluminium spout
ER587-JET	Jet-Selective aluminium spout

### DUST CAPS

GKG25	Buna-N dust cap & spring loaded chain suit 25mm spout
GKG32	Buna-N dust cap & spring loaded chain suit 32mm spout
GKG38	Buna-N dust cap & spring loaded chain suit 38mm spout
GKG38-J	Buna-N dust cap & spring loaded chain suit Jet Selective spout

### ADAPTOR

EK432	Brass adaptor to suit AVN040 o/w nozzle for fitting spouts.
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### STRAINER

ES418	Poly / stainless steel 100 mesh strainer suit EK432 adaptor
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### SPLASH GUARD

EK419	Buna-N guard suit EK432 adaptor
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### STATIC CLAMPS

EKG1200	Clamp & Lead
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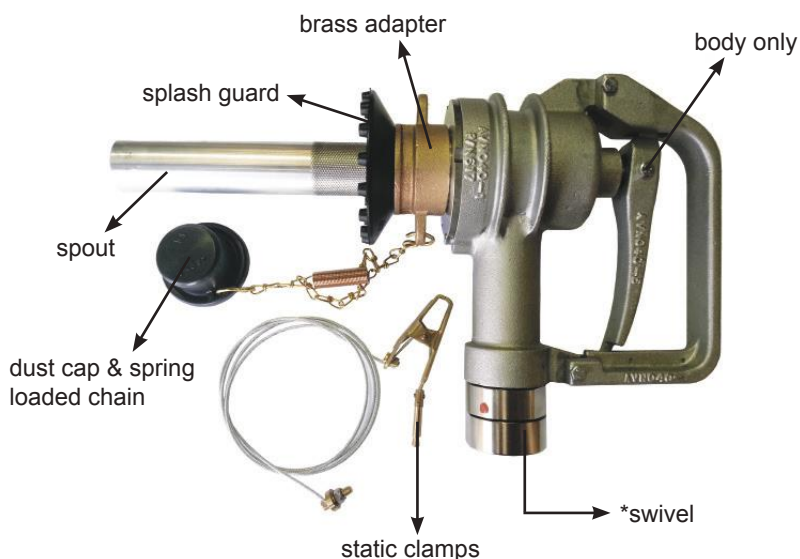
# AVN042 Aviation Overwing Fuelling

## Ordering Information

### Ordering the Complete Nozzle:

Part No	Spout Size
AVN-25Z	25mm
AVN-32Z	32mm
AVN-38Z	38mm
AVN-JZ	Jet Selective

\* Complete nozzle does not come with swivel



## Ordering Accessories

### NOZZLE BODY ONLY

AVN042

### SPOUTS

ER250	25mm (reduced) spout
ER495	32mm aluminium spout
ER583	38mm aluminium spout
ER587 JET	Jet-Selective aluminium spout

### DUST CAPS

GKG25	Buna-N dust cap & spring loaded chain suit 25mm spout
GKG32	Buna-N dust cap & spring loaded chain suit 32mm spout
GKG38	Buna-N dust cap & spring loaded chain suit 38mm spout
GKG38-J	Buna-N dust cap & spring loaded chain suit Jet Selective spout

### ADAPTOR

EG432	Brass adaptor to suit AVN042 o/w nozzle for fitting spouts
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### STRAINER

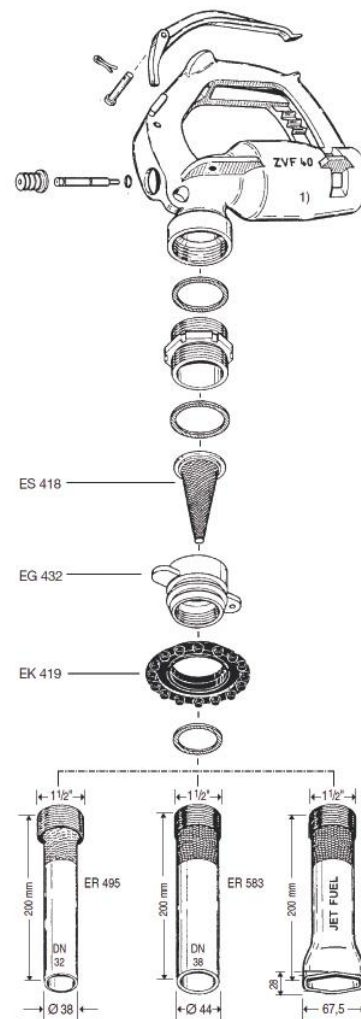
ES418	Poly / stainless steel 100 mesh strainer suit EK432 adaptor
EG-ASS	(Adaptor EG432 + Strainer ES418)

### SPLASH GUARD

EK419	Buna-N guard suit EG432 adaptor
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### STATIC CLAMPS

EKG1200	1.2m bonding cable and clip
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# Carter Nozzle Underwing - 64348

Easier swivelling under all conditions

## Features

- Swivel independent of quick disconnect (QD)
- Connects to 3-lug international standard aircraft adapter
- Designed in accordance with new SAE design specification for commercial nozzles AS5877
- Self-adjusting pressure-loaded nose seal. No mechanical adjustments or springs used. Leak free under extreme side loads, worn adapters and extreme temperatures.
- Optional easy change nose seal — no tools required
- Lead-in ramps (interface with aircraft adapter lugs) of stainless steel for longer life
- Positive mechanical interlock — nozzle can not be opened until connected to aircraft and can not be removed from aircraft in the open position
- Flow control handle of high strength zinc-aluminium alloy
- Replaceable bicycle handles and grips standard for ease of operation. Circular grip optional.
- Two threaded ports in nozzle body for simultaneous vacuum breaker and product sampling fitting installation are standard
- Lightweight and rugged
- Modular construction with use of bolt flanges minimized
- 2, 2-½, & 3 inch NPT & BSPP threaded QD inlets available
- Optional 40, 60 and 100-mesh screens retained with snap rings for ease of removal
- 35 psi (2.413 bar), 45 psi (3.103 bar) & 55 psi (3.792) hose end control valves (HECV) available
- Dry break or ball valve for easy strainer inspection available
- Low pressure drop
- Optional bonding cable and vacuum breaker
- Redundant safety lock on QD



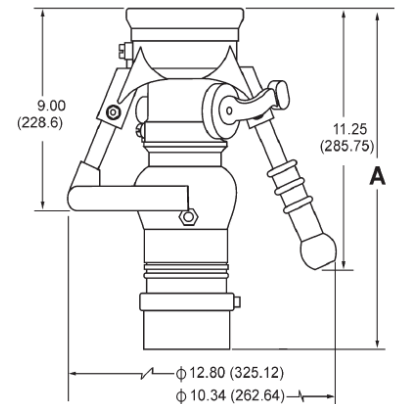
# Carter Nozzle Underwing - 64348

## Ordering Information

### Envelope Dimensions

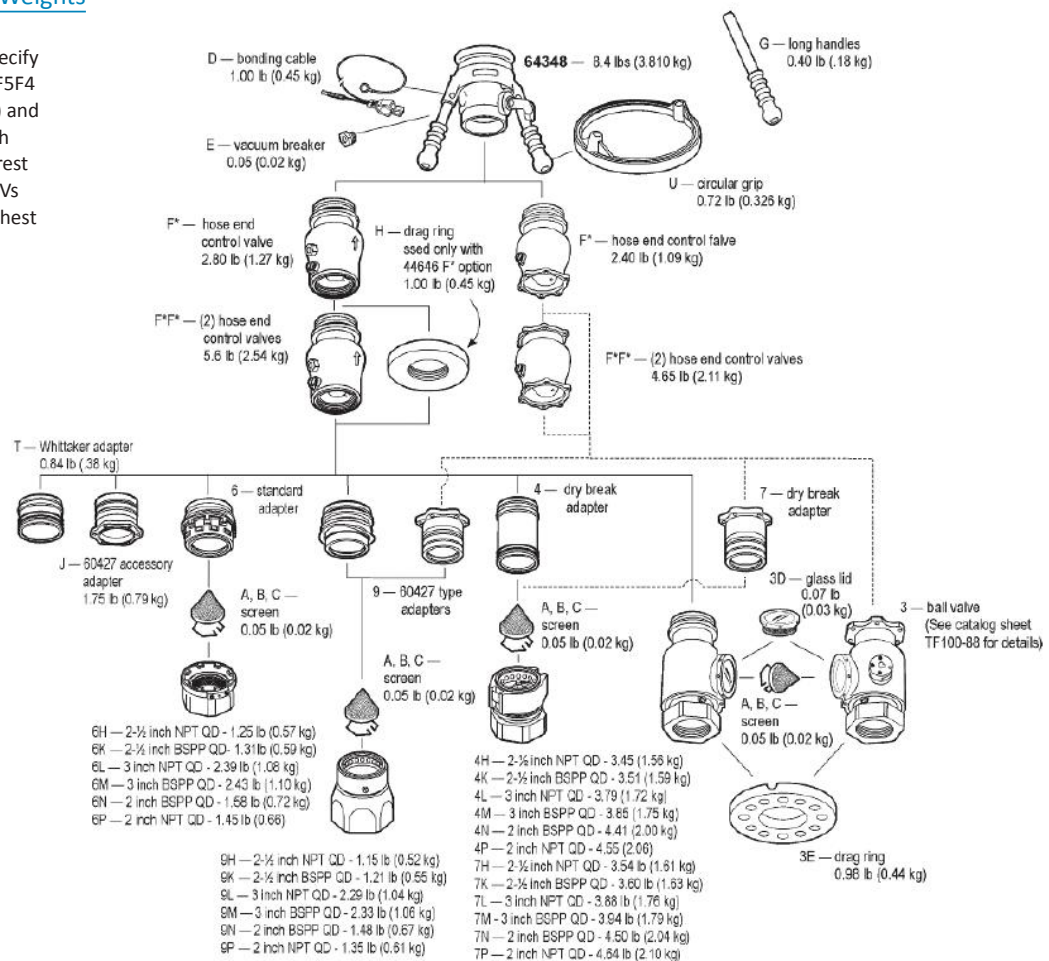
Dimensions shown in inches (millimetres)  
A = Various options available.

Contact the Liquip Sales Department for assistance in determining which of the numerous models and options available will best suit your application.



### Illustrated Options & Weights

\* For a dual HECV setup specify two options in series; e.g. F5F4 results in 55 psi (3.792 bar) and 45 psi (3.103 bar) units with the former assembled nearest the nozzle inlet. If two HECVs are desired, specify the highest pressure setting first.



\*F3 = 35 psi (2.413 bar) HECV  
F4 = 45 psi (3.103 bar) HECV  
F5 = 55 psi (3.792 bar) HECV

For a dual HECV setup specify two options in series, F5F4 results in 55 psi (3.792 bar) and 45 psi (3.193 bar) units with the former assembled nearest the nozzle inlet.  
If two HECV's are desired, specify the highest pressure setting first.

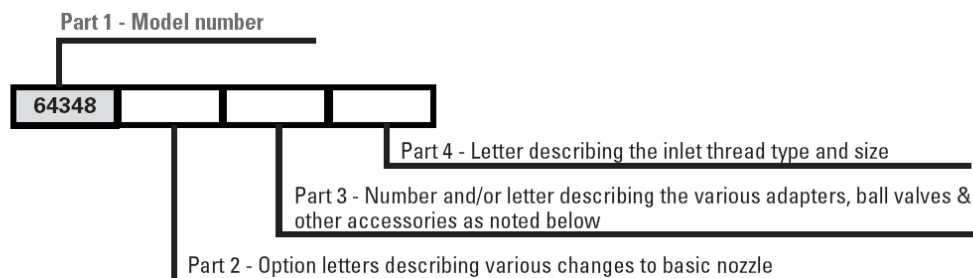
\*F3 = 35 psi (2.413 bar) HECV  
F4 = 45 psi (3.103 bar) HECV  
F5 = 55 psi (3.792 bar) HECV

For a dual HECV setup specify two options in series, F5F4 results in 55 psi (3.792 bar) and 45 psi (3.193 bar) units with the former assembled nearest the nozzle inlet.  
If two HECV's are desired, specify the highest pressure setting first.

# Carter Nozzle Underwing - 64348

## Ordering Data

The part number for a complete nozzle consists of four parts as illustrated (right) and described below.



### Part 2

The following options may be added as part 2 of the part number as indicated above to order a unit to meet your requirement.

Option	Description	Option	Description
*A	Adds 40-mesh screen	G	Replaces standard handles with long handles
*B	Adds 60-mesh screen	H	Adds drag ring to nozzle with any option F in conjunction with option T or options 1 or 6 from part 3
*C	Adds 100-mesh screen	J	Adds adapter to allow mating to 60427 QD
D	Adds bonding cable	Q	Adds fuel sample QD (GTP-235-3/8)
E	Adds vacuum breaker	***R	Adds flight refueling adapter
**F3	Adds 35 psi (2.413 bar) HECV	T	Adds adapter to mate with Whittaker accessories
**F4	Adds 45 psi (3.103 bar) HECV	U	Replaces standard handle with circular handle
**F5	Adds 55 psi (3.792 bar) HECV		
*	Options A, B & C only available when a male half from part 3 or option R is specified		
**	To obtain a nozzle with a dual HECV setup, specify two options in series, e.g. F5F4 results in 55 psi (3.792 bar) and 45 psi (3.103 bar) units with the former assembled nearest the nozzle inlet. If two HECVs are desired specify the highest pressure setting first.		
***	Option R only available with 47013 HECV		

### Part 3

The configuration of the inlet is defined by adding the appropriate number or number and option letter from the table (right) in conjunction with the appropriate option letter from part 4 below. The nozzle may terminate in an adapter half only, if desired. In this case, leave part 4 blank. To obtain a female half, QD or dry break, or to complete the specification of the ball valve outlet, part 4 must be completed.

Option	Description	Option	Description
*1	For nozzle with flanged inlet HECV	R	Adds defuel key with option 3 only
*2	For nozzle with swivel inlet HECV	4	Adds male adapter half (44697) to mate with basic nozzle and dry break QD (61154)
3	Adds ball valve (64015). Part 4 must be completed with option 3. Add options D, E, J and R for other accessories to complete the specification.	6	Adds male adapter half to mate standard QD
D	Adds glass inspection port to ball valve	7	Adds male adapter half to mate dry break QD when a single HECV is used
E	Adds drag ring to ball valve	9	Adds male adapter half (43046 with HECV, 44362 without HECV) to mate 60427 style QD
J	Adds operating handle with option 3 only		

\* If Option 1 or 2 is not used with any other option, then the shortest configuration nozzle will be provided

### Part 4

Options specifying the desired thread for adapters or ball valves selected in part 3.

Option	Description	Option	Description
H	Inlet thread — 2-1/2 inch NPT	*M	Inlet thread — 3 inch BSPP
K	Inlet thread — 2-1/2 inch BSPP	P	Inlet thread — 2 inch NPT
*L	Inlet thread — 3 inch NPT		

\* 3 inch Inlet threads not available with option 3 ball valves

#### Examples:

64348CD6H	Nozzle with 100-mesh screen, bonding cable and standard QD with 2-1/2 inch NPT inlet thread
64348BF41	Nozzle with 60-mesh screen, 45 psi (3.103 bar) HECV with inlet flange to mate 60427 type accessories. Note — no inlet QD or other configuration is specified in this case.
64348F514P	Nozzle with 55 psi (3.792 bar) HECV with flanged adapter half and 61154 dry break with 2 inch NPT inlet. Note — swivel adapter half can be specified by using 64348F524P.

# Carter Nozzle Underwing - 64250

## Features

- Easier swivelling under all conditions. Swivel independent of quick disconnect.
- Connects to 3-lug international standard aircraft adapter
- Designed in accordance with new SAE design specification for commercial nozzles AS5877
- Self-adjusting pressure loaded nose seal. Leak free under extreme side loads, worn adapters and extreme temperatures.
- Uses same accessories as previous 64200 and 64348 models. All accessories now have stainless steel wear ring in swivel ball joint.
- Lead-in ramps (interface with aircraft adapter lugs) of stainless steel for longer life
- Positive mechanical interlock — nozzle can not be opened until connected to aircraft; can not be removed from aircraft in open position
- Interlock mechanism internal to nozzle body
- No collar or other moving parts on exterior of nozzle with the exception of the operating lever
- Two threaded ports in nozzle body for simultaneous vacuum breaker and product sampling fitting installation are standard
- Lightweight and most rugged of any Carter brand nozzle
- Modular construction with use of bolt flanges minimized
- 2, 2-½ & 3 inch NPT & BSPP and 3 inch JIS threaded quick disconnect (QD) inlets available
- 60 & 100-mesh screens retained with snap rings for ease of removal
- Operating lever replaceable from exterior of nozzle and is made of less expensive, more ductile material. Also backed up with boss on nozzle body to prevent bending.
- 35 psi (2.413 bar), 45 psi (3.103 bar) & 55 psi (3.792 bar) hose end control valves (HECV) available
- Dry break or ball valve for easy strainer inspection available
- Low pressure drop
- Optional bonding cable and vacuum breaker
- Redundant safety lock on the QD
- Replaceable knob on operating handle eliminates razor sharp wear patterns prevalent on competitor's nozzles
- Options include a "U" bracket for nozzle stowage and one piece stirrup handle with stowage capability. No need to use an aircraft adapter as a stowage device.



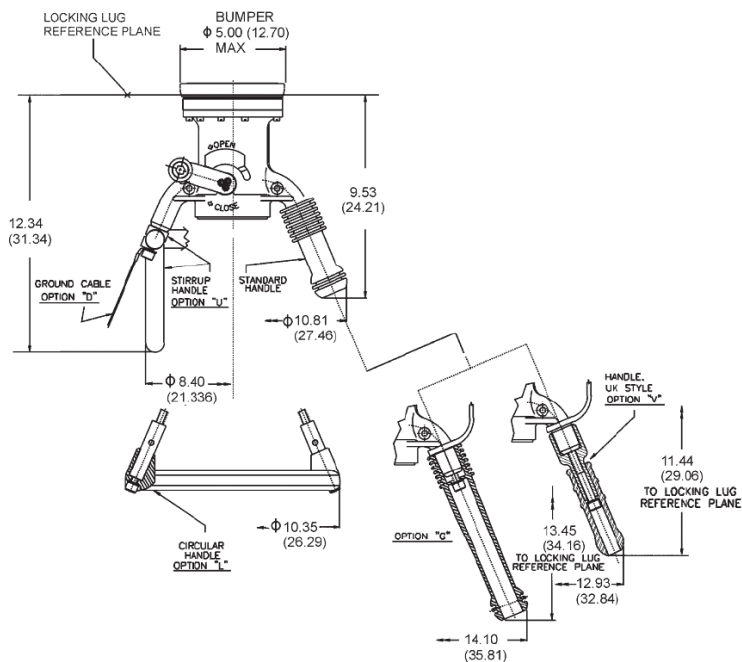
# Carter Nozzle Underwing - 64250

## Ordering Information

### Envelope Dimensions

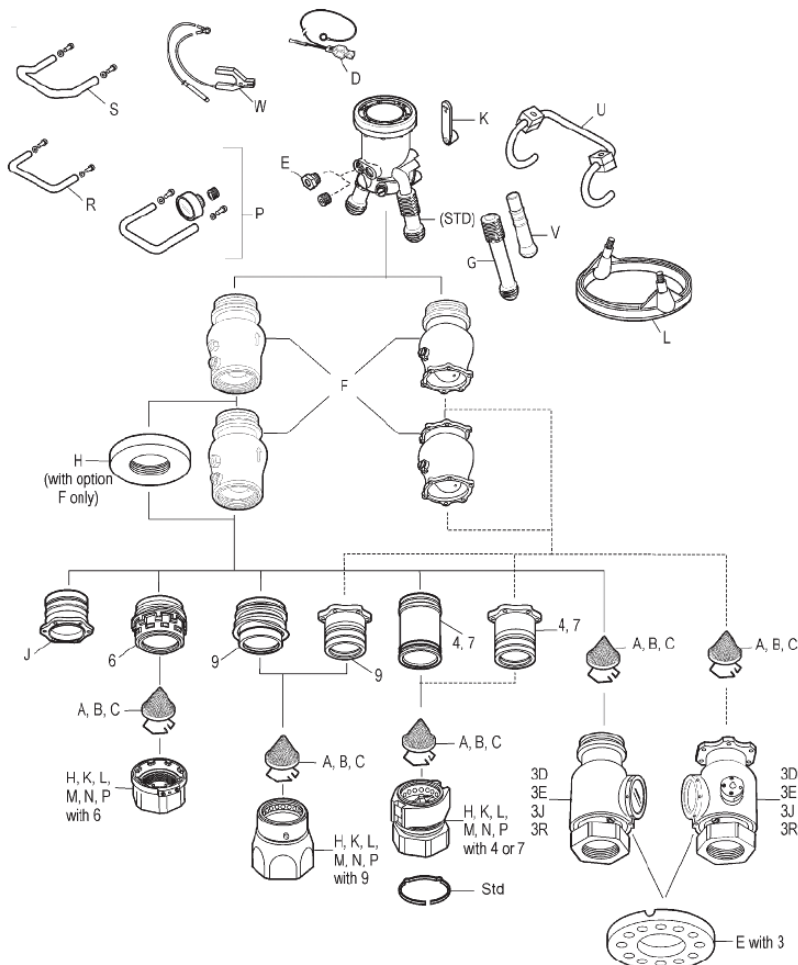
Dimensions shown in inches (millimetres)

Contact the Liquip Sales Department for assistance in determining which of the numerous models and options available will best suit your application.



### Illustrated Options & Weights

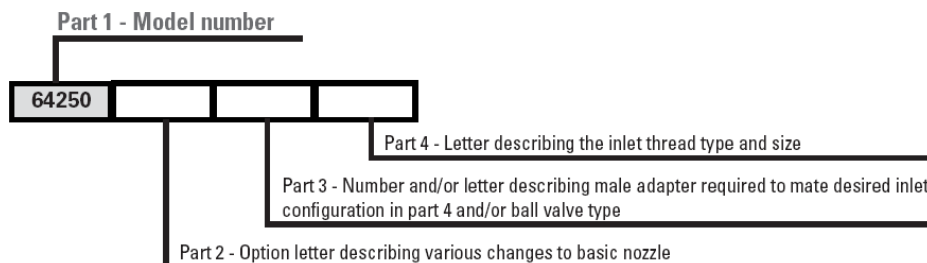
**Note:** The solid lines present one path of compatible options while the dotted lines connect an alternate path of compatible options. Refer to the tables under Ordering Data on page 3 for complete descriptions of the various options.



# Carter Nozzle Underwing - 64250

## Ordering Data

The part number for a complete nozzle consists of four parts as illustrated (right).



### Part 2

The following options may be added to part two of the part number to obtain the desired unit configuration.

Option	Description	Option	Description
*A	Adds 40-mesh screen	J	Inlet adapter to mate 60427 style outlet
*B	Adds 60-mesh screen	K	Replaces standard operating handle with longer one
C	Adds 100-mesh screen	L	Replaces standard carrying handles with circular handle
D	Adds bonding cable	P	Adds pressure gauge with protective bracket
E	Adds vacuum breaker	R	Adds nozzle stowage bracket
**F3	Adds 35 psi (2.413 bar) HECV	S	Adds 45° nozzle stowage bracket
**F4	Adds 45 psi (3.103 bar) HECV	T	Adds adapter to mate Whittaker accessories
**F5	Adds 55 psi (3.792 bar) HECV	U	Replaces standard handle with stirrup handles
G	Replaces standard handles with long handles (47233-2)	V	Replaces standard carrying handles with UK RAF style handles
H	Adds drag ring to nozzle with any option F in conjunction with option T or options 2 or 6 from part 3 (220870)	W	Adds military style bonding cable

\* Options A, B & C only available when a male half from part 3 is specified

\*\* To obtain a nozzle with a dual HECV setup specify two options in series; F5F4 results in 55 psi (3.792 bar) and 45 psi (3.103 bar) units with the former assembled nearest the nozzle inlet. If two HECV's are desired specify the highest pressure setting first.

### Part 3

The configuration of the inlet is defined by adding the appropriate number(s) and/or letter(s) from the table below as part 3 in conjunction with the appropriate option letter from part 4.

Option	Description	Option	Description
*1	Indicates nozzle with flanged inlet HECV	R	Adds defuel key to remove strainer cap to ball valve
*2	Indicates nozzle with swivel inlet HECV	4	Adds male adapter half (44701 w/o HECV, 44185 with flanged inlet HECV, 44697 with swivel inlet HECV) to mate basic nozzle and thumb latch QD
3	Adds ball valve (64015). Options D, E, J & R (below) may be added to complete the ball valve specification	6	Adds male adapter half to mate std QD
D	Adds glass inspection port to ball valve	7	Adds male adapter half (44697 w/o HECV, 44185 with flanged inlet HECV) to mate dry break QD
E	Adds drag ring to ball valve	9	Adds male adapter half (43046 with flanged inlet HECV, 44362 otherwise) to mate 60427 style QD
J	Adds spanner wrench to ball valve		

\* If option 1 or 2 is used with no additional options from part 3, then the shortest configuration nozzle will be provided

### Part 4

The following options may be added to obtain a female half, QD or dry break, or to complete the specification of the ball valve outlet. The nozzle may terminate in an adapter half only. In this case leave part 4 blank.

Option	Description	Option	Description
H	Inlet thread — 2-½ inch NPT	N	Inlet thread — 2 inch BSPP
K	Inlet thread — 2-½ inch BSPP	P	Inlet thread — 2 inch NPT
L	Inlet thread — 3 inch NPT	Z	Inlet thread — 3 inch JIS (used only with options 6 & 9)
*M	Inlet thread — 3 inch BSPP		

\* Three-inch BSPP inlet threads not available with option 3 ball valves

Examples:

64250CD6H Nozzle with 100-mesh screen, bonding cable and standard QD with 2-½ inch NPT inlet thread

64250BF41 Nozzle with 60-mesh screen, 45 psi (3.103 bar) HECV with inlet flange to mate 60427 type accessories. Note that no inlet QD or other configuration is specified in this case.

64250F517P Nozzle with 55 psi (3.792 bar) HECV with flanged adapter half and 61154 dry break QD with 2 inch NPT inlet. Note: swivel adapter half and 61154 dry break QD can be specified by using 64250F527P.

# Carter Hose End Control Valves (HECV)

For line mounted applications, these lightweight Hose End Control Valves (HECVs) provide pressure limitation at the outlet to protect the aircraft while refuelling. Several different pressure settings are available to tailor the control system to the customer's requirements.

## Features

- Lightweight
- Low pressure drop
- Direct spring acting
- Three pressure settings available (see Ordering Data for details)
- Downstream surge pressure control — 75 psi (5.17 bar) max
- Fail safe design
- Model 60129-1 replaces older Model 40680 (part number change only)
- Mechanical blockout device Model 61656 for system test and defueling now available — no connection to fuel pressure required

*Contact the Liquip Sales Department for assistance in determining which of the numerous models and options available will best suit your application.*



**Model 44646**



**Model 47013**



**Model 60129-1**  
(shown with quick disconnect)

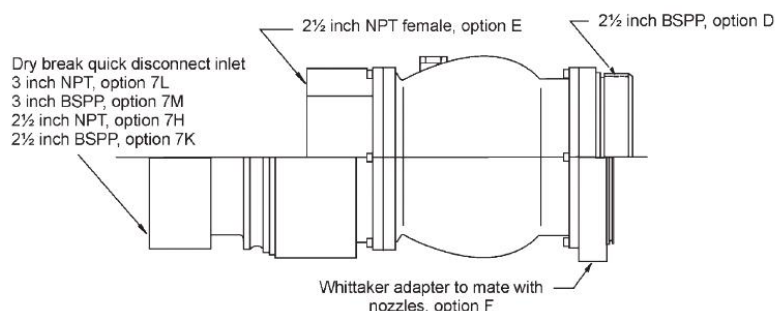
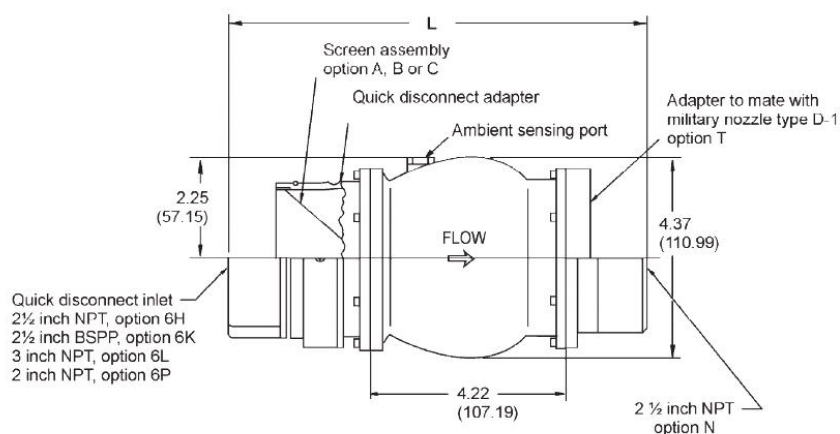
# Carter Hose End Control Valves (HECV)

## Ordering Information

### Envelope Dimensions

Dimensions shown in inches (millimetres)

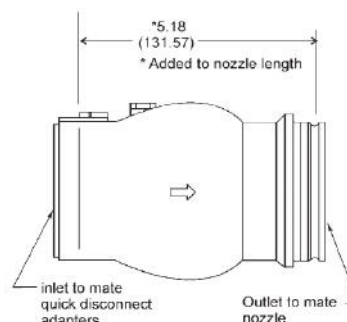
Options for Model 60129-1	Length inches	(mm)
D6, DR, D7	8.30	210.82
D6H, D6K, D6L, D6M	10.20	259.08
DE, FR, F6, F7	.60	19.304
D7H, D7K, D7L, D7M	1.32	287.52
FE	.90	175.26
F6H, F6K, F6L, F6M	9.50	241.30
F7H, F7K, F7L, F7M	10.62	269.74
NE	8.16	207.26
NR, N6, N7	8.86	225.04
N6H, N6K, N6L, N6M	0.76	273.30
N7H, N7K, N7L, N7M	1.88	301.75
TE	6.72	170.69
T6H, T6K, T6L, T6M	9.32	236.72
TR, T6, T7	7.42	188.46
T7H, T7K, T7L, T7M	10.44	265.17



### Model 44646

Designed for use with Eaton's Carter brand nozzle Models 64348, 64200, 64349 or 64201. It has a swivel joint on both ends.

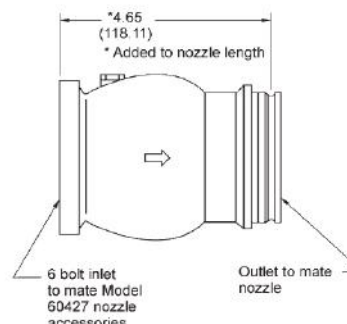
Available with 35, 45 or 55 psi springs (2.413, 3.103 or 3.792 bar). There are no additional options available for Model 44646.



### Model 47013

Designed for use on Eaton's Carter brand nozzle Model 64049 or on Model 64348 or 64349 nozzles that incorporate a Model 64015 ball valve, or for use on any Carter brand nozzle with the dual HECV configuration. Swivel on the outlet end only.

Available with 35, 45 or 55 psi springs (2.413, 3.103 or 3.792 bar). There are no additional options available for Model 47013.

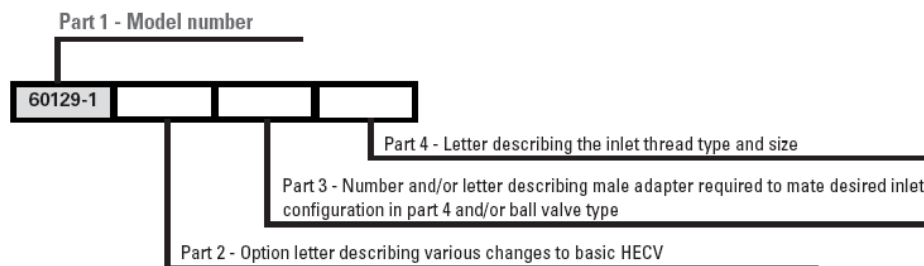


# Carter Hose End Control Valves (HECV)

## Ordering Information

### Model 60129-1

For installation on Eaton's Carter brand Model 60427, Whittaker Model F116/F117 or Avery Hardoll Model HU3000/HU4000 nozzles or for line mounted applications. The part number of a complete 60129-1 HECV will consist of four basic parts as shown at right.



### Part 2

The options shown (right) may be added as part 2 of the part number as indicated above to order a unit to meet your requirements.

Option	Description
*A	40- mesh screen
*B	60-mesh screen
*C	100-mesh screen
D	Adds 2-½ inch BSPP male straight outlet
E	Adds 2-½ inch NPT female straight inlet
**F	Adds outlet adapter to mate Whittaker F116/F117 nozzle
**3	Specifies 35 psi (2.413 bar) spring setting
**4	Specifies 45 psi (3.103 bar) spring setting
**5	Specifies 55 psi (3.792 bar) spring setting
N	Adds 2-½ inch NPT male straight outlet
R	Adds inlet adapter to mate flight refueling disconnect
T	Adds adapter flange to outlet to mate military nozzle inlet
W	Inlet & outlet flanges to mate Whittaker F116/F117 nozzles

\* Options A, B & C only available when a male half from part 3 or option R is specified

\*\* The spring setting number must be included at the end of part 2. If not specified, a 45 psi (3.103 bar) spring setting will be supplied.

### Part 3

One option numbers from part 3 must be included to specify the type of inlet configuration desired, except when option R is ordered. May be ordered with the inlet terminating in an adapter half only, if desired. In this case leave part 4 blank. If a female half QD or dry break is desired, part 4 must be completed.

Option	Description	Option	Description
6	Adds male adapter half to mate standard female QD Model 60679 & old style dry break QD Model 60672-1	7	Adds male adapter half to mate Model 61154 dry break

### Part 4

One of the following letters must be included as part 4, as indicated, to specify the inlet thread and size.

Option	Description	Option	Description
H	Inlet thread — 2-½ inch NPT	M	Inlet thread — 3 inch BSPP
K	Inlet thread — 2-½ inch BSPP	P	Inlet thread — 2 inch NPT
L	Inlet thread — 3 inch NPT		

### Examples:

60129-1	This unit is intended for use on Model 60427 nozzle or on 64049, 64348 or 64349 nozzles when a dual HECV setup is used
60129-14	45 psi (3.103 bar) HECV with inlet and outlet to mate Model 60427 nozzle (formerly ordered as 40680-45 or 60129-1-45)
60129-1C56K	55 psi (3.792 bar) HECV with 100-mesh screen, outlet to mate Model 60427 nozzle and inlet with 2-½ inch BSPP QD
44646	For installation on Models 64348, 64200, 64349 or 64201 nozzles. This unit may also be used on older nozzle Models 61428 or 61429. It has ball swivel joints on both ends. Order this HECV by the model number 44646 followed by the desired spring setting, -35, -45 or -55.
47013	For installation on Model 64348 or 64349 nozzles, either in conjunction with a Model 64015 ball valve or when a dual HECV installation is desired. This HECV has a 6-bolt flanged inlet and a ball joint swivel outlet connection to mate the above nozzles. Order this HECV by model number 47013, followed by the desired spring setting, -35, -45 or -55.

# Carter Dry Break Quick Disconnect

## Features

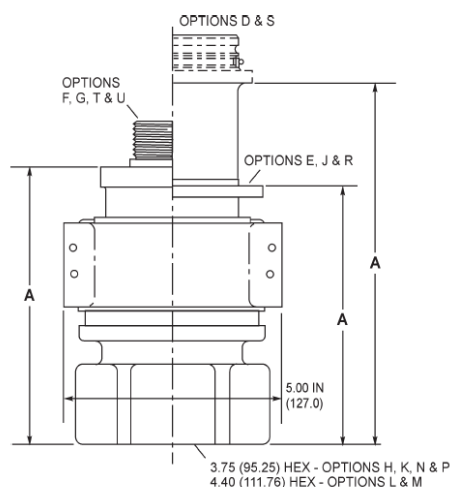
- Dry break mechanism proven from long years of service in the older Model 60672-1 design QD
- Dry break inlet half minimizes fuel spillage during screen check
- Special seal design and impregnated Teflon® wear rings facilitate disconnect and swivel capability. Teflon wear rings also reduce side loading of seal, providing better sealing capability than other designs.
- Wear rings prevent metal to metal contact (galling) of male and female halves
- Military male half adapter has o-ring groove — expensive gasket not needed
- Spring loaded thumb latches lock ball sleeve. No locking screws — no tools required. Either latch will keep sleeve in locked position. Provides two independent locks.
- Spring load on sleeve in opposite direction of normal hose drag (won't accidentally be pulled to the unlocked position) — third lock
- Safety clip (formerly option X, now standard) — fourth lock
- Higher strength check valve actuating fork
- CRES (stainless steel) ball race rings utilized on male adapter half. Eliminates aluminium bronze male used on older commercial 60672-1 model.
- Female inlets available in 2, 2-½ & 3 inch NPT & BSPP threads
- 40, 60 & 100-mesh screens available
- Male outlet adapters available to mate all military D-1/D-2, 60427, 64348, 1-½ & 2 inch NPT overwing and closed circuit refuelling (CCR) nozzles & 1-½ & 2 inch BSPP overwing nozzles



## Envelope Dimensions

Dimensions shown in inches  
(millimeters)

Options	Dim. "A"	
	inches	(mm)
D, S	8.03	(203.96)
F, G, T, U	5.97	(151.64)
E, J, R	5.72	(145.29)



# Carter Dry Break Quick Disconnect

## Ordering Information

Model 61154 dry break disconnect is available in six basic female half units (see descriptions shown at the right) to which the options listed below may be added to obtain a complete unit.

### Superseding Information

Model 61154 dry break disconnect is designed to replace the older Model 60672-1, used on the D-1 and Model 60427 nozzles, and Model 44363, used on older Model 61428 nozzles. The male and female halves of Model 61154 are not interchangeable with either the 60672-1 or 44363 model's male and female halves. The entire dry break disconnect must be replaced.

### Note:

It is important to consider whether a hose end regulator is used or not when choosing the dry break disconnect. The male half option is different when a regulator is used. If the incorrect male half option is specified, either the nozzle opening handle will interfere with the dry break disconnect (short adapters, options J or S, used where no regulator is present); or the nozzle assembly will be longer than necessary (long adapters, options D or R, used with a regulator).

Model	Description
61154H	Female half with 2-½ inch NPT inlet
61154L	Female half with 3 inch NPT inlet
61154K	Female half with 2-½ inch BSPP inlet
61154M	Female half with 3 inch BSPP inlet

Option Letter	Description
A	Adds 40-mesh screen and retaining ring (44373-40)
B	Adds 60-mesh screen and retaining ring (44373-60)
C	Adds 100-mesh screen and retaining ring (44373-100)
D	Adds long male half adapter to mate with Model 60427 nozzle, less regulator and related accessories (44700)
E	Adds male half adapter to mate military D-1/D-2 nozzles (44663)
F	Adds male half adapter to provide 2 inch BSPP male thread to mate overwing nozzle (44746)
G	Adds male half adapter to provide 1-½ inch BSPP male thread to mate overwing nozzle (47024)
J	Adds short male half adapter to mate Model 60427 nozzle with regulator and related accessories (44185)
R	Adds short male half adapter to mate Model 61428 nozzle with regulator and related accessories (44697)
S	Adds long male half adapter to mate Model 61428 nozzle without regulator and related accessories (44701)
T	Adds male half adapter to provide 1-½ inch NPT male thread to mate overwing nozzle or CCR nozzle (44698)
U	Adds male half adapter to provide 2 inch NPT male thread to mate overwing nozzle (47065)

### Notes:

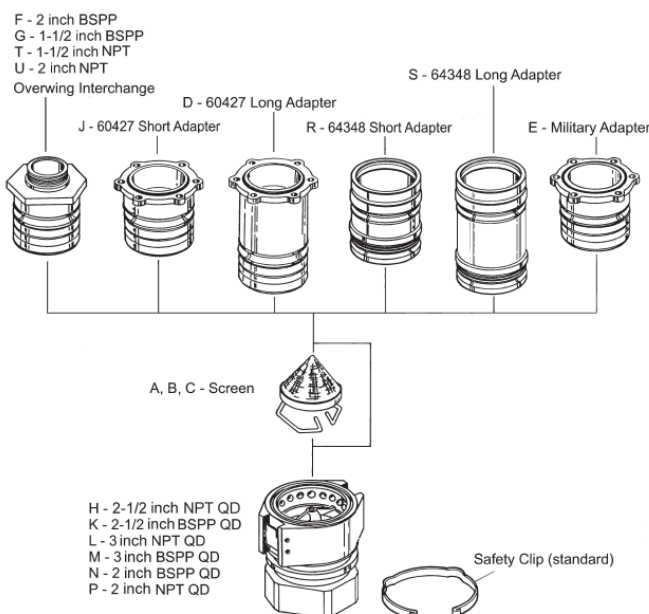
- Options A, B, & C fit into the male half adapters only (options D, E, F, J, R, S, & T)
- Options D, E, F, G, J, R, S, T, or U must be ordered with one of the six basic units above to obtain a completed unit

### NSN Information

Several of the 61154 dry breaks have NSN numbers issued as follows:

NSN	Eaton Model	Description
4730-01-366-7215	61154AEL	Dry break QD, 40-mesh screen, 3 inch NPT inlet, outlet to mate D-1/D-2 nozzle
4730-01-366-9406	61154AEP	Dry break QD, 40-mesh screen, 2 inch NPT inlet, outlet to mate D-1/D-2 nozzle
4730-01-306-6328	61154EP	Dry break QD, 2 inch NPT inlet, outlet to mate D-1/D-2 nozzle
4730-01-353-8497	61154BEH	Dry break QD, 60-mesh screen, 2-½ inch NPT inlet, outlet to mate D-1/D-2 nozzle

### Illustrated Options



## Nozzle Stowage

The Liquip Aviation Nozzle Stowages are used on virtually all Liquip aircraft refuelling vehicles as well as other non-vehicle or stand-alone aviation fuelling applications.

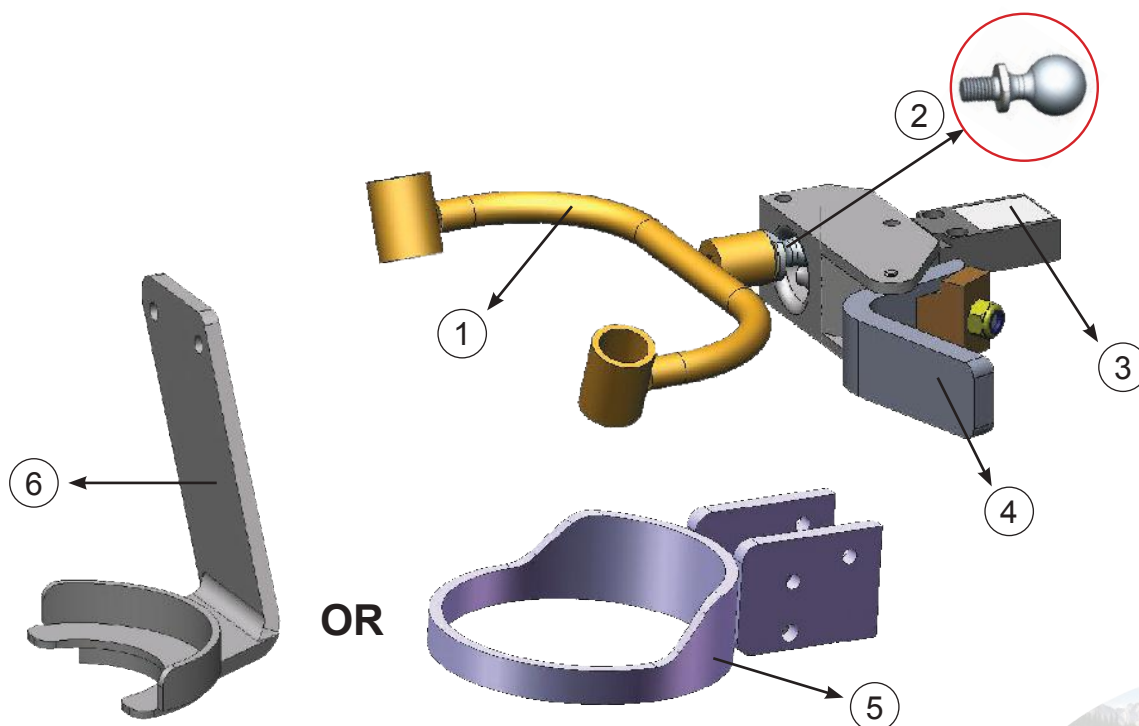
### Ball & Socket - Underwing

The Liquip ball and socket nozzle stowage assembly provides safe and sturdy nozzle storage as well as an interlocking mechanism. The interlocking mechanism can be connected to either an electrical interlock switch or a pneumatic interlock valve.

Releasing a nozzle from the socket is made easy using a lever located directly under the socket. This assembly consists of an anodised aluminium alloy body and stainless steel ball to minimise the chance of sparking on contact.

### Ordering Information

Item No	Part No	Description
1	4600-06-01	Interlock Handle only
2	4600-05-01	Interlock Ball only
3	8568	Plunger Interlock Switch
4	4600-05-00	Interlock Ball & Socket Assembly
5	4600-01-01	Nozzle Holder
6	4600-04-01	Nozzle Holder

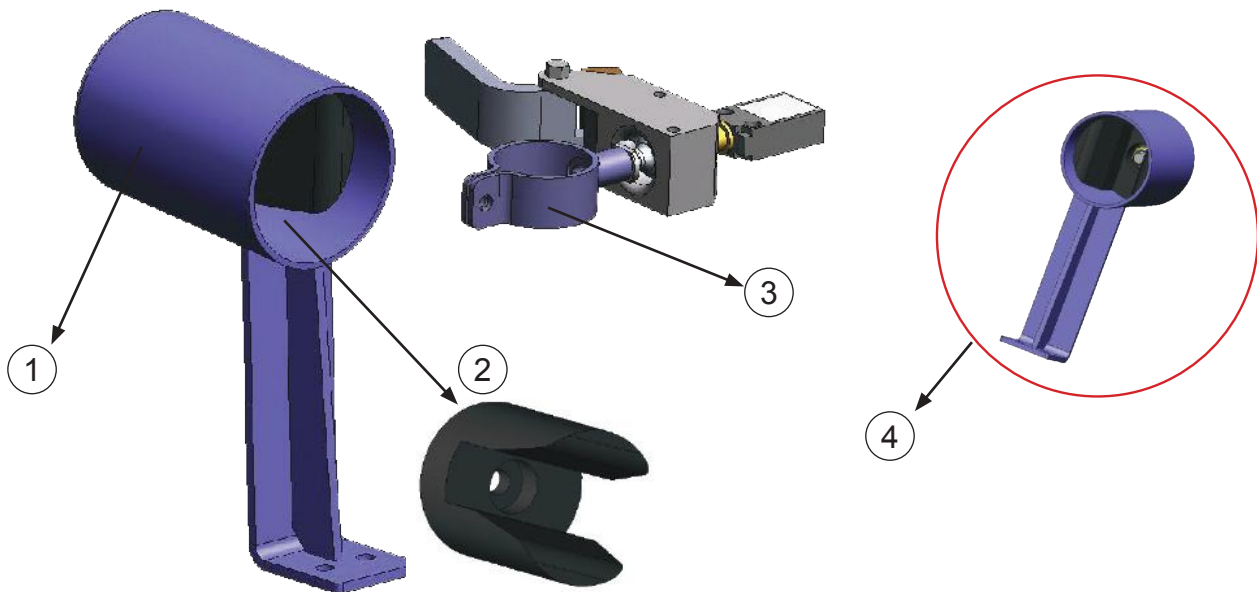


# Nozzle Stowage

## Ball & Socket - Overwing

### Ordering Information

Item No	Part No	Description
1	4600-03-02	Nozzle Stowage Cover
2	4600-03-06	Jet Selective Nozzle Stowage
3	4600-06-02	Overwing Nozzle Interlock Bracket
4	4600-03-01	Nozzle Stowage Holder Assembly



# Nozzle Stowage

## Twist-Lock Bayonet

A 'cup stowage with "twist-lock" bayonet adaptor" is a recent variant.

## Ordering Information

Item No	Part No	Description
1	4600-01-07	Bucket Style Nozzle Stowage
2	20216201F	Twist-lock Bayonet Adaptor
3	8568	Plunger Interlock Switch (Ex'd Rated)



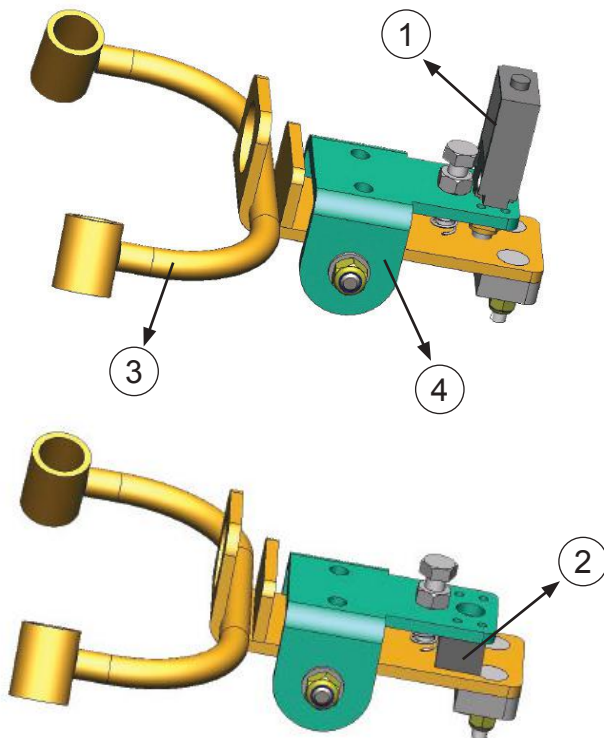
## Nozzle Stowage

### Drop-In

The “drop-in” type is purely for platform stowages. The interlocking mechanism is typically connected to an electrical interlock switch (a pneumatic interlock valve could also be used).

### Ordering Information

Item No	Part No	Description
1	8568	Plunger Interlock Switch
2	8850	Proximity Interlock Switch
3	4600-02-03	Drop-In Handle
4	4600-00-02	Drop-In Nozzle Stowage





## *Bottom Load Accessories*

# OPW EUROLINE SERIES INTERNAL VALVE

CIVACON's EURO100-Line Bottom Valves are designed for increased safety, durability and service performance. The EURO100-Line high flow bottom valves are available as Compact 100-1 series, Super Compact 100-2 series, 4" TTMA or TW 100-3 series and T-shape 100-4 series.

## Features & Benefits

- All EURO100-Line Bottom Valves in accordance with EN13308 (Non Pressure Balanced), EN13316 (Pressure Balanced), ADR and API RP 1004.
- Available models: Compact, Super Compact, 4" TTMA or TW outlet and T-Shape.
- Pressure balanced or non pressure balanced operation.
- Sequenced or non-sequenced operation.
- 4" or DN100 connection.
- Lightweight pressure die-cast for improved strength and reduced weight.
- Hard anodized and stainless steel internals.
- Stainless steel filter/strainer.
- Shear Groove to prevent spillage in case of an accident.
- Superior flow rate:
  - up to 2.500 litres/minute.
  - no moving parts in the flow path.
- Viton GLFT seals.
- Valve service inside of the compartment.
- Manually openable in case of emergency.

## Technical Information

Nominal Size	4" or DN100
Working Pressure	5 bar (500 kPa)
Operating Pressure	4 bar
Maximum Flow Rate	2,500 Litre/min
Seals	Vton GFLT
Working Temperature	-20 °C to 70 °C other temps on request
Weight	EURO100-1: 4.6 kg. EURO100-2 : 5.5 kg EURO100-3 : 4.7 kg EURO100-4 : 5.8 kg



EiURO100-1 Series



# OPW EUROLINE SERIES INTERNAL VALVE

## Ordering Information

### Compact Model: EURO100-1 series

EURO100-1-AL40: 4" non-pressure balanced, non sequenced.  
EURO100-1S-AL40: 4" non-pressure balanced, sequenced.  
EURO100-1B-AL40: 4" pressure balanced, non sequenced.  
EURO100-1BS-AL40: 4" pressure balanced, sequenced.

### Super Compact Model: EURO100-2 series

EURO100-2-AL40: 4" non-pressure balanced, non sequenced.  
EURO100-2S-AL40: 4" non-pressure balanced, sequenced.  
EURO100-2B-AL40: 4" pressure balanced, non sequenced.  
EURO100-2BS-AL40: 4" pressure balanced, sequenced.

### 4" TTMA Outlet Model: EURO100-3 series

EURO100-3-AL40 4" non-pressure balanced, non sequenced.  
EURO100-3S-AL40 4" non-pressure balanced, sequenced.  
EURO100-3B-AL40 4" pressure balanced, non sequenced.  
EURO100-3BS-AL40 4" pressure balanced, sequenced.

### 4" T-Shape Model: EURO100-4 series

EURO100-4-AL40 4" non-pressure balanced, non sequenced.  
EURO100-4S-AL40 4" non-pressure balanced, sequenced.  
EURO100-4B-AL40 4" pressure balanced, non sequenced.  
EURO100-4BS-AL40 4" pressure balanced, sequenced.

## Related Products

**SF-100-ST40:** Steel sump flange.  
**10-02-43:** Aluminium sump flange.  
**10-01-74/EU:** Aluminium square outlet flange.  
**10-01-84:** Gasket for square outlet flange.



EiURO100-1 Series



EiURO100-2 Series



EiURO100-3 Series

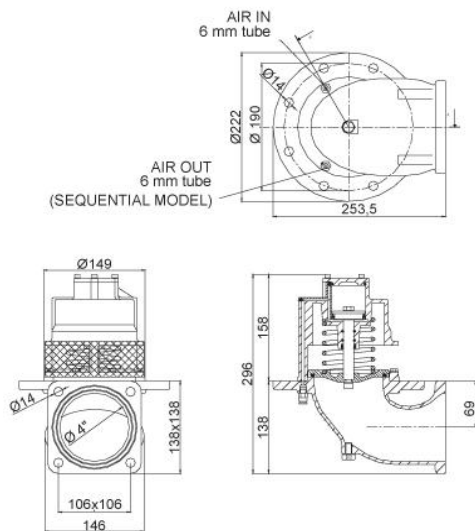


EiURO100-4 Series

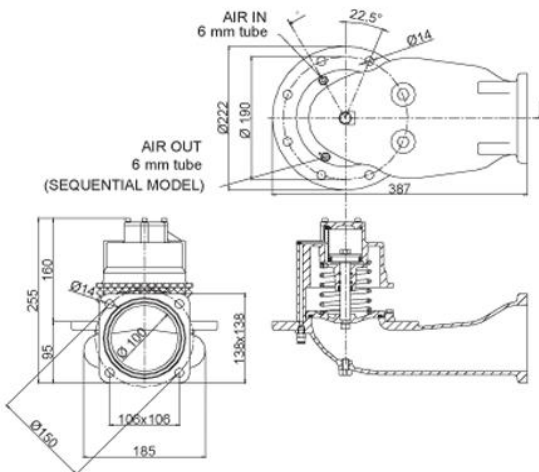
# OPW EUROLINE SERIES INTERNAL VALVE

## Product Specifications

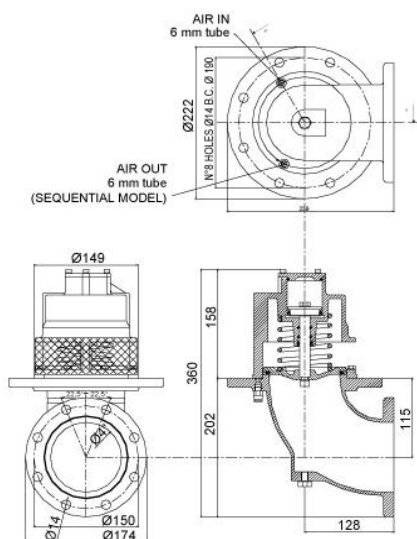
### EURO100-1 SERIES



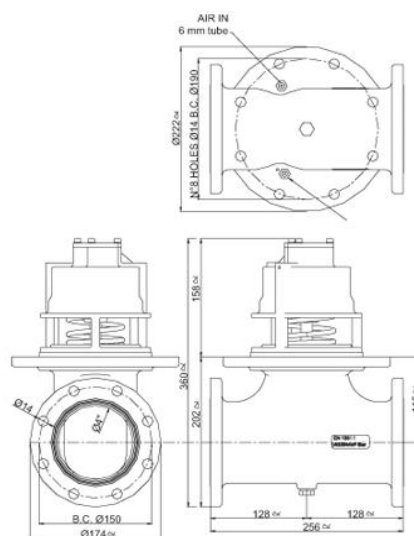
### EURO100-2 SERIES



### EURO100-3 SERIES



### EURO100-4 SERIES



## Spare Parts

### Repair kit

EURO100RK: Seal kit for EURO100-series Bottom Valve.

Contents EURO100RK Repair kit

89-60-75/V: O-ring (Viton).

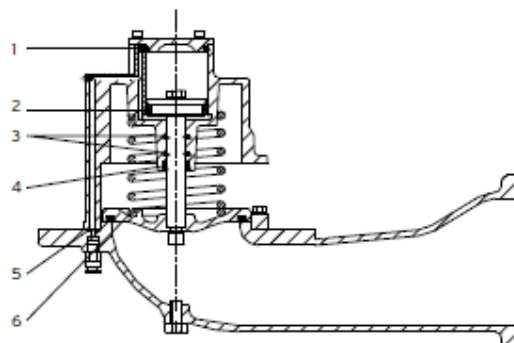
26-60-27: Gasket (Viton).

26-60-26: O-ring (Viton).

82-30-53: Gasket (Viton).

89-60-76/V: O-ring (Viton).

92-60-70: O-ring (Viton).



## Normec Internal Footvalve

4" foot valve with pneumatic control, pressure balanced design. The foot valve is made so that the shutter position can be checked by the position of a control stem. The shutter can be manually opened by means of a special key, in any case of failure of the air supply (80.40.60).

### Technical Specifications

Flow Rate:	Up to 2500 l/min
Working Pressure:	1000kPa
Min Operating Air Pressure:	400kPa
Max Operating Air Pressure:	900kPa
Air Fittings:	1/8" BSP
Materials:	Aluminium body and valve piston mechanism Stainless steel shaft Viton seals

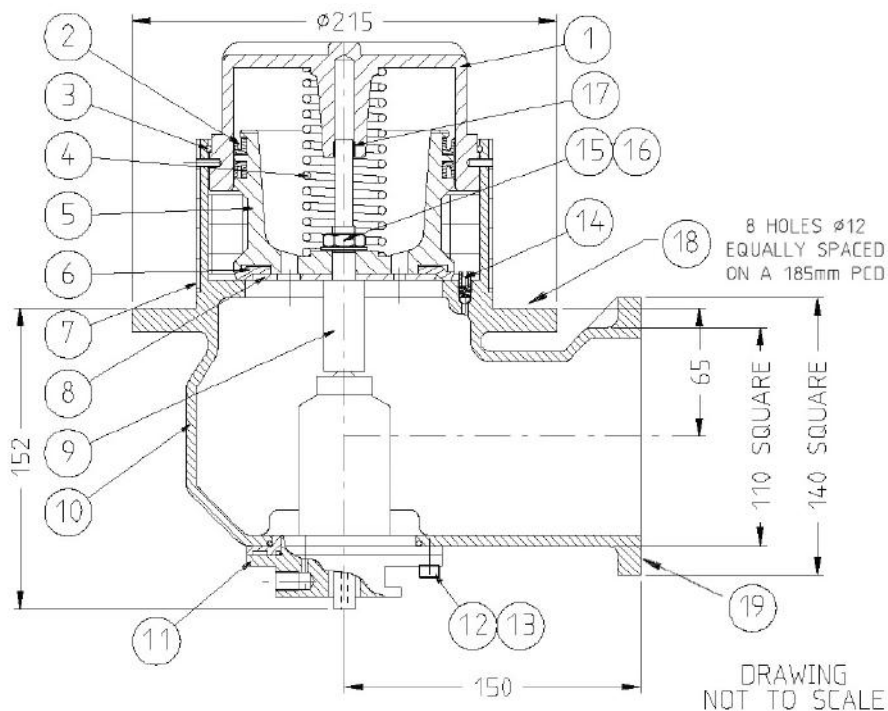
### Ordering Information

Part No	Description
NOR-904120	Pressure Balanced Internal Footvalve
300605.6	Aluminium Tank Flange to suit
300140.1	Viton Gasket to suit flange



# Normec Internal Footvalve

## Ordering Information



**NOR-904120 (Parts List)**

Item No	Part No	Description	Qty	Material
1	80.42.73	Compensating Bell	1	Aluminium
2	034.024	U-Seal	2	Viton
3	80.40.04	Spring Clip Internal	1	St Steel
4	90.41.26	Spring	1	N/P M/S
5	80.42.74	Poppet	1	Aluminium
6	80.42.75	Poppet Seal	1	Viton
7	90.41.23	Filtrating Gauze	1	Z/P M/S
8	90.41.24	Seal Retaining Washer	1	Z/P M/S
9	90.41.22	Poppet Spindle	1	St Steel
10	90.41.21	Valve Body	1	Aluminium
11	90.40.50	Piston	1	Aluminium
12	003.039	Capscrew	4	Z/P M/S
13	024.005	Washer Shakeproof	4	Z/P M/S
14	80.43.10	Equalising Pressure Valve	1	Z/P M/S
15	015.063	Nut	1	Z/P M/S
16	027.108	Washer	1	Z/P M/S
17	049.016	Bush	1	
18	300140.1	Gasket	1	Viton
19	300138.2	Square Gasket	1	Viton

# Carter Bottom Loading Adaptor

Carter provides the 2 1/2 inch aircraft standard bayonet refuelling adapter, to mate underwing nozzles or hydrant couplers, with several choices of flanged or threaded inlet. It is also available as a stand alone module without a housing. These adapters are designed to be used for either bottom loading of a refueller, for connection to a hydrant system or tank farm pumping system on refuellers.

Carter offers a choice of either outlet flanges or TTMA flanges for the three and four inch styles. The 2.5" outlet styles are available only in threaded connections, either NPT or BSPP. The ANSI type flanged units are most suited for hydrant applications while the TTMA units are suited for bottom loading or recirculation systems. The 2.5" units are (by choosing the correct unit) usable in either application.

## Features

- Product Selection units available.
- Plastic or military metal sealing caps available.
- Convenient bosses to mount pressure gauges or sampling ports standard.
- Pressure equalisation valve offered in poppet for hydrant applications.



Model 6958 fuelling adapter



Model 61272 bottom loading adapter



Model 61531 military style sealing cap



Model 61529 aircraft adapter

# Carter Bottom Loading Adaptor

## Ordering Information

### Model 64373

3 inch 125/150 lb. ANSI flat faced flange x 2-½ inch bayonet  
Product selection positions 4-6 available. Weight 5.8 lbs (2.631 kg).

Option	Description	Comments	Weight lb kg	
*A	Adds product selection (4,5,6)	In Lieu of option F	+0.4	.181
*B	Adds pressure relief valve	In lieu of option E	+0.0	
C	Adds pressure cap	In lieu of option D	+0.5	.227
D	Adds plastic cap	In lieu of option C	+0.1	.045
*E	Adds standard poppet (no relief valve)	In lieu of option B	+0.0	
*F	No product selection	In lieu of option A (for bottom loading application use Model 61409)	+0.0	

\* Options A or F & B or E must be specified to achieve a completed part number

### Model 64040

3 inch ANSI flange x 2-½ inch bayonet  
No product selection (use for bottom loading only)

Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045

### Model 61528

3 inch TTMA flange x 2-½ inch bayonet  
No product selection (use for bottom loading only). Weight 3.3 lbs (1.497 kg).

Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045
*C	Commercial MS24484-2 adapter	In lieu of option D	+0.0	
*D	Mil-spec MS24484-5 adapter	In lieu of option C	+0.0	

\* Options "C" or "D" must be specified to achieve a completed part number

### Model 6958

2-½ inch outlet x 2-½ inch bayonet  
No product selection (use for bottom loading or recirculation only). Weight 2.9 lbs (1.315 kg).

Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045
*C	Commercial MS24484-2 adapter	In lieu of option D	+0.0	
*D	Mil-spec MS24484-5 adapter	In lieu of option C	+0.0	
*G	Adds 2-½ inch - 8 NPT female outlet	In lieu of option H	+0.0	
*H	Adds 2-½ inch BSPP female Outlet	In lieu of option G	+0.0	

\* Options C or D & G or H must be specified to achieve a completed part number

### Model 60195

2-½ inch outlet x 2-½ inch bayonet  
product selection positions 4-6 standard. Weight 3.3 lbs (1.497 kg)

Option	Description	Comments	Weight lb kg	
A	Deletes product selection		-0.4	.181
B	Adds pressure relief valve	In lieu of option F	+0.0	
*C	Adds pressure cap	In lieu of option J	+0.5	.227
*D	Adds standard poppet (no relief valve)	In lieu of option B	+0.0	
*G	Adds 2-½ inch — 8 NPT female outlet	In lieu of option H	+0.0	
*H	Adds plastic cap	In lieu of option E	+0.1	.045

\* Options B or F & G or H must be specified to achieve a completed part number

# Carter Bottom Loading Adaptor

## Ordering Information

### Model 61247

Modular fueling adapter in accordance with MS24484-5

Option	Description	Comments	Weight lb kg	
61247	Modular adapter — MS24484-5	Qualified military unit	0.9	.408

### Model 61529

Modular fueling adapter in accordance with MS24484-2  
Use for bottom loading only. Not for airplane use. Weight 0.9 lb (.408 kg).

Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045
Z	Adds mounting flange o-ring		+0.0	

### Model 61531

Pressure cap in accordance with MS29526-2

Option	Description	Comments	Weight lb kg	
61531	Pressure dust cap — MS29526-2	Not for airplane use	0.5	.227

### Model 60373

4 inch 125/150 lb. ANSI flat faced Flange x 2-½ inch bayonet  
Product selection positions 4-6 available. Weight 7.4 lbs (3.356 kg).

Option	Description	Comments	Weight lb kg	
*A	Adds product selection (4, 5 & 6)	In lieu of option F	+0.4	.181
*B	Adds pressure relief Valve	In lieu of option E	+0.0	
C	Adds pressure cap	In lieu of option D	+0.5	.227
D	Adds plastic cap	In lieu of option C	+0.1	.045
*E	Adds standard poppet (no relief valve)	In lieu of option B	+0.0	
*F	No product selection	In lieu of option A	+0.0	

\* Options A or F & B or E must be specified to achieve a completed part number

### Model 61409

4 inch 150 lb. ANSI flat faced flange x 2-½ inch bayonet  
No product selection (use for bottom loading only). Weight 6.9 lbs. (3.133 kg).

Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045
*C	Commercial MS24484-2 adapter	In lieu of option D	+0.0	
*D	Mil-spec MS24484-5 adapter	In lieu of option C	+0.0	

\* Options C or D must be specified to achieve a completed part number

### Model 61272

4 inch TTMA flange x 2-½ inch bayonet  
No product selection (use for bottom loading only). Weight 3.6 lbs (1.633 kg).

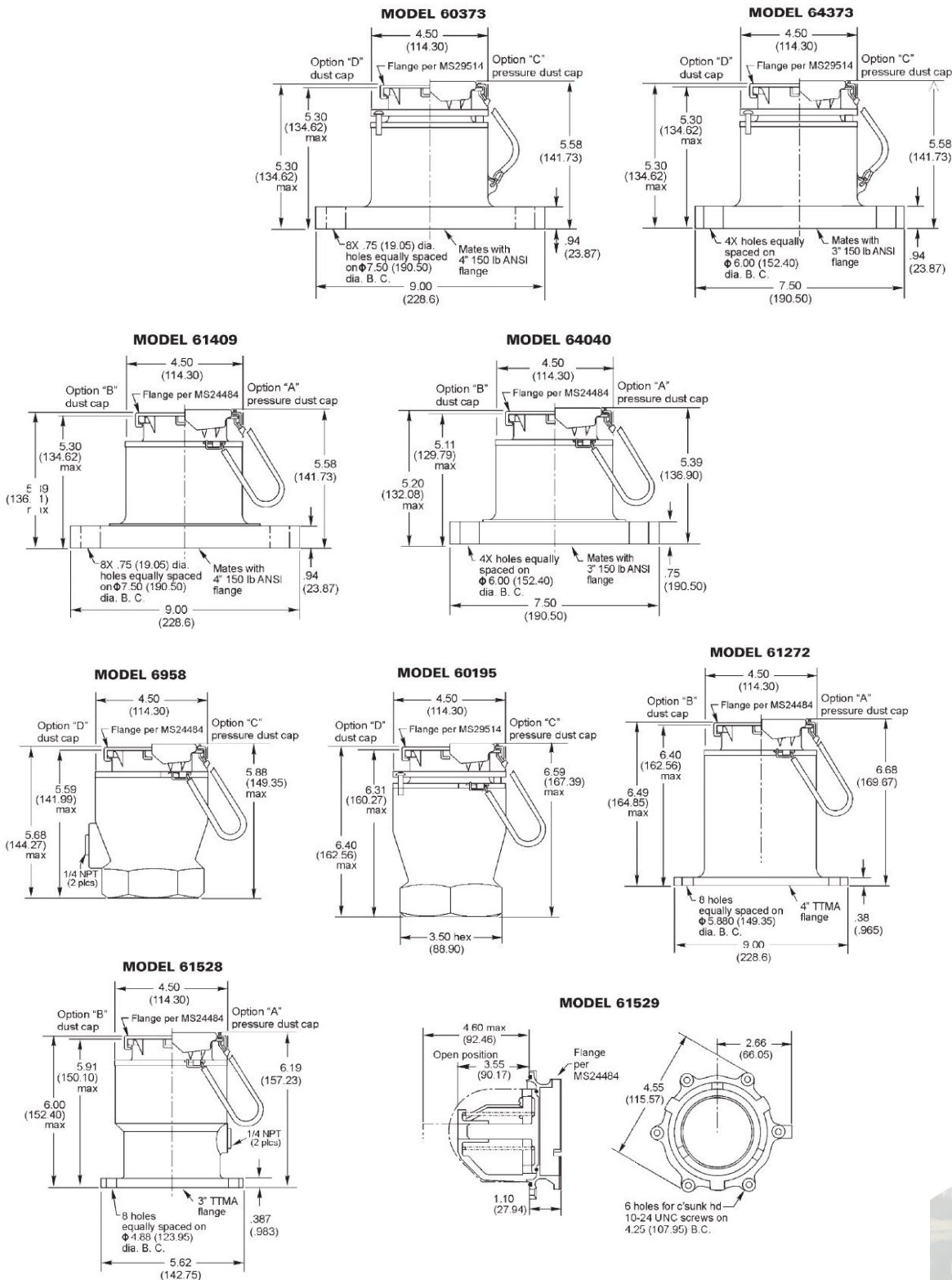
Option	Description	Comments	Weight lb kg	
A	Adds pressure dust cap	In lieu of option B	+0.5	.227
B	Adds plastic dust cap	In lieu of option A	+0.1	.045
*C	Commercial MS24484-2 adapter	In lieu of option D	+0.0	
*D	Mil-spec MS24484-5 adapter	In lieu of option C	+0.0	

\* Options C or D must be specified to achieve a completed part number

# Carter Bottom Loading Adaptor

## Envelope Dimensions

Dimensions shown in inches (millimetres)





## *Hydrants*

# Carter Hydrant Coupler 4 Inch - 64910

The Model 64910 is the latest coupler design and it supersedes Models 64900 and 60700-1. It is used for air reference pressure control systems.

The lower half of Model 64910 has been completely redesigned. This new lower half incorporates three (3) detent pins, an internal collar locking device and collar lifting handles [both "short" (standard) or "tall" (option "T")], providing improved ergonomics and operational handling during disconnect.

Two additional coupler models that include this new lower half are also available, Model 64912 for digital pressure control systems, and Model 64913, which is electro-hydraulically controlled.

Earlier coupler Models 64900 and 60700-1 can be retrofitted to gain these new features by changing only the lower half.



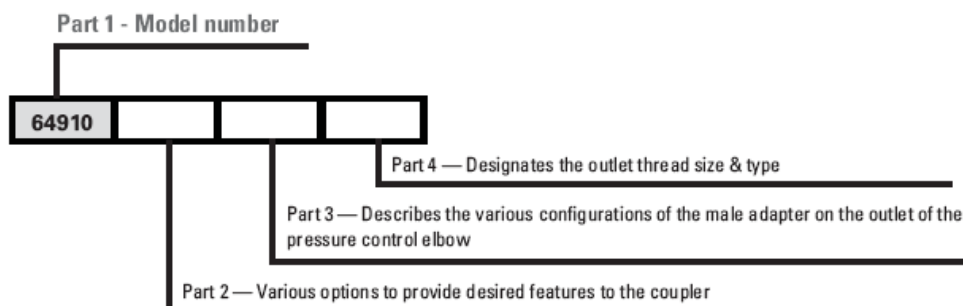
## Features

- Mates all adapters and all standard hydrant valves in accordance with API bulletin 1584
- Outlet of elbow is flanged to accept various outlet male adapter fittings. Options to mate older quick disconnects (QDs) available, reducing maintenance costs if male fitting is damaged.
- 3 and 4 inch NPT or BSPP outlet threads available
- Air/fuel sense ports parallel to outlet
- All ports with straight O-ring sealed threads
- Air bleed under sealed screw
- Closing time adjustment accessible without removal of air port fitting
- Studs used for connecting lower half, reducing chance of over-tightening connecting fasteners
- External collar locking device eliminated
- Optional carrying handles available. Transverse mounting standard. A second QD mounted handle is also available.
- Carriage affixed by studs. No special length bolts required, reducing chances for errors when carriage is added in the field.
- Port to connect to hydrant provided on coupler. No special hose assembly required
- Parts common to 4 inch inline valves and Model 60700-1 coupler used for less costly maintenance
- Design changes have not increased weight

# Carter Hydrant Coupler 4 Inch - 64910

## Ordering Information

Various options are available on Model 64910 coupler. The complete model number is comprised of four parts, as explained in the tables below.



### Part 2

One or more of the options shown in the table (right) may be added to the basic model number 64910 to obtain desired features.

Option	Description	Option	Description
B	Adds folding handle	J	Adds 3/8 inch hose barbs to air & fuel
C	Adds product selection	R	Adds 90° elbow 1/4 inch female NPT for air/dual operated hydrant valve actuation
D	Adds lockwire to flange joint fasteners	T	Adds "tall" lower collar lifting handle
E	Adds API style air/fuel QD	W	Adds carriage assembly
F	Adds hose barb fittings to air and fuel ports	Y	Adds handle assembly at outlet port
H	Adds 3/8 inch NPT to both air & fuel ports		

### Part 3

One of the options described in the table (right) must be added to determine the outlet male adapter configuration.

Option	Description	Option	Description
3	Male adapter fitting to mate 60700-1 style female QD	4	Male adapter to mate with 44220 QD

### Part 4

One of the options described below must be added to specify the outlet thread size and type.

Option	Description	Option	Description
L	Adds 3 inch NPT threaded female QD	P	Adds 4 inch NPT threaded female QD
M	Adds 3 inch BSPP threaded female QD	R	Adds 4 inch -8 NPSC threaded female QD (used with option 3 only)
N	Adds 4 inch BSPP threaded female QD	Z	Adds 4 inch BSPP female QD with cast handle (used with option 3 only)

**Note:** If part four is left blank, no female quick disconnect will be shipped. This is a proper designation when it is desired to use a Model 64910 to replace a Model 60700-1, 60600 or 60600-1 coupler. In this case part three must correctly designate the proper male adapter fitting.

#### Examples:

- 64910BF3L Coupler with folding handle, hose barbs in all air/fuel ports, male adapter fitting to mate female QD with 3 inch NPT threads
- 64910CT3 Coupler with product selection and male adapter fitting to mate to female QD (no female QD provided) and "tall" lower collar lifting handle

## Carter Hydrant Pit Valve - 60554

The Carter Model 60554 Hydrant Pit Valve is a family of valves that includes lanyard, air or dual air/lanyard operated pilot valves, with the latter available with a defueling option. The hydrant pit valve consists of three basic parts, lower valve assembly, upper valve assembly (or API outlet adapter) and the pilot valve. The lower valve assembly contains an isolation valve which will allow the removal and servicing of the upper valve assembly and the pilot valve assembly while the pit valve is under pressure.

The Model 60554 hydrant pit valve is API1584 3rd edition compliant and is designed to minimize the propagation of surge pressure shocks into the upstream piping system during closure of the valve.

### Features

- Two-piece upper half standard, replaceable API outlet adapter of stainless steel per API Bulletin 1584. Ductile iron and all stainless uppers optional.
- Standard inlet flange mates with 4-inch 150 lb. ANSI flange.
- Optional inlet flange mates with 6-inch, 300 lb. ANSI flange making valve conform to the IP Standard.
- Closing time is 2-5 seconds.
- Opening time is 5 to 10 seconds.
- Servicing valve standard to provide means to remove the upper valve assembly and pilot valve assembly with the unit under pressure.
- 10 or 20-mesh screen options available.
- All seals are field replaceable.
- Large pressure equalizing valve in the outlet is standard.
- Working pressure – 300psi
- Stone guard optional with 6-inch inlet flange option.
- Ductile iron epoxy coated for corrosion protection
- Main piston well guided to minimise piston seal wear.



# Carter Hydrant Pit Valve - 60554

## Pilot Options

- Model 60554D — Lanyard operated pilot valve for manual on/off control. Valve allows flow in the fuelling direction only.
- Model 60554E — Air operated pilot valve for deadman control. Valve allows flow in the fuelling direction only.
- Model 60554F — Dual air and lanyard operated pilot valve for deadman control and manual on/off control for use in small pits only (12 or 13 inch diameter). Unidirectional only, unless combined with option J.
- Model 60554J — Air operated pilot valve for deadman control with defuel control to allow flow of fuel in either fuelling or defueling direction
- Model 60554-3D — Same as Model 60554D except material of outer housing is ductile iron per ASTM A395 (special order only). The upper and lower valve assemblies are fastened together with 15 metric threaded screws instead of the normal 8-UNF threaded screws (replaced Model 60554-2D). Two piece upper half not available on this unit.
- Model 60554X — Remove the pilots from the Hydrant Valve and replacing it with a sealed male disconnect fitting. As a result you only need to have one pilot for each hydrant servicer rather than one for each hydrant valve, reducing cost. The remote pilot is also sealed and thereby eliminates issues related to the inward breathing pistons in the conventional pilots which can inhale contaminants resulting in internal corrosion and increased maintenance. Fuel leakage into the hydrant servicer's pneumatic system is also not possible with this design. The remote pilots are compatible with air or fuel command systems.
- Model 60554Y — As per X pilot but with Pneumatic operated "fork" mechanism to eject the remote pilot, effectively making it a dual pilot (part number 47834)
- Model 60554Z — New Dual Pilot (for Pit Boxes 18" in diameter and larger):  
Additionally, for those users who require the dual pilot to be permanently attached to the hydrant valve, Eaton now offers a new Option "Z" pilot. This pilot adopts the sealed piston technology from our remote pilots into a compact lanyard mechanism that eliminates issues related to the inward breathing pistons in the conventional pilots. Fuel leakage into the hydrant servicer's pneumatic system is also not possible with this design.

Existing hydrant valves can easily be converted to any of the remote pilot options. They eliminate all of the common maintenance issues related to contaminated fluids entering the pilot piston area of existing "E", "F", or "U" pilots and also eliminated the possibility of fuel entering the pneumatic systems on the hydrant servicer.



# Carter Hydrant Pit Valve - 60554

## New Remote Pilots:

These remote pilots stay attached to the hydrant servicer via the command hose and they can be energized with either air or fuel:

Part number 64230 Simple Disconnect (requires manual lifting of the collar to engage and to disengage)

– OR –

Part number 64280 Push-On Disconnect can be pushed on, but collar must be raised to disengage, or will disengage automatically when pulling the lanyard on the Option “Y”, noted above.

Optional extension handle available on both remote pilots.



## Ordering Information

Option letters may be combined with the basic units, except as noted, to customize the valve to fit specific installation requirements. Note basic models referenced on page 2, “Model Descriptions” section.

Option	Description	Option	Description
A	Adds 10-mesh screen between upper and lower halves of the unit (81557-10)	M	Adds dry break (with bleed) to option E, F, J or U air connection (not available on option X)
B	Adds 20-mesh screen between upper and lower halves of the unit (81557-20)	N	Adds adapter kit for installing unit into 12 or 13 inch Avery Hardoll pits with 3 inch ANSI mounting flanges. Can not be used with options G, H, K or L.
C	Adds six-position product selection (44290)	P	Adds 4 inch spool piece to convert inlet flange to mate with 6 inch 300-lb ASA raised face flange (47199). Resultant valve height is 16 inches (special order on 60554-2D & 3D).
G	Adds spool piece to convert inlet flange to mate with 6 inch 300-lb. ANSI flange to meet IP standard (44364) (special order on 60554-2D & 3D)	Q	Changes upper half housing (adapter) to one piece ductile iron (special order - not available on Model 60554-3D)
H	Adds 4-mesh stone guard to inlet. Available only with option G above (43578)	R	Changes upper half housing (adapter) to two-piece ductile iron/stainless steel (not available on Model 60554-3D — special order)
K	Adds adapter kit to D, E or F options only, to mate Avery Hardoll 12 inch pits. Can not be used with option U.	S	Changes upper half housing (adapter) to 316 stainless steel (43214-4) (special order)
L	Adds adapter kit to D, E or F options only, to mate Avery Hardoll 13 inch pits. Can not be used with option U.	T	Adds fusible plug to air port to either E, F, J or U options only (not available on option X)

Example: 60554BDGH — IP standard unit with 6 inch inlet, manually operated pilot valve, stone guard and 20-mesh screen

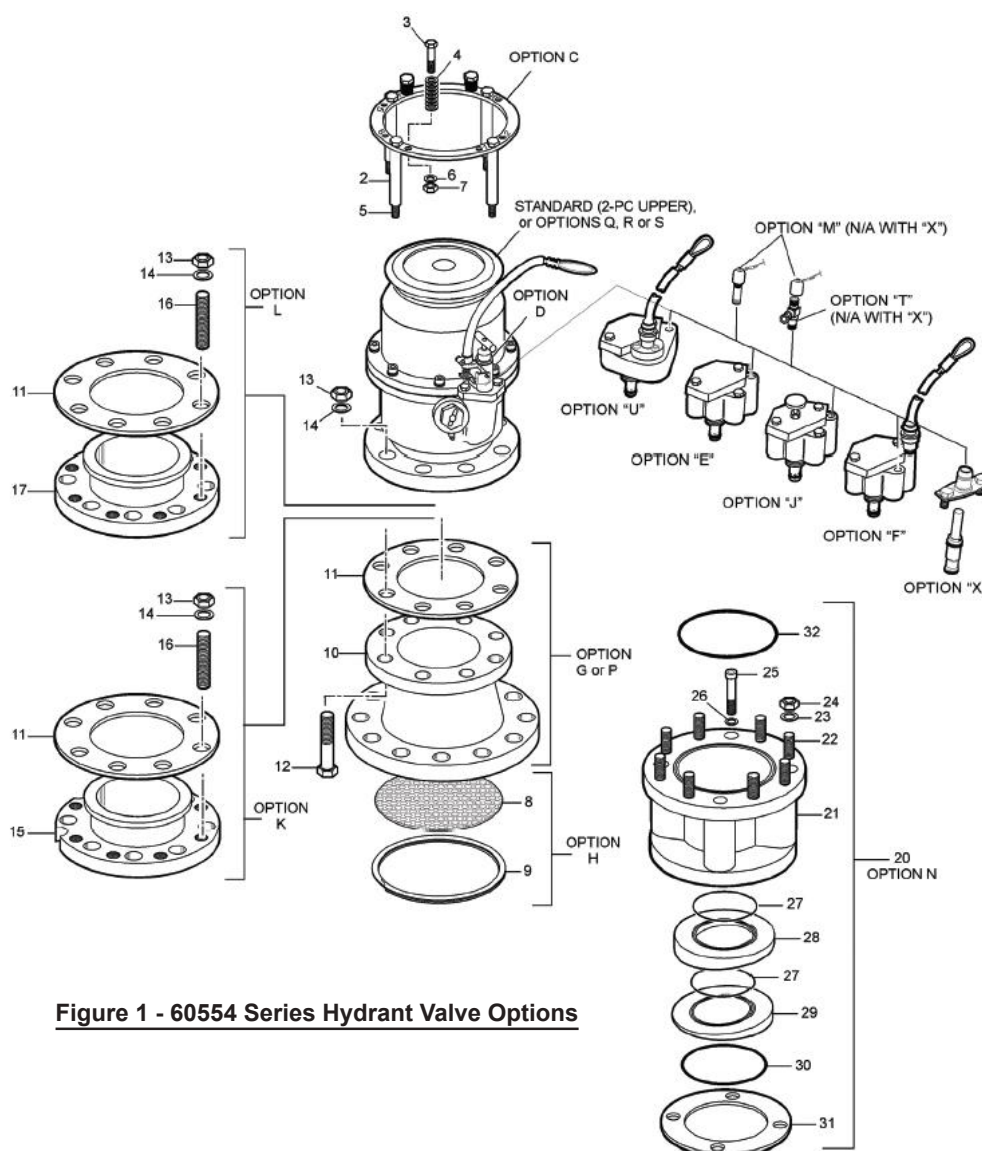
# Carter Hydrant Pit Valve - 60554

## Ordering Information (Options)

Fig.	Item	Part Number	Description	Units/ Assy	Hydrant Option	Spares/10 Units/Yr.
1	C	44290	Product Selection Ring Assy	1	C	-
	1	207721	Ring	4	C	-
	2	207722	Standoff	4	C	-
	3	GF6-13	Bolt	3	C	-
	4	GF960-616L	Washer	3	C	-
	5	GF5-35	Bolt	4	C	-
	6	GF960-616	Washer	27	C	-
	7	GF21083N6	Nut	3	C	-
	D	44248	Lanyard Pilot Valve	1	D	-
		42836	Lanyard Pilot Valve (Obsolete)	-	-	-
	E	44721	Pilot Valve, Air Operated	1	E	-
		44247	Pilot Valve (Obsolete)	-	E	-
		42846	Pilot Valve (Obsolete)	-	E	-
	F	47091-1	Pilot Valve, Dual Air/lanyard for small pits	1	F	-
	X	47576	Valve Connector Assy	1	X	-
	G	44364	6 x 4" IP Spool Assy	1	G	-
	10	207742	Adapter	1	G	-
	11	82154	Gasket	1	G	-
	12	82155	Bolt	8	G	-
	13	82156	Nut	8	G	-
	14	GF960-1016	Washer	16	G	-
	H	43587	Stone Guard Assy	1	H	-
	8	203331	Stone Guard	1	H	-
	9	RR-637-S	Retaining Ring	1	H	-
	J	44570	Pilot Valve, Defueling	1	J	-
	K	44744	12" Pit Spool Assy	1	K	-
	11	82154	Gasket	1	K	-
	13	82156	Nut	8	K	-
	14	GF960-1016	Washer	8	K	-
	15	210341	Spool	1	K	-
	16	210384-36	Stud	8	K	-
	L	44745	13" Pit Spool Assy	1	L	-
	11	82154	Gasket	1	L	-
	13	82156	Nut	8	L	-
	14	GF960-1016	Washer	8	L	-
	16	210384-36	Stud	8	L	-
	17	210342	Spool	1	L	-
	M	44731	Quick Disconnect Assy	1	M	-
	18	B2K16-VB	Male QD Fitting	1	M	-
	19	220013-01	Close Nipple	1	M	-
	-	47709	Dust Cap	1	M	-
	20	47077	Adapter Kit, Option N installation	1	N	-
	21	47075	Adapter	1	N	-
	22	220345	Stud	8	N	-
	23	82156	Nut	8	N	-
	24	GF960-1016	Washer	8	N	-
	25	GF16997-171	Bolt	4	N	-
	26	5712-403-63	Washer	4	N	-

# Carter Hydrant Pit Valve - 60554

Fig.	Item	Part Number	Description	Units/ Assy	Hydrant Option	Spares/10 Units/Yr.
1	27	MS29513-232	O-ring	2	N	-
	28	220343	Plate	1	N	-
	29	220342	Plate	1	N	-
	30	MS29513-237	O-ring (alternative to 31)	1	N	-
	31	220344	Gasket (alternative to 30)	1	N	-
	32	MS29513-246	O-ring	1	N	10
	P	47199	6 x 4" Short (4") Spool Assy	1	P	-
	10	220965	Adapter	1	P	-
	11	82154	Gasket	1	P	-
	12	210384-22	Stud	8	P	-
	13	82156	Nut	8	P	-
	14	GF960-1016	Washer	16	P	-
	T	47326	Fusible Plug	1	T	-
	U	47361-1	Pilot Valve, Dual Air/lanyard large pit	1	U	-



**Figure 1 - 60554 Series Hydrant Valve Options**

# Carter Hydrant Pit Valve - 60554

## Ordering Information (KITS for Maintenance)

KIT NUMBER	DESCRIPTION - CONTENTS	COMMENTS
KD60554-1	This kit is for use in repairing/overhauling any 60554 Hydrant Valve less the Pilot Valve and contains 2-10, 2-12, 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25 & 4-28.	Replaces KD60554 Kit.
KD60554-2	This kit is for use in repairing a complete 60554D Hydrant Valve including the Lanyard Operated Pilot Valve and contains 2-10, 2-12, 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 5-1, 5-5, 5-19, 5-22 & 5-26 .	
KD60554-3	This kit is for use in repairing a complete 60554E or 60554J Hydrant Valve including either the Air Operated Pilot Valves with or without the defueling option and contains 2-10, 2-12, 2-22, 4-3, -2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 6-3, 6-9, 6-10, 6-11, 6-13 & 6-15.	
KD60554-4	This kit is for use in repairing older Hydrant Valves with obsolete 42836 Pilot Valve and contains 2-10, 2-12, 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 5-1, 5-5, 5-19, 5-26 & Seal 202711.	For 60554D Valves with obsolete 42836 Pilot Valves.
KD60554-5	This kit is for use in repairing older Hydrant Valves with obsolete 42846 Pilot Valve and contains 2-10, 2-12, 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 6-9, 6-10, 6-11, Seal 600-015-10, MS29513-218, & Seal 202711.	For 60554E and J Valves with obsolete 42846 Pilot Valves.
KD60554-6	This kit is for use in repairing or converting 60554E or J Valves for use at temperatures down to -65° F and contains 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 6-10, 6-11, & O-ring MS29513-014, Poppet 220424, Seal 220425, Seal 220426, & Seal 220427.	Valves using this kit may have limited operation life at normal operating temperatures and the conversion may be only useful during the winter months.
KD60554-7	This kit is for use in repairing a complete 60554F or 60554U Valves complete with Dual Air/Lanyard Pilot Valve and contains 2-10, 2-12, 2-22, 3-3, 4-2, 4-4, 4-9, 4-17, 4-21, 4-22, 4-23, 4-24, 4-25, 4-28, 6-3, 6-9, 6-10, 6-11, 6-13 & 6-15	
KD60554-8	This kit is for use in converting any one piece upper housing (except option S) to a two-piece aluminum/stainless steel upper. It contains 3-3, 3-4, 3-5 and 3-6.	
KD60554-9	This kit is used to upgrade hydrant valves with serial numbers 8454 to 11160 to meet the requirements of the 3 <sup>rd</sup> Edition of API 1584 – items 6A,	This kit provides the steel poppet and the two piece upper housing required for older valves to meet the requirements.
KD60554-10	This kit is used to upgrade later hydrant valves with the aluminum poppet assembly but with the appropriate upper half (aluminum housing with the replaceable stainless steel interface ring). Serial numbers 11161 and subsequent.	This kit is used to upgrade the poppet assembly only to the steel version to meet the requirements.
2KD42836	Kit to Upgrade the old style Lanyard Operated Pilot Valve, 42836, to the newer production style, 44248, allowing the use of current production hardware - items 5-1, 5-5, 5-16, 5-19, 5-20, 5-21, 5-22, 5-23 & 5-26.	

## Hydrant Pit

### The future of hydrant pit technology

Liquip Polyflex Hydrant Pit is one quarter the weight of conventional pits, and provides a non-conductive, seamless, advanced-sealing pit. It comes complete with a light-weight lid, offers easy maintenance and improved product retention in case of spills or drips.

This assembly provides an environmentally sealed container for aircraft runways where fuelling and inspection access is required. Generally designed for most industry pit refuelling valves & high/low point drains. The covers and rims have been designed to exceed the extremely high loads & standards set down by the aviation industry.

The durable pit body is a high-tech polyethylene one-piece construction with cast aluminium rim fitted into the body to provide a liquid-tight bond. The Polyflex pit holds up to 100 litres of product with the valve in place and as the bellows is moulded to the body, there are no separate seals.

The body is electrically non-conductive, consumes no cathodic protection power and the sloped bottom ensures fluid build-up in the pit is drained to one side so it is immediately noticeable and easier to clean.



# Hydrant Pit

## Technical Specifications

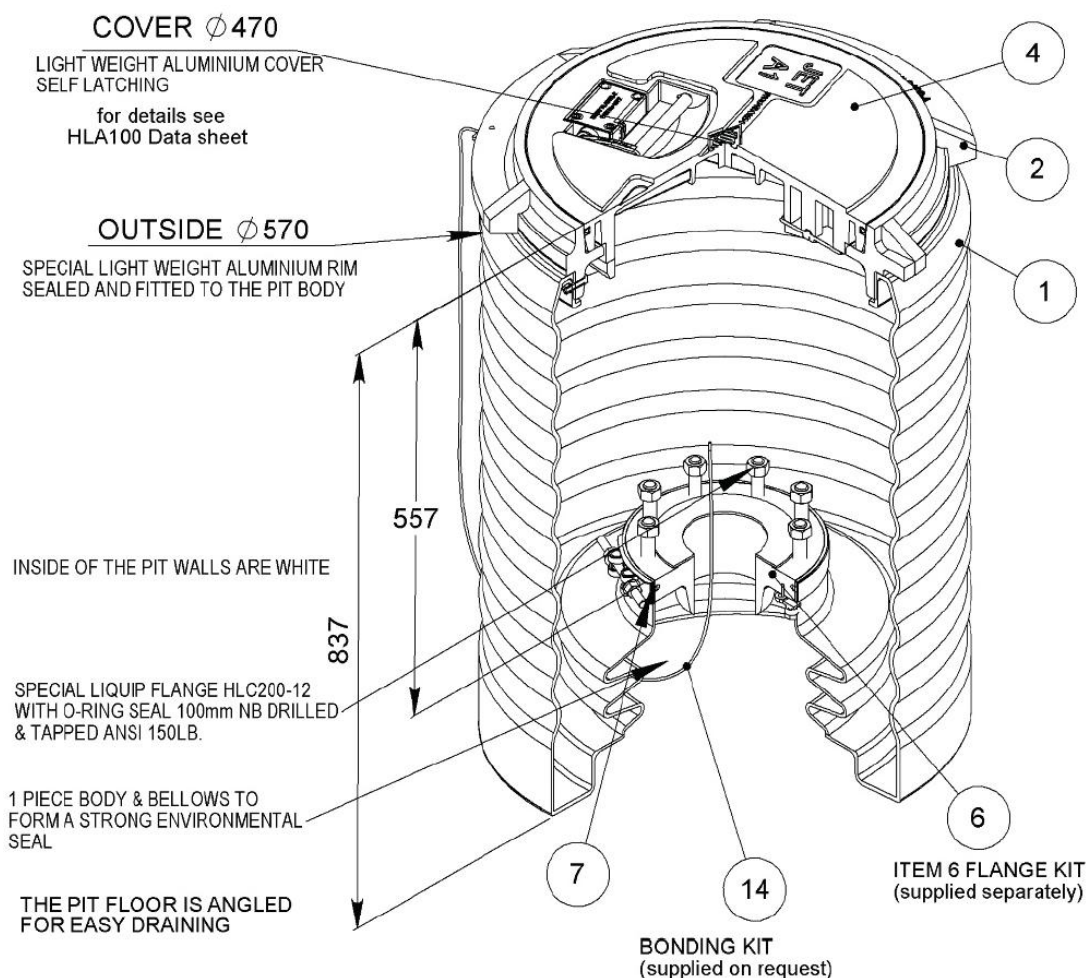
Variants:	HPA100, HPA150, HPA200 and HPA250
Pit Body:	High density polyethylene, non-conducting UV stabilised for outdoor storage Working temperature range: - 40 degrees C to 200 degrees C Yield 18Mpa      S.G. 0.94 Elongation 450% Flex modules 690Mpa
Pit Rim & Outer Lid:	Aluminium AA601 heat treated and aged T6
Weld Neck:	100mm or 150mm ANSI 150 with fully sealed blind drilled and tapped stud holes, machine finish outside diameter and fastening point for bonding strap. The bonding strap runs from the pipe to the pit rim and is stainless steel.
Integral Bellows:	The integral moulded bellows provides seamless flexibility to accommodate the riser pipe. The 24" pit retains 45 litres before the liquid level reaches the top of the bellows. The bellows has an extended top, allowing variable installation height and surplus can be trimmed back. Entry point is designed for 100mm ANSI 150 bolt pattern weld neck flange with thick flange for improved sealing.
Lightweight Lid:	The HLA100 is the lightest pit lid on the market today which can still withstand the high forces and weights exerted by aircraft as set out in some specifications. It has an automatic self latching feature with single latch mechanism and an anti-slip top. It fits both the 18" and 24" pit (the 24" pit has an "outer lid"). The outer lid on 24" pits can also easily be removed when a larger access area is required for maintenance purposes.
Weight Comparison:	Conventional Steel Pit with Lid, 18" $\pm$ 115 kgs Conventional Steel Pit with Lid, 24" $\pm$ 158 kgs Conventional Aluminium Lid $\pm$ 25 kgs Liquip Lightweight Aluminium Lid, HLA100 $\pm$ 13 kgs Total Weight of Liquip HPA200 (24" Pit, 4" Bellows) $\pm$ 75.5 kgs Total Weight of Liquip HPA250 (24" Pit, 6" Bellows) $\pm$ 85.0 kgs Total Weight of Liquip HPA100 (18" Pit, 4" Bellows) $\pm$ 32 kgs Total Weight of Liquip HPA150 (18" Pit, 6" Bellows) $\pm$ 32 kgs

# Hydrant Pit - HPA100

## Ordering Information

A 570mm diameter light weight Hydrant pit assembly with integral bellows to accept a special 100 NB flange & 100NB pit valves. The assembly comes complete with both inner and outer covers.

Item No	Part No	Description
1	HLC100-1	Body Pit Hydrant 450
2	HLC100-4	Rim Pit Hydrant 460 Aluminium
4	HLA100	Cover Hydrant 450mm Aluminium
6	HLC200-12	Flange Kit 100mm 150lb
7	HLC100-10	Clamp Ring for Hydrant to 100mm Bellows to Pit Flange
14	HLC200-11	Bonding Kit (Supplied separately)

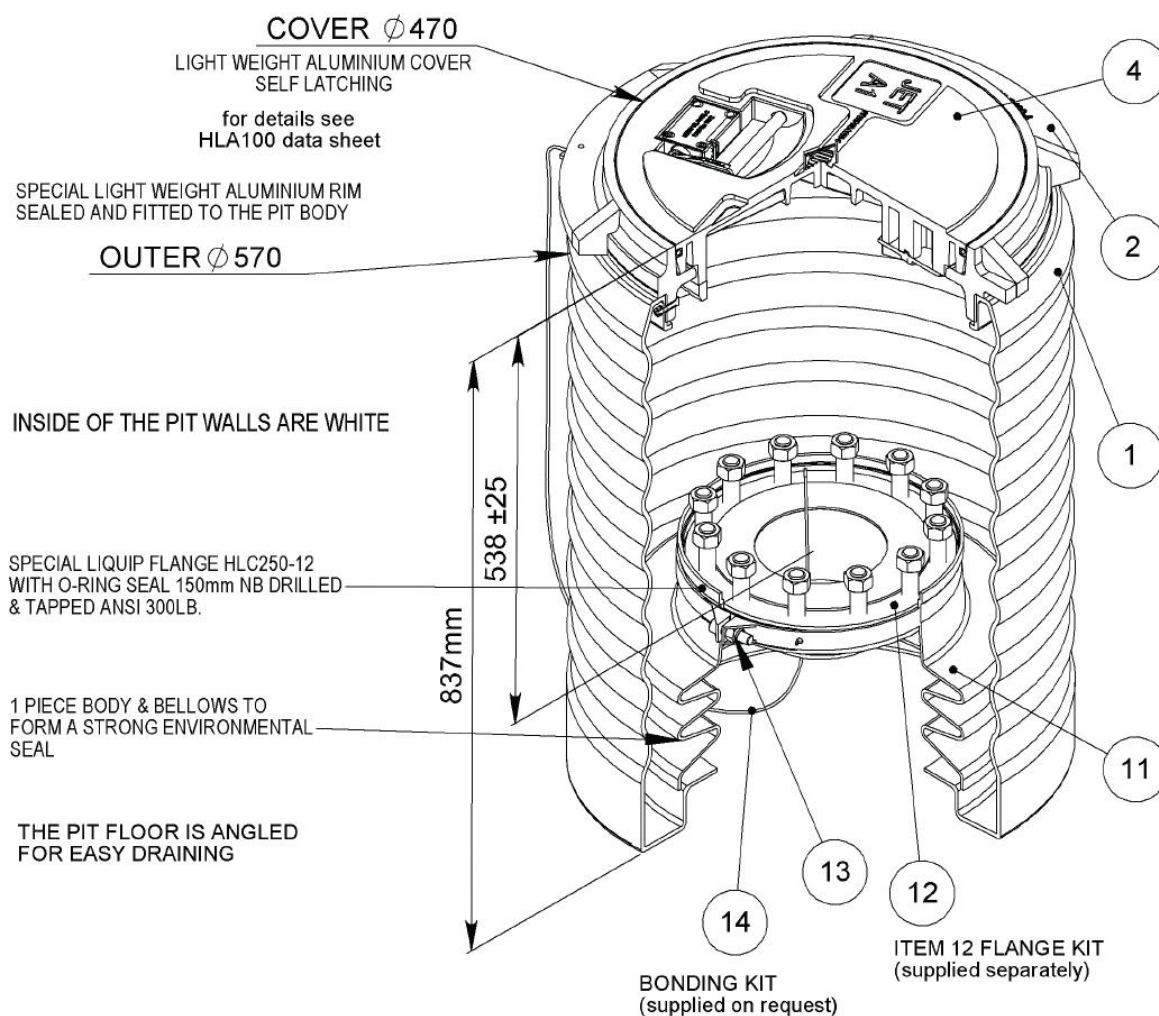


# Hydrant Pit - HPA150

## Ordering Information

A 570mm diameter light weight Hydrant pit assembly with integral bellows to accept a special 150 NB flange, 150NB & 100NB pit valves. The assembly comes complete with both inner and outer covers.

Item No	Part No	Description
1	HLC100-1	Body Pit Hydrant 450
2	HLC100-4	Rim Pit Hydrant 460 Aluminium
4	HLA100	Cover Hydrant 450mm Aluminium
11	HLC150-5	Bellows Hydrant Pits All
12	HLC250-12	Kit Flange for 150mm Bellows
13	HLC150-10	Clamp for 150mm Bellows HLC150
14	HLC200-11	Bonding Kit (Supplied separately)

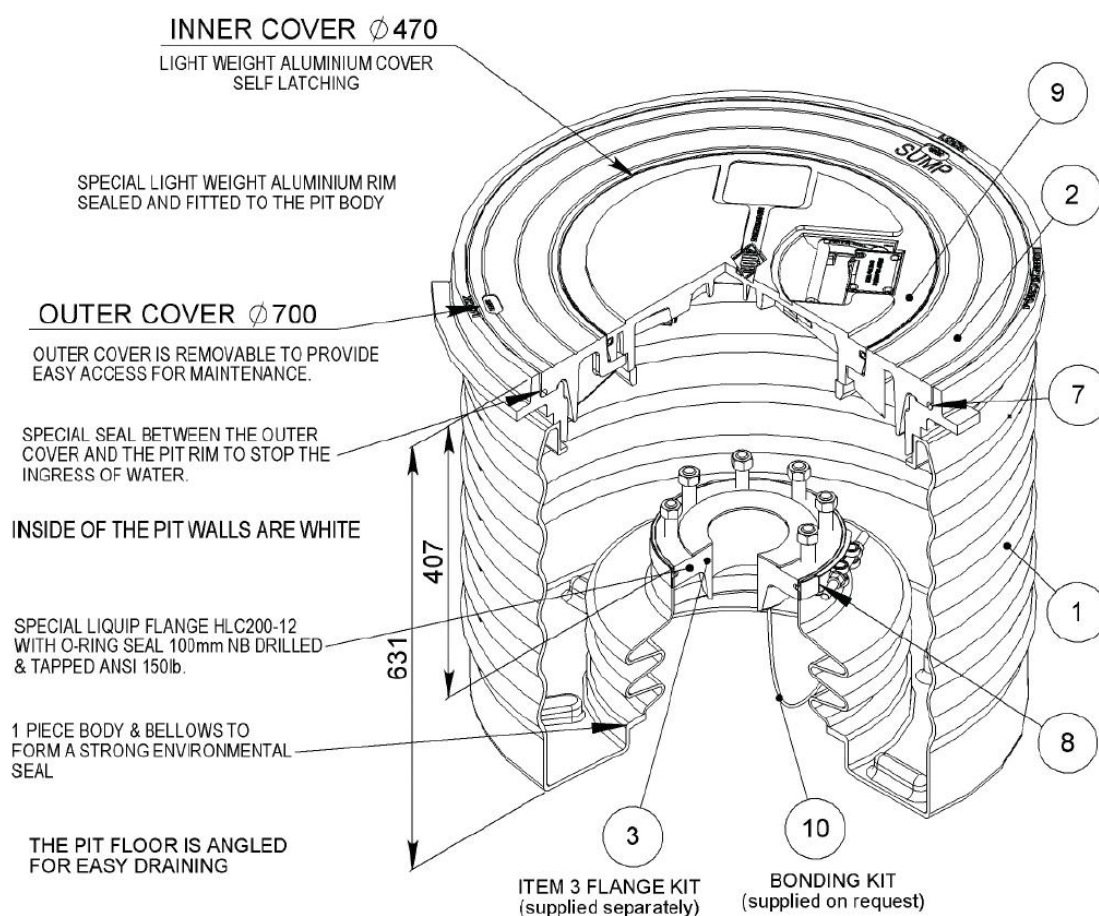


# Hydrant Pit - HPA200

## Ordering Information

A 700mm diameter lightweight Hydrant pit assembly with integral bellows to accept a special 100 NB flange & 100NB pit valves only. The assembly comes complete with both inner and outer covers.

Item No	Part No	Description
1	HLC200-2	Body Hydrant Pit 600mm Details
2	HLC200-3	Outer Lid Assembly 450 x 600mm
3	HLC200-12	Flange Kit 100mm 150lb
7	HLC200-10	Seal for Outer Lid Hydrant Pit
8	HLC100-10	Clamp Ring for Hydrant to 100mm Bellows to Pit Flange
9	HLA100	Cover Hydrant 450mm Aluminium
10	HLC200-11	Bonding Kit (Supplied separately)

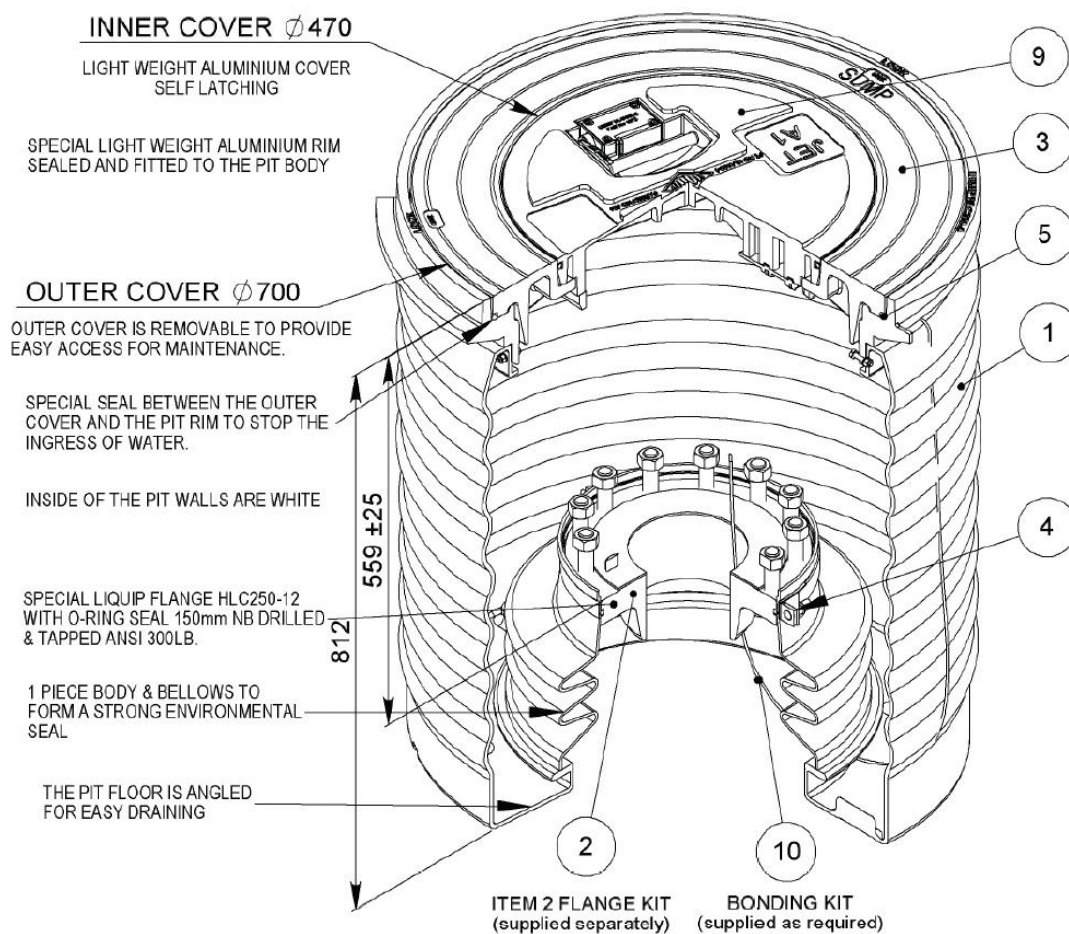


# Hydrant Pit - HPA250

## Ordering Information

A 700mm diameter light weight Hydrant pit assembly with integral bellows to accept a special 150 NB flange, 150NB & 100NB pit valves. The assembly comes complete with both inner and outer covers.

Item No	Part No	Description
1	HLC250	Body Assembly 600mm
2	HLC250-12	Kit Flange for 150mm Bellows
3	HLC200-3	Outer Lid Assembly 450 x 600mm
4	HLC150-10	Clamp for 150mm Bellows HLC150
5	HLC200-10	Seal for Outer Lid Hydrant Pit
9	HLA100	Cover Hydrant 450mm Aluminium
10	HLC200-11	Bonding Kit (Supplied separately)

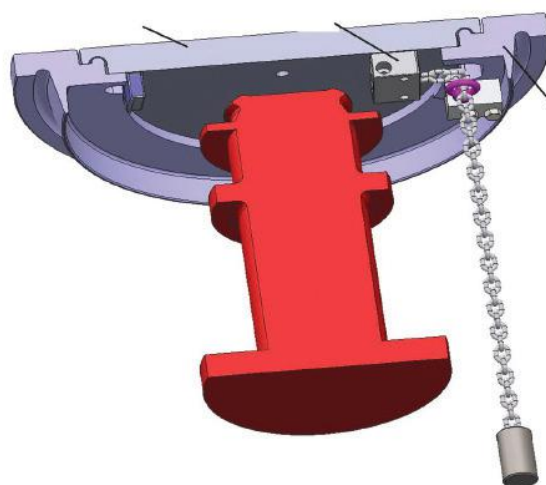
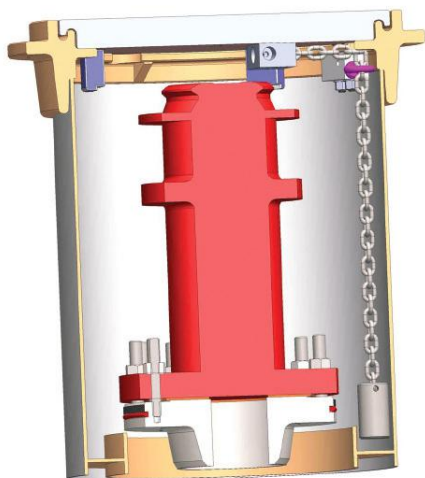


## Tether

Liquip Hydrant Pit tethering systems are available for new and existing pits. Installation is simple and ensures compliance with JIG Bulletin No.10.

### Ordering Information

Part No	Description
PRS100	24" Aluminium Hydrant Pit Lid - Twist to release
	18" Aluminium Hydrant Pit Lid - Twist to release
PRS200	24" Aluminium Hydrant Pit Lid - Latching
	24" Aluminium with Composite Lid - Latching
	18" Aluminium with Composite Lid - Latching





## *Meters & Pumps*

# Avery Hardoll BM Series PD Meters

Avery Hardoll bulk meters are precision made, positive displacement, liquid measuring instruments, which maintain accurate metering.

The simplicity of design and construction together with sustained accuracy of an Avery Hardoll bulk meter has led to the widespread use of these meters on aviation refuelling vehicles, in oil terminals throughout the world.

## Features & Benefits

- Positive displacement liquid measuring instruments.
- Unequaled performance in measurement to 0.1% accuracy.
- Not affected by outside factors caused by calibration.
- 115 to 3,870 LPM flow rates.
- Accuracy between calibration levels.
- Suitable for use in distribution depots and aviation refueling vehicles.
- Repeatability better than 0.02%.
- Serviceability: designed for quick and easy maintenance



# Avery Hardoll BM Series PD Meters

## Technical Information

Pressure Ratings	Max working pressure: 150 PSI. Test pressure: 300 PSI,
Temperature Range	-28°C to 100°C.
Maximum Flow Rate	1,370 LPM (82 m3/hr) single capsule. 2,500 LPM (168 m3/hr) double capsule - intermittent. 3,870 LPM (232 m3/hr) triple capsule.
Volume per revolution	2.27 litres (single capsule). 4.54 litres (double capsule). 6.82 litres (triple capsule).
Repeatability	0.02% (typically).
Materials	Manifold: Fabricated steel or ductile iron ductile iron not available on triple capsule meters. Body: Ni-Resist cast iron. Vanes: Carbon. Rotor: Aluminium or Ni-Resist cast iron. Outer Covers: Aluminium or Ni-Resist cast iron. Inner Covers: Ni-Resist cast iron. Bearings: Stainless steel. Seals: High nitrile or fluorocarbon.



# Avery Hardoll Electronic Meter Controller

The Avery-Hardoll MASTERLOAD II™ is a versatile micro processor based electronic controller. It is an intrinsically safe system that is ideal for use in Category 2 hazardous areas and is comprised of a pulse transmitter mounted on the meter, a display unit giving readouts of batch volume, flow rate and a totaliser.

Displays of batch delivery, rate of flow and totaliser are given on three large liquid crystal displays that provide readouts of batch volume, flow rate and the totaliser. These displays can be easily configured to show alternative values such as temperature compensated volume and volume to weight conversions.

Additional displays can show repeat or supplementary information at other convenient locations on the refuelling vehicle.

## Features & Benefits

- Accurate, dynamic meter calibration.
- Volume to weight conversion.
- Temperature compensation (optional).
- Two-way data interchange to cab mounted data capture systems.
- Interface to deadman system.
- Interface to accessories with 4-20 mA output.
- Flexible installation.



# Avery Hardoll Electronic Meter Controller

## Technical Information

<b>IP Ratings</b>	All units are designed for outdoor use & are sealed to specification IP 65.	<b>Non-volatile Memory</b>	Infinite data retention.
<b>Security</b>	Full wire sealing. Automatic error checking. Alarm reporting. Data Storage for 40 transactions.	<b>Power Supply</b>	12/24 VDC.
<b>Operating Temperature</b>	-20 to 40° C.	<b>Power consumption</b>	350mA max. (excluding relays).
<b>Transitter</b>	Temperature: -30 to 120° C. Fitting: Direct drive available. Approval: EN ISO 6551-1995 Level A. Channels: 3 Independent. Security: Sense line.	<b>Relays</b>	Max of 11 plug-in. Typical - 1 Deadman. Pulse output.
<b>Humidity</b>	Resistant up to 100% R.H.	<b>Inputs</b>	4-20mA (4).
<b>Temperature Probe PRT</b>	Accuracy: +/-0.1° C Discrimination: 0.1° C. Range: -30 to 120° C. Set Up: Factory set. Alarm Limits: Programmable. Display: °F or °C. Compensation: 15, 20 or 31.5° C.	<b>Linearisation</b>	1, 2, 4 or 8 selectable. Full dynamic interpolation. Accuracy: +/- .02 @ measuring condition. and 15° C if temperature compensation fitted.
<b>Safety Classification</b>	Category 2.	<b>Manual Input</b>	Density for weight indication.
<b>ATEX Approvals</b>	Power Supply Unit: (flameproof). -II 2 G EEx d IIB T6. -Cert. No. ITS04ATEX11903. Display Unit: -II 2 G EEx ib IIB T4 -Cert. No. BAS02ATEX2199	<b>Product correction tables</b>	IP/ASTM Table Selection to IP65. Generalised crude (A tables). Generalised products. Table 54. Table 53
<b>Delivery Override</b>	Key Operated IP 65 Box (option).	<b>Locations</b>	Flexible mounting: (max 50 meters between units).

# Sampi Meters

## Exceptional Accuracy

The SAMPI positive displacement (PD) meters are ideal for tank truck or depot applications. For metering aviation gasoline and jet fuels the Class 2 meter has a nonferrous construction and SAMPI is approved for use by NSC (Australia) and other major international weights and measures regulatory bodies.

### Superior Accuracy at constant flow

With all other conditions being constant, the SAMPI meter does not vary more than 0.05% in repeatability over the entire range.

### Accuracy over the widest range of flow

The SAMPI meter has an ideal combination of minimum seal or slippage area with lowest pressure differential across the seal. This results in better accuracy over a wide range of flow than available in other type of commercially produced positive displacement meters.

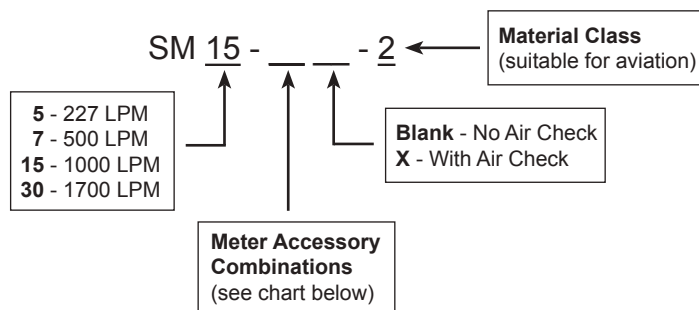
### Accuracy regardless of pressure fluctuations

With the SAMPI meter's unique dual-case design, the bearing surfaces of the meter element are internally and externally subjected to the same system pressure. Therefore, the meter element cannot be stretched or distorted to cause changes in seal area that would adversely affect accuracy.


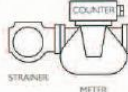
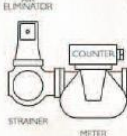
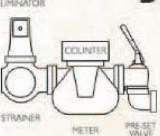

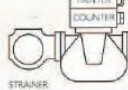
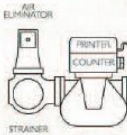
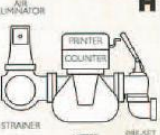

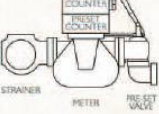
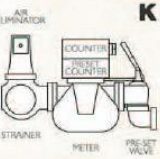

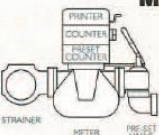
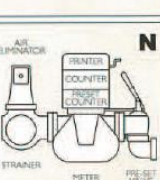


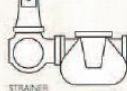



# Sampi Meters

## Ordering Information

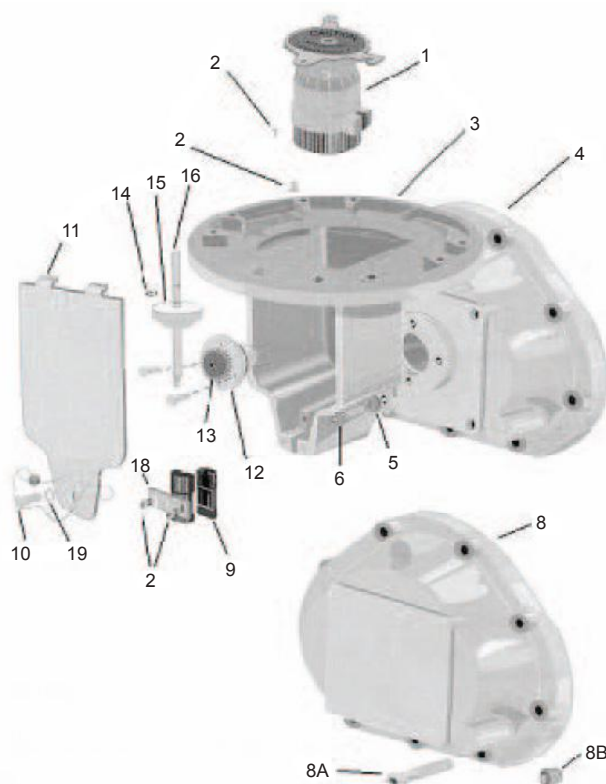


## Meter Accessory Combinations

	NO STRAINER NO AIR ELIMINATOR NO VALVE	STRAINER NO AIR ELIMINATOR NO VALVE	STRAINER AIR ELIMINATOR NO VALVE	NO STRAINER NO AIR ELIMINATOR VALVE	STRAINER NO AIR ELIMINATOR VALVE	STRAINER AIR ELIMINATOR VALVE
COUNTER NO PRINTER NO PRE-SET						
COUNTER PRINTER NO PRE-SET						
COUNTER NO PRINTER PRE-SET						
COUNTER PRINTER PRE-SET						
NO COUNTER NO PRINTER NO PRE-SET						

# Sampi Meters - SM 5

## Ordering Information

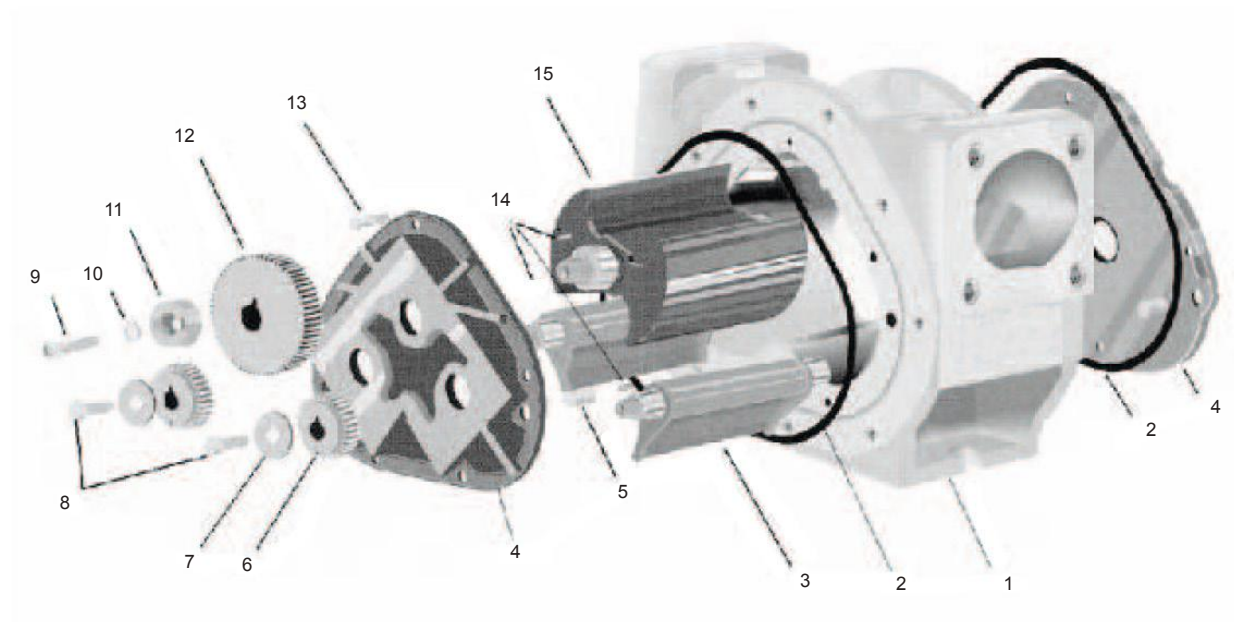


Cover Assembly			
Item No	Part No (Class 2)	Description	Qty
1	2030040101	Adjuster Assembly	1
2	N320005010A	Screw 5 Pgx10 8,8 Z Iso 1217	4
3	I0000-25170	Bracket Counter Adapter	1
4	I0123-501148	Cover Front	1
5	*I0705-06743	Flat Washer (.265 ID)	4
6	*I0673-09084	Screw, Counter Bracket (1/4-20 X 1)	4
8	I0124-48273	Cover Rear	1
8A	*I0627-09080	Screw 5/16-18 X 1 3/8"	18
8B	NPT I0566-06790	Plug 1/4-18 NPT	2
9	2061041786	Driveshaft Bushing	1
10	N321006060Z	Screw 6 Pgx60 8,8 Z Iso 1217	1
11	2061048274	Plate Dust Cover	1
12	*I0250-48601	Packing Gland Assy	1
13	*I0165-48284	Gear packing gland (12 teeth)	1
14	2071002188	Retaining Ring	1
15	2061040818	Pinion Gear (2:1)	1
16	2061041787	Shaft	1
18	2061048208	Blocks Bearing	1
19	N3300064Z	Flat Washer D.6	1

\* Can be supplied only in KIT

# Sampi Meters - SM 5

## Ordering Information

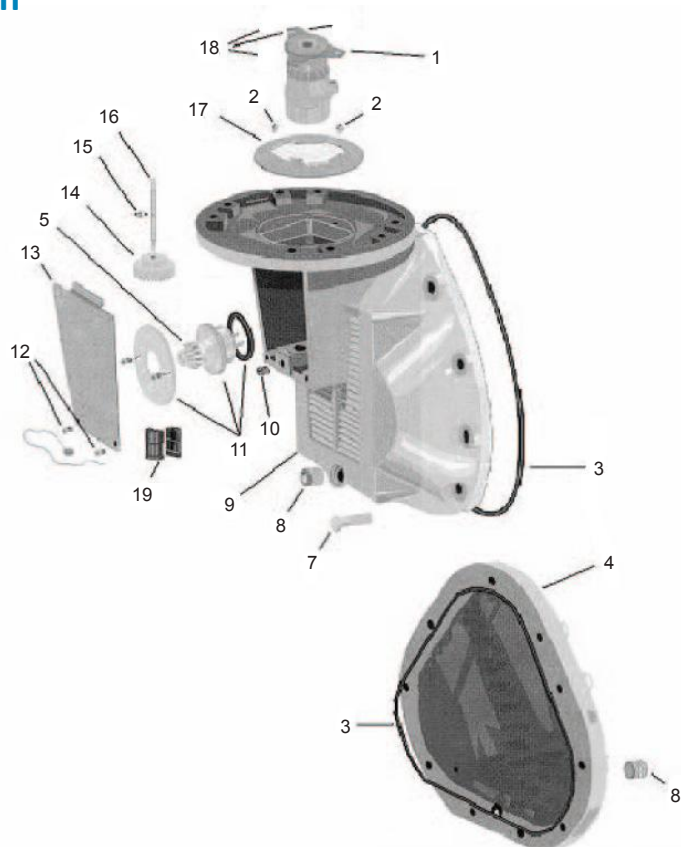


Meter Element			
Item No	Part No (Class 2)	Description	Qty
1	I0110-501149	Housing	1
2	*I0430-09120	O-ring, viton	2
3	I0155-48976	Displacement Rotor Assy	2
4	I0144-44286	Plate Bearing	2
5	I0318-40665	Pin Dowel	4
6	I0163-49469	Gear displacement pinion	2
7	I0771-48319	Washer Rotor Gear	2
8	I0673-09110	Screw 1/4-20 x 3/4"	2
9	I0675-09336	Screw 1/4-20 x 1"	1
10	I0765-09337	Washer, lock	1
11	I0326-501140	Driver Packing Gland	1
12	I0161-49468	Gear Blocking Rotor	1
13	*I0611-09079	Screw 10-24 x 5/8"	8
14	I0528-48345	Key Stainless Steel	3
15	I0153-48079	Blocking Rotor Assy	1

\* Can be supplied only in KIT

# Sampi Meters - SM 30

## Ordering Information

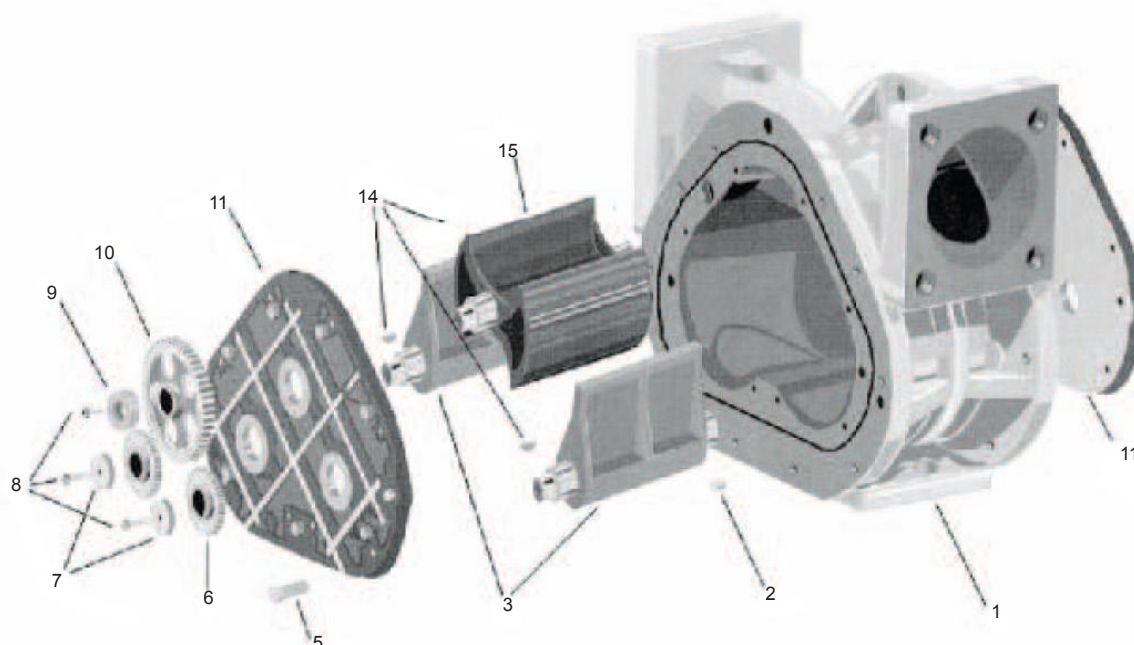


Cover Assembly			
Item No	Part No (Class 2)	Description	Qty
1	2030045660	Adjuster Assembly	1
2	I0000-00362	Screw	2
3	*I0430-09325	O-Ring	2
4	I0125-44104	Cover Rear	1
5	*I0165-48283	Pinion gear (1:1)	1
7	*I0627-09085	Screw .312-18 x 1,375	22
8	I0566-04759	Pipe Plug	2
9	I0123-44103	Cover Front	1
10	I0603-06703	Screw. 250-20x.250	1
11	*I0250-48601	Packing gland	1
12	*I0630-04494	Screw. 250-20x.250	2
13	I0362-46169	Dust Cover	1
14	2061040122	Pinion Gear 24 teeth	1
15	2071002188	Retaining Ring	1
16	2061041790	Shaft	1
17	I0364-43044	Plate adjuster mounting	1
18	N3280048065Z	Screw	3
19	2061041786	Driveshaft bushing	1

\* Can be supplied only in KIT  
[www.liquip.com](http://www.liquip.com)

# Sampi Meters - SM 30

## Ordering Information



Meter Element			
Item No	Part No (Class 2)	Description	Qty
1	I0110-44101	Housing	1
2	I0318-40099	Pin Dowel	4
3	*I0155-47575	Displacement Rotor Assy	2
5	*I0611-09098	Screw 1/4-20 unc	16
6	*I0163-47388	Gear Pinion	2
7	*I0771-48348	Washer Rotor Gear	2
8	*I0673-07483	Screw 25-20 x 1.00	3
8°	*I0773-06174	Lock, washer, .250	3
9	*I0326-48844	Driver Packing Gland	1
10	*I0161-47387	Gear Blocking Rotor	1
11	I0144-44102	Plate Bearing	2
14	*I0528-07229	Key Stainless Steel	3
15	*I0153-47574	Blocking Rotor Assy	1

\* Can be supplied only in KIT

## Pulser - ERP200

The ERP200 Series Electronic Remote Pulser is designed to convert signals from a rotating shaft into an electrical signal. The apparatus comprises a printed circuit board (PCB), a metallic mounting bracket and a plastic slotted disk (shaft) all housed in a plastic enclosure. Access to the internal block is via a plastic lid fitted with a rubber O-Ring and mounted with screws.

There are several situations where a remote pulser may be preferred or even required:

- (i) When buying a meter capsule only, with no register or drive and no calibration gears. A remote pulser is much cheaper to buy and much less to maintain.
- (ii) When there is no room to have a mechanical or electronic register mounted on the meter. The remote pulser is much smaller than any register.
- (iii) Using a remote pulser also allows the register to be mounted in a better viewing position.

A solid-state pulse transmitter provides accurate readings at high revolutions for remote applications.

A quality sealed plastic housing is able to operate in a broad temperature range with excellent impact and chemical resistance.

The electronic pulse transmitter has three opto sensors each sensor producing 25 Pulses per revolution, thus producing 150 combinations of pulses per revolution. The pulses signals are used by Registers for measuring purpose.

With three opto sensors, the pulse transmitter can detect:

- (i) Flow direction
- (ii) Faulty opto sensors
- (iii) Loss of power.



# Pulser - ERP200

## Operation

<b>2.1 Specifications</b>	Fully solid state electronic circuit. Intrinsically safe, approved for Zone 0 Fully weather sealed to IP 66 Weights & Measures approved	
<b>Electrical</b>	<b>Certification Parameters</b>	<b>Safe Zone Parameters</b>
<b>Input</b>	U <sub>i</sub> = 26.6V, I <sub>i</sub> = 660mA P <sub>i</sub> = 1.2W, C <sub>i</sub> = 1.14μF, L <sub>i</sub> = 0mH	V <sub>in</sub> : +9VDC to +30VDC I <sub>in</sub> : 100mA max
<b>Operating Temperature</b>	-20°C to +60°C	-40°C to +80°C
<b>Rotation</b>	Bi-directional	
<b>Input Shaft Speed</b>	1000 rpm maximum	
<b>Output Pulse (P1, P2, P3)</b>	Push-Pull Outputs. 0V to +5VDC with in-line resistor 100R per channel. Square wave.  For clockwise rotation, channel 2(P2) lags channel 1(P1) by 60 electrical degrees and channel 3(P3) lags channel 1(P1) by 120 electrical degrees. The disk has 25 evenly spaced slots, each slot corresponding to one electrical cycle (360 electrical deg.) or 14.4 mechanical angular Deg. The duty cycle of the pulse is 50% therefore there are 6 stages for each electrical cycle (S0 - S5). Ref. Figure 2.	
<b>K factor</b>	K = $\frac{N \text{ pulses}}{\text{litre}}$ pulses/rev/single channel = 25 pulses/rev/combined 3 channel =150	

## Mechanical:

**Drive:** Bearing is a sealed ball bearing for low friction, long life and no maintenance. Vibration is controlled by spring loaded friction washer.

**Mounting:** Body mounting is the same pattern as Veeder Root pulsers for interchangeability. It can therefore be driven off a Veeder-Root mechanical register: off the existing post-calibration gear drive train by mounting on an adaptor plate; or by driving directly off the meter chamber main shaft.

**Materials:** Construction of body, cover and toothed wheel and shaft is in acetal, supported by a sealed-for-life ball bearing. Friction damping is by spring-loaded Teflon washer. Cover is bolt-on for ease of access with calibration-seal lug provided and O-Ring water sealing. Maximum speed of 1,000 rpm is sufficient for all current applications when driving directly off the meter main shaft. There is no minimum speed, each tooth is counted.

**Weight:** The unit is lightweight and only weighs 500g per assembly (without cable).

**Port:** One entry M16 conduit thread complete with adaptor & strain relief to suit M16 conduit. Use suitable conduit or cable gland, min IP66. Refer to section 3.3.

*Note: Removing adaptor may affect IP rating.*

# Pulser - ERP200

## Electrical:

When the application of the ERP200 Series is in areas subject to safety requirements such as oil company operations, it is essential that all legislative, industry and company requirements be thoroughly researched and understood. Not only do these vary from country to country but also there are some 'grey' areas with the operation of vehicles in zoned places such as loading gantries.

All ERP200 Series equipment is certified for Zone 0 installation. Installation shall be carried out in accordance with the applicable code of practice by suitably trained personnel.

Following instructions contain details on wiring and how to avoid interference from extraneous sources. In all cases, use the Liquip power filter as that contains power-filtering equipment to ensure a clean, stable power supply to the electronics.

Electronic boards are a hybrid of surface-mount and through-hole components each being selected according to past experience of reliability and mechanical strength.

## Safety Certification:

### 1. IEC Ex

Certificate: IECEX TSA 08.0043X

Marking: Ex ia IIA T4 IP66

Ta = -20°C to +60°C

### 2. ATEX

Certificate: TRAC09ATEX11220X

Marking:

CE 0518 Ex II 1 G

Ex ia IIA T4 IP66

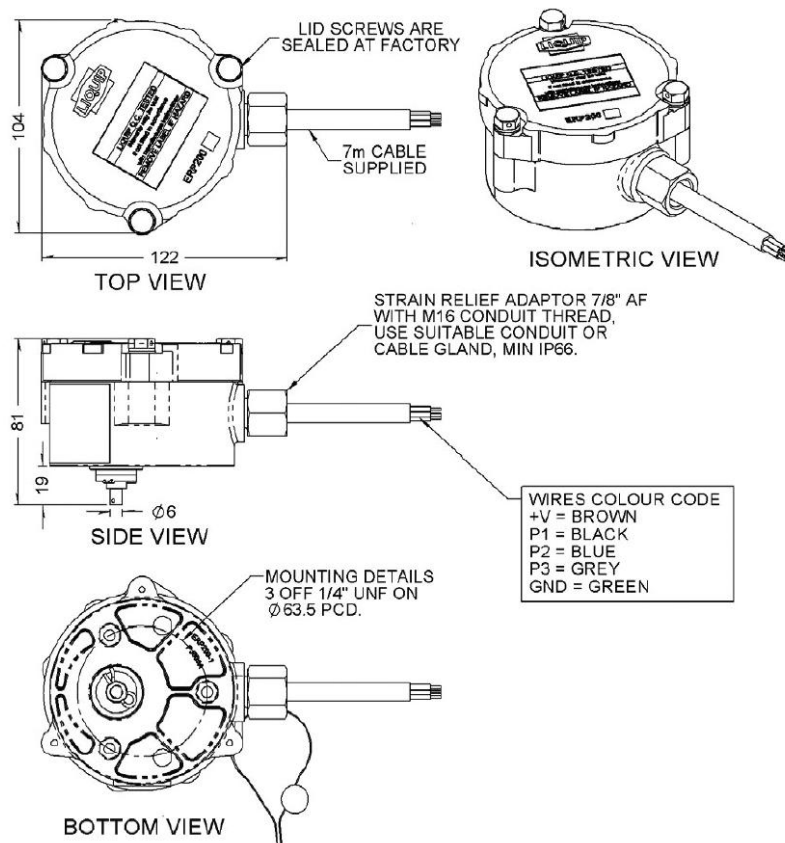
Ta = -20°C to +60°C

## Conditions of Safe Use:

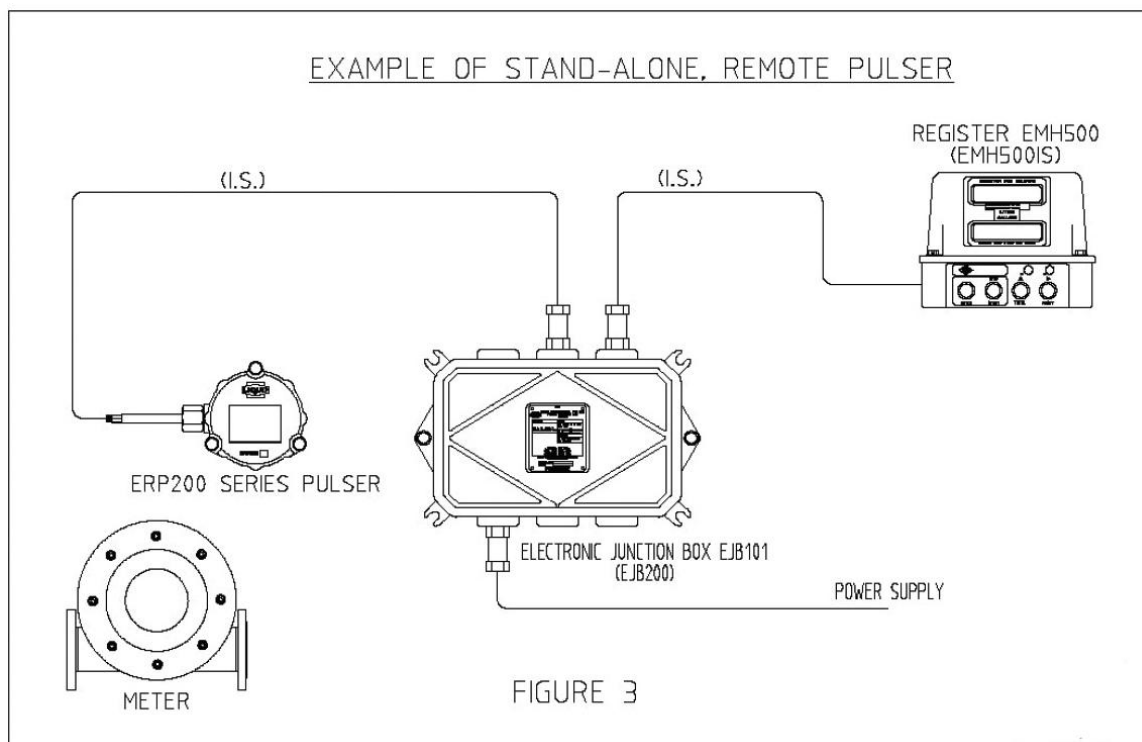
1. Input Parameters:  $U_i = 26.6V$ ,  $I_i = 660mA$ ,  $P_i = 1.2W$ ,  $C_i = 1.14\mu F$ ,  $L_i = 0mH$ .
2. Warning: In Zone 0 only: Electrostatic Hazard. Do not rub. Clean with a damp cloth. Do not use solvents.
3. Port entry: Use suitable conduit or cable gland, min IP66.
4. Any length of connecting cable may be supplied subject to satisfying the L and C parameters of the equipment.

## Weights and Measures Approval:

1. AUSTRALIA: NMI S351A, S407



## Pulser - ERP200



### Ordering Information (Kits)

Kits for mounting Remote Pulser (Top Mount)	
Part No	Description
EPM200-3Z	Meter kit for electronic remote pulser to top mount to Neptune meter
EPM200-4Z	Meter kit for electronic remote pulser to top mount to Sampi & Lc meters WITH calibrator
EPM200-7Z	Meter kit for electronic remote pulser to top mount to Lc meters NO calibrator (to suit Lc meter with old style drive)
EPM200-9Z	Meter kit for electronic remote pulser to top mount to Lc meters NO calibrator (to suit Lc meter with hexagon drive)
EPM200-5Z	Meter kit for electronic remote pulser to top mount to SBM meters
EPM200-6Z	Meter kit for electronic remote pulser to top mount to Smith meters

Kits for mounting Remote Pulser (Direct Mount)	
Part No	Description
EPM100-3Z	Meter kit for electronic remote pulser to direct mount to Lc meters
EPM100-4Z	Meter kit for electronic remote pulser to direct mount to SBM meters
EPM100-7Z	Meter kit for electronic remote pulser to direct mount to Sampi meters
EPM100-8Z	Meter kit for electronic remote pulser to direct mount to Avery-Hardoll meters

# Electronic Meter Register - DFV Series

The DFV100 series is the latest advancement in Liquip's range of electronics, featuring as a stand alone register or Diptronic CPU.

The DFV101 is a state of the art electronic meter register and level gauging monitor in one compact housing.

The DFV101 allows for increased operational efficiency through a lightweight design and by combining two units into one, users will be able to achieve the benefits of both units by ordering a single unit.

The DFV101 is approved for Zone 1 (IECEx) truck mounted or fixed site product transfer applications..



## Key Features

### Common to all potted DFV units

- Weights & Measures Approved: NMO UK, NMI-Aust & NZ, Europe - MID & NTEP - USA (EU & USA = Register function only).
- Durable Aluminium housing with hinged door to allow easy access to internal connections.
- Large display to easily view multiple information simultaneously.
- RS232 and CAN communication.
- Intuitive set up and programming.
- Electronic calibration.
- Non-linearity correction.
- Non volatile memory for storing set parameters.
- Operates on 12 or 24 volt installations.
- Backlit display for easy viewing in low light.
- Piezoelectric buttons for reliability.
- Connection to a ticket printer or a third party fuel management system.
- Can be connected to a large digit display
- Micro SD card for easy software upgrades.

### Register

- Preset functionality / batch control.
- Solenoid outputs are voltage free and can perform a 2 stage ramp up and ramp down of the fluid flow.
- No flow timer.
- One calibration point with Weights & Measures sealable captive fastener.
- Compatible with most flow meters on the market.
- Pulse output can be programed as optional additional fourth relay.
- Functionally backwards compatible with Liquip EMH registers.
- Flowrate displayed on main screen along with volume during delivery.
- Future expansion and modularity available.

### Diptronic

- Automatic level gauging updated in real time keeps users off the top of the tank.
- Same menu system as DIP200 for ease of operation with operators already familiar with Liquip Diptronic.
- CAN output for rapid communication with external device.
- Can read up to 6 probes/compartments.
- Can be used to provide a sealed parcel solution.
- DFV103 comes with built in power filter negating the need for external power filter.
- Can be connected to slave unit to read an additional 6 probes/compartments.
- Volume shown in 1L increments.
- ±1mm accuracy with no moving parts for minimal maintenance.
- Compatible with E 705 Diptronic probes (pots).
- Enables temperature compensated deliveries.
- Enables split deliveries to maximise fleet efficiency.

## Safety Approvals (All units)

### IECEx

- Safety Approved for use in Zone 1 (IECEx). IECEx TSA 14.0021X Ex e ib mb [ia] IIA T4 Gb IP66 (Ta = -20°C to +60°C)

### ATEX

- Safety Approved for use in Zone 1 (ATEX) DEMKO 14 ATEX 1407X Ex e ib mb [ia Ga] IIA T4 Gb IP66 (Ta= -20°C to +60°C) 0518 II 2 (1) G

### UL

- UL Safety Approved - USA & Canada for use in Class 1 Zone 1.  
Cl. I, Zn1, AEx e ib mb [ia Ga] IIA T4 Gb EX e ib m [ia Ga], IIA T4 Gb  
Ta= -20°C to +60°C Um = 32V  
E477774

## Associated Equipment

- ERP200 - Remote Pulser
- 4155 - Temperature Probe
- DFV100 - DFV Register
- DFV103 - DFV Diptronic CPU
- DIP130 - Diptronic Stick
- DIP150 - Diptronic Stick - Low Profile
- Expansion Modules - Contact Liquip
- Cold climate register - Contact Liquip

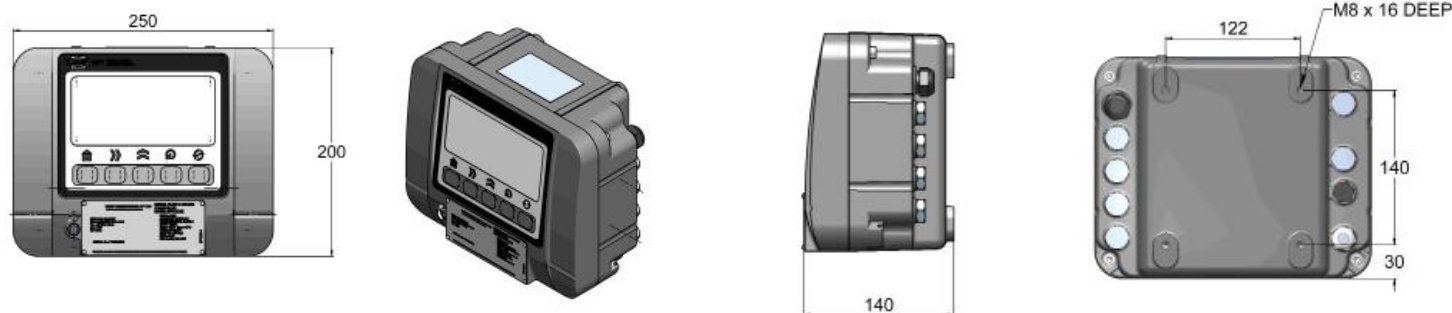
# Electronic Meter Register - DFV Series

## Technical Information

<b>Size</b>	Approx, 250 x 200 x 140mm
<b>Displays</b>	1 line x 14 characters 14 mm high and 4 lines x 24 characters 8 mm high
<b>Power Input</b>	9 to 32Vdc (safety approved) or 9 to 45V (operational) @ 250mA polarity protected. In-line fuse (rated 3A, antisurge) is strongly recommended
<b>Operating Temperature</b>	-20°C to +60°C (safety approved)
<b>Temperature Correction</b>	-40 to +60°C for all petroleum products Extended ranges available according to local regulations
<b>Temperature Probe</b>	Pt100 class A, 3 wires, Liquip P/N 4155
<b>Ingress Protection</b>	IP66
<b>Product Density</b>	0.653 - 1.075kg/L (petroleum products) - For others contact Liquip
<b>Weight</b>	Approx. 6kg
<b>Communication</b>	Two RS232C ports to be used to communicate with a PC or other serial device such as a modem or printer. One CAN port. Compatible with Epson CTM-290 or TM-295, Blaster Printer.
<b>Touch PC</b>	Commands that can be interrogated include resetting the meter and requesting the current delivery quantity. See software section for detail.
<b>Pulse Input</b>	Will accept 3-channel pulses of 60° phase shifted, from ERP200 pulser, dual (quadrature) or single pulse (reed or open-collector) from third-party pulsers. Third party pulsers may not be NMI approved
<b>Pulse Output</b>	Open drain, active-low output, signal calibrated to 10 pulses/litre, where the pulse frequency can be set up to either 400Hz or 2kHz max. (with fixed pulse duration 1.25 ms or 0.25 ms respectively).
<b>External Reset</b>	This is an input/output signal.
<b>Relay Outputs</b>	Up to 4 Relay Outputs. Current sink, 3A max. Solenoid to be connected between this output and the positive of the power supply. Additional in-line fuse (3A, antisurge) is strongly recommended.
<b>Program Memory</b>	microSD card

## Mounting Instructions

The DFV101 can be either remote mounted or mounted to a meter using an adaptor bracket.



### Adaptor Bracket: Front mount to various meters

When direct mounting to a meter is unavoidable

DFV100-23 (Suits the following meters)

- LC - M5, M7, M10, M15, M25, M30, M40, M60
- SAMPI - M5, M7, M15, M30

### Adaptor Bracket: Top mount to various meters

DFV100-18 - Top mount bracket to suit meters that use the OE standard 4 bolt register mount.

For mounting to other meters please contact Liquip

# Electronic Meter Register - DFV Series

With a range of models available and combining the best in performance, style and functionality, the DFV is the right choice for Register and Diptronic applications.



	DFV100	DFV103	DFV101
Register	✓	✗	✓
Diptronic	✗	✓	✓
Updateable*	✓	✓	✓
Upgradeable**	✓	✓	N/A
Operating Temperature	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
IP rating	IP66	IP66	IP66

## SAFETY APPROVALS

	DFV100	DFV103	DFV101
Suitable for: Zone 2 IEC Ex	✓	✓	✓
Zone 1 IEC Ex	✓	✓	✓
Zone 1 ATEX	✓	✓	✓
Class 1 Zone 1 ULus, cUL	✓	✓	✓

## METROLOGICAL APPROVALS

	DFV100	DFV103	DFV101
NMO UK	✓	✓	✓
AUST W&M	✓	✓	✓
NZ W&M	✓	✓	✓
MID - OIML (EU)	✓	✗	✓ <sub>+</sub>
NTEP	✓	✗	✓ <sub>+</sub>
Measurement Canada	PENDING	PENDING	PENDING

\* Updateable: Free software updates are available as issued by Liquip.

\*\* Upgradeable: Chargeable upgrades are available to convert a DFV100 or DFV103 to a DFV101.

+ Approval is only applicable for Register function.

## Junction Box - EJB101

Liquip electronic system requires complete integrity of power supply to guarantee data communication is not corrupted. The EJB101 has been produced to provide the complete power interface.

The cast aluminium housing has a weather-proof seal and is Ex 'e' rated. Five ports are provided - one for the supply from the vehicle battery (9v to 30v), one output to supply power and communication to the register and the remaining ports are for the auxiliary devices (such a communication ports, temperature probe, remote pulser and solenoids ). These ports may require approved glands and conduit to comply with regulations. The single electronic board is manufactured to Cenelec standard for the intrinsically safe barrier and also provides circuit protection and power conditioning for surge and ripple protection.

The EJB200 is built for intrinsically safe barriers and also provides circuit protection and power conditioning for protection against ripples and surge.



## Isoil Digital Display - LFD-6

Isoil's new LFD-6 remote display unit has been designed mainly for use on hydrant dispensers and aviation refuellers working at airports. This application requires the volume measured by the PD meter be repeated and easily read from a reasonable distance within the working area.

The LFD-6 nevertheless can be used in any application where the operator is working at a distance from the meter counter and an easily readable display is required. Such typical applications include top loading of tank trucks and rail cars, also loading of barges, ships, etc.

From a metrology standpoint, it is the main meter (and counter) that is the only official metering reference. Therefore, the LFD-6 has to be considered as a simple repeater of the main instrument. The value displayed is received by factorised pulses representing the minimum value to be read (e.g. if the display is required in litres, then 1 pulse=litre). If the LFD-6 is used in conjunction with ISOIL's Vegall or VegaT electronic counter it can be linked via serial line. The LFD-6 has a maximum of 6 digits plus a decimal point that can be programmed in a fixed position. At the end of the delivery the unit can be reset to zero remotely by means of a dedicated input.

The display brightness is achieved by automatic, self adjusting LED which provides very high readability in all lighting conditions. The LFD-6 is suitable for use in explosive areas and harsh environments. ATEX conformity and IP66 protection rating.

### Ordering Information

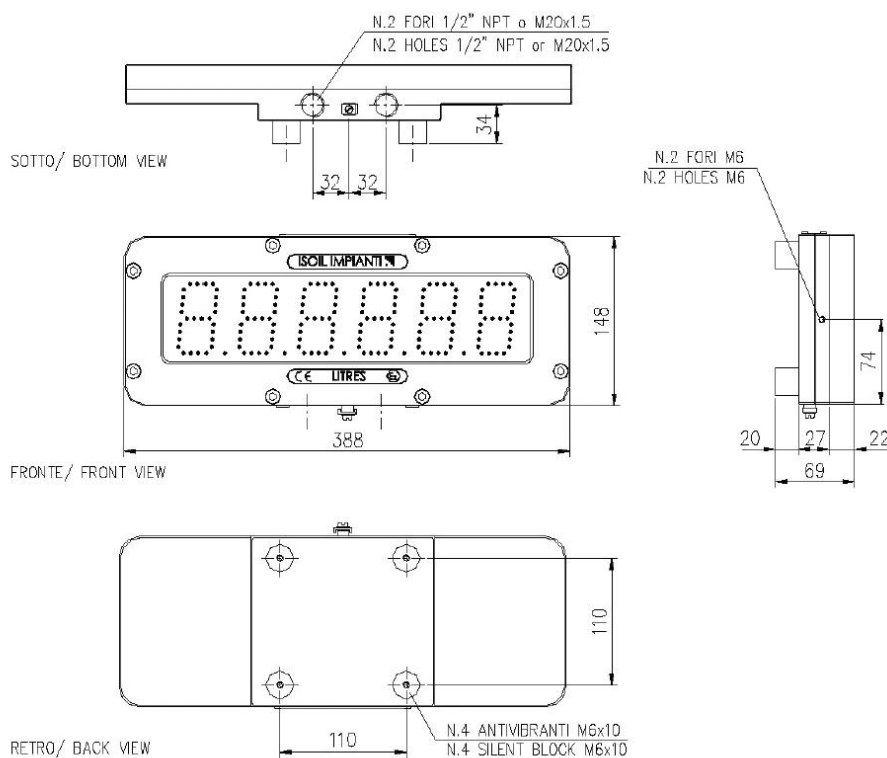
Part No	Description
LFD-6	Remote Digital Display



# Isoil Digital Display - LFD-6

## Technical Specifications

<b>Reading:</b>	N° 6 digit 63(H)x30(L) mm– Red L.E.D. high efficiency type+decimal point
<b>Brightness:</b>	Self adjusting according to the environmental conditions
<b>Unit of measure:</b>	At custom choice by means of labels with the main units of measure
<b>Counting input:</b>	From npn/ pnp open collector transistor or square wave 5-15VDC – 5KHz max
<b>Reset input:</b>	From npn/ pnp open collector transistor or square wave 5-15VDC – 5KHz max
<b>Serial communication:</b>	N° 1 line settable as RS232 or RS485 (communication protocol compatible with ISOIL VEGAI e VEGA T electronic registers)
<b>Mains:</b>	10-30VDC
<b>Power:</b>	10 W max
<b>Working temperature:</b>	-25÷55°C
<b>Stock temperature:</b>	-40÷65°C
<b>Relative humidity:</b>	0÷95% without condensation
<b>Housing's material:</b>	Anodised aluminium alloy
<b>Environmental protection:</b>	IP66
<b>ATEX conformity:</b>	For category II 2 G protection mode Ex IIB T6- EC type examination certificate: INERIS 08ATEX0028
<b>Cable entries (standard):</b>	From the bottom, 2 holes ½" NPT
<b>Cable clamps:</b>	In the bottom side, spring terminals for wires 1,5mmq max
<b>Mounting facilities:</b>	N° 6 screwed holes M6x10 on the back and lateral sides for wall or bracket mounting Equipped with silent block supports
<b>Dimensions /Weight:</b>	388x148x49mm / 5 Kg



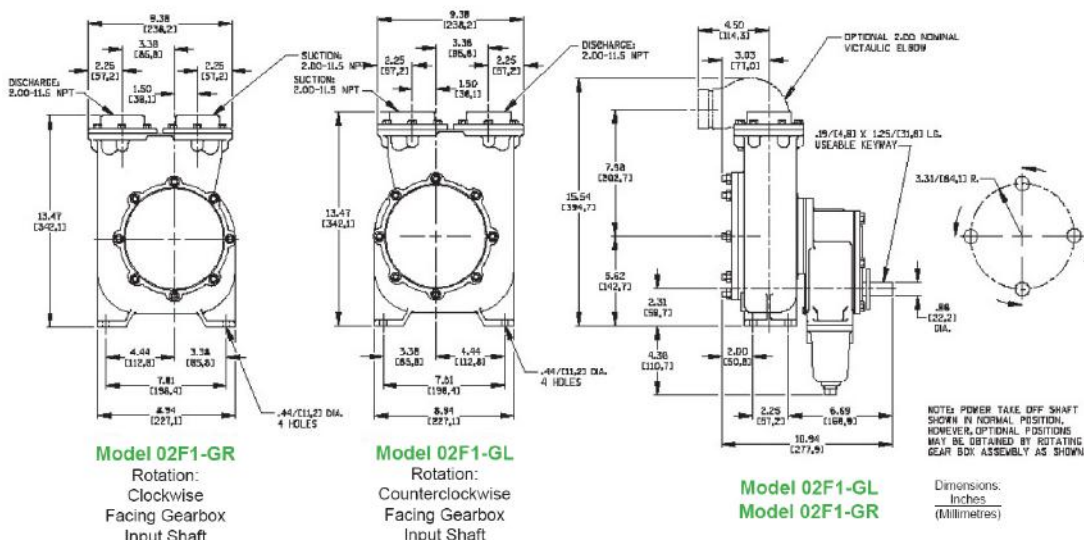
# Gorman Rupp Pump 2"

## Most economical and best quality pump

Gorman Rupp pumps are proven performers in reliability. Self-priming centrifugal PTO pumps are ideal for handling aircraft fuels. Designed for truck mounting.

### Technical Specifications

<b>Size:</b>	2" x 2" (51 mm x 51 mm) NPT - Female
<b>Casing:</b>	Aluminium Alloy 356-T6 Maximum Operating Pressure 234 psi (1613 kPa)*
<b>Enclosed Type, Six Vane Impeller:</b>	Aluminium Alloy 356-T6 w/Gray Iron 30 Hub Insert
<b>Pinion Shaft:</b>	Alloy Steel 4320
<b>Replaceable Wear Ring:</b>	Copper Alloy C93200
<b>Removable Cover Plate:</b>	Gray Iron 30, 6 lbs. (3 kg)
<b>Seal:</b>	Type 21, Mechanical, Self-Lubricated. Carbon Rotating Face. Ni-Resist Stationary Face. Fluorocarbon Elastomers (DuPont Viton® or Equivalent). Stainless Steel No. 18-8 Cage & Spring. Maximum Temperature of Liquid Pumped, 160°F (71°C)*
<b>Seal Guard:</b>	Brass Tubing ASTM B-135
<b>Gearbox Housing:</b>	Gray Iron 30
<b>Gearbox Lubrication:</b>	SAE 90 Gear Oil
<b>Gear:</b>	Alloy Steel 4620
<b>Gear Ratio:</b>	5.69:1 Increase
<b>Bearings:</b>	Open Single Row Ball
<b>Flanges:</b>	Gray Iron 30
<b>Gaskets:</b>	Buna-N w/Cork and Vegetable Fiber
<b>Hardware:</b>	Standard Plated Steel
<b>Optional Equipment:</b>	Victaulic™ Elbow Victaulic is a Registered Trademark of Victaulic Company of America



# Gorman Rupp Pump 2"

## Ordering Information

Part No	Description
8425	Pump Gorman Rupp 2" model 02F1-GR (right-hand rotation)

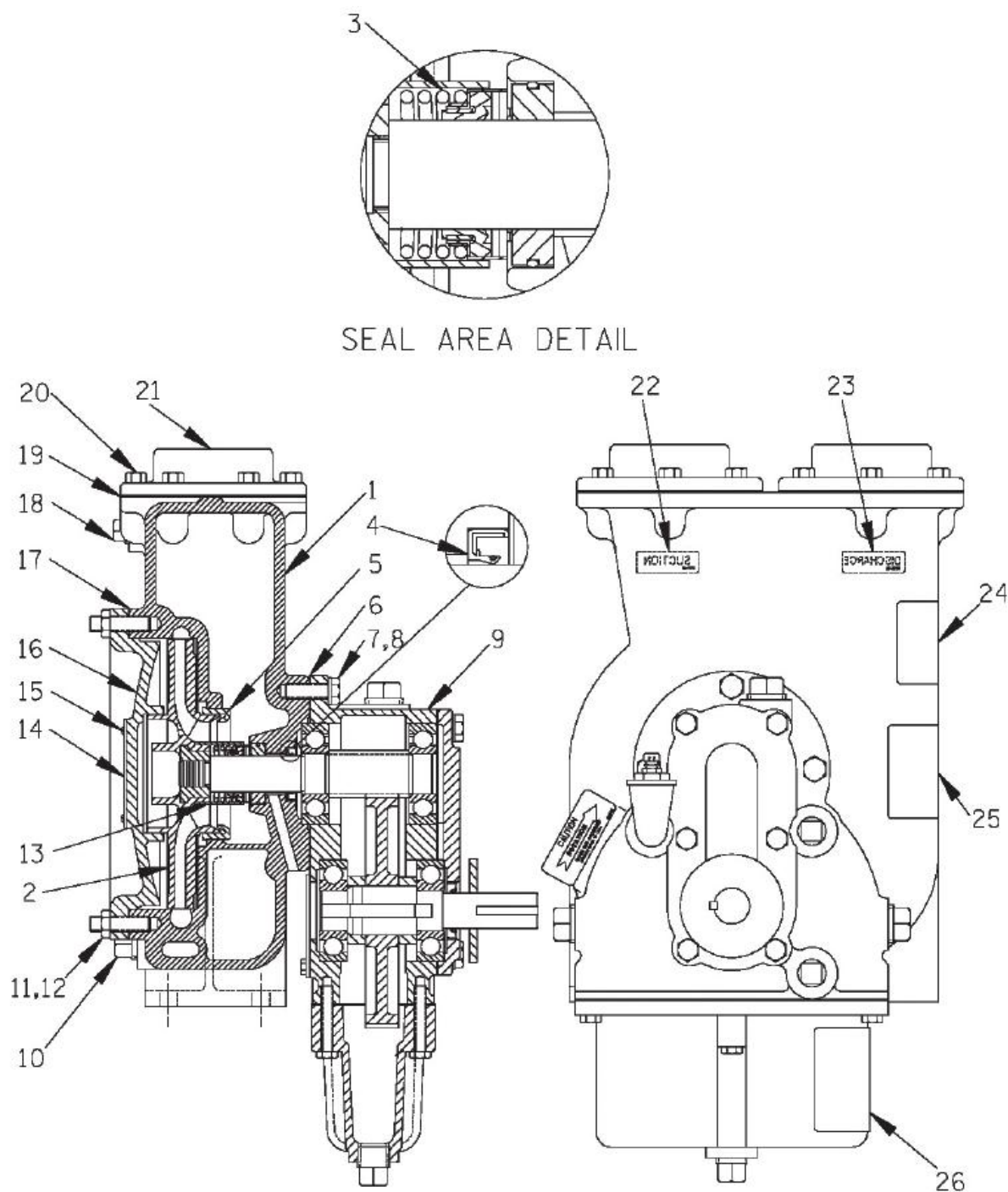


Figure 1. Pump Model 02F1-GR

# Gorman Rupp Pump 2"

## Ordering Information

If your pump serial number is followed by an "N", your pump is NOT a standard production model. Contact the Liquip part sales team to verify part numbers.

Parts List Pump Model 02F1-GR				
Item		Part No	Description	Qty
1		8751B	Pump Casing	1
2		8101	Impeller	1
3	*	25271-851	Seal Assembly	1
4	*	25217-165	Oil Seal	1
5	*	8099	Wear Ring	1
6	*	8102G	Gasket	1
7		B0604	Hex Head Capscrew	3
8		J06	Lock Washer	3
9		44161-020	Gear Box Assembly	1
10		P06	Pipe Plug	1
11		C0606	Stud	8
12		D06	Hex Nut	8
13		31143-056	Seal Guard	1
14		38818-020	Name Plate	1
15		BM#04-03	Drive Screw	4
16		11156	Cover Plate	1
17	*	8098G	Cover Plate Gasket	1
18		P04	Pipe Plug	2
19	*	9288A	Flange Gasket	2
20		B0603	Hex Head Capscrew	12
21		9586A	Flange	2
22		6588AG	Suction Sticker	1
23		6588BJ	Discharge Sticker	1
24		GR-02	G-R Decal	1
25		38816-077	Gear Lube Decal	2
26		8382B	Lubrication Decal	REF
NOT SHOWN		38817-039	Instruction Tag	1
NOT SHOWN		6588U	Instruction Tag	1

\* Indicates parts recommended for stock

## Gorman Rupp Pump 2"

### Ordering Information

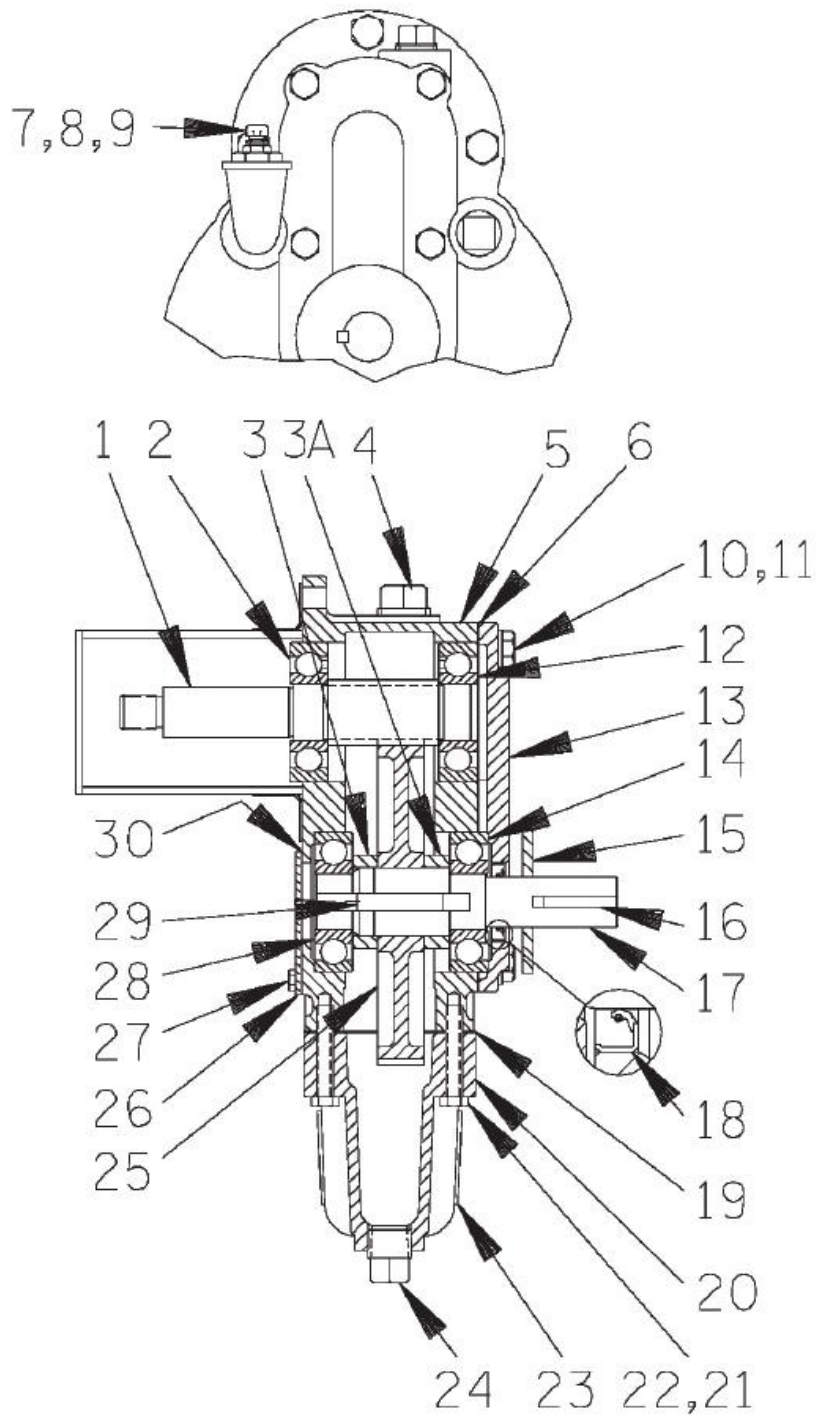


Figure 2. 44161-020 Gear Box Assembly

# Gorman Rupp Pump 2"

## Ordering Information

If your pump serial number is followed by an N", your pump is NOT a standard production model. Contact the Liquip part sales team to verify part numbers.

Parts List 44161-020 Gearbox Assembly				
Item		Part No	Description	Qty
1		38521-016	Pinion Shaft	1
2	*	23275-206	Ball Bearing	1
3		8104	Spacer Sleeve	2
4		P08	Pipe Plug	1
5		8103B	Gear Box	1
6	*	8097G	Gasket	1
7		S1530	Air Vent	1
8		AP0802	Reducing Pipe Bushing	1
9		RS08	Street Below	1
10		B0503	Hex Head Capscrew	6
11		J05	Lock Washer	6
12	*	23275-206	Ball Bearing	1
13		8097	Bearing Cover	1
14	*	S1120	Ball Bearing	1
15		31131-063	Slinger Ring	1
16	*	N0305	Key	1
17		8095	Drive Shaft	1
18	*	S1617	Oil Seal	1
19	*	10332G	Gasket	1
20		38354-032	Oil Sump	1
21		B0406	Hex Head Capscrew	2
22		B0403	Hex Head Capscrew	4
23		8382B	Decal	2
24		P08	Pipe Plug	5
25		8022	Drive Gear	1
26		8120	Cover Plate	1
27		BW#10-01-1/4S	Hex Head Capscrew	3
28	*	S1120	Ball Bearing	1
29	*	N0506	Key	1
30	*	8120G	Cover Gasket	1

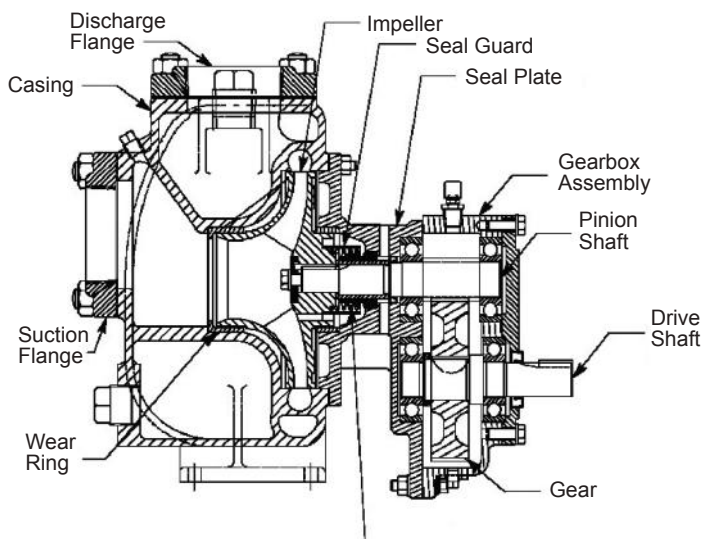
\* Indicates parts recommended for stock

# Gorman Rupp Pump 3"

These 3" pumps are used as the product pump on most larger capacity Liquip JET-A aviation refuellers. These Gorman Rupp self-priming product (aviation fuel) pumps are driven by an hydraulic motor on the fuelling module. They pull the product (JET fuel) from the cargo tank and pump into aircraft at around 1,000+ litres / min.

## Technical Specifications

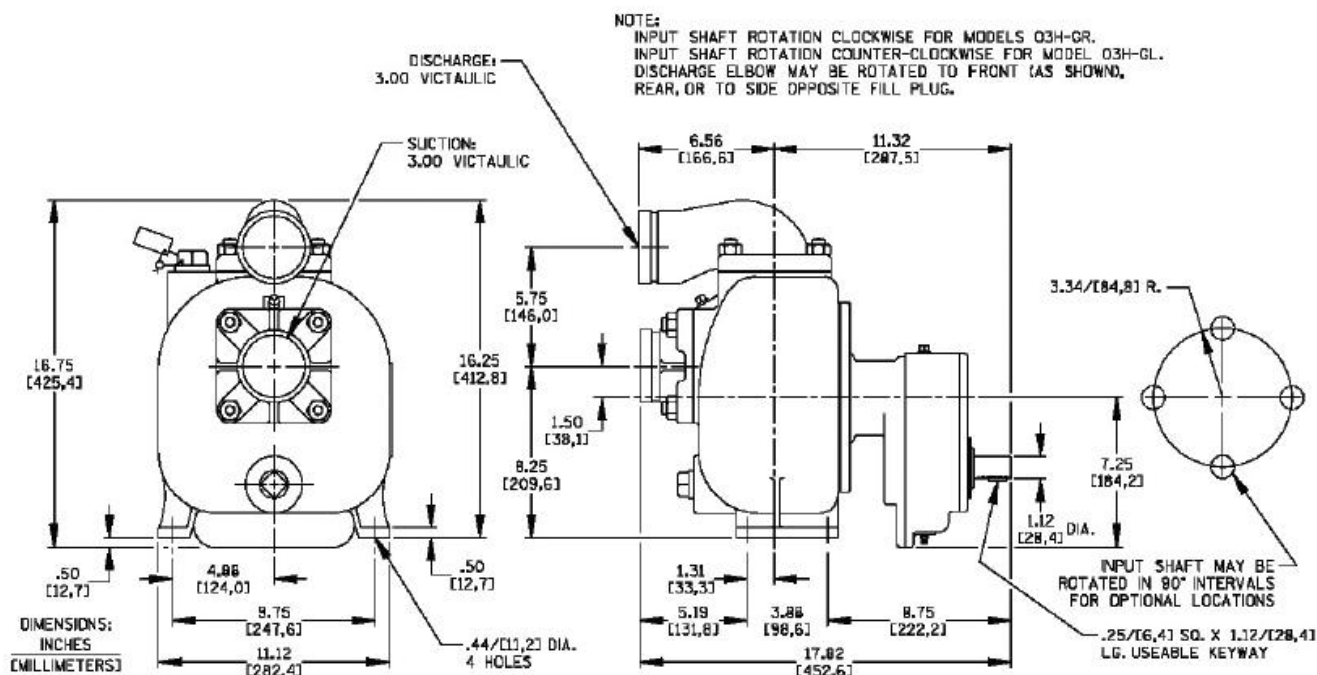
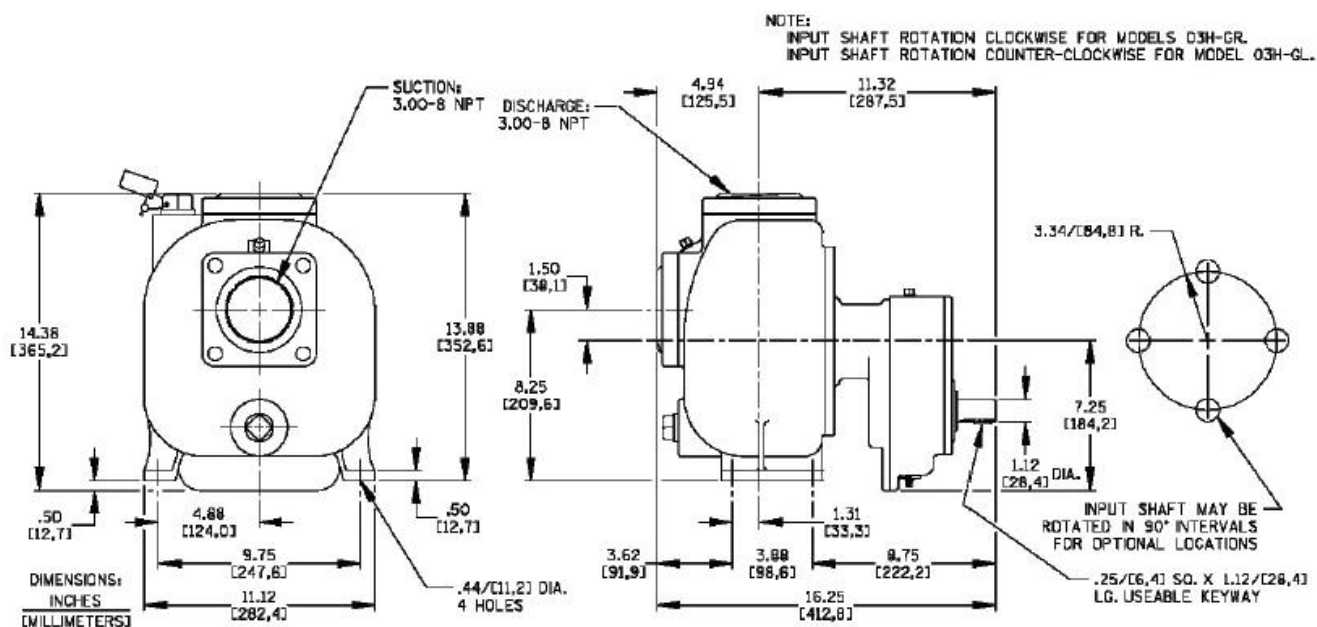
<b>Size:</b>	3" x 3" (76 mm x 76 mm) NPT - Female
<b>Casing:</b>	(03H1) Aluminium Alloy 356-T6 (03H3) Ductile Iron 60-40-18 Maximum Operating Pressure 176 psi (1214 kPa)*
<b>Enclosed Type:</b>	Almag 35. Handles 7/16" (11,1 mm) Diameter Spherical Solids
<b>Five Vane Impeller:</b>	
<b>Pinion Shaft:</b>	Alloy Steel 4320
<b>Shaft Sleeve:</b>	Alloy Steel 4130
<b>Replaceable Wear Ring:</b>	Copper Alloy C93200
<b>Seal Plate:</b>	Gray Iron 30, 6 lbs. (3 kg)
<b>Seal Guard:</b>	Copper Alloy C26000
<b>Gearbox Housing:</b>	Gray Iron 30
<b>Gearbox Lubrication:</b>	SAE 90 Gear Oil
<b>Gear:</b>	Alloy Steel 4620
<b>Gear Ratio:</b>	4.09:1 Increase
<b>Bearings:</b>	Open Single Row Ball
<b>Flanges:</b>	(03H1) Aluminium Alloy 356-T6 (03H3) Ductile Iron 60-40-18
<b>Gaskets:</b>	Buna-N w/Cork and Vegetable Fiber
<b>O-Rings:</b>	Buna-N
<b>Hardware:</b>	Standard Plated Steel
<b>Optional Equipment:</b>	Victaulic™ Elbow Victaulic is a Registered Trademark of Victaulic Company of America



*\*Contact Liquip staff for applications exceeding maximum pressure and/or temperature indicated.*

# Gorman Rupp Pump 3"

## Specification Data



# Gorman Rupp Pump 3"

## Ordering Information

Part No	Description
8426	Pump Gorman Rupp 3" model 03H1-GR

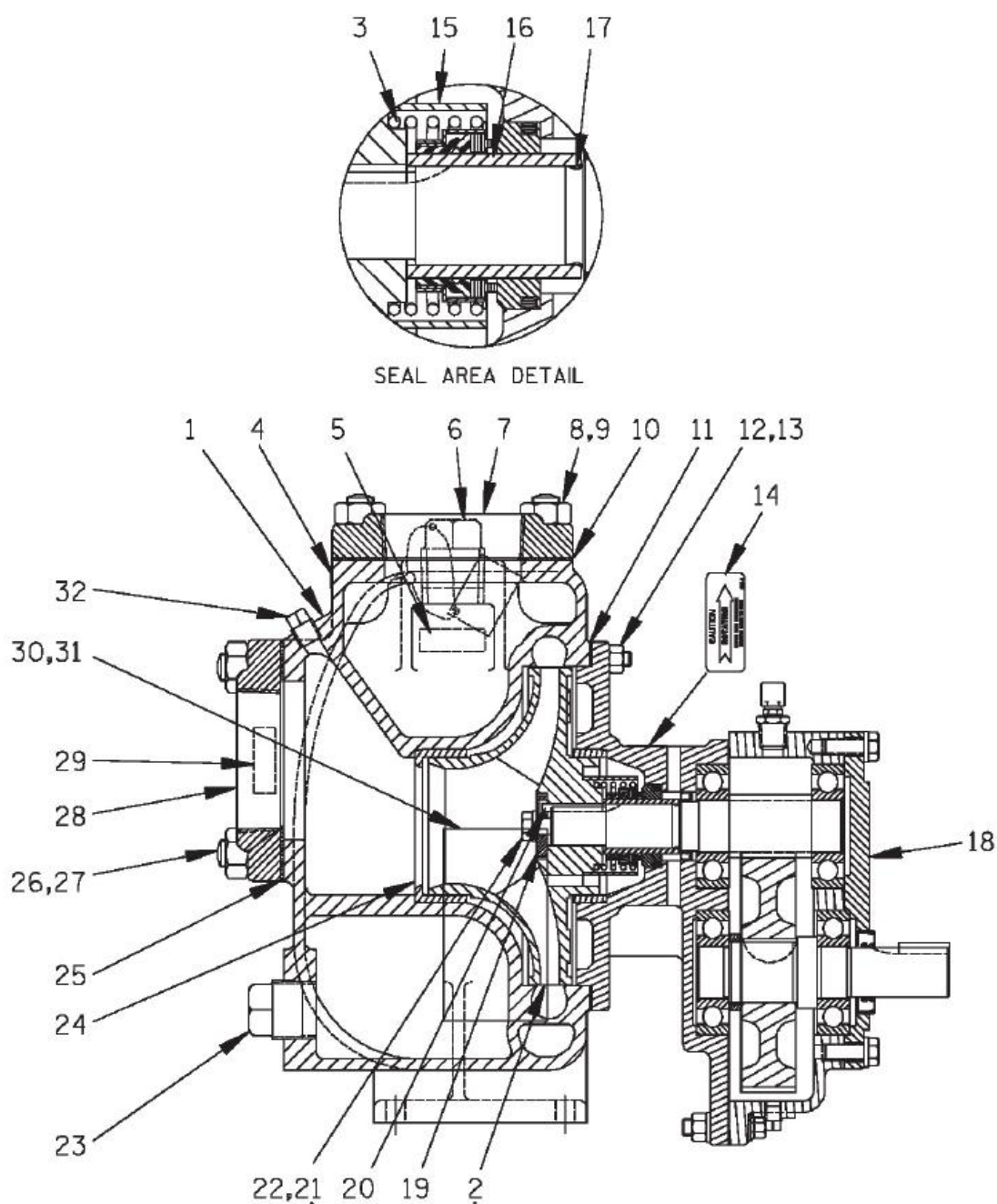


Figure 1. Pump Model 03H1-GR

# Gorman Rupp Pump 3"

## Ordering Information

If your pump serial number is followed by an "N", your pump is NOT a standard production model. Contact the Liquip part sales team to verify part numbers.

Parts List Pump Model 03H1-GR				
Item		Part No	Description	Qty
1		8274A	Pump Casing	1
2	*	8251A	Impeller	1
3	*	25271-192	Seal Assembly	1
4		6588BJ	Discharge Sticker	1
5		6588AH	FL Here to PRM Stk	1
6		48271-064	Fill Plug Assy	1
7		1390	Discharge Flange	1
8		C1009	Stud	4
9		D10	Hex Nut	4
10	*	1318GB	Discharge Gasket	1
11	*	3GC	Pump Casing Gasket Set	1
12		C0605 1/2	Stud	8
13		D06	Hex Nut	8
14		2613M	Rotation Decal	1
15		9834	Seal Guard	1
16	*	9140	Shaft Sleeve	1
17	*	S1461	Shaft Sleeve O-Ring	1
18		44161-014	Gearbox Assembly	1
19	*	6750	Impeller Washer	1
20	*	N0305-1/2	Impeller Key	1
21		BT0604	Nylock Capscrew	1
22		J06	Lockwasher	1
23		P20	Casing Drain Plug	1
24	*	62ZL5	Wear Ring	1
25	*	1318GB	Suction Flange Gasket	1
26		C1009	Stud	4
27		D10	Hex Nut	4
28		1390	Suction Flange	1
29		6588AG	Suction Sticker	1
30		38818-018	Name Plate	1
31		BM#04-03	Drive Screw	4
32		P04	Pipe Plug	1

\* Indicates parts recommended for stock

# Gorman Rupp Pump 3"

## Ordering Information

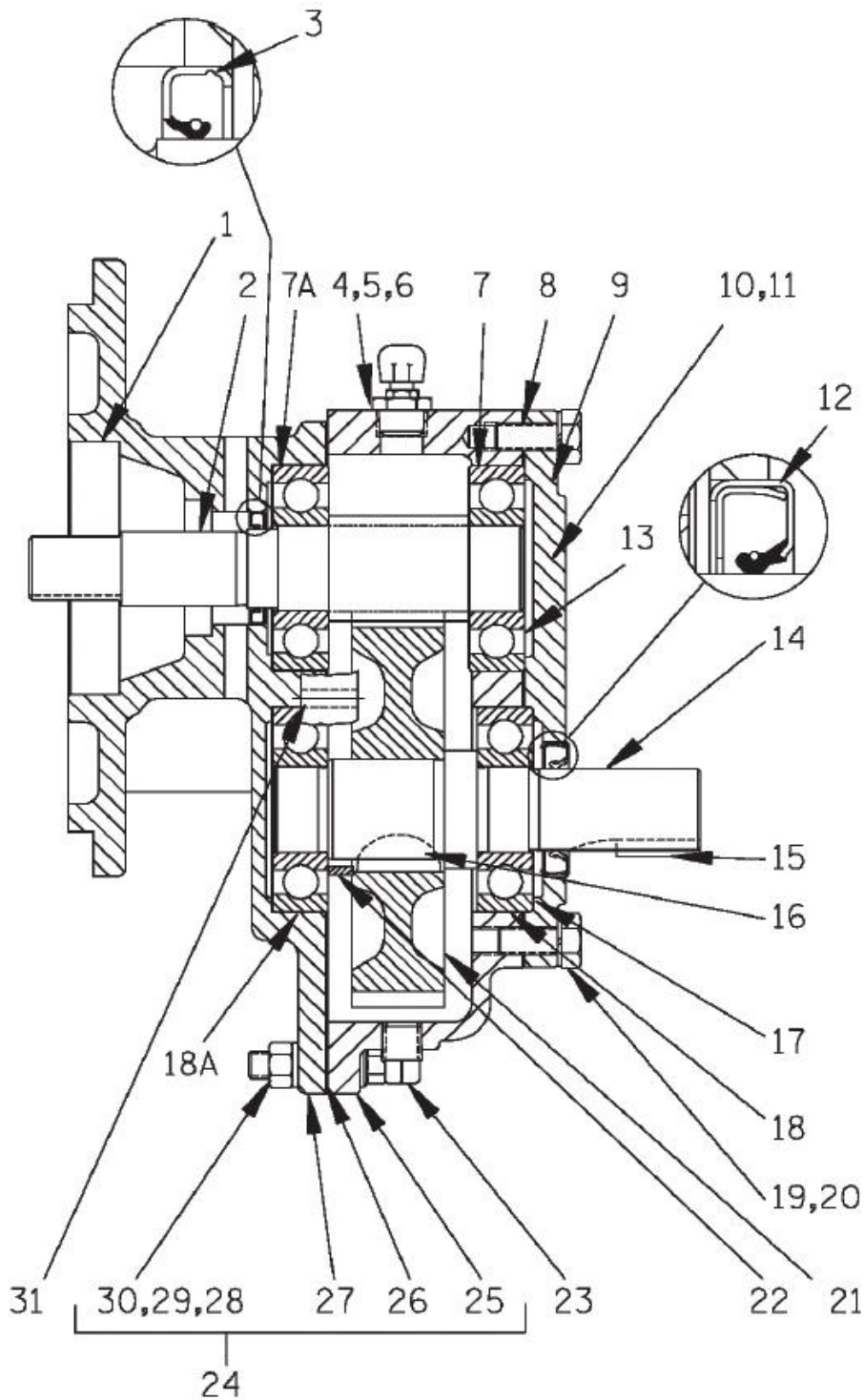


Figure 2. 44161-014 Gearbox Assembly

# Gorman Rupp Pump 3"

## Ordering Information

If your pump serial number is followed by an "N", your pump is NOT a standard production model. Contact the Liquip part sales team to verify part numbers.

Parts List 44161-014 Gearbox Assembly				
Item		Part No	Description	Qty
1		62ZL6	Wear Ring	1
2		8896	Pinion Shaft	1
3	*	S1764	Oil Seal	1
4		S1530	Air Vent	1
5		AP0602	Reducing Pipe Bushing	1
6		11495A	Shipping Plug	1
7	*	S390	Ball Bearing	1
7A	*	S390	Ball Bearing	1
8	*	8871G	Gasket	1
9		8871	Cover Plate	1
10		38816-239	Lubrication Decal	1
11		2613CQ	PTO Lubrication Decal	1
12	*	S389	Oil Seal	1
13	*	S464	Adjusting Shim Set	1
14		8837	Drive Shaft	1
15	*	N0404-1/2	Key	1
16	*	AV1210	WDF Key	1
17	*	S464	Adjusting Shim Set	1
18	*	S390	Ball Bearing	1
18A	*	S390	Ball Bearing	1
19		J06	Lock Washer	6
20		B0604	Hex Head Capscrew	6
21		8895	Helical Gear	1
22		9142	Spacer Sleeve	1
23		P06	Pipe Plug	5
24		8914	Gear Housing Assembly	1
25	†	NOT AVAILABLE	- Gear Housing	1
26		8870G	- Gasket	1
27	†	NOT AVAILABLE	- Seal Plate	1
28		31871-065	- Flanged Capscrew	8
29		J06	- Lock Washer	8
30		D06	- Hex Nut	8
31		AA0403 -1/2	Dowel Pin	2

\* Indicates parts recommended for stock

† Indicates the mating surfaces of items 25 and 27 are machines at the factory for a flush fit. These items are available only by ordering the complete gearbox housing assembly (Item 24).

# Portable Aviation Drum Pump

Liquip Portable Aviation Drum Pump refuelling assembly is a complete frame-mounted package, consisting of:

- A hand pump capable of 1 litre per turn
- Velcon VF31 mini-filter and cartridge
- Static reel with cable and clamp
- Hose - 25mm (1") aviation hose (length to suit customer requirements)
- Nozzle - ZVF25.41 manual 25mm (1") bowser-style nozzle with built-in swivel,
- Strainer, dust cap and earth clamp/pin
- Drum Spear suitable for 200 litre drums
- Ground / earth spike

The unit is mounted in a lightweight aluminium frame designed to be free-standing on top of the fuel drum. Filter monitors are last line in defence against fuel contamination by water and dirt. The monitor vessel contains a 6 inch diameter monitor cartridge designed to indicate (by a rise in pressure differential between the inlet and outlet) a problem with water or dirt contamination. The product is pumped under pressure to flow through the housing inlet chamber and "outside-in" through the monitor cartridge. This specially developed multimedia cartridge configuration traps and holds minute solid particles (to less than one micron) whilst absorbing any water contamination, culminating in shutting down the flow if water is present in any volume.

**OPTION:**

Electric pump in place of hand pump

## Ordering Information

Contact the Liquip Sales Department for assistance in determining which of the numerous models and options available will best suit your application.





## *Fuel Sampling*

## Epoxy Lined Container

These re-usable double-coated epoxy-lined containers have been tested in accordance with the approval procedure defined in ASTM Standard Practice D-4306.

They are made specifically for transporting samples of jet fuel for laboratory testing.

The cap is epoxy coated and can be safety wire sealed while the new design reduces the amount of fuel and dirt particles trapped in the chine when pouring.

### Ordering Information:

Part No	Description
TL-2935B-1	1 gallon can
TL-2935A-5	5 gallon can
TL-2935-2A	Shipping box to suit 1 gallon can
TL-2935-3	Shipping box to suit 5 gallon can



## Collector Tank

These 90 Litre Liquip aviation fuel Collector / Recovery / Slops Tanks are typically used on aviation Refueller and Hydrant Dispenser vehicles. They collect / store fuel from fuel sampling (which is typically manually dumped in through the hatch or from the ALJAC Sampler, if fitted)), from system depressurisation process, from the show-flow / air eliminator etc. or from nozzle drain adaptors.

The Collector Tank is drained / evacuated by one or more procedures: by an evacuation pump (standard is hydraulically-driven, but can be air-operated diaphragm type (if specified) or manually via the tank's drain valve.

These Collector Tanks are based around a "standard" (base model) 90 litre capacity tank to which several components may be added, creating several variants.

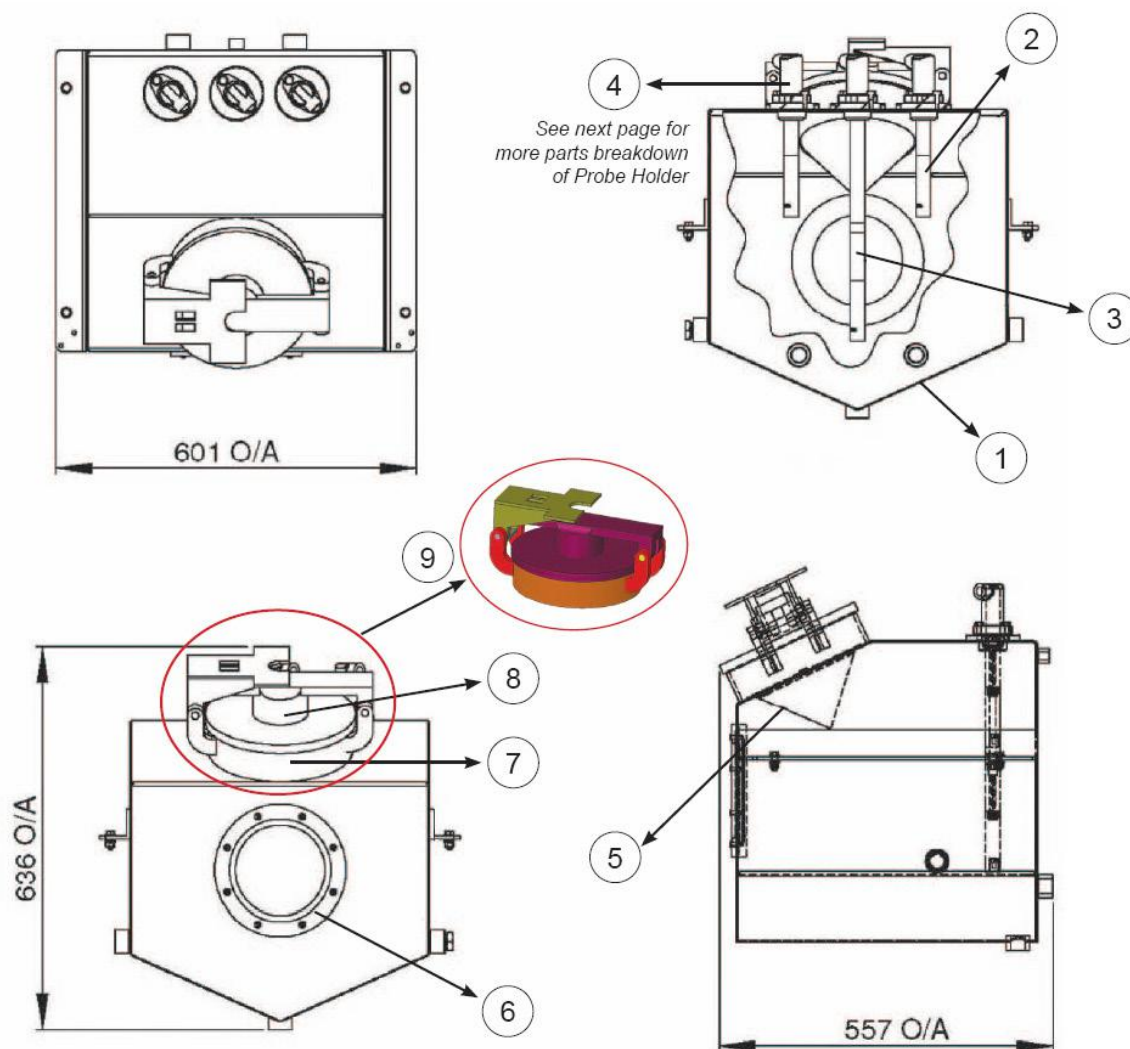
As these 90 litre tanks are now a standard, on both Dispensers and Refuellers, typically the only optional additions on the 90 litre versions would be with or without:

- Nozzle Drain - Carter 61528B Aircraft (A/C) Adaptor.
- Sight Glass (porthole contents level gauge).
- Internal Level Sensors / Probes / Float Switches for Low, High or Overfill sensing / warning.
- Some "special builds" may have other non-standard components such as external level gauges etc.
- \*CONICAL STRAINER. The CS100ST is a 100 mesh Stainless Steel conical strainer that fits into the tank hatch



# Collector Tank

## Ordering Information



Item No	Part No	Description	Qty
1	2000-01-00	Collector Tank - Bare	1
2	2000-04-00	Probe Assembly - High & High/High	2
3	2000-04-01	Probe Assembly - Low Level	1
4	VOH200-5	Probe Holder	3
5	CS100ST	Conical Strainer	1
6	2000-03-00	Standard Porthole	1
7	EH231-1A	Aluminium Coaming Assembly	1
8	VOH500-32LP	Aluminium Emergency Vent Low Pressure	1
9	EH231	Inspection Hatch Assembly	1

# Millipore Adaptor

The chrome-plated dry break connection is available with a 3/8" BSPP and includes a dust cap. Mainly used for fuel sampling, they are also suitable for a variety of applications including pressure checking and gauge testing.

For pipework, the extension adaptor length of the unit is suitable for 6" pipework and can be cut down and re-angled for smaller pipe diameters.

## Technical Information

**Design Pressure:** 5,000 kPa.

## Ordering Information

Part No	Description
MSA011V	Adaptor 3/8" BSPP
MSF100	Mating female half to 3/8" hosetail
AT104	Adaptor probe assembly

**Note:** It is recommended to always have an additional valve between the millipore adaptor and the system.



MSA011V

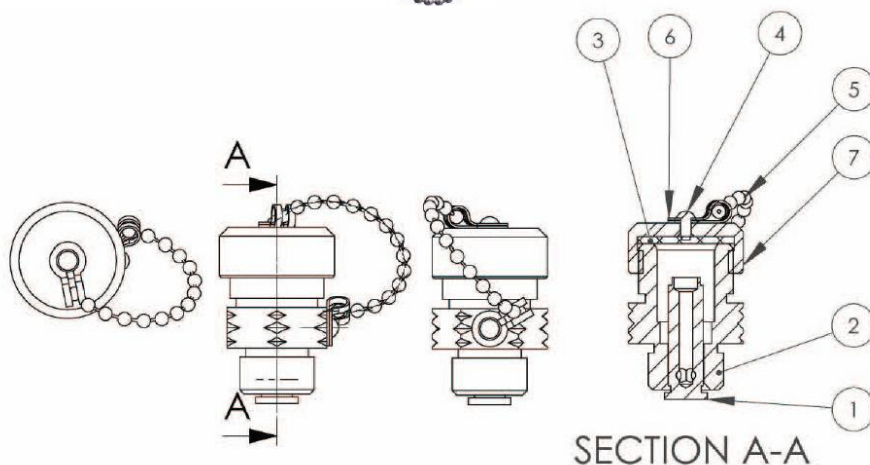


MSA011V

MSF100



AT104



SECTION A-A

Parts List			
Item No	Part No	Description	Qty
1	MSA010-2	Millipore Adaptor	1
2	MSA011-1	Millipore Sampling Adaptor Body	1
3	6090	Seal - Cap	1
4	6579 (2)	Hammer Drive Screws	2
5	7153 (2)	Chain Bead	1
6	7154	Clip - Bead Chain	2
7	MSA010-3 (2)	Cap for Millipore Adaptor	1

## Aljac Sampler

# Environmentally acceptable, operationally efficient and safe, eliminating any product loss

Aljac Closed Circuit Samplers have been designed to permit visual examination and full quality control checking of fuel samples within a closed system. A fuel sample is taken by opening the inlet valve and filling the sampler. Visual examination can be completed and the various checks carried out. When the checks are complete, the drain valve is opened and the sample is released into the slops tank.

The Basic Sampler comprises a glass tube, with hinged, vented cover, a cone-down epoxy coated aluminium base, and drain valve with easily operated handle. Fuel enters through a tangential port to promote vortexing which concentrates any impurities.

Accessories are available to permit all currently established methods of water detection, together with density and temperature readings.

Internally: A holder for either Shell Water Detector (SWD) syringe or the Exxon Hydrokit, for suspended water checking.

Externally: A fitting for the SWD syringe at the inlet to the Sampler, adjustable to any angle for convenience. A sample from this point will accurately reflect the condition of the product from which the sample is being taken.



## Operation

A fuel sample is taken by opening the inlet valve and filling the sampler. Visual examination can then be completed and the various checks carried out depending on the accessories fitted. When the checks are complete, the drain valve is opened and the sample released either to a dump tank or back to storage.

## Features

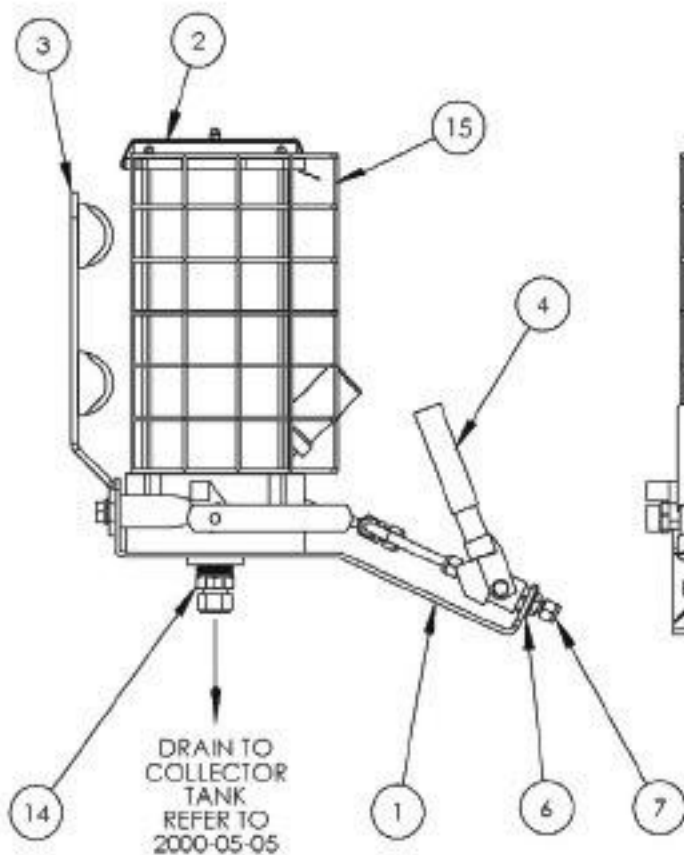
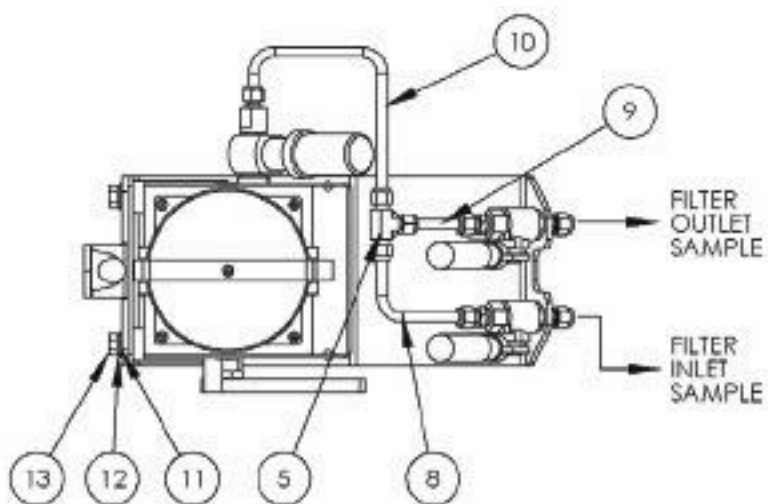
- Full visual examination
- Elimination of spillage
- Drain to dump/slop tan
- Accessible for internal cleaning
- Suits Density measurement
- Suspended water checking
- Temperature measurement
- Inlet connections: 3/8
- Outlet connections: 1"



ALJAC4

# Aljac Sampler

## Ordering Information



**M060**  
Shell Water Detector Capsules  
(box of 80)



**M105**  
5ml Re-suable syringe

# Aljac Sampler

## Ordering Information

Item No	Part No	Description	Qty
1	2000-05-01	Bracket Mounting Aljac Assembly	1
2	ALJAC4	Aljac Assembly	1
3	2000-05-04	Post Light Assembly	1
4	8476	Valve Ball 3/8"NPT Apollo	2
5	9049	Tee Tube 3/8" SS	1
6	8622	Washer Flat 16mm ZP	2
7	8648	Fitting Tube Comp. Straight 3/8"NPT x 3/8"T SS	5
8	2000-05-06	Tube 3/8" SS	1
9	2000-05-07	Tube 3/8" SS	1
10	2000-05-08	Tube 3/8" SS	1
11	8620	Washer Flat 12mm ZP	2
12	8618	Washer Spring 12mm ZP	2
13	ZZ0151	Bolt Hex HD M12-1.75P x 30mm ZP	2
14	9036	Fitting Tube Comp. Straight 1"BSP x 3/4"T SS	1
15	2000-05-10	Guard Mesh Frame	1



## *Overfill Protection*

## Liquid Detection Probes - LDP Series

**Liquip LDP series optic overfill sensors raise the bar in safety with true fail safe technology & individual 'optic-on' light.**

Liquip's LDP200 Series liquid detection probes are used as overfill protection on road tankers and in storage tanks. The probes are compatible with existing gantry monitors and interchangeable with current probes. They improve safety with a self-checking design. Probe can be checked for operation independently.

Sensing mechanism used is the different behaviour of a light beam in a glass prism when the prism is wet instead of dry. There is a very large difference in refractive index of air compared with petroleum liquids and this difference provides a very well defined and reliable switching point. With the probe dry, the light beam reflects back internally in the prism and in liquid the beam is refracted out into the liquid and "lost". Electronics in the probe are designed to create the light beam, detect its return or disappearance and pass that message to the Rack Monitor for appropriate response.



### Technical Specifications

#### Electrical Parameters:

IECEX:	Ui = 30V, Ii = 690mA, Pi = 9W, Ci = 105pF, Li = 0mH
Operating Temperature:	-40°C to +65°C
IP Rating:	IP66
Level Repeatability:	±0.5mm
Design Pressure:	600kPa

#### Power Limit (Pi = 9W) applies:

Ii max = 690mA when Ui max = 13.04V OR  
Ii max = 300mA when Ui max = 30V

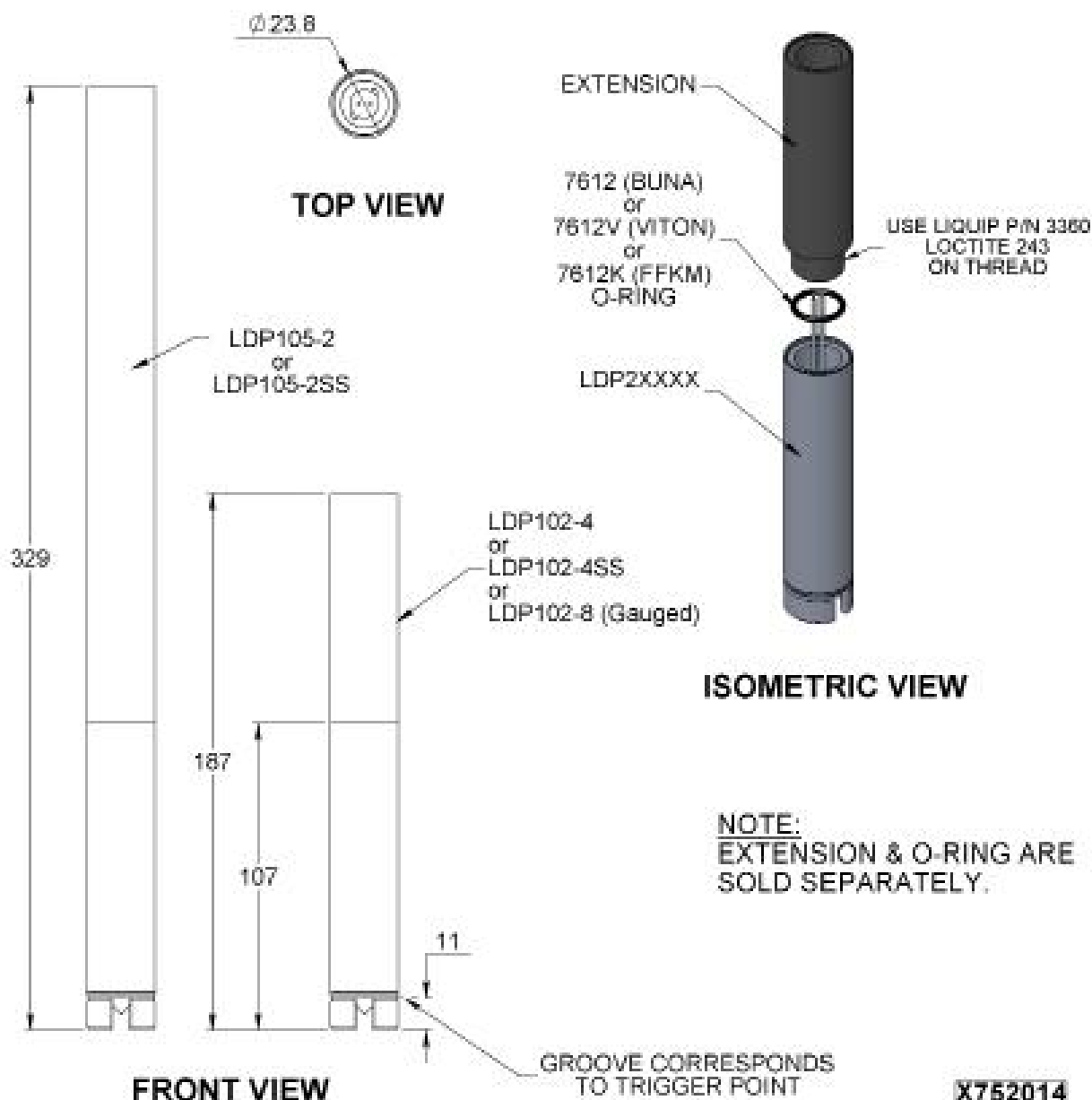
#### Safety Certification

LDP202 and LDP205	<ul style="list-style-type: none"> <li>IECEX Certificate: IECEx ITA 14.0014X</li> <li>Marking: Ex ia IIA T4 Ga IP66 Tamb = -40°C to +65°C</li> </ul>
	<ul style="list-style-type: none"> <li>ATEX Certificate: TUV 15ATEX 7627X</li> <li>Marking:  0518  II 1 G Ex ia IIA T4 Ga Tamb = -40°C to +65°C</li> </ul>
LDP202SS, LDP205SS, LDP202SC, LDP205SC	<ul style="list-style-type: none"> <li>IECEX Certificate: IECEx ITA 14.0014X</li> <li>Marking: Ex ia IIA T3 Ga IP66 Tamb = -40°C to +65°C</li> </ul>
	<ul style="list-style-type: none"> <li>ATEX Certificate: TUV 15ATEX 7627X</li> <li>Marking:  0518  II 1 G Ex ia IIA T3 Ga Tamb = -40°C to +65°C</li> </ul>

# Liquid Detection Probes - LDP Series

<b>MATERIALS</b>	<ul style="list-style-type: none"> <li>Aluminium probe body, retainer &amp; extension OR Stainless steel body, retainer &amp; extension, Pyrex glass prism, and epoxy.</li> <li>Viton o-rings OR FFKM o-rings</li> </ul>
<b>MAINTENANCE</b>	Irreparable item, no routine maintenance required, replace with new if found faulty.
<b>INSTALLATION</b>	<ul style="list-style-type: none"> <li>It is the requirement of the ATEX Approval that the probe is installed in such a way that the probe is Electrostatically Grounded. Install the grubscrew in PJB500, PJB301 &amp; VOH200-5 kit for this requirement.</li> <li>It is recommended to use Liquip PJB500, PJB301 or VOH200-5 Probe Holder which is compatible with Liquip manhole covers. Probe can be removed from tank top without having to access interior to remove a hood.</li> <li>Installation should be in accordance with APPLICABLE standards SUCH AS EN60079-14 and EN60079-25 or IEC60079-14 and IEC60079-25 or ANSI/ISA RP12.06.01 and ANSI/NFPA 70 or CSA C22.1 Part 1, Appendix F or EQUIVALENT.</li> <li>Users shall avoid ignition hazards due to impact or friction on the apparatus when used in Zone 0 areas.</li> <li>Any free ends of cable not terminated shall be appropriately terminated to ensure no contact with additional sources of power is possible.</li> </ul>
<b>WIRING METHOD</b>	<ol style="list-style-type: none"> <li>2 - Wire System for LDP202, LDP202SS and LDP202SC Attached drawing shows a typical 6 channel compartment system based on Australian Standard. For 8 channel compartment system ask Liquip for more details.  </li> <li>5 - Wire System for LDP205, LDP205SS and LDP205SC Attached drawing shows a typical 7 compartments tanker, the number of probes varies with the number of compartments in the tanker as the probes are connected in series.</li> </ol>
<b>OPERATIONAL PARAMETERS</b>	<p>Liquid properties must conform to the following:</p> <ul style="list-style-type: none"> <li>Have refractive index between 1.10 and 1.47. If in doubt, carry out test with sample of liquid at working temperatures.</li> <li>Not be reflective (e.g. milk will not trip probe as white reflects)</li> <li>Be non-gelling and remain liquid at all operational temperatures. Viscosities up to 3500 cSt, work without suffering from clingage.</li> <li>No particles in suspension which can form clinging opaque surface coating on prism.</li> <li>Use with standard petroleum products and water-based compounds only. Any other chemical content must be checked with Liquip.</li> <li>Not allow sunlight to access prism during operation.</li> <li>Not install probe, or carry out routine tests adjacent to any reflective surface. (Incident light and reflections may cause false readings)</li> </ul>
<b>HANDLING PRECAUTIONS</b>	<p>Treat with care in particular protect tip until probe is installed. Protect open end of probe from moisture and chemicals.</p> <p>The probe prism is protected and light-shielded by the retainer.</p>
<b>ACCESSORIES</b>	<p>Extension bars of aluminium or stainless steel to suit various length applications. The following extension bars can only be used:</p> <ul style="list-style-type: none"> <li>LDP102-4 (80mm long)</li> <li>LDP102-4SS (80mm long Stainless Steel)</li> <li>LDP102-8 (Gauged, 80mm long)</li> <li>LDP105-2 (222mm long)</li> <li>LDP105-2SS (222mm long Stainless Steel)</li> <li>Note: LC99 extension bar is not compatible.</li> </ul>
<b>ASSOCIATED EQUIPMENT</b>	<ul style="list-style-type: none"> <li>RM100 Series Rack Monitor</li> <li>TP Series "Ground Boss" truck plug</li> <li>DP305 Dummy Probe</li> <li>DP307 Dummy Probe</li> <li>PJB301 Probe holder</li> <li>PJB500 Probe holder</li> <li>VOH200-5 Probe holder</li> </ul>

# Liquid Detection Probes - LDP Series



**X752014**

Issue: C

## Ordering Information

LDP202	2 Wire Probe, Aluminium Body	LDP202SCZ	2 Wire Probe, SS Body, Chemical Trim, Kit - Kalrez Seals
LDP205	5 Wire Probe, Aluminium Body	LDP202SSZ	2 wire Probe, SS Body, Kit - Viton Seals
LDP202SS	2 Wire Probe, SS Body with Viton Seals	LDP202XLZ	2 wire Probe, Aluminium Body, Kit with LDP105-2 Long Extension
LDP205SS	5 Wire Probe, SS Body with Viton Seals	LDP202Z	2 Wire Probe, Aluminium Body, Kit - Buna Seals
LDP202SC	2 Wire Probe, SS Body with FFKM Seals	LDP205SCZ	5 Wire Probe, SS Body, Chemical Trim, Kit - Kalrez Seals
LDP205SC	5 Wire Probe, SS Body with FFKM Seals	LDP205SSZ	5 Wire Probe, SS Body, Kit - Viton Seals
		LDP205XLZ	5 Wire Probe, Aluminium Body, Kit with LDP105-2 Long Extension
		LDP205Z	5 Wire Probe, Aluminium Body, Kit - Buna Seals

## Probe Holders

### Probe Holder - PJB500

The PJB500 is a walkway or manhole cover mounted overfill probe holder.

It includes 2 x M20 conduit thread ports.

The PJB500 provides a protected, clean and dry environment to mount overfill probes to tanker walkways.

### Specifications

- Housing can be mounted through a hole and sealed with the locknut or screwed directly into a M60 X 2 thread.
- By removing the top cover, access can be gained for height adjustment of the probe or to the wiring connections.
- The body has two M20 x 1.5mm entries. This eliminates the need to mount a tee with cover in the conduit line. This will allow for better connections and easier fault finding.
- The probe can be adjusted by loosening the internal capscrew to release the clamp and sliding the probe up or down to the correct sensing height.
- Will accommodate probe diameters of 24mm (such as Liquip LDP style).
- Plate thickness for mounting is from 4 to 17mm.
- Overall height when mounted is 96mm, overall diameter is 110mm.
- Housing rated IP66.



### Probe Holder - VOH200-5

The VOH200-5 is a lightweight aluminium junction box for direct mounting to "VOH" manhole covers, or via a weld flange VRB-13 direct to the tank top.

### Ordering Information

Part No	Description
PJB500	Probe Holder 2" male BSPP
VOH200-5	Probe Holder



# Mini Monitor

The Mini Monitor has been developed for sites or vehicles with one or two tanks or compartments only with the necessity for overfill protection and / or automatic re-order.

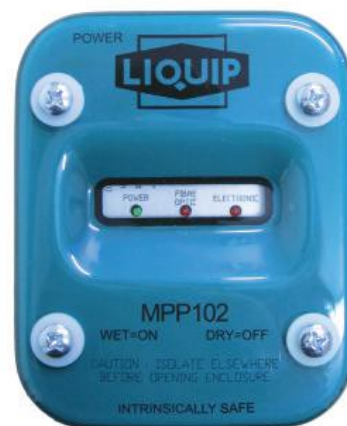
The MPP102 works with either:

1. a single electronic probe
2. via a truck plug connected to a standard gantry monitor
3. directly to a pump, control valve, alarm etc.

All sensor outputs are intrinsically safe. Output signal is by an integral relay rated at 24V DC 5A or 12V DC 5A. This signal is used in the tank control system to either stop liquid flow or sound an alarm. LED indicators show the condition of the system at all times.

## Technical Specifications

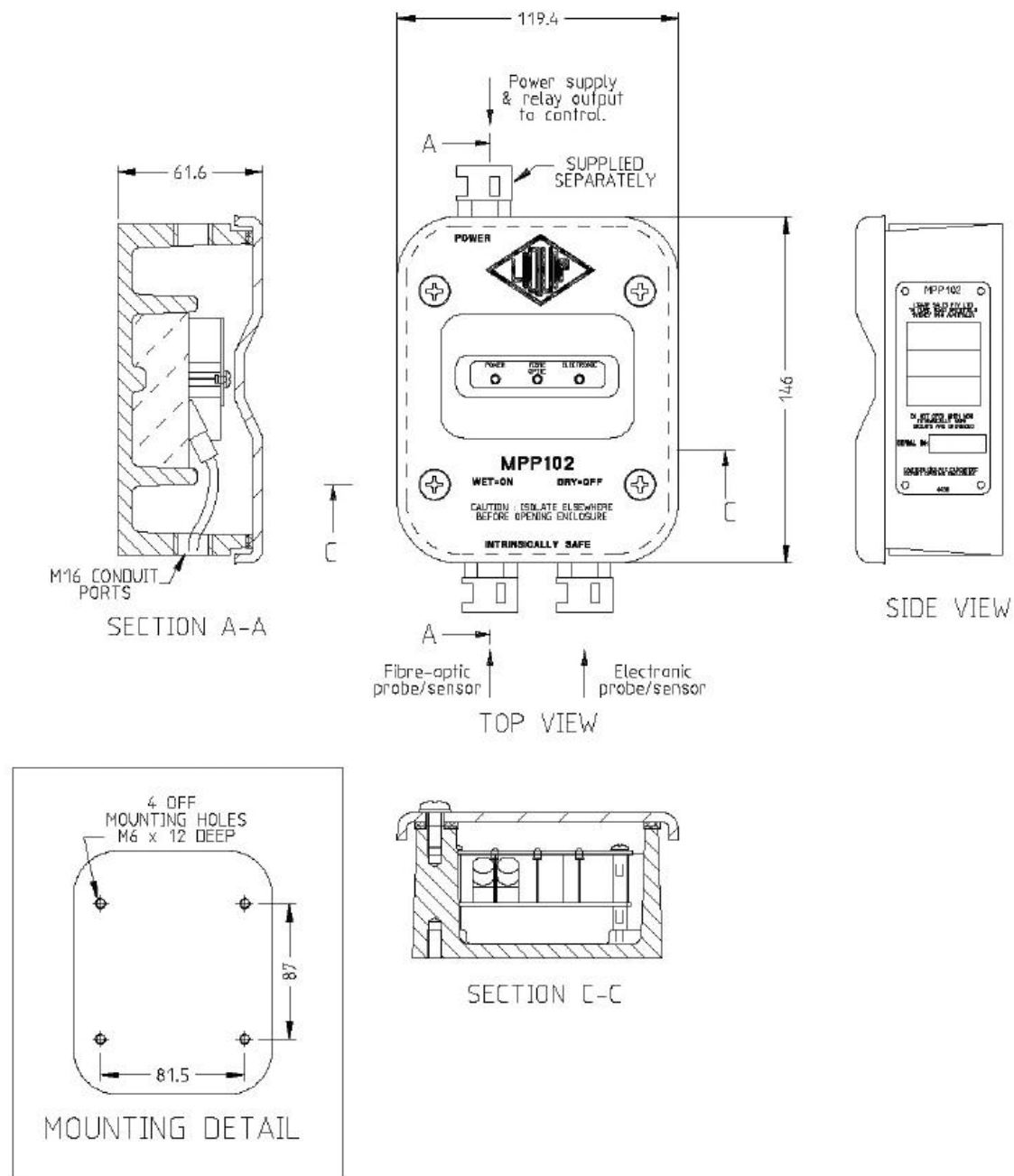
<b>Weight:</b>	1.35kg
<b>Dimensions:</b>	146mm x 119.4mm x 61.6mm (Height/Width/Depth)
<b>Max Voltage:</b>	+11.5Vdc to +30Vdc
<b>Max Current:</b>	200mA maximum
<b>Temperature range:</b>	-25 to +55°C
<b>Probe Interface:</b>	1 x 2-Wire electro-optical overfill probe output. 1 x Fibre-optic overfill probe input/output.
<b>Relay Output:</b>	30Vdc @ 3A Common/Normally-Open/Normally-Closed.
<b>Mounting:</b>	Four mounting M6 holes in rear of body. Conduit ports threaded M16.
<b>Materials of Construction:</b>	Housing is made from cast aluminium Polycarbonate cover Wiring and conduit to be to IP66 minimum.
<b>Associated Equipment:</b>	Probes: FOT100, FOB100, AGP102 & LC99A Fibre-optic cable Fibre-optic cable joiner kit Fibre-optic polisher kit EAC201 earth assurance clamp, JB100 junction box & DP250N dummy probe (Note: Part numbers may change without notice)



# Mini Monitor

## Ordering Information

Part No	Description
MPP102	Mini Monitor





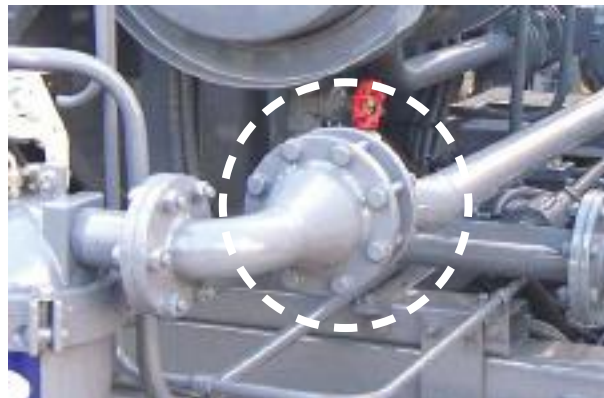
## *Valves*

## Non-Return Valves - NRV80

LIQUIP NRV80 sandwich type non-return Valve is typically fitted between standard 3" TTMA or 80mm DIN pipeline flanges, predominantly in aviation Refuellers.

Special contoured and shaped valve to allow minimum pressure drop under full flow condition. Immediately after the flow ceases the valve shuts, preventing product from draining back down the pipeline.

However should a pressure build up occur due to temperature increase and expansion, the valve is fitted with a small thermal relief valve to guard against over pressurisation.



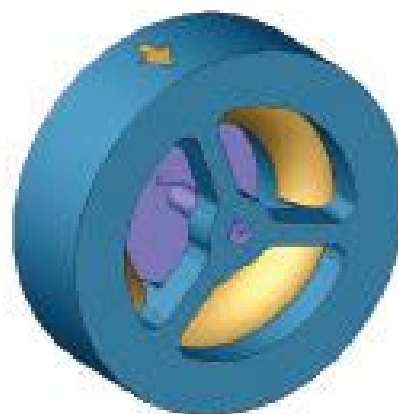
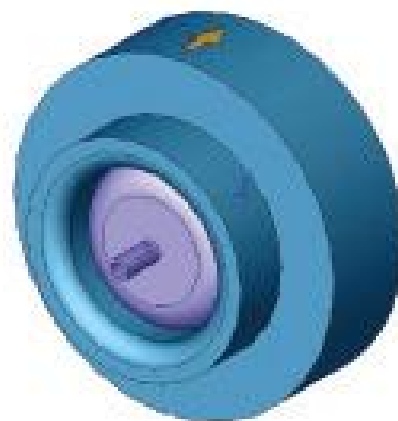
### Technical Specifications

**Special Features:** No gasket required. O-rings are used for positive sealing. Thermal relief valve. Full flow.

**Materials of Construction:** Aluminium body, poppet, spider and washer.  
All viton seals and o-rings.  
Stainless steel shaft screws and springs.  
Suitable for aviation fuel.

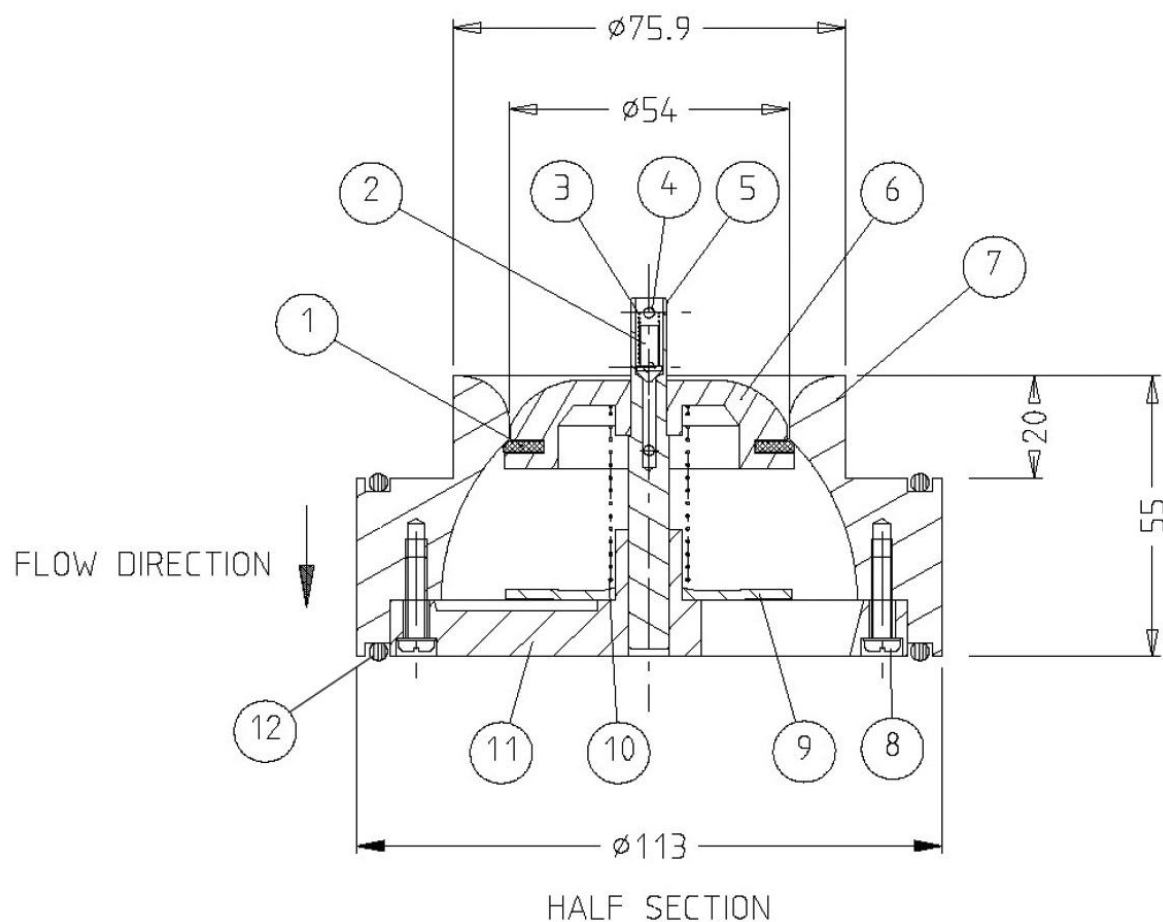
Main poppet opens at a pressure of 0.9 kPa.

Vacuum poppet opens at a pressure of 350 kPa.



# Non-Return Valves - NRV80

## Ordering Information



Item No	Part No	Description	Qty	Material
1	4623	Seal Main	1	Viton
2	4624	Seal Vacuum	1	Viton
3	6110	Spring Vacuum	1	S/S
4	0756	Pin Cotter 1/16" x 1/2"	1	S/S
5	NRV80-1	Shaft	1	S/S
6	NRV80-2	Poppet	1	Aluminium
7	NRV80-3	Body	1	Aluminium
8	6464	Screw M4 x 16LG Pan/HD Slot	2	S/S
9	5316	Washer	1	Aluminium
10	6111	Spring Poppet	1	S/S
11	NRV80-4	Spider	1	Aluminium
12	4626	O-ring	2	Viton

## Carter In-Line Pressure Control Valve (PCV)

These valves utilize a direct operating design concept with a control module added to the basic valve. This control module is mounted to the main valve body with one bolt. The new control module gives the unit finer control and eliminates exterior tubing from the valve.

There are also separate air-to-fuel interface seals that are vented to the atmosphere eliminating the typical fuel to air leakage of competing pilot operated valves.

The same control module is used on both the 3 & 4 inch valves. Most of the seals in the main body of the 3 & 4 inch valves are the same, thus minimizing the spares required for any type of maintenance. The control module incorporates a unique bleeder that requires no tools to facilitate bleeding, and it has a vent to prevent fuel from entering the air system, a problem found in several competitors' valves.

Due to the efficient flow path design, they offer less "wide-open" pressure drop, hence up to 16% greater flow rate than the competing Whittaker units allowing for the refuelling of aircraft in a shorter time.

### Features

- Standard 150 lb ANSI inlet and outlet flanges
- Victaulic adapters available
- Bleeder on module block facilitates simple bleeding of air from the valve — no venting is required once proper bleeding is accomplished
- No expensive servos to adjust
- Spare parts required for maintenance kept to a minimum due to lack of complicated servos. Many parts are common to bypass valves of same size.
- Many spares common to Carter brand couplers



# Carter In-Line Pressure Control Valve (PCV)

## Ordering Information

Both Models 64500 and 64510 have two available options to be added to the basic part number when desired.

### Option Description

D	Victaulic adapter on inlet
E	Victaulic adapters on inlet and outlet

**Note:** It is not recommended to use option E on a valve without additional support to keep it from turning in the piping

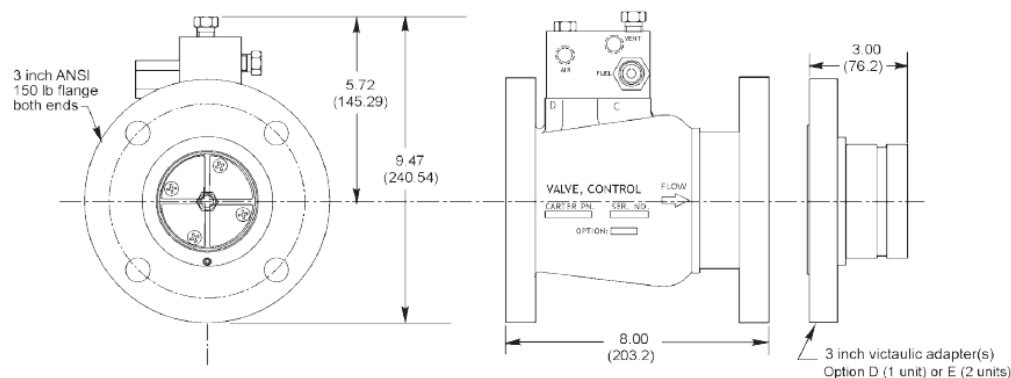
## Operating Characteristics

	64500 — 3 inch	64510 — 4 inch
<b>Working Pressure</b>	Up to 200 psi (13.793 bar)	Up to 200 psi (13.793 bar)
<b>Rated Flow</b>	Up to 800 gpm (3028 l/min)	Up to 1200 gpm (4542 l/min)
<b>Pressure Drop</b>	4.9 psi (.338 bar) @ 600 gpm (2271 l/min)	4.3 psi (.296 bar) @ 1000 gpm (3785 l/min)
<b>Pressure Control</b>	25 to 75 psi (1.724 to 5.171 bar) nominal	25 to 75 psi (1.724 to 5.171 bar) nominal
<b>Overshoot</b>	>5% of rated flow	>5% of rated flow
<b>Opening Time</b>	5 to 10 seconds	5 to 10 seconds
<b>Closing time</b>	2 to 5 seconds — (see overshoot)	2 to 5 seconds — (see overshoot)
<b>Repeatability</b>	±3 psi (.207 bar)	±3 psi (.207 bar)
<b>Surge Control</b>	>120 psi (8.273 bar)	>120 psi (8.273 bar)
<b>Operating Temperature</b>	-40°F to +125°F (-40°C to +52°C)	-40°F to +125°F (-40°C to +52°C)

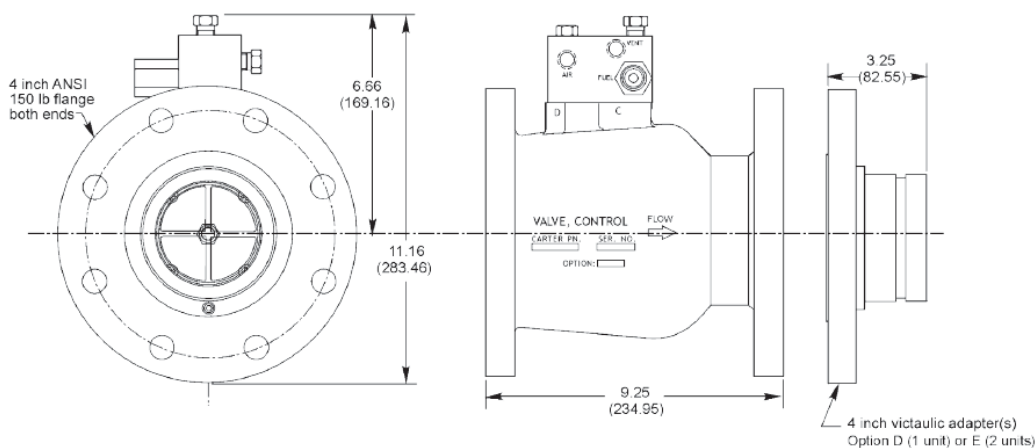
## Envelope Dimensions

Dimensions shown in inches (millimetres)

Model 64500



Model 64510



## Stainless Steel Flanged Ball Valves

These ball valves are 2-piece stainless steel floating ball type valves with Teflon trim.

Our range of flanged ANSI150 Lb. stainless steel ball valves incorporate a fire safe design which features:

- Blow out-proof stem
- Secondary metal seat
- Metal to metal seal



### Ordering Information

Part No	Description
9657	1 1/2" S/S Flanged Ball Valve
9952	2" S/S Flanged Ball Valve
9656	3" S/S Flanged Ball Valve
9655	4" S/S Flanged Ball Valve



## Small Isolation Ball Valves

These in-line ball valves are 2-piece either stainless steel or nickel-plated brass double-female BSP valves & Teflon trim.

### Ordering Information

Part No	Description
9019	1/4" BSP Ni-plated Brass Ball Valve
0365	1/2" BSP Ni-plated Brass Ball Valve
0366	1/2" BSP Ni-plated Brass Ball Valve
0367	3/4" BSP Ni-plated Brass Ball Valve
8479	3/8" S/S Two Piece Ball Valve
8498	1/4" S/S Two Piece Ball Valve
TS2005	2 1/2" Two Piece Ball Valve



## Apollo Valve

The "Apollo"™ whilst a registered Brand name has become a generic term for spring-loaded / return or "deadman" pull-down handle valves. They are in a variety of sizes.

### Ordering Information

Part No	Description
8476	3/8" BSP S/S Construction
8477	1/2" BSP S/S Construction
8585	3/4" BSP S/S Construction
8584	1" BSP S/S Construction
8586	1 1/2" BSP S/S Construction
8590	2" BSP S/S Construction

**N.B. NPT versions are available by special order**



## Tank Compartment Internal Drain Valve

The ITV1-AO 25mm internal valve with integral elbow, has been designed for use on aircraft refueller tankers which have small sample or drain lines. The normal fitting in the sump is a 25mm BSP socket. Flow is outwards only. The elbow incorporates a shear groove above the pipe attachment aperture to ensure a breakaway (in the event of damage) at that point.

Valve poppet, spring and shaft are all attached above the shear point to ensure the continued containment of product in the tank. In the event of fire the air line will soften at 80 degrees C and release any air in the system and close the poppet.

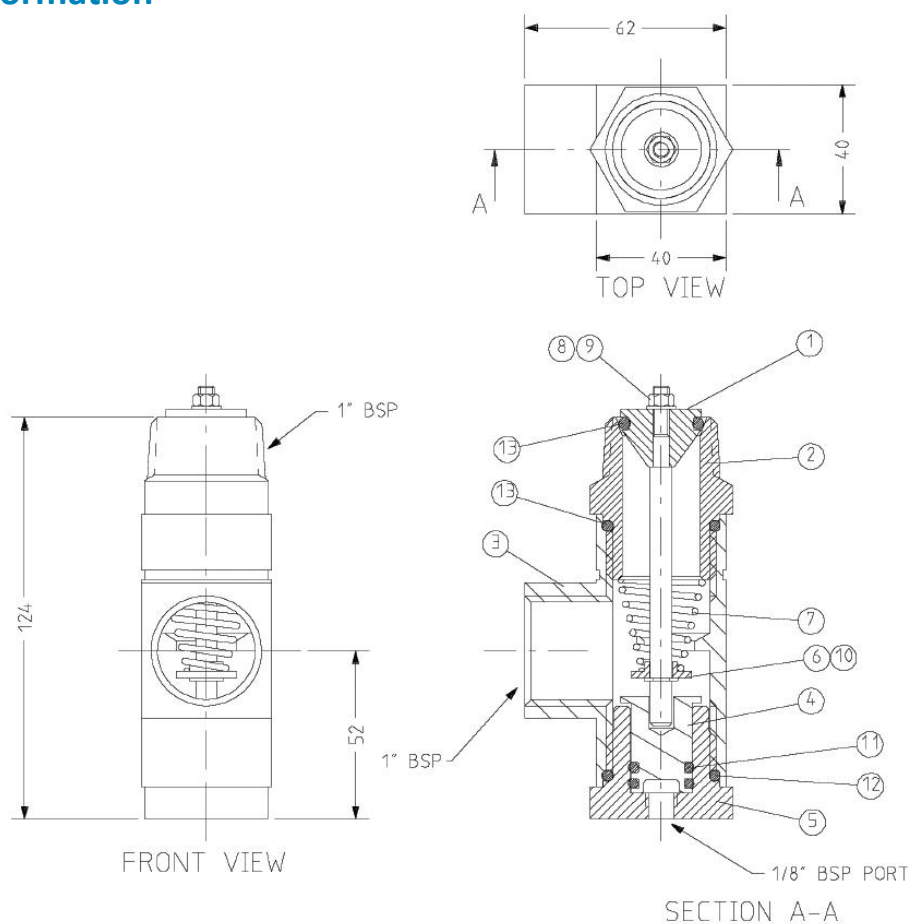
### Ordering Information

Part No	Description
ITV1-AO	Internal Valve Air Operated



# Tank Compartment Internal Drain Valve

## Ordering Information



ITV1-AO (Parts List)				
Item No	Part No	Description	Qty	Material
1	ITV1-1	Poppet Assembly	1	AL
2	ITV1-2	Valve Seat	1	Steel
3	ITV100-1	Body Valve	1	Aluminium
4	ITV100-2	Piston	1	Delrin
5	ITV1-5	Cylinder End	1	Steel
6	ITV1-6	Step Washer	1	St Steel
7	4411	Spring	1	St Steel
8	4380	Nut	1	St Steel
9	0809	Washer	1	St Steel
10	4517	E-Clip	1	St Steel
11	0288	O-Ring	2	Viton
12	0171	O-Ring	2	Nitrile
13	0252	O-Ring	1	Viton

## ATS Tank Sump

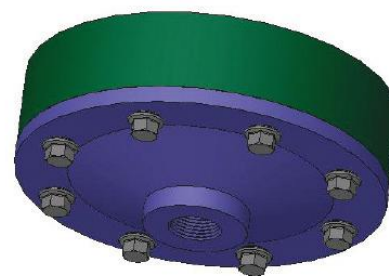
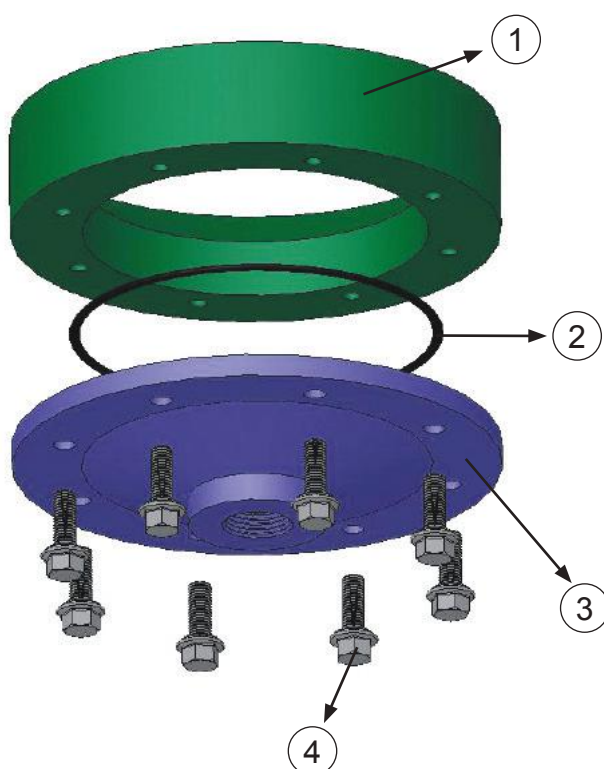
- Aluminium conical tank sump with sloping bottom and central 1" female BSP socket for drain.
- Large capacity volume.
- Removable bottom plate to facilitate cleaning.

**Associated Equipment:** ITV1-AO pneumatic sampling valve.

### Ordering Information

Tank Sump	
Part No	Description
ATS100	ATS Tank Sump

Parts List		
Item No	Part No	Description
1	ATS100-1	Aluminium Sump
2	1530	O-ring Buna
3	ATS100-2	Aluminium Weld Flange
4	4947	Setscrew
	5261	Washer





## *Gauges*

# Gammon Differential Pressure Gauges

These gauges are a spring-loaded cylinder type and have a TEST valve or push-button to check that the cylinder has full, free travel. Typically, the 30psi spring versions are used unless otherwise specified.

They measure the Differential Pressure across the filter vessel, increasing pressure indicating that the filtration elements / cartridges are becoming clogged and will need replacing on / before a specified pressure level.

## Common Features

- Read differential pressure directly at top of piston
- Accurate within 1/2 psi at system pressures to 300psi
- No subtraction calculation required
- All models available in aluminium or stainless steel
- Positive and negative Surge Pressures will not influence calibration
- Multiple calibrations: Front face - psi and kPa  
Back face - Bar and kg/cm<sup>2</sup>
- Every glass tube tested to 1200psi
- Rugged construction: Suitable for vehicle or stationary use
- Built-in Gauge Protection Filter, 10 microns
- Maximum Operating Pressure: 300psi
- Fittings: 1/4" NPT female, 1/4" BSP available
- Temperature Range: Standard Viton Seals: -30° to 160°F; -34° to +71°C  
Low Temperature Seals: -90°F/-68°C
- Ultraviolet Light Protection: film cover prevents rays from degrading fuel in the glass tube.
- Two scale ranges available, 0-15 and 0-30psi. Any 0-15psi gauge can be converted to 0-30psi by ordering kit GTP-9104 containing a new spring and a new nameplate (scale).

## System pressure gauges available to mount at top of all models

To add a 2" face diameter gauge, order:

GTP-686A for 0-60psi	GTP-686C for 0-160psi
GTP-686B for 0-100psi	GTP-686D for 0-300psi



GAMMON GAUGE CONTROL SYSTEM



PEAK HOLD  
With Push Button  
TEST VALVE  
GTP-534-PB-PH



PUSH BUTTON  
IN FRONT  
GTP-534 PBF

# Gammon Differential Pressure Gauges

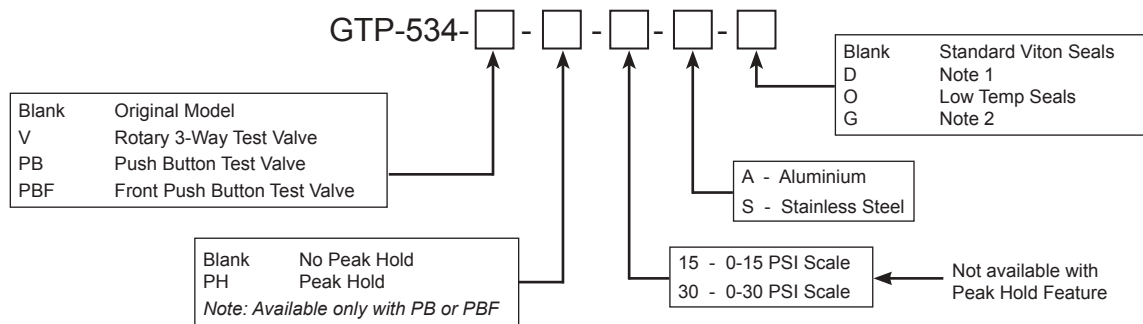
## Unique Features

**Peak-Hold reading** - The maximum differential pressure that is measured during an operation automatically locks the piston so that the operator will have that information without actually having watched the gauge at the time. After the reading has been seen, the operator releases the piston by turning a knob. It is usually impossible for the operator to see the gauge while refuelling an aircraft so the highest differential pressure reading is rarely seen, just as in the case of an unmanned facility such as pipeline or hydrant system. This feature eliminates that problem.

**Push Button Test Valve** - Hold the button inward to relieve pressure under the piston. System pressure will force the piston down so operator can observe motion. Erratic movement of the piston indicates contamination of piston and glass tube, requiring cleaning.  
*Note: This test releases about 30ml of fuel that can be collected in a cup or directed to recovery systems.*

**Pressure Relief Feature** - Incorporated in all Push Button models is a pressure relief valve set at 300psi to protect the gauge from excessive pressure if isolation valves have been closed.

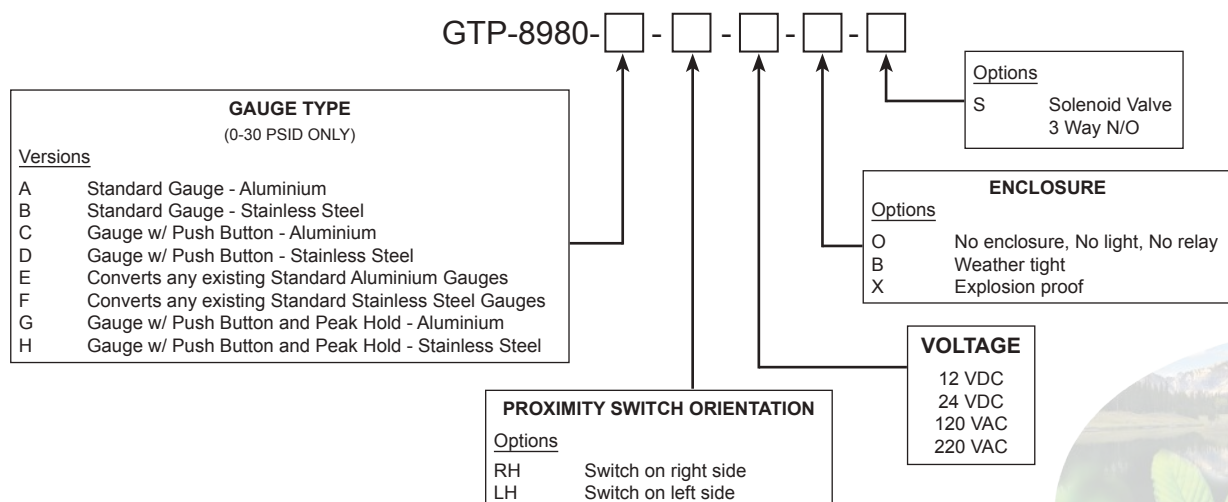
## Ordering Information - GTP 534 Series



**Note 1** - A suffix D provides 2 Selector Valves, one at each connection. The ports on each valve are labelled A and B so that the gauge can be connected to measure differential pressure alternately on two different filters or on a filter having two stages.

**Note 2** - Same as Note 1 but suffix G denotes 1/4 BSP threads

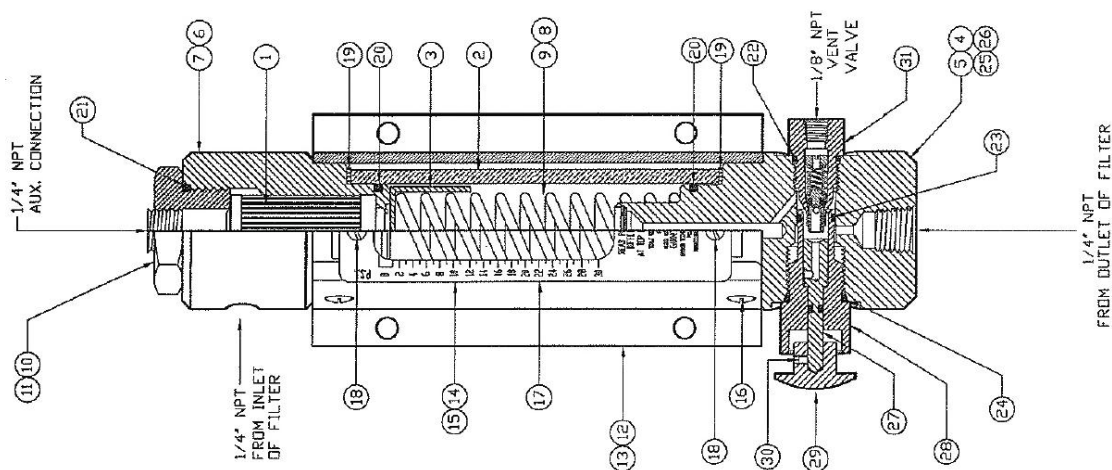
## Ordering Information - GTP 8980 Series



# Gammon Differential Pressure Gauges

Differential Pressure Indicator with Push Button							
Item No	Part No	Description	Qty				Material
			GTP-534-PB-30A	GTP-534-PB-15A	GTP-534-PB-30S	GTP-534-PB-15S	
1	GTP-2233	Filter Element	1	1	1	1	-
2	GTP-547	Glass Cylinder	1	1	1	1	Glass
3	GTP-548	Piston	1	1	1	1	-
4	GTP-552-8PB	Lower Flange Assembly - PB on side	1	1	-	-	Aluminium
5	GTP-552-9PB	Lower Flange Assembly - PB on side	-	-	1	1	Stainless Steel
6	GTP-8935-1	Upper Flange Assembly	1	1	-	-	Aluminium
7	GTP-8935	Upper Flange Assembly	-	-	1	1	Stainless Steel
8	GTP-560-1	Spring 0-15 Range	-	1	-	1	Stainless Steel
9	GTP-560-2	Spring 0-30 Range	1	-	1	-	Stainless Steel
10	GTP-8950	Bleeder Plug Assembly	1	1	-	-	Aluminium
11	GTP-8950-1	Bleeder Plug Assembly	-	-	1	1	Stainless Steel
12	GTP-581-1	Cage	1	1	-	-	Aluminium
13	GTP-537-4	Cage	-	-	1	1	Stainless Steel
14	GTP-690-1	Scale 0-30 Range	1	-	1	-	Stainless Steel
15	GTP-672-1	Scale 0-15 Range	-	1	-	1	Stainless Steel
16	GTP-582	Screw	8	8	8	8	Stainless Steel
17	GTP-1271	UV Shield	1	1	1	1	Mylar
18	GTP-701	Screw	2	2	2	2	Stainless Steel
19	GTP-9341	Washer	2	2	2	2	Nylon
20	GTP-2200-023V	O-Ring	2	2	2	2	Stainless Steel
21	GTP-2200-119V	O-Ring	1	1	1	1	Stainless Steel
22	GTP-2200-906V	O-Ring	1	1	1	1	Viton
23	GTP-2200-012V	O-Ring	1	1	1	1	Viton
24	GTP-2200-908V	O-Ring	1	1	1	1	Viton
25	GTP-9170-10	Lower Flange Assembly - PB on front	1	1	-	-	Aluminium
26	GTP-9170-11	Lower Flange Assembly - PB on front	-	-	1	1	Stainless Steel
27	GTP-552-8J	Push Button Shaft Assembly	1	1	1	1	S/S / Viton
28	GTP-552-8A	Actuator Body	1	1	1	1	Stainless Steel
29	GTP-552-8E	Knob	1	1	1	1	Aluminium
30	-	Set Screw	1	1	1	1	S/S / Nylon
31	GTP-552-8G	Vent Port Assembly	1	1	1	1	S/S / Viton

## Ordering Information - Parts List



# Pressure Gauges

These gauges are designed to resist pulsation, shock, vibration, weather and most corrosive atmospheres. Fluid medium which does not clog connection port or corrode 316 stainless steel.

## Technical Specifications

### Accuracy

± 1% of Span (Grade A ANSI B40.1)

### Ranges

0-1000 kPa/psi and 0-1600 kPa/psi

### Operating temperature

Ambient = -20°C to 60°C

Media: max. +85°C

### Connection

Material: 316L Stainless Steel welded to case

Low back mount (LBM) 1/4" BSPT

### Bourdon Tube

Material: 316L Stainless Steel

30" Hg to 800 psi by C-type

### Movement

Stainless steel

### Dial

White painted aluminium

### Pointer

Micro Adjustable

### Case

304 stainless steel with polished twist lock ring, with panel mount clamp

### Ring

Bayonet SST ring with front flange

### Window

Tempered glass, sealed to case with gasket suitable for silicone



## Ordering Information

Part No	Description	Size
9095	0-1000 kPa/psi	63mm
PGSS1000	0-1000 kPa / 0-145 psi	100mm
PGSS1600	0-1600 kPa / 0-230 psi	100mm

**NB: Order options - Silicon fill**



## *Accessories*

## Filter Standard Sensing Assemblies

The 5000-03-00 standard Sensing Kit for Hydrant Dispenser Filter Vessels was introduced in early 2008 to standardise the components and layout for Liquip aviation refuelling equipment.

The 5000-03-04 assembly is the standard for most Refuellers.

The 5000-03-09 assembly is the standard only for Low Profile LEFT HAND orientation Dispensers (typically for Asia and the Middle East).

The Main Components in the kit (see illustration on following page) comprise the Air Eliminator, Depressurisation & Pressure relief / Check valves, and two small isolation Ball Valves.

*\*In late 2010 the Show Flow was removed from the assembly and relocated near the Collector Tank or Control Panel for easier operator viewing during fuelling operations.*



Dispenser 5000-03-00 Sensing Assembly



Refueller 5000-03-04 Sensing Assembly

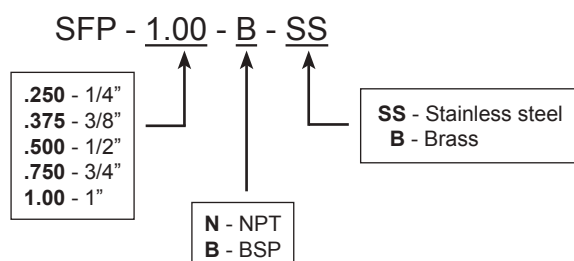
### Show Flow

The "Show-Flow" is a visual indicator & shows flow in the fuel system by the yellow paddle-wheel spinning. The SFP style can be mounted both horizontal and vertical, offering bi-directional flow indication with low pressure losses.

The SFP style operates over a wide flow range, no routine maintenance required, low pressure loss and 230 PSI/400 degrees F capability. Constructed from high quality materials, these in-line indicators are suitable for many applications including water, oil, chemicals, air and gases.

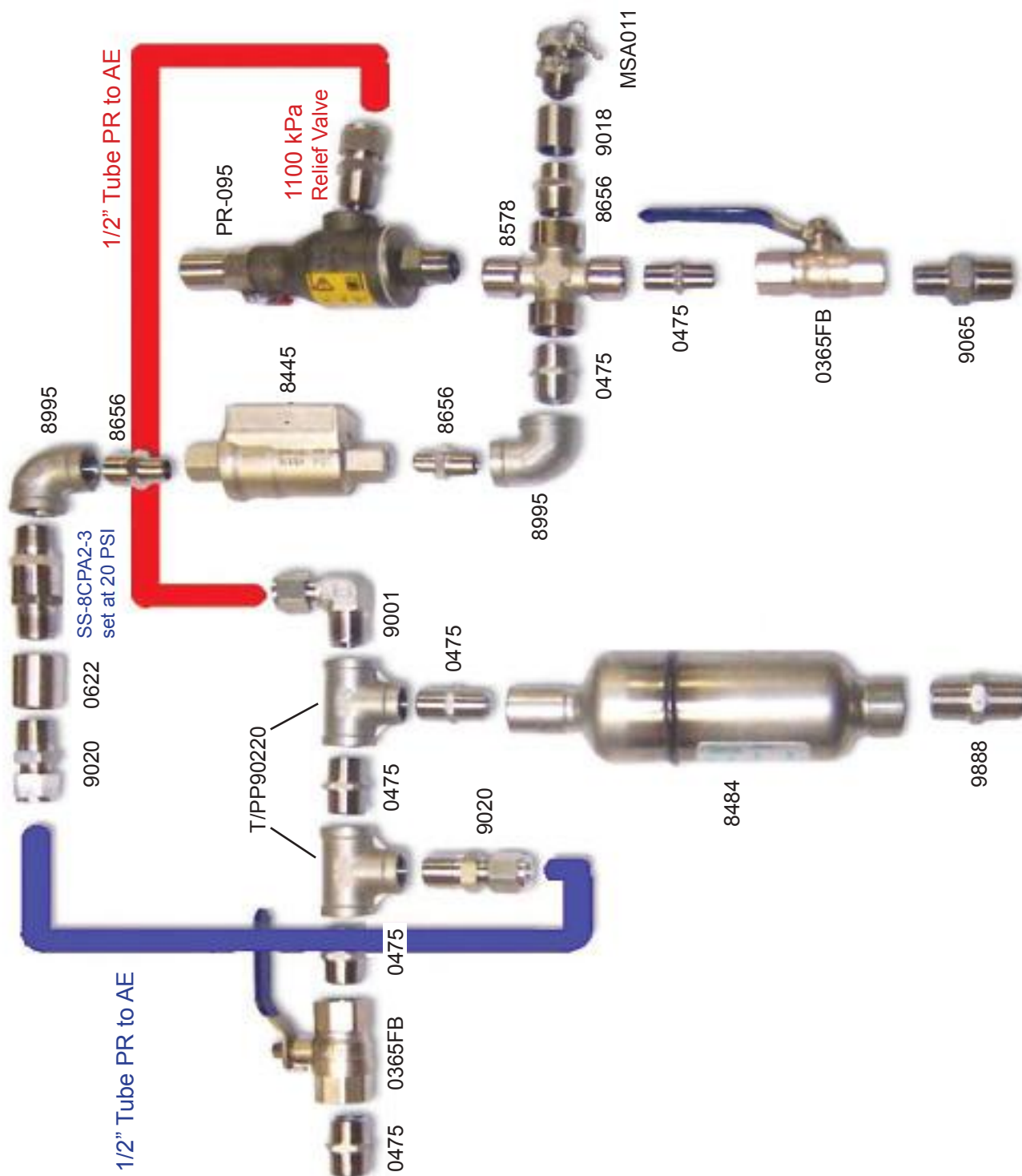


### Ordering Information



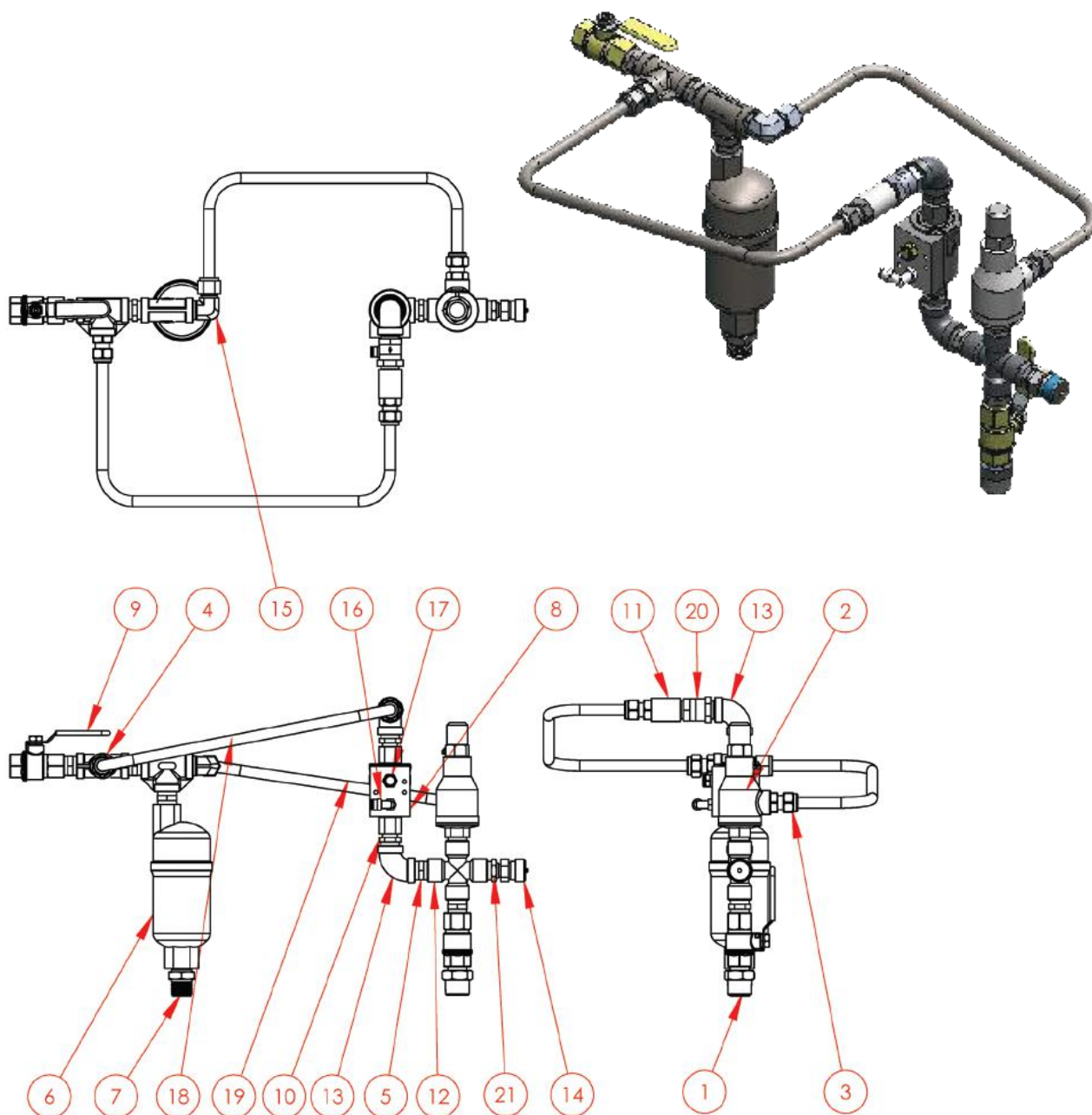
# Filter Standard Sensing Assemblies

## Sensing Assembly Kit



# Filter Standard Sensing Assemblies

## Ordering Information (Dispenser Assembly Kit - RH Operation)



### NOTES:

1. Apply Loctite 243 Threadlocker to all threads on assembly.
2. Ensure that the Axial Valve (Item 10) is mounted in a vertical orientation as shown.
3. Set non return valve (Item 20) is set and engraved @ 20 P.S.I
4. Certificate Test completed.

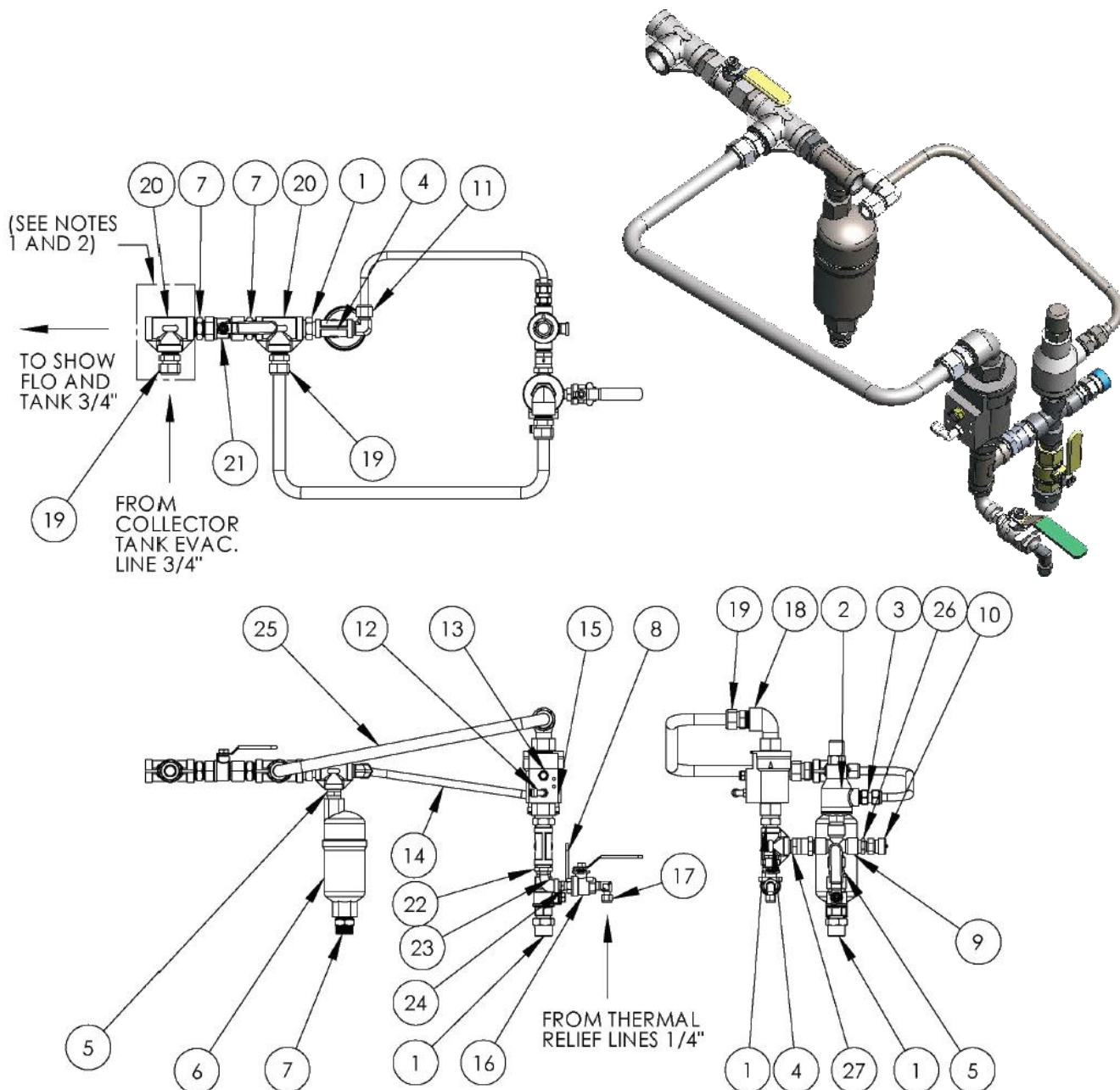
# Filter Standard Sensing Assemblies

## Ordering Information (Dispenser Assembly Kit - RH Operation)

Dispenser Sensing RH 5000-03-00			
Item No	Part No	Description	Qty
1	9065	3/4"BSPx1/2" BSP RED. NIPPLE SS	1
2	PR-095	1/2" BSP CERTIFIED RELIEF VALVE SS	1
3	9020	MALE ADAPTOR 1/2"BSP x 1/2" TUBE	3
4	T/PP90220	TEE - 1/2"BSP SS	2
5	0475	1/2" S/S HEX NIPPLE	5
6	8484	AIR ELIMINATOR	1
7	9888	NIPPLE 3/4"BSP SS	1
8	8445	3/8" AXIAL VALVE	1
9	0365FB	1/2" SS BALL VALVE FULL BORE	2
10	8656	1/2" X 3/8" REDUCING NIPPLE	2
11	0622	1/2" BSP SOCKET 304 SS	1
12	8578	1/2"BSP CROSS	1
13	8995	ELBOW F&F 1/2"BSP SS	2
14	MAS011	SAMPLING VALVE	1
15	9001	1/2" BSP x 1/2" TUBE SS ELBOW	1
16	8521	ELBOW FITTING 1/8"-6MM PUSH IN TUBE	1
17	2278V	1/8" AIR SILENCER	1
18	5000-03-01	TUBING FOR AXIAL VALVE TO TEE	1
19	5000-03-02	TUBING FOR PUMP RELIEF TO AE	1
20	SS-8CPA2-3	1/2"BSP NON RETURN VALVE 25 PSI	1
21	9994	BUSH RED 1/2"BSP x 3/8" BSP St.	1

# Filter Standard Sensing Assemblies

## Ordering Information (Refueller Assembly Kit)



### NOTES:

1. Assembly depicts for Collector Tank Evacuation by Pneumatic Diaphragm Pump.
2. Items indicated are not used when Collector Tank is evacuated by education.
3. Apply Loctite 243 Threadlocker to all threads on assembly.
4. Ensure that the Axial Valve (Item 10) is mounted in a vertical orientation as shown.
5. Ensure correct setting of Check Valve 8852 or between 14-22 PSI.

# Filter Standard Sensing Assemblies

## Ordering Information (Refueller Assembly Kit)

Refueller Sensing 5000-03-04			
Item No	Part No	Description	Qty
1	9065	3/4"BSPx1/2" BSP RED. NIPPLE SS	3
2	PR-095	1/2" BSP CERTIFIED RELIEF VALVE SS	1
3	9020	MALE ADAPTOR 1/2"BSP x 1/2" TUBE	1
4	T/PP90220	TEE - 1/2"BSP SS	2
5	0475	1/2" S/S HEX NIPPLE	2
6	8484	AIR ELIMINATOR	1
7	9888	NIPPLE 3/4"BSP SS	3
8	0365FB	1/2" SS BALL VALVE FULL BORE	1
9	8578	1/2"BSP CROSS	1
10	MAS011	SAMPLING VALVE	1
11	9001	1/2" BSP x 1/2" TUBE SS ELBOW	1
12	8521	ELBOW FITTING 1/8"-6MM PUSH IN TUBE	1
13	2278V	1/8" AIR SILENCER	1
14	5000-03-02	TUBING FOR PUMP RELIEF TO AE	1
15	8509	3/4" AXIAL VALVE N/O	1
16	8498	1/4" VALL VALVE SS	1
17	9025	1/4" BSPx 1/4" TUBE COMP ELBOW SS	1
18	8993	ELBOW S/S BSP M&F 3/4"	1
19	9024	3/4"BSP x 3/4" TUBE SS STRAIGHT TUBE FITTING	3
20	9823-20	TEE EQUAL 3/4" BSP SS	2
21	0367	3/4" BALL VALVE	1
22	9039	1/2"x1/4" Reducing Bush SS	1
23	9014	1/4" M-F BSP ELBOW	1
24	8866	1/4"BSP HEX NIPPLE SS	1
25	5000-03-05	TUBING FOR AXIAL VALVE TO TEE - REFUELLER	1
26	9994	BUSH RED 1/2"BSP x 3/8" BSP SS (9994)	1
27	SS-8CPA2-3	1/2"BSP NON RETURN VALVE 25 PSI	1

## Velcon Small Filter Housings - VF-31E, VF-61, VF-609

### Clean dry fuels and oils with high performance

These filter housings are versatile housings designed for use with several different high performance Aquacon® and other filter cartridges. Refer to the cartridge selection table on page 3 for application and other details.

Aquacon cartridges filter out water by chemically locking it into layers of super-absorbent media. Water capacity is as much as 11/2 quarts, depending on the specific vessel and cartridge. These cartridges also effectively filter out dirt, rust and other particulates.

As an Aquacon cartridge reaches its water-holding limit, the media expands very rapidly and restricts the flow. The pressure drop will rapidly increase, signalling the need to change cartridges.

The VF-61, with ACO series cartridges installed, has become the standard for low flow rate full flow aviation fuel monitor applications.

### Features

- Wide variety of applications
- Free and emulsified water to less than 5 ppm
- 1/2 micron particulate removal
- Provides protection against "slugs" of water
- Pressure increase signals cartridge change

### Applications

- Jet Fuel
- AVGAS
- Motor Gasoline
- Diesel Fuel
- Biodiesel
- Selected Solvents
- Oils: Insulating, Hydraulic, Lubricating
- Compressed Air and Other Gasses



**VF-61**

(Also available: VF-61UL Filter Housing, for diesel fuels. Recognized under the Component Recognition Program of Underwriters Laboratories Inc.)



**VF-31E**

# Velcon Small Filter Housings - VF-31E, VF-61, VF-609

Filter Cartridge Selection Table

Housing P/N	Product being filtered	Application	Cartridge P/N	Data Sheet	Type	Micron	Flow Rate (GPM)
VF-31E	Jet Fuel & Avgas <sup>(1)</sup>	Dirt & Free water	ACO-21001L	1681	Absorbent	0.5	1-15
	Mo-gas		AC-21005	1582		5	
	Gasohol	Dirt	FOG-21005	N/A	Paper filter	5	1-15
	Diesel <sup>(1)</sup>	Dirt & Free water	AD-21025	1655	Absorbent	25	1-15
	Oils		AC-21005	1582		5	Varies with oil viscosity <sup>(2)</sup>
			AD-21025	1655		25	
	Air/Gas		ACA-210	1689		1	100 SCFM @
		Dirt	FOS-210PLP5	N/A	Synthetic Filter	0.5	100 psig
VF-61	Jet Fuel & Avgas <sup>(1)</sup>	Dirt & Free water	ACO-512P3L	1681	Absorbent	0.3	5-50
			ACO-51201L			0.5	5-50
			OS-51288	1858	Coalescer/ Separator	0.5	Jet: 5-35 Avgas: 5-45
	Mo-gas	AC-51205	1582	Absorbent	5	5-50	
	Diesel <sup>(1)</sup>	AD-51225	1655		25	15-50	
	Oils	OS-51286	1858	Coalescer/ Separator	5	5-18	
		AC-51205	1582	Absorbent	5	Varies with oil viscosity <sup>(2)</sup>	
		AD-51225	1655		25		
	Solvents	ASL-51201	1692		1		5-50
	ALL	Dirt	FO-512PL1/2	1549	Paper Filter	0.5	Fuels: 5-50
			FO-512PL05			5	Oils: Varies with oil viscosity <sup>(3)</sup>
			FO-512PL25			25	
			FOS-512PL25	1734	Synthetic Filter	25	
VF-609	Jet Fuel & Avgas <sup>(1)</sup>	Dirt & Free water	ACO-609P3L	1681	Absorbent	0.3	15-36
			ACO-60901L			0.5	
			ACO-60905L			5	
	Diesel <sup>(1)</sup>	OS-60988	1858	Coalescer/ Separator	0.5	Jet: 5-35 Avgas: 5-45	
		AD-60925	1655	Absorbent	25	15-30	
		OS-60986	1858	Coalescer/ Separator	5	5-18	

## NOTES:

- For aviation and diesel fuel applications, always install a differential pressure gauge or other means of determining differential pressure.
- See Data Sheet #1709 for absorbent cartridge (AC, AD) flow rates.
- See Data Sheet # 1532 for paper filter (FO) flow rates, see Data Sheet # 1747 for synthetic filter (FOS) flow rates. For Biodiesel applications, please contact Velcon.

Please consult installation instructions and operating procedures that accompany products for more detailed information.

# Velcon Small Filter Housings - VF-31E, VF-61, VF-609

## Ordering Information

(Please note: Cartridges are NOT supplied. They must be ordered separately)

HOUSING P/N:	VF-31E	VF-61	VF-609
<b>SUPPLIED WITH:</b>	<ul style="list-style-type: none"> <li>1 ea P/N G-0995 Buna-N O-ring</li> <li>Mounting holes in head - 4 ea 1/4-20 NC</li> <li>1 ea plug (for fuel &amp; oil applications)</li> <li>1 ea 1/8" petcock drain (for air, gas, &amp; aviation fuel applications)</li> </ul>	<ul style="list-style-type: none"> <li>1 ea P/N G-0986 Buna-N O-ring</li> <li>1/8" brass petcock vent valve, installed</li> <li>1/2" drain plug, installed</li> <li>1 ea 1/2" petcock drain, shipped loose</li> </ul>	<ul style="list-style-type: none"> <li>1 ea P/N G-0565 Buna-N O-ring</li> <li>1/4" brass petcock vent valve</li> <li>1/2" drain valve</li> </ul>
<b>RECOMMENDED SPARES</b>	<ul style="list-style-type: none"> <li>1 ea P/N G-0995 Buna-N O-ring</li> <li>4 ea replacement filter cartridges</li> </ul>	<ul style="list-style-type: none"> <li>1 ea P/N G-0986 Buna-N O-ring</li> <li>6 ea replacement filter cartridges</li> </ul>	<ul style="list-style-type: none"> <li>1 ea P/N G-0565 Buna-N O-ring</li> <li>6 ea replacement filter cartridges</li> </ul>
<b>If using with gasoline/solvent applications:</b>		<ul style="list-style-type: none"> <li>2 ea P/N G-0986A Viton O-rings</li> </ul>	<ul style="list-style-type: none"> <li>2 ea P/N G-0565A Viton O-rings</li> </ul>
<b>OPTIONS</b>	N/A	<ul style="list-style-type: none"> <li>P/N 554Y020 - (carbon steel 1/2" NPT ball valve, with mounting nipple)</li> <li>P/N 10678 - (differential pressure gauge assembly)</li> <li>P/N CK-1488 (quick release hand bolts)</li> </ul>	<ul style="list-style-type: none"> <li>P/N 554Y020 - (carbon steel 1/2" NPT ball valve, with mounting nipple)</li> <li>P/N 07-224 - (differential pressure gauge assembly)</li> <li>PN 07-224AMB (mounting block)</li> </ul>
<b>SPECIFICATIONS</b>			
<b>Weight</b>	3 lbs, 15 oz	8 lbs	8 lbs
<b>Shipping Weight</b>	4 lbs, 15 oz	10 lbs	10 lbs
<b>Inlet/Outlet Connection</b>	1" NPT	1 1/2" NPT	1 1/2" NPT
<b>Cover</b>	Bolted	Bolted, 4 bolts	Bolted, 4 bolts
<b>Maximum Operating Pressure: 150 psi</b>			
<b>Material: Cast aluminum head, carbon steel shell with epoxy powder coated exterior &amp; interior</b>			

### OVER PRESSURE PROTECTION

When exposed to a high concentration of water, the differential pressure across an absorbent cartridge (AC, ACO, AD, or ASL Series cartridges) will immediately increase. Pressure bypasses or other means to limit the inlet pressure to 75 psi (5 bar) should be installed to prevent cartridge from collapsing.

### CAUTION

To protect the fuel system, including the VF-609 and other components, be sure to install pressure relief valve(s).

### CAUTION

Do not use absorbent cartridges (ACO-xxxxxL, AC-xxxxx, AD-xxxxx) with pre-mixed jet fuel or avgas containing anti-icing additives.

## ILS400 In Line Suction Strainer

ILS400 is a lightweight, inexpensive aluminium suction line strainer for larger pumps such as those fitted to large vehicles and prime movers for bulk industrial deliveries. It suits 76mm and 102mm diameter flow.

ILS400 in line suction strainer protects down stream equipment such as meters and pumps from debris and foreign objects. Strainer basket can only be fitted for correct direction of flow. Drain bosses provided in body and lid to suit any mounting angle.

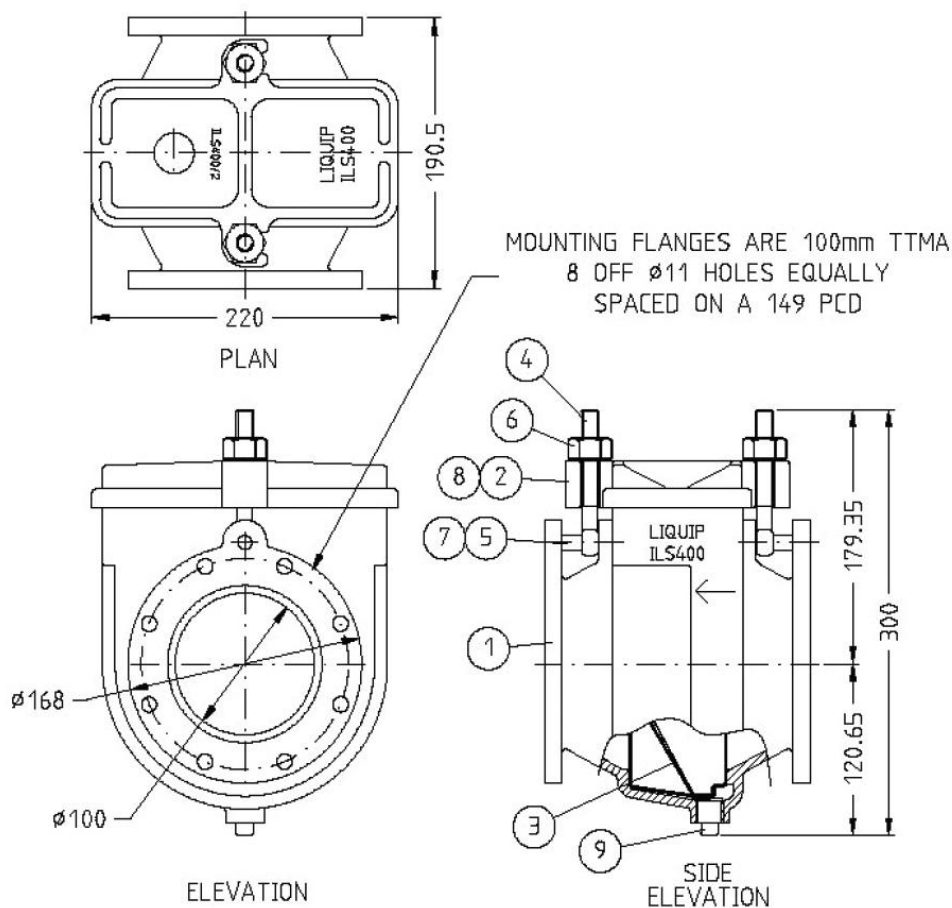
### Technical Specifications

<b>Materials of Construction:</b>	All metal construction. Cast aluminium body & lid. Steel mesh with aluminium surround. Nitrile seal. Available to aviation standard on special order.
<b>Technical Data:</b>	Maximum vacuum to 90kPa Maximum working pressure to 700kPa
<b>Weight:</b>	4.7 kg
<b>Mounting:</b>	4" TTMA flanges Mount with arrow in correct flow direction
<b>Associated Equipment:</b>	LBV400 butterfly valve BF4-SG-40, BF4-SG-25, sight glasses
<b>Dismantle:</b>	Simply remove lid by unscrewing 2 off lid retaining nuts and remove basket



# ILS400 In Line Suction Strainer

## Ordering Information



Item	Part No	Description	Qty	Material
1	ILS400-1	Body - Strainer	1	Aluminium
2	ILS400-2	Lid - Strainer	1	Aluminium
3	ILS400-3	Strainer Basket	1	AL & Zinc Plated
	ILS400-3-200P	Strainer Basket - 200 Mesh Size	1	AL & S/S
	ILS400-3-350P	Strainer Basket - 350 Mesh Size	1	AL & S/S
	ILS400-3-80P	Strainer Basket - 80 Mesh Size	1	AL & S/S
	ILS400-3-AV	Strainer Basket - 250 x 50 Mesh Size	1	AL & S/S
	ILS400-3-40S	Strainer Basket - 40 Mesh Size	1	AL & S/S
4	ILS400-4	Eyebolt	2	Z/P M/S
5	ILS400-5	Hinge Pin	2	Z/P M/S
6	ILS400-6	Nut	2	Brass
7	0194	O-Ring	2	Nitrile
8	2344	Seal Lid	1	Nitrile
9	70390	Plug - Square Head	1	Galv Stl

# Basket Strainers

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.

The 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 standards, and this feature allows the basket to be removed quickly with no special tools, hence minimising the downtime 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.



## Features

- 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 required for Basket removal
- Side Drain Point
- O-Ring Lid Seal, No Gaskets
- Optional Differential Pressure Tapping
- Optional Automatic Air Vent Valve

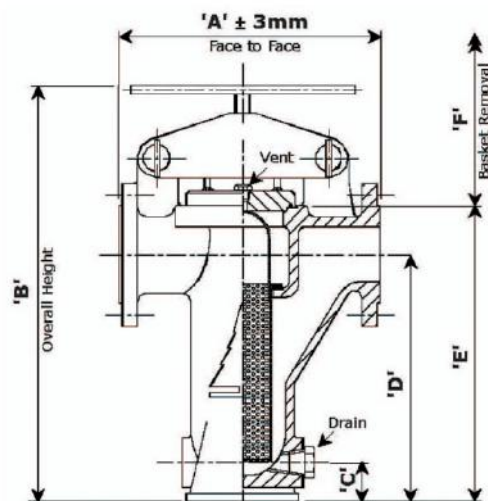
## Specifications

<b>Standard:</b>	PED/97/23/EC
<b>Design Pressure:</b>	20.0 BarG (290 psig)
<b>Test Pressure:</b>	29.5 BarG (428 psig) (refer to flange tables for temperature limitations)
<b>Flanges:</b>	ANSI B16.5 150lb raised face
<b>External Finish:</b>	Red oxide primer. Other paint finishes on request
<b>Internal Finish:</b>	Clean and oiled as standard Abrasive blasted and painted with Copon EA4/EA9 white epoxy lining on request

# Basket Strainers

## Ordering Information

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



Part No	Size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Basket Area (sq. cm)	Vent ("NPT)	Drain ("NPT)	Nett Weight (kg)
6003073001	3"	365	570	40	342	410	375	652	3/8"	3/4"	47
6003074001	4"	445	695	47	426	505	450	1088	3/8"	1"	70
6003075001	6"	600	990	95	619	734	630	2151	1/2"	1.1/2"	167
6003083001	8"	715	1190	112	787	927	800	3973	1/2"	1.1/2"	310

# Elaflex Rubber Expansion Joints

## Electrically conductive flexible connections for pressure or vacuum

In fluid handling systems it is often necessary to make allowance for pipework expansion, vibration and slight misalignment. A multi-purpose solution to many of these problems is the Elaflex rubber expansion joint.

It compensates for stresses arising from these thermal variations or misalignment, substantially dampening vibration from associated plant such as pumps, compressors, etc. preventing the transmission of objectionable noises.

Rubber expansion joints have been proved in service for many years and are approved by a number of Authorities.

The TW YELLOW range is commonly used on aircraft refuelling units


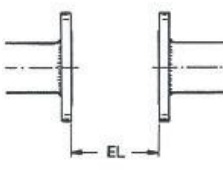
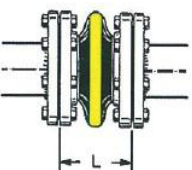
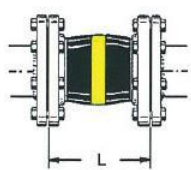
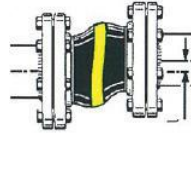
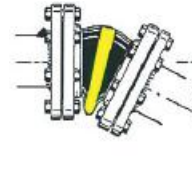
### Technical Specifications

<b>Recommended for:</b>	Hydro-carbon products with less than 50% aromatics.
<b>Tube:</b>	Seamless Nitrile NBR., oil resistant for temperatures up to + 100°C.
<b>Cover:</b>	Neoprene, electrical-conductive, oil resistant and weatherproof.
<b>Flanges:</b>	Forged aluminium.
<b>Electrical Resistance:</b>	Between 1k Ohms and 1Meg Ohms.
<b>Max. Working Pressure:</b>	10 Bar.
<b>Test Pressure:</b>	16 Bar

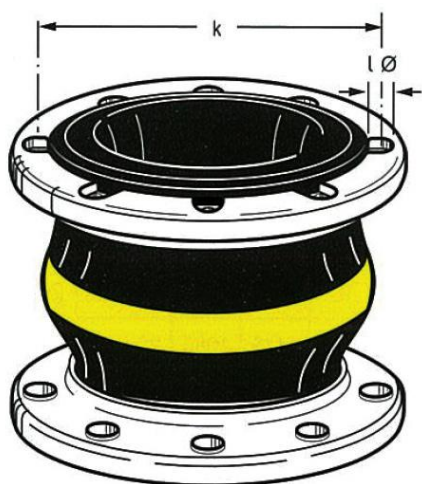


# Elaflex Rubber Expansion Joints

## Ordering Information

ERV-G Expansion Joints								
Length		Recommended Installation Length		Allowable Range of Movement in Service				
								
BL	Tolerance	EL minimum	EL maximum	L minimum	L maximum	max. lateral offset	DN mm	Angular rotation
130 mm	+5 mm -0 mm	120 mm	135 mm	100 mm	160 mm	±30 mm	25 - 50	±30°
150 mm		140 mm	155 mm	115 mm	180 mm	±30 mm	65 - 80	±25°
160 mm		145 mm	170 mm	125 mm	195 mm	±35 mm	100 - 150	±20°
175 mm		160 mm	185 mm	135 mm	210 mm	±35 mm	200 - 300	±10°
200 mm		180 mm	210 mm	160 mm	235 mm	±35 mm	350 - 600	±8°
250 mm	±6 mm	230 mm	260 mm	210 mm	285 mm	±35 mm	700 - 800	±6°
300 mm	±10 mm	280 mm	310 mm	260 mm	340 mm	±40 mm	900 - 1000	±5°

with 8-hole "TW" flanges DIN 28 461 of carbon steel, zinc plated



BL = 130 mm

Part No	DN mm	k mm	l Ø mm
ERV50	50	130	11,5
ERV65	65	130	11,5
ERV80	80	130	11,5
ERV100	100	150	14

PN 10

## Swivels

### SJF Flanged Swivels

The SJF Swivels are available in 4" size and provide rotational coupling of loading arm and hydrant cart components. SJF swivels are cast stainless steel. Sealing is enhanced by the purpose designed Viton primary face seal, and two Viton O-rings which isolate the bearing pack from product leaks.

In the unlikely event that the primary seal leaks, the product is contained by the O-ring before it can wash grease from the bearings causing them to fail in operation. Any leak is also immediately visible from a tell-tale weep hole. The greasing system incorporates the Liquip trade-mark pressure relief outlet to ensure correct lubrication, by ejecting old grease and particles that can cause wear. The 4" swivels have 4" TTMA flanges.



### Ordering Information

Part No	Description	Material
SJF101L	SJF 4" Flanged Swivel with 4" TTMA flanges	Stainless Steel

### VNS Swivels

The VNS-A4 is a 100mm (4") straight single-plane cast aluminium swivel with 4" TTMA flanged ends allowing 360° rotation. It may be used on any application where another plane of rotation is required.

For example it may be used on loading arms instead of the coupler spool to enable rotation of the API coupler. Liquip's grease relief system (grease nipple one side with relief valve mounted opposite for efficient removal of old grease and debris) extends the life of the swivel by ejecting old grease and wear particles. Dual O-Rings are for product seal and dust seal respectively.



### Ordering Information

Part No	Description	Material
VNS-A4	4" Straight Single-plane Swivel with 4" TTMA flanged ends	Aluminium

## Swivels

### SJW Weld-On Swivels

SJW Swivels are available in 3" and 4" sizes and can be of Mild Steel or Stainless Steel. These swivels are used for fabrication of loading arms and pipework requiring up to 360° rotational joints. They are machined from Nitrided Steel with pre-prepared ends for welding directly to pipe or tube.

SJW Swivels are a most cost-effective way of achieving a rotating joint, for loading arms or other equipment requiring swivelling joints. Sealing is enhanced by the purpose designed Viton or Teflon primary seal, and two Viton o-rings which isolate the bearing pack from product leaks. In the unlikely event that the primary seal leaks, the product is contained by the O-Ring before it can wash grease from the bearings causing them to fail in operation. Any leak is also immediately visible from a tell-tale weep hole. The greasing system incorporates the Liquip trade-mark pressure relief outlet to ensure correct lubrication, by ejecting old grease and particles that can cause wear.



### Ordering Information

Part No	Description	Material
SJW075MMVZ	SJW Weld-On 3" Swivel	Mild Steel
SJW100MMVZ	SJW Weld-On 4" Swivel	Mild Steel
SJW075SSVZ	SJW Weld-On 3" Swivel	Stainless Steel

## Camlocks

The standard range of Camlocks are to NATO specification MIL-C-27487. Aluminium construction, all units confirm to Australian Code of Practice CP23.

### Aviation Selective Couplings

The aim of these units is to ensure that all dedicated aviation road tankers fitted with selective couplings are compatible and can be loaded **ONLY** with aviation fuels, and that all aviation receiving points can **ONLY** accept aviation fuels from the dedicated road tankers.

The Liquip range of dedicated couplings provide product selectivity between Avgas and Jet Fuel and are available in the following configurations:

- Top and bottom loading
- Gantry loading valve
- Road tanker API valve
- Road tanker API to camlock adapter
- Female camlock hose end fittings
- Male camlock receipt point fittings

The standard range of Camlocks are to NATO specification MIL-C-27487. Aluminium construction, all units confirm to Australian Code of Practice CP23.

Notches and pins are used to dedicate these couplings for use with Aviation Gasoline or Aviation Turbine Fuel, thus preventing the wrong product being loaded into the wrong tank.

### Ordering Information

Contact the Liquip Sales Department for assistance in determining which of the numerous models, sizes and options available will best suit your needs.



## Static Reels

### LSR100 Lockable Static Earthing Reel

Static reels are used to bond two pieces of equipment to allow static charge to be safely equalised. Static reels are typically used when product is transferred from one tank to another e.g. when pumping between a tanker and storage tank or when fuelling aircraft.

Liquip offers the LSR100, which has been developed to provide users with a safe and reliable static earthing reel that when locked won't inadvertently unwind while a vehicle is moving.

### Technical Specifications

- Nominal reel resistance is 5 ohms
- Meets AS 2809:2 – Maximum end-to-end resistance of 10 ohms.
- Carbon brush runs in sealed section to eliminate dirt and corrosion.
- Shaft has grease reservoir for all-of-life lubrication.



### SR202 Static Earthing Reel

Static reels are used to bond two pieces of equipment to allow static charge to be safely equalised. Static reels are typically used when product is transferred from one tank to another e.g. when pumping between a tanker and storage tank or when fuelling aircraft.

Liquip offers the SR202, which has been developed to provide users with a safe and reliable static earthing reel.

The SR202 has a large drum so that it can be wound quickly and is fitted with a cable guide.

### Technical Specifications

- Maximum end-to-end resistance 2 ohms.
- Carbon brush runs in sealed section to eliminate dirt and corrosion.
- Shaft has grease reservoir for all-of-life lubrication.
- Can hold up to a max of 76m standard PVC coated wire (4mm diameter)



# Static Reels

## Ordering Information

Static Reel SR Series	
Part No	Description
LSR100	Lockable static reel complete with 30m cable and bonding clip.
SR202	Large diameter static reel comes with cable guide, manual operation
LR203	Large diameter Lanyard reel c/w 15m ORANGE cable & dog-clip

## Static Cable and Clamps

Liquip have a large range of static reel accessories available.



EKG1200



KK100



9170

Static Clamps	
Part No	Description
EKG1200	Static cable & aircraft clamp/clip - Solid heavy duty brass clamp complete with 1.2m of cable
KK100	Static clamp - Heavy duty solid brass clamp
9170	Static clamp - Standard plated steel with teeth jaws
GTP-1101	Static clamp - Aluminium alloy clip to MIL-C-83413/7, jaw gap 2mm fully closed
GTP-1097S-1	Aircraft grounding pin - Stainless steel

Static Cables	
Part No	Description
SR100-18	Static cable 2mm - Galvanised wire 6x7 strand, yellow PVC coated (1,00m roll or cut lengths)
9457	Static cable - Stainless steel wire, reflective orange PVC coated (300m roll or cut lengths)

## Static Reels

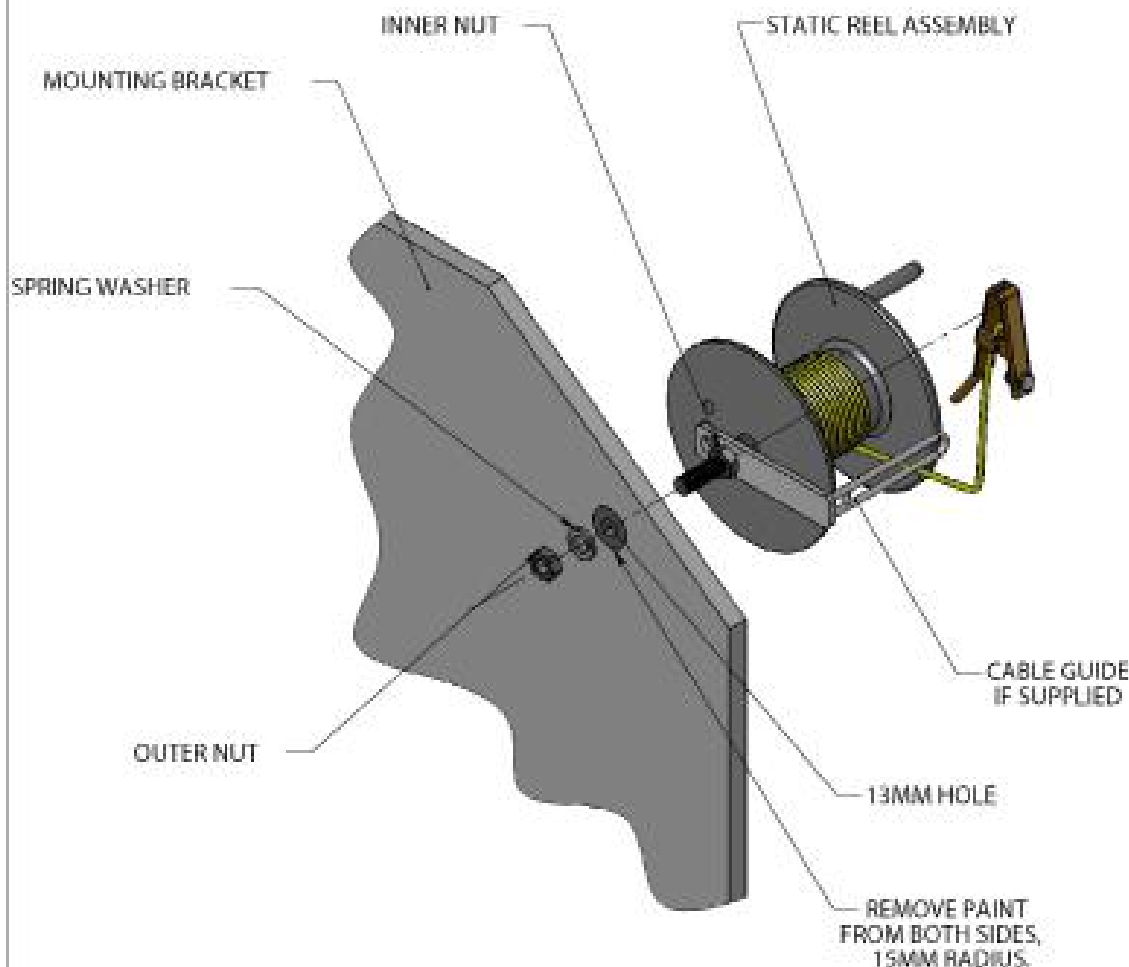
# LSR100 Installation Guide

Good electrical conductivity at the mounting bracket is essential to the performance of the static reel.

The mounting bracket itself must be chosen for its continuity with the vehicle chassis and both sides of the mounting bracket must provide a clean, smooth, bare metal surface of at least 15mm radius from the centre of the 13mm diameter hole. Ensure the inner nut is tightened securely on the shaft and fasten the assembly with the outer nut and spring washer on the other side of the mounting bracket.

For LSR100 fitted with the optional spacer and cable guide, fit onto the shaft first and tighten with the inner nut. The entire reel is then secured to the mounting bracket by the spring washer & outer nut on the other side of the bracket.

Further earthing continuity may be obtained by fitting a ring terminal and wire (not supplied) between the fixed nut and the mounting bracket and running it to a second earthing location on the chassis. Using a multimeter, confirm resistance from clamp to chassis is less than 100.



METERS - VALVES - VENTS - MANHOLES - HOSE REELS - OVERFILL PROTECTION - LOADING ARMS - ELECTRONIC DIPSTICKS



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L110714

Sheet 1 of 1  
Issue: A

# Aljac Continuity Tester

## Safe, reliable and cost effective loading of fuel

The Aljac Continuity Tester (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. It self checks calibration and available battery power and only then allows the test to proceed. The ACT uses a single dual colour light emitting diode (LED) to indicate the condition of the bonding system under test, which makes the results very simple to interpret. The default set point is 25 Ohms which is in accordance with the JIG Guidelines for aviation fuel systems, but alternative set points can be specified at the time of order placement. 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 a sealed, non rechargeable, high capacity battery which gives it an extended operational life, but 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 calibration before every test. The ACT incorporates a current limitation feature and is safe for use in hazardous areas, unlike many other devices which are currently in use. We can provide a Stowage Bracket which can be used to neatly stow the ACT when not in use, or can hold the ACT securely during testing.



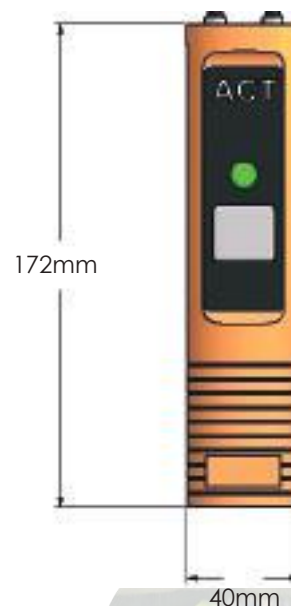
## Technical Specifications

- 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
- Housing: High visibility orange impact resistant PA6 Polyamide
- Battery: Lithium Thionyl Chloride 3.6V
- Microprocessor: Atmel AVR EXMEGA 16A 4U
- Flying Leads: 2 x 0.5 metres long, with plugs/clips

## Ordering Information

Part No	Description
0100400180	Continuity Tester
0100400181	Stowage Bracket

Net Weight: 180 grams



## Smartwire PLC

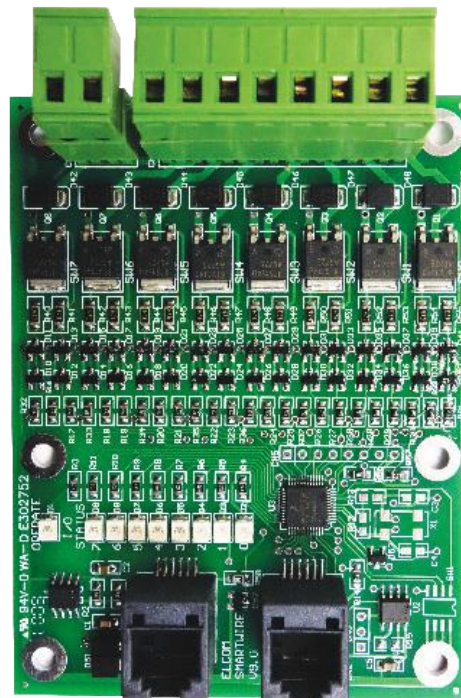
### With Liquip SMARTWIRE system the options are virtually unlimited.

The SMARTWIRE system is a 2-wire programmable control system designed to simplify implementation and installation. The system consists of input and output modules, a power filter and an interface board.

With the SMARTWIRE system a majority of the operational functions of fuelling aircraft are transformed to electronic form. The system is extremely flexible, offering easy adaptation in the field, if required, without costly modifications.

The SMARTWIRE PLC ensures that all fuelling operations cannot be overridden by an operator and it features a time-out which ensures the "deadman" is present in the operators hand at all times. The same PLC also controls all interlock functions for nozzle stowage, deck lowering, P.T.O. and all bottom load gates.

Liquip individually program each PLC to suit customer requirements.



### Ordering Information

Part No	Description
LSW4A	Smartwire PLC

# Power Conditioner

This LIQUIP DCC100 is an electronic Power Filter which conditions power to Electronic Meter Register systems (EMH\*), Overfill systems (such as Diptronic® DIP200) etc on Liquip aviation Refuellers and Hydrant Dispensers (where fitted) to protect connected equipment from surges and voltage spikes generated by vehicle operation. One DCC100 is required for each unit (piece of equipment / component) being protected.

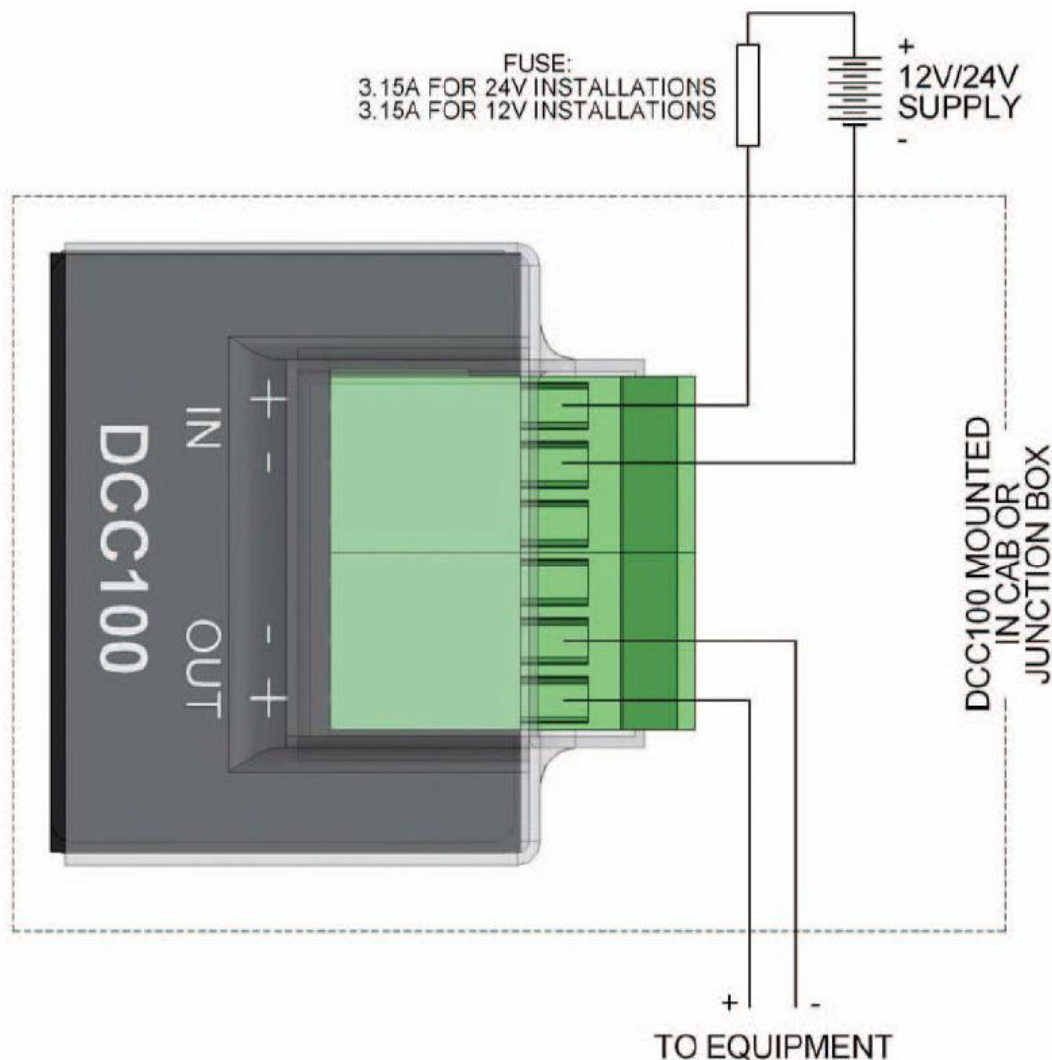
## Technical Specifications

<b>Materials of Construction:</b>	Heatshrink, plastic, metal.
<b>Mounting:</b>	<p>The DCC100 is not designed to be exposed to dirt or moisture. It must be either mounted in the cab area, typically in the fuse box, or inside a junction box of IP rating 66 minimum (Liquip JBL100 or similar)</p> <ul style="list-style-type: none"> <li>• Ensure cable glands are rated for a minimum IP66.</li> <li>• Wire as per wiring diagram attached.</li> <li>• Ensure IP66 rated blanking plugs are used in any unused holes in junction box.</li> </ul>
<b>Weight:</b>	0.1 kg (without junction box)
<b>Input Voltage:</b>	9V-36V DC
<b>Output Voltage:</b>	12V DC
<b>Maximum Load:</b>	Total 1.67A Continuous
<b>Voltage Spike Protection:</b>	Protect up to 50V/100ms spike
<b>Output Voltage Noise:</b>	Less than 0.1V
<b>Recommended Fuse Rating:</b>	3.15A slow blow
<b>Cable Size:</b>	0.2– 2.5mm <sup>2</sup> , strip length 6mm
<b>Ingress Protection:</b>	IP20
<b>Dimensions:</b>	55W x 65L x 25H (mm)
<b>Associated Equipment:</b>	<p>DIP200, DIP240, EMH5xx, EMH6xx, MPP102, PPM300 Series, COP Series</p> <p>JBL100 Junction box IP66 with 3 x M20 holes</p>



# Power Conditioner

## DCC100 Wiring Diagram



**NOTE:**

This is a general wiring diagram ONLY.

Any wiring instructions for specific equipment supersede this diagram.

## Ordering Information

Part No	Description
DCC100	12 VDC Output Power Conditioner

# Deadman Assemblies

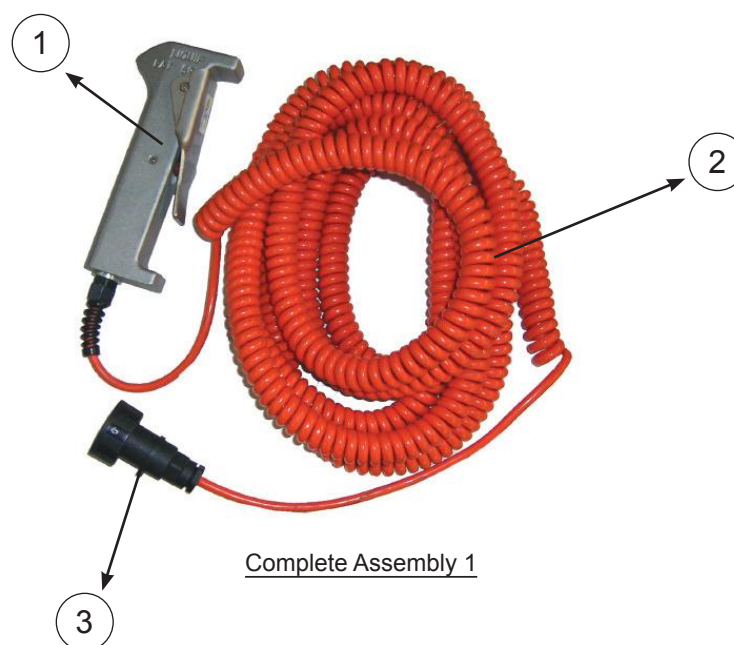
## Excellent operator comfort

Deadman system is a safety device with intrinsically safe wiring that confirms a critical operation is constantly supervised. Liquip deadman handles are compact, durable and designed for maximum operator comfort. They contain a sealed micro-switch (enclosed in the handle) with a cable connection. The handles require low operating force and are wear resistant. They are designed for the aviation environment and easy to assemble/disassemble. The bright orange "curly" lead is 3.4 metres (14') long and will stretch to 18 metres. Longer cables are available on special order.

## Ordering Information

Deadman Assemblies	
Order No	Description
8422	COMPLETE Assembly 1 (ALUMINIUM Deadman complete with cable / curly cord)
GTP-8392-Z-50	COMPLETE Assembly 2 (PLASTIC Deadman complete with cable / curly cord)

Deadman Spare Parts		
Item No	Part No	Description
1	DMH100	Aluminium Deadman - Handle ONLY
2	8693	Cable / Lead (curly cord), orange, 3.4m.
3	9097	Cable plug Male sealed 2W



## Platform Wand Assembly

Liquip Platform Wand assembly is designed to prevent a hydrant dispenser's scissor-lift platform from colliding with an aircraft wing. The wand is mounted on top of the platform frame / handrail and if the wand is pushed down by contact with an aircraft wing, an activation plate trips a proximity switch which in turn halts any platform movement by shutting down the hydraulic system that elevates the platform. This simple concept also allows the wand to be operated by hand as an emergency stop for personnel on the platform.

The wand stem is made from galvanised mild steel and the ball on the end of the wand is plastic to prevent wing damage on contact.

### Ordering Information

Platform Wand Assembly		
Part No	Description	Qty
1500-02-01	Platform Wand	1
8850	Magnetic Proximity Switch	1



## Decals & Signage

Liquip carry an extensive range of fuel handling decals and labels. All decals are printed on top quality decal stock for long life in all conditions. Engraved operational signage is laser cut.

### AVGAS & JET A-1

Pipeline markers are available in 57mm & 100mm.

Other variations are also available to suit Oil Company requirements.

### CLASS SIGNS

Type 1 to 9. Available in metal or adhesive vinyl.



### Ordering Information

Part No	Description
2270	Class 3 sign
2272	Holders for class signs in pressed steel (zinc plated)
9906	No Smoking Sticker (220 x 220mm)

## Spill Management Products

Contain any spill by having everything you need for fast, efficient response on-hand. In areas where spills are likely to occur, the Liquip range of Spill Kits takes the guesswork out of clean-up. Refills are available for all kits.

### Custom Kits

Liquip have spill kits for a wide variety of applications. If you have a special requirement, Liquip can design a kit to fit your needs and budget. "SELECT" absorbs oil / petroleum products while repelling water.

Also Available: Large Drum kits, Booms (various sizes), Folded Rolls, Absorbent Mats

### Zippered Truck Kit (15" X 18" X 6")

CONTENTS	SELECT
Socks	(3) 3" x 48"
Sheets	(30) 17" x 19"
Absorbs	28.4 litres

### Duffel Bag Kit (29" X 13" X 12")

CONTENTS	SELECT
Socks	(3) 3" x 96"
Large Sheets	(25) 17" x 19"
Pillows	(2) 15" x 25"
Disposable gloves	1 pair
Disposable bags	2
Absorbs	64.35 litres



### Spill Containers

These fully sealed Spill Containers are lightweight, strong and resistant to most chemicals. Spill Containers feature: Quick release lid, Meshed floor, Drain point ball valve, PVC construction

## Ordering Information

Part No	Description
JBFA65	Spill Kit Container
8790	Zippered Truck Kit
8834	Duffel Bag Kit
CEP-P100	17" x 19" x 3/8" Sheets
8835	Sock 3" x 48"
9107	Disposal Bag

## Platform Ladders

The Hills / Bailey range of aluminium platform ladders conform to Australian and New Zealand Standard 1892 and have an industrial load rate of 140kg.

Available with "Treadsafe" platform and optional safety-advice decal.

### Features

- Industrial Duty Rated. Designed for use on industrial work sites where greater strength and safety is required
- Heavy Duty, 150kg Load Rating
- Strong, aluminium construction
- Fully welded front and rear frames for strength and durability
- Wide, aluminium anti-slip platform (490x400mm) for a secure work area
- 900mm handrail height from platform
- Anti-slip rubber feet for added safety and stability
- Made to Australian and New Zealand Standards AS/NZS 1892.1
- Available - optional retractable Castors/Wheels Kits
- Australian Made & Owned



### Ordering Information

Part No	Description
FS13315	0.6 (2") HD Platform Step 2
T/PP93611	0.9m (3") HD Platform Step 3
FS13311	1.1m (4") HD Platform Step 4
FS13314	1.4m (5") HD Platform Step 5
FS13316	1.7m (6") HD Platform Step 6
FS10718	2.0m (7") HD Platform Step 7
FS10719	2.3m (8") HD Platform Step 8
FS22971	Castor/Wheel Kit (Fits 2-6" Plat)
FS22972	Castor/Wheel Kit (Fits 7-8" Plat)

*All product dimensions indicated are nominal.*

## Wing Mats

These 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 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.

### Ordering Information



Size: 460 x 610mm, opening diameter 127mm

Part No	Colour
56AFP-1824	Hi-Vis Orange
56AFP-1824B	Black
56AFP-1824R	Red

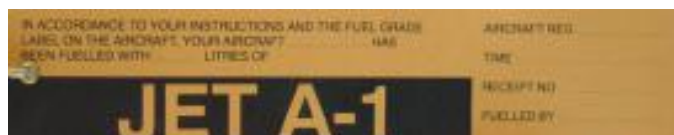


Size: 460 x 920mm, opening diameter 127mm

Part No	Colour
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 clear to him which grade of fuel has been delivered before he attempts to move the aircraft.



Part No	Description
0906000133	Jet A1 Refuelling Tag (Pack of 50)



Part No	Description
0906000134	AVGAS Refuelling Tag (Pack of 50)

## Stainless Steel Buckets

Stainless steel buckets complete with carry handle, pourer, static lead and clamp.

### Ordering Information

Part No	Description
T/PP95483	Stainless steel bucket



## Fire Extinguisher Holder

These new lightweight fire extinguisher holders are a strong, durable design. The flat back ensures easy installation and they can be mounted on either truck or trailer. An internal tension strap helps secure the extinguisher and minimise any movement inside the holder. Will accept extinguishers 600mm in height.

### Ordering Information

Part No	Description
JBFR75	Fire Extinguisher Holder



mm	mm	mm	mm
750	300	300	600+

## Stainless Steel Safety Lock Wire

Safety wire or lockwire is a type of lock mechanism that prevents fasteners from loosening due to vibration and other forces. The presence of safety wiring also indicates that the fasteners have been properly tightened.

### Ordering Information

Part No	Description
GTP-1924	.032" Stainless Steel Safety Lock Wire



## Water Finding Paste

Water Finding Paste is a water detection system used to aid in the detection of water within fuel supplies. Water Finding Paste is normally used in the petroleum industry to monitor and detect moisture levels in various fuel types.

### Ordering Information

Part No	Description
8058	70g jar Water Finder Paste



## Fuel Finding (Ullage) Paste

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

### Ordering Information

Part No	Description
M056	Kolor Kut 62g Tub Fuel (Ullage) Paste



## Density Calculator

The Density Calculator converts density reading taken with a hydrometer to corrected density at 15°C. It separates scales for 3 different types of fuel.

### Ordering Information

Part No	Description
GTP-2727EF	Density Calculator

