

LIQUIP

PART OF OPW A DOVER COMPANY

Liquip Product Catalogue

Issue 1

www.liquip.com

LEADING THE WAY IN FLUID HANDLING SOLUTIONS WORLDWIDE



Since 1969, Liquip has been **Leading the Way** and quietly setting industry standards worldwide.

We are recognised around the globe as the benchmark for fluid handling equipment and we are committed to continued growth as a leader in quality products and solutions for Specialist fluid applications.

The Liquip brand represents an unparalleled focus on optimising safety, efficiency, reliability and environmental sustainability through innovative fluid handling and information management solutions.
Our comprehensive product line means you can **get absolutely everything you need from a single source**, with equipment that exceeds expectations and offers exceptional whole-of-life value.

Being part of the OPW family means that customers can get access to an **integrated solution** where every component is designed and manufactured to work in unison.

Liquip Sales Team

LIQUIP
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Tank Truck



Metering, Pumping & Gauging



Terminal / Depot



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Typical Liquip Tank Layout

Liquip Tank Truck Overview



Manholes & Hatch Weather Covers



Diptronic Level Gauging



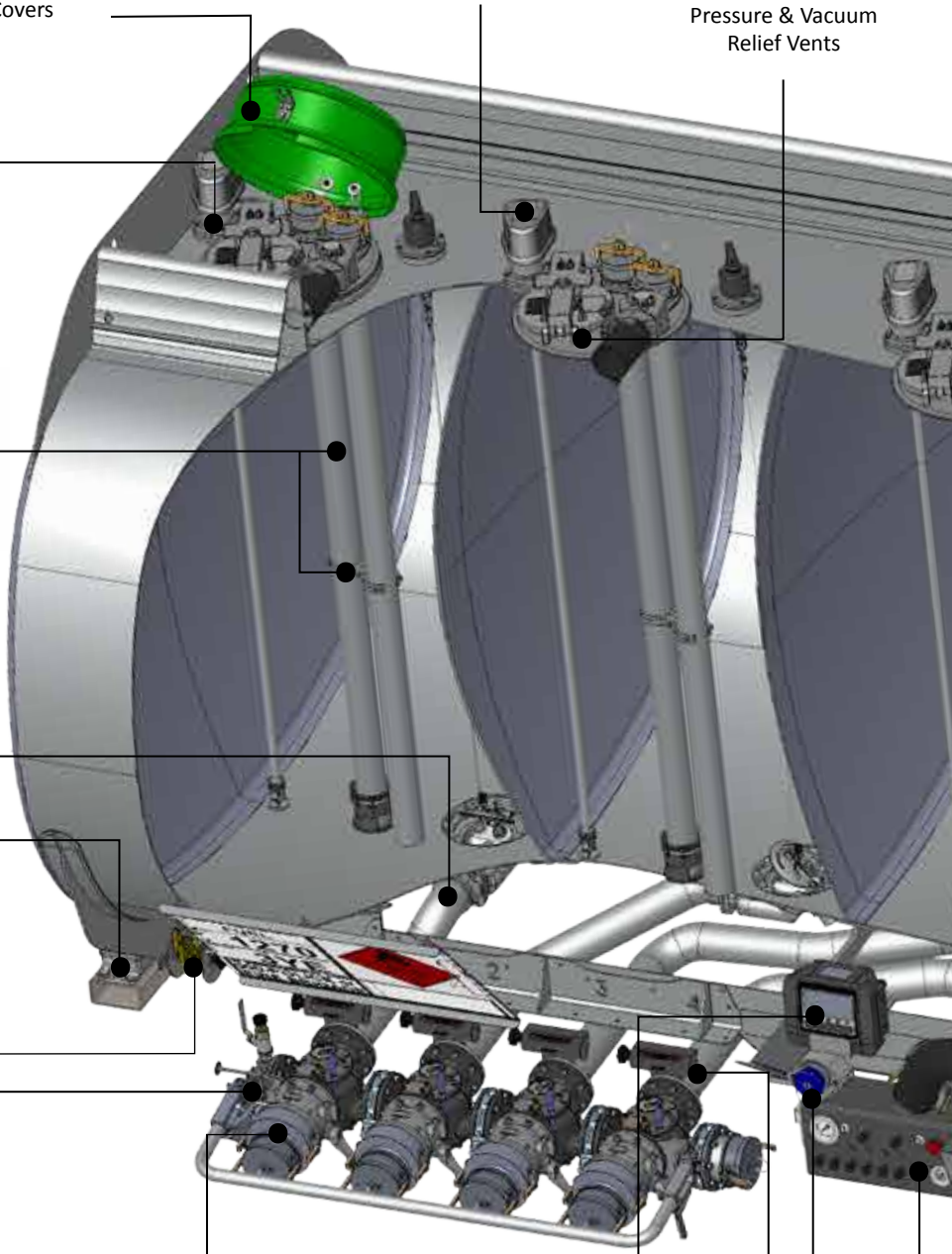
Pressure & Vacuum Relief Vents

Vapour Vents & Accessories





Dip & Fill Tubes & Tube Steady



Pipe Bends & Accessories



Rollover Sensors



Static Reels



Manifolds & Vapour Gates



API Coupler & Accessories



Digital Register & Diptronic Unit



Typical Liquip Tank Layout

Liquip Tank Truck Overview



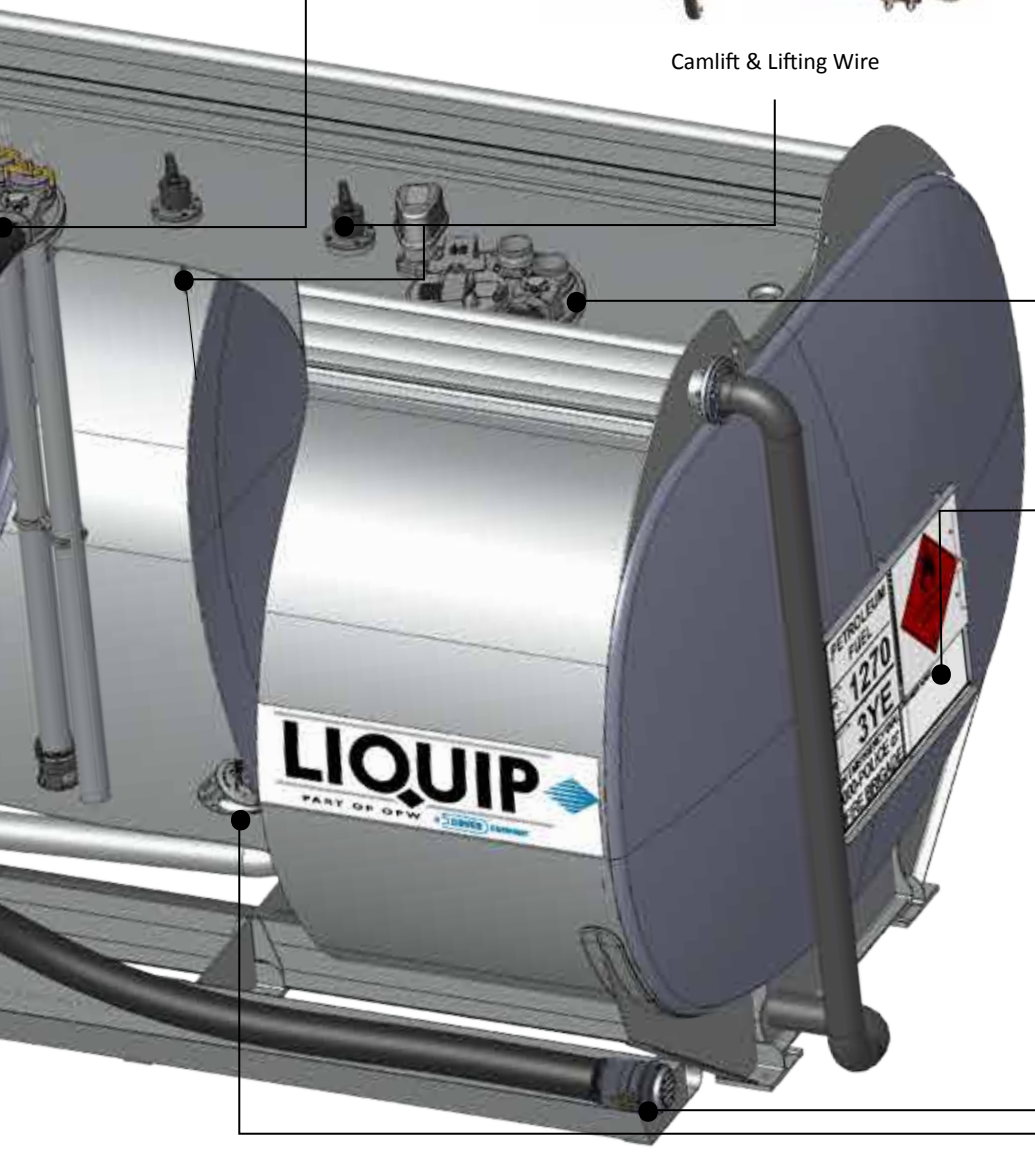
Overfill Probes
& Probe Holders



Dip & Fill Fittings



Camlift & Lifting Wire





Hazchem Signs



Vapour Couplers
& Accessories

Product Indicators



Truck Plugs



Pneumatic Control
Boxes

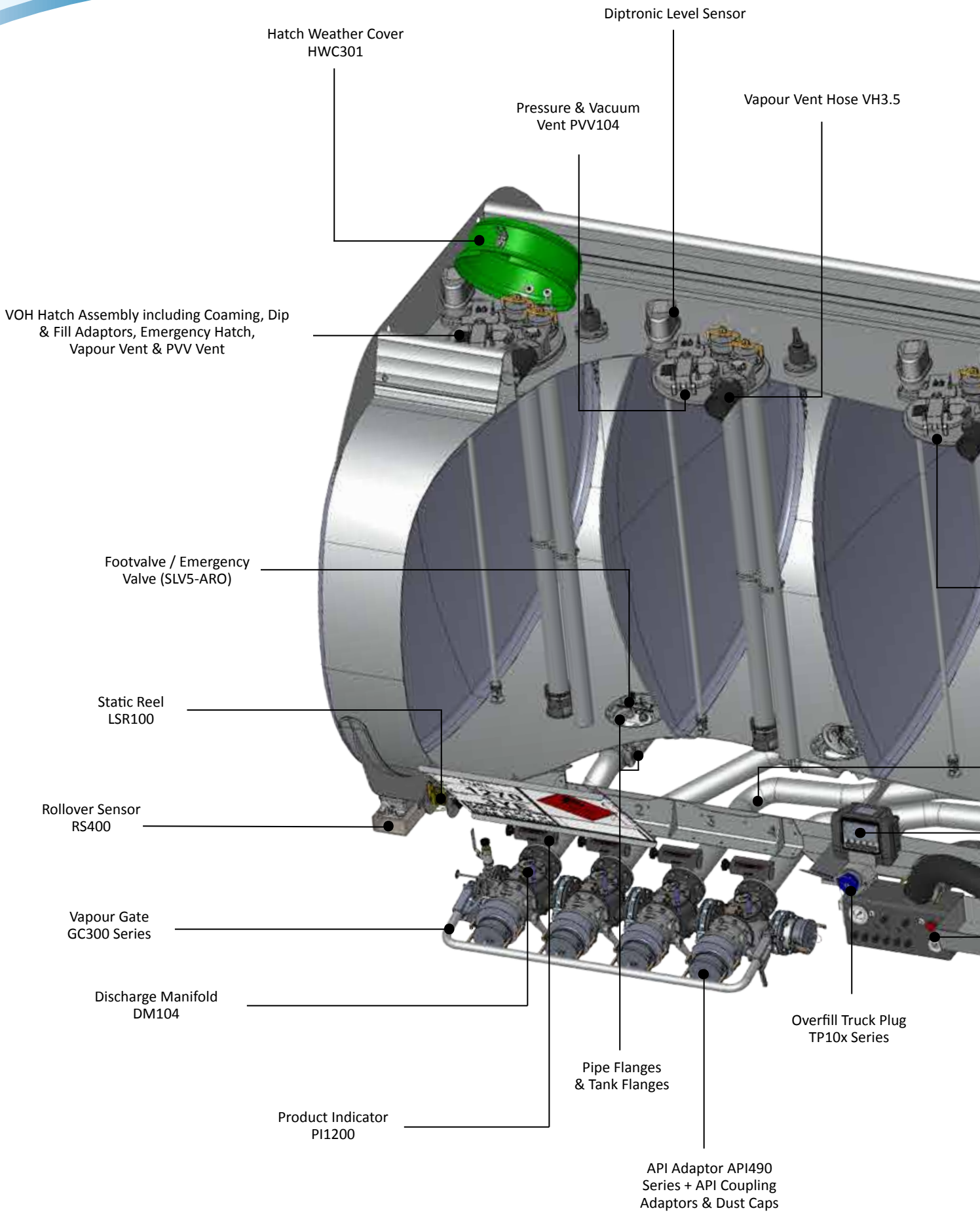


Footvalves & Accessories



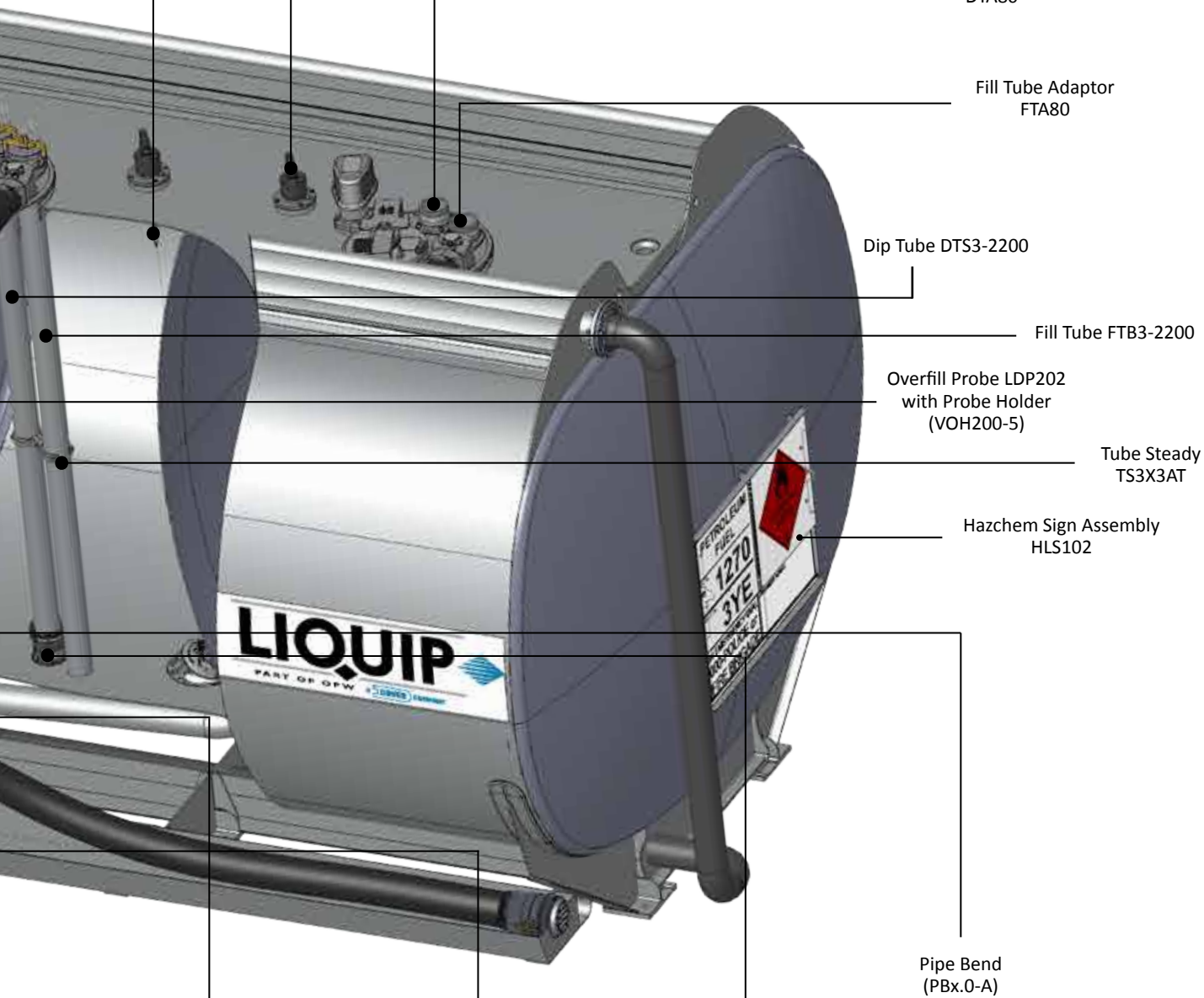
Typical Liquip Tank Layout

Standard Fuels

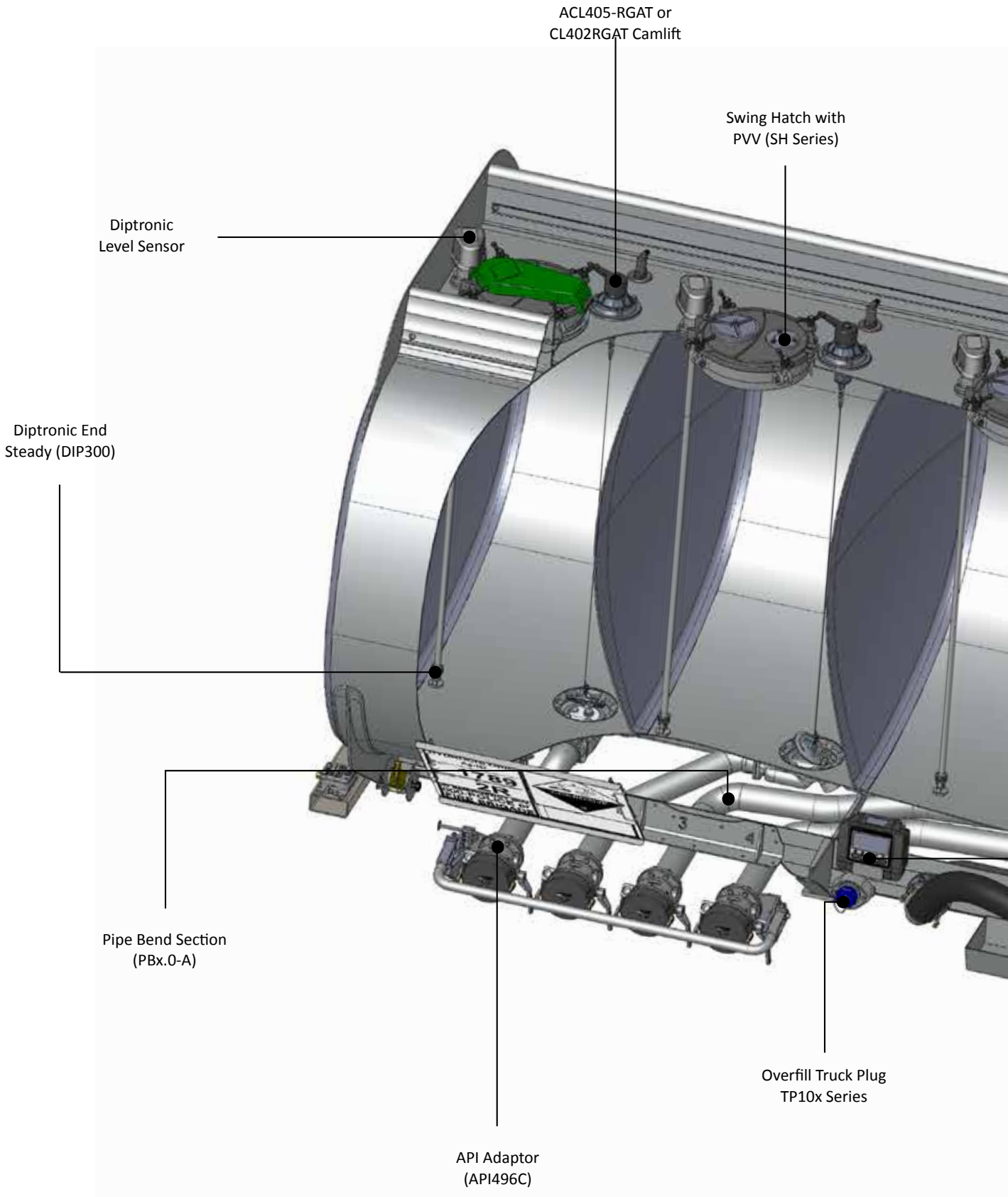


Typical Liquip Tank Layout

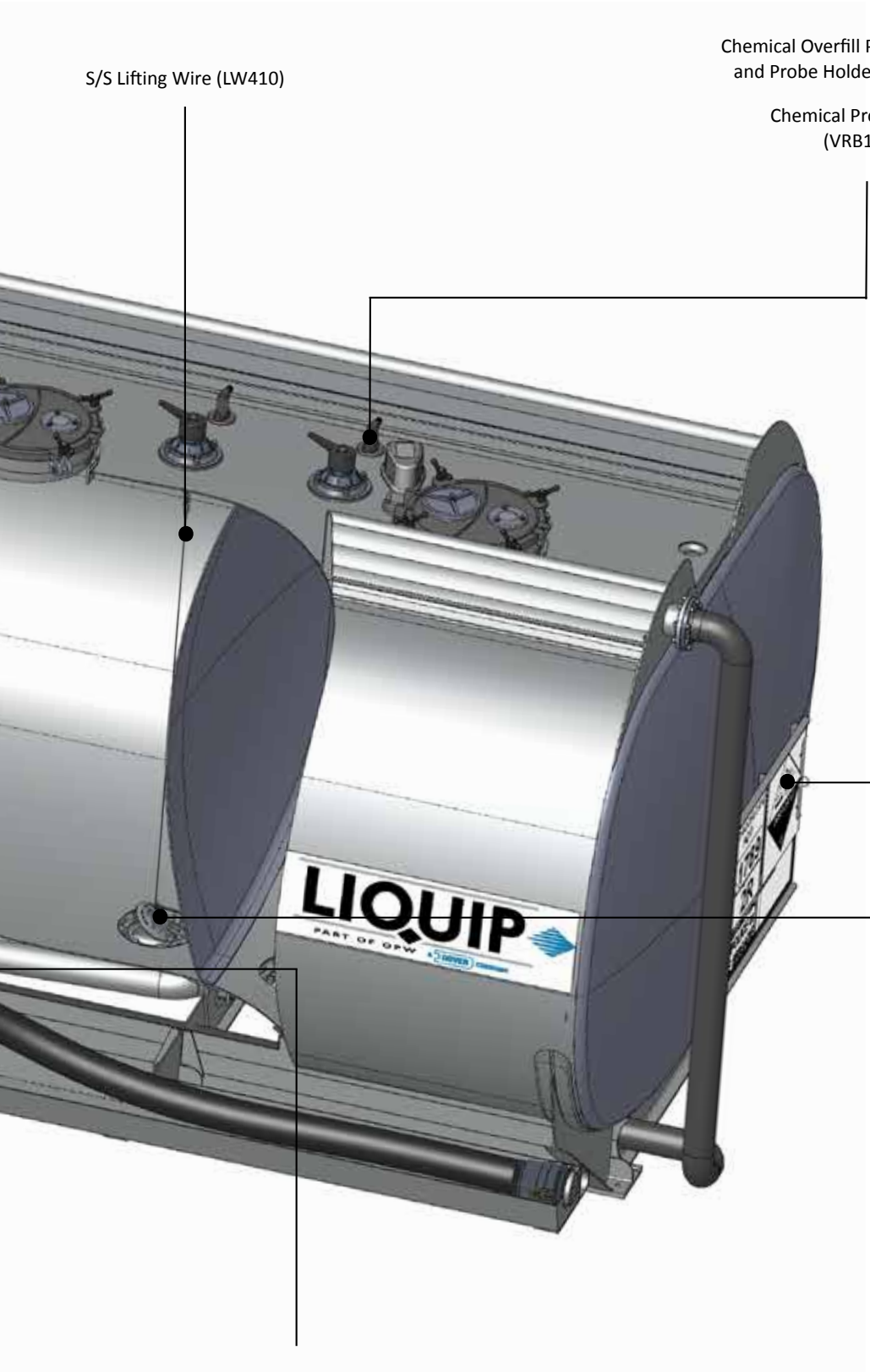
Standard Fuels



Typical Liquip Tank Layout
Chemical Tanker



Typical Liquip Tank Layout
Chemical Tanker

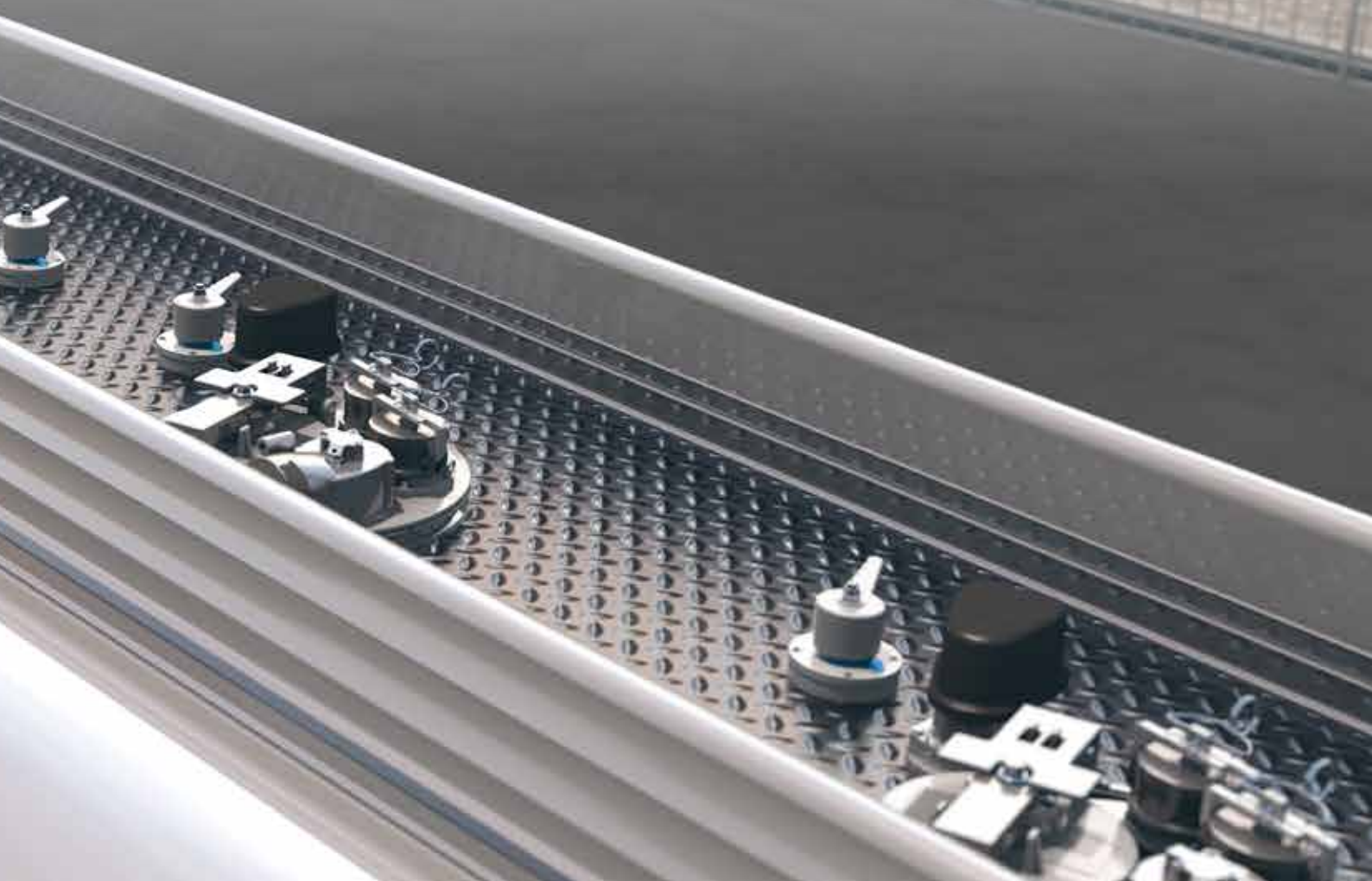


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Tanker Top



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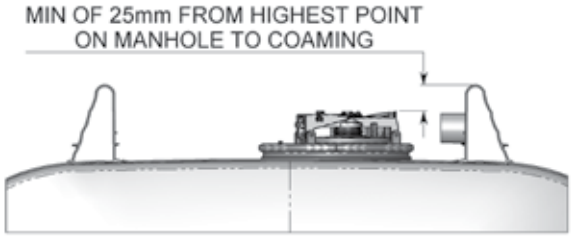
Manholes and Hatches

In most cases, location of equipment is dictated by reasons of specifications or standards. The following procedures are a guide for installation where known specifications exist. Typically a distance of 25mm should exist between the highest point of walkway equipment and top of rollover coaming.

Location Of Hatch

Allow adequate clearance for welding operation and for operation of swinging lids or removable caps. Generally the fill cap (oversees hatches) hinge is positioned towards the front of the tanker to aid closure if accidentally left open while driving.

- Models fitted with dip stick provisions on the manhole cover must be aligned with dip point on tank floor - along the centre line of the tank.
- Maximize size of clear passageway for safety of personnel.



Welding In Weld-Ring

Weld-ring may sit in or on the tank shell dependent on the allowable height.

For setting your own height or for rounded walkways a straight-sided ring exists, but if the walkway is flat a ring with a shoulder is recommended for the VOH400.

Special Instructions

- Loosen all clamping mechanisms and studs on the manhole assembly.
- Ensure manhole is positioned so dip tube in hatch and dip guide on tank floor align.
- Cut hole (refer to table below for dia.) in walkway with clean edge to provide 1mm to 2mm air gap between tank and weld-ring.
- Insert ring so it rests on walkway at desired height with enough height to enable welding torch to fit under lugs etc.
- Place six (6) tack welds around outside of ring not more than 20mm long.
- Fully weld around outside of ring with fillet weld runs not more than 100mm long on opposite sides of ring or taking other steps to ensure minimal distortion during welding. (i.e. skip welding, backstep etc.).

Note:

1. Contact Liquip for a weld in diagram.
2. A continuous weld may create residual stresses and cause cracking.

Fitting Hatch

- Allow weld-ring to cool to avoid damage to seal
- Remove any weld spatter from sealing face: check flatness and roundness
- Flatness of the seal face must be within 1mm; roundness of the seal face must be within 2mm
- Fit manhole with seal where applicable
- Fit clamp band, where applicable, (top label up) and clamp bolt and tap gently around band as bolt is tightened
- When assembling the VOH400 & VOH200 manhole covers to the weld-ring, the clamp-band nut tension should be 27-34 Nm. As the clamp-band is being tensioned the clamp-band must be tapped gently around the band during tightening of the nut.
- When assembling the VOH700 & VOH500 manhole covers to the weld-ring the fastener tension should be 10-12 Nm. Draw down fasteners evenly to prevent a lopsided fit.
- Pressure test to local standards requirements. Vents may need to be blanked or disabled during pressure testing.

Dip/Fill Tubes and Related Equipment

- Insert dip and fill tubes through mounting bosses
- Cut tubes 25mm shorter than bottom of tank when the tube is correctly positioned on hatch to allow for clearance.
- Cut fill tube off at 45° to allow the liquid to escape easily
- Position gauze in dip and fill tubes away from inspection hatch to minimise possible damage from top loading spears
- Install tube steady to stop any excess movement
- Dip tube guides can be fitted later after noting position of tubes on tank base.

Hatch Weather Covers

This comes complete with all equipment needed to install, with instructions for the different models, as each has varying fixtures.

Recommended Hatch Hole Sizes

Coaming	Suits Hatch Series	Material	Hole diameter required	Mount type/ torque	Typical Test Pressure
VOH300-15 & 15P	410	Aluminium 6060-T595	449-450mm	Clampband/27-34Nm	45kPa
VOH300-17	410	Mild Steel 250 grade	449-450mm	Clampband/27-34Nm	45kPa
VOH500-14A	500	Aluminium 5005 H34	515-516mm	24 bolts/10Nm	35kPa
VOH500-17M	500	Mild Steel 250 grade	502-503mm	24 bolts/10Nm	35kPa
VOH700-26	750	Aluminium 5005 H34	400-401mm	24 bolts/10Nm	35kPa
VOH700-26M	750	Mild Steel 250 grade	400-401mm	24 bolts/10Nm	35kPa

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

VOH SERIES Ordering Guide

MANHOLE COVER



VOH410 VOH410-1 MANHOLE COVER



VOH500D VOH500D-1 DIE CAST WITH ⌀60.8 PROBE MOUNT



VOH500E VOH500E-1 WITHOUT PROBE MOUNT



VOH750 VOH750-1 MANHOLE COVER

EMERGENCY VENT AND BRIDGE ARRANGEMENT



VOH500-32A
OPERABLE BRIDGE, PLAIN HANDLE AND EMERGENCY VENT SUB-ASSEMBLY



VOH500-33A
OPERABLE BRIDGE, LOCKABLE HANDLE AND EMERGENCY VENT SUB-ASSEMBLY



VOH500-32B
OPERABLE BRIDGE, PLAIN HANDLE AND EMERGENCY VENT SUB-ASSEMBLY



VOH500-33B
OPERABLE BRIDGE, LOCKABLE HANDLE AND EMERGENCY VENT SUB-ASSEMBLY



VOH500-32U
OPERABLE BRIDGE, PLAIN HANDLE AND EMERGENCY VENT SUB-ASSEMBLY



VOH500-33U
OPERABLE BRIDGE, LOCKABLE HANDLE AND EMERGENCY VENT SUB-ASSEMBLY

VOH	410	2A	4A	0

PRESSURE / VACUUM VENT



4A

PVV104
TO AS2809
AUST STANDARD

OPENS AT:
PRESSURE: 1611 kPa
VACUUM: 281 kPa

MUST BE FITTED TO 'A' SERIES EMERGENCY VENTS



4U

PVV104U
TO NFPA385 &
UK REQUIREMENTS

OPENS AT:
PRESSURE: 1611 kPa
VACUUM: 280.4 kPa

MUST BE FITTED TO 'U' SERIES & 'B' SERIES EMERGENCY VENTS

NO PVV104 FITTED 4N



4O

PVV104-2 BLANKING PLATE
4250 GASKET NBR CORK
0107 WASHER SPRING
0714 CAPSCREW ¼" X 1"

GRAVITY LATCH



1

IF GRAVITY LATCH IS REQUIRED ADD FOLLOWING PARTS:

1 x VOH700-12 GRAVITY LATCH
1 x 0096 E-CLIP ½"
1 x 4446 SPRING f. GRAVITY LATCH

GRAVITY LATCH NOT FITTED 0

PART NUMBER EXAMPLE FOR VOH410 SERIES MANHOLE, CLAMPBAND STYLE WITH BRIDGE AND PLAIN HANDLE, 30kPa SPRING, PVV104, NO GRAVITY LATCH. COAMINGS, SEAL AND CLAMPBAND ASSEMBLIES TO BE ORDERED SEPARATELY, SEE LIQUIP DRAWING V90803 FOR PART NUMBERS.



18” Clampband Style Manhole Covers

VOH410 SERIES

Liquip offers a unique 455mm (18”) diameter Manhole Cover to suit the specification of oil companies and transport fleets.

VOH410 Series Manhole Covers are available in cast aluminium and come with four equipment mounting positions for the addition of overfill probes, vapour vents, dip & fill tubes and tank gauging.

Australian drop test approval makes these manholes ideal for both top and bottom loading.

The VOH410 Series is the premier manhole cover in the industry.

Features & Benefits

- Australian drop tested to provide additional security in the event of a tanker roller.
- Cast aluminium lightweight & durable construction.
- Two-stage opening mechanism enables internal pressure to be released before completely opening the manhole cover.
- 225mm (9”) emergency pressure vent included to enable bulk pressure release in event of a fire or rollover.
- Emergency vent doubles as an easy to open inspection hatch for top loading or visual inspection.
- Can be fitted with a 1” thermal pressure & vacuum vent complying with recognised industry codes (for thermal expansion purposes).
- Any mounting positions not utilised can be securely blanked off until required.
- Secure locking feature via Gravity Latch or Lockable bridge & Handle available.
- Additional security can be achieved with a non opening bridge & handle design.

Technical Information

Regulations

Passes the Australian drop tests.

Mounting

A single clamp-band fits around the circumference of the manhole cover and the corresponding coaming which is tightened using a single bolt. Care must be taken to fit this clamp band according to instructions to ensure manhole cover integrity.

Ordering Information

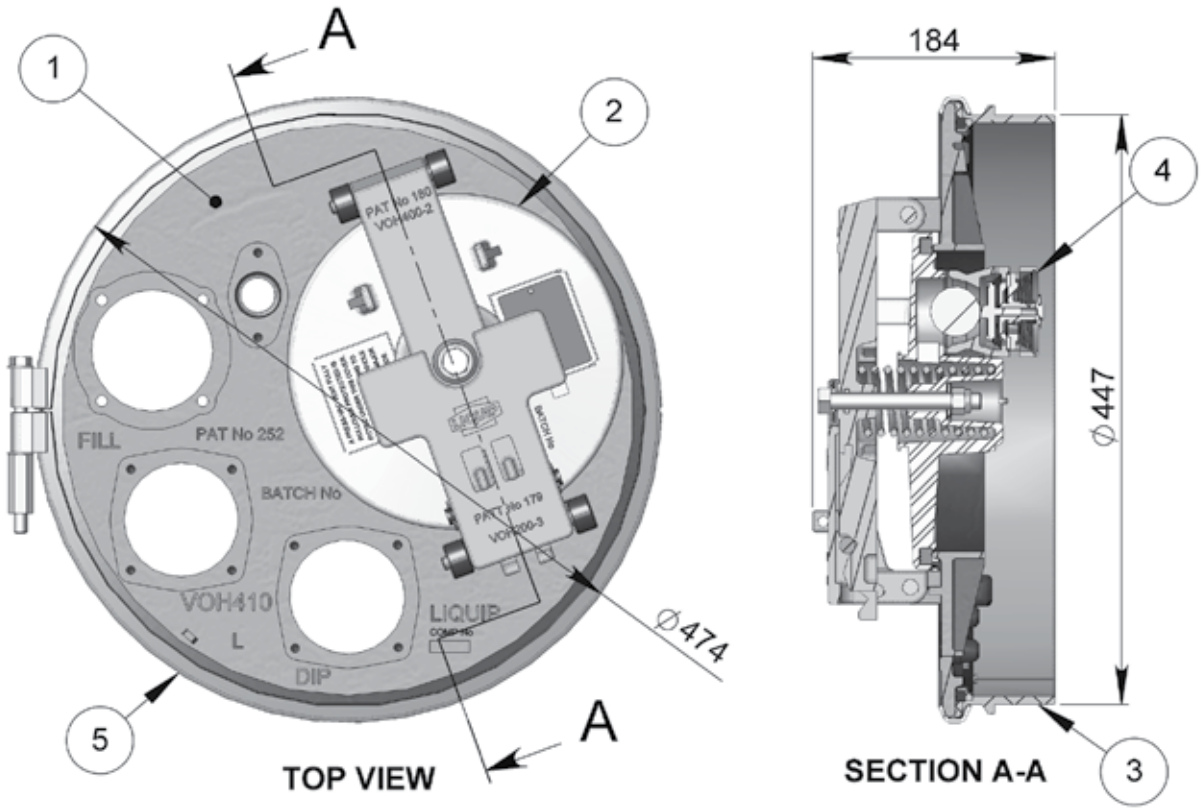
- **VOH4102A4N0:** Aluminium 18” manhole cover assembly.
- **VOH4102A4A0Z:** VOH4102A4N0 comes with clamp band assembly and PVV104 (vapour vent).
- **VOH4102A4N0Z:** VOH4102A4N0 comes with clamp band assembly and PVV blanking plate.

Note: Refer for VOH Series ordering guide for all models available.

Associated Equipment

- **VOH300-15:** Aluminium Coaming (Ribbed).
- **VOH300-15P:** Aluminium Coaming (Plain).
- **VOH300-17:** Mild Steel Coaming- Not Drop Test Approved.
- **PH100-3:** Nut Clamp Band.
- **4370:** Zinc plated flat washer 3/8 x 3/4 OD.
- **4877:** Zinc plated BSW Bolt 3/8 x 5 HX.
- **VOH-16:** Dip & Fill Blank Plate.
- **VOH200-14:** Overfill Probe Blank Plate.
- **VOH400-10:** Lock Key.
- **AVV3.0-10:** Vapour Recovery Blank Plate.
- **UG101:** Ullage Gauge.
- **VOH300-7:** VOH410 Main Seal (Nitrile).

VOH410 MANHOLE ASSEMBLY



ITEM 2: MODEL SHOWN WITH PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-32A)
VARIANTS: PLAIN HANDLE, 24kPa (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32B)
PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32U)
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-33A)
LOCKABLE HANDLE, 24kPa (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-33B)
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32U)

ITEM 3: MODEL SHOWN WITH ROLLED ALUMINIUM COAMING VOH300-15
VARIANTS: ROLLED ALUMINIUM COAMING VOH300-15P (PLAIN FOR CURVED WALKWAYS)
MILD STEEL COAMING VOH300-17
COAMING SUPPLIED SEPARATELY

ITEM 4: PRESSURE VACUUM VENT REQUIRED IS DETERMINED BY CONFIGURATION OF ITEM 2.

NOT SHOWN: GRAVITY LATCH SUB-ASSEMBLY (ADD IF REQUIRED - VOH500-34Z)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	VOH410-1	MANHOLE 18" TO AS2809 AUST STANDARD	1	ALUMINIUM
2	VOH500-32A	EMERGENCY VENT PLAIN BRIDGE & HANDLE	1	ALUMINUM
3	VOH300-15	COAMING EXTRUDED ALUMINIUM	1	ALUMINIUM
4	PVV104	PRESSURE AND VACUUM VENT	1	ALUMINIUM
5	VOH400-35Z	CLAMPBAND AND SEAL SUB-ASSEMBLY	1	STEEL



20” Bolt Style Manhole Covers

VOH500 SERIES

Liquip offers a 500mm (20”) diameter cast aluminium manhole cover to suit the specification of oil companies and transport fleets.

VOH500 Series Manhole Covers come with three equipment mounting positions for overfill protection, vapour recovery and Dip & Fill accessories.

Australian drop test approval makes these manholes ideal for both top and bottom loading.

Features & Benefits

- Passes Australian drop tests.
- Cast aluminium lightweight & durable construction.
- 225mm (9") emergency pressure vent included to enable bulk pressure release in the event of a fire or rollover.
- Emergency vent doubles as an easy to open inspection hatch for top loading or visual inspection.
- Can be fitted with a 1” thermal pressure & vacuum vent complying with recognised industry codes (for thermal expansion purposes).
- Any mounting positions not utilised can be securely blanked off until required.
- Available with either a plain or lockable handle.
- Secure Locking Feature via Gravity Latch or Lockable Bridge & Handle.

Technical Information

Regulations

Passes the Australian drop tests.

Mounting

The VOH500 series is attached to the manhole coaming using a 24 bolt pattern.

Ordering Information

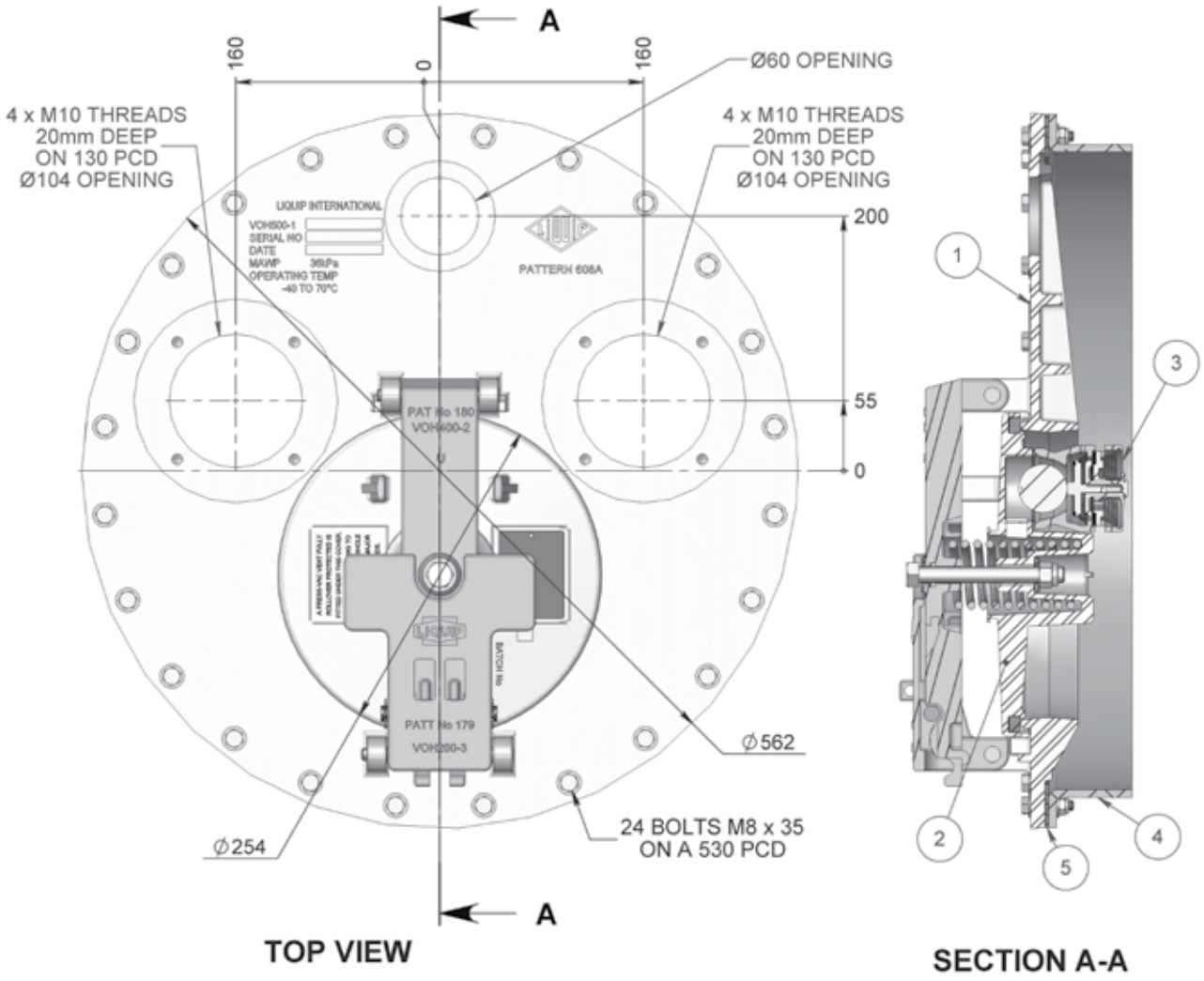
- **VOH500-NFQ:** VOH500 Manhole 24 Bolt, Alum bridge (30kPa) plain handle, PVV blank plate.
- **VOH500E2A40:** VOH500 Manhole 24 Bolt (no probe mount), Alum bridge (30kPa) plain handle, PVV blank plate, no Gravity latch.
- **VOH5002B4U0:** VVOH500 Manhole 24 Bolt, Alum bridge (24kPa) plain handle, PVV104U, no Gravity latch.

Note: Refer for VOH Series ordering guide for all models available.

Associated Equipment

- **VOH500-14A:** Aluminium coaming.
- **VOH500-17M:** Steel coaming.
- **7237Z:** Blank Plate for accessory mounting positions.
- **PJB500:** Overfill Probe Holder.
- **VOH400-10:** Lock Key.

VOH500 MANHOLE ASSEMBLY



ITEM 2: MODEL SHOWN WITH PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-32A)
VARIANTS: PLAIN HANDLE, 24kPa (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32B)
PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32U)
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-33A)
LOCKABLE HANDLE, 24kPA (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-33B)
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-33U)

ITEM 3: PRESSURE VACUUM VENT REQUIRED IS DETERMINED BY CONFIGURATION OF ITEM 2.

ITEM 4: MODEL SHOWN WITH ROLLED ALUMINIUM COAMING VOH500-14A
VARIANT: MILD STEEL COAMING VOH500-17M
COAMING SUPPLIED SEPARATELY

ITEM 5: GASKET & FASTENER SUB-ASSEMBLY IS SUPPLIED SEPARATELY.

NOT SHOWN: GRAVITY LATCH SUB-ASSEMBLY (ADD IF REQUIRED - VOH500-34Z)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	VOH500D-1	COVER MANHOLE 20" TO CEN REGULATIONS	1	ALUMINIUM
2	VOH500-32A	EMERGENCY VENT PLAIN BRIDGE & HANDLE	1	ALUMINIUM
3	PVV104	PRESSURE AND VACUUM VENT	1	ALUMINIUM
4	VOH500-14A	COAMING FOR VOH500 MANHOLE	1	ALUMINIUM
5	VOH500-36Z	GASKET & FASTENER SUB-ASSEMBLY	1	NBR CORK



18” Bolt Style Manhole Covers

VOH750 SERIES

Liquip offers a unique 455mm (18”) diameter Manhole Cover to suit the specification of oil companies and transport fleets.

VOH750 Series Manhole Covers are available in cast aluminium and comes with three equipment mounting positions for overfill protection, vapour recovery and Dip & Fill accessories.

Australian drop test approval makes these manholes ideal for both top and bottom loading.

Features & Benefits

- Australian drop test approved.
- Cast aluminium lightweight & durable construction.
- Two stage opening mechanism enables internal pressure to be released before completely opening the manhole cover.
- 225mm (9”) emergency pressure vent included to enable bulk pressure release in event of a fire or rollover.
- Emergency vent doubles as an easy to open inspection hatch for top loading or visual inspection.
- Can be fitted with a 1” thermal pressure & vacuum vent complying with recognised industry codes (for thermal expansion purposes).
- Any mounting positions not utilised can be securely blanked off until required.
- Available with either a plain or lockable handle.
- Secure Locking Feature via Gravity Latch or Lockable Bridge & Handle.

Technical Information

Regulations

Passes the Australian drop tests.

Mounting

The VOH750 series is attached to the manhole coaming using a 24 bolt pattern.

Ordering Information

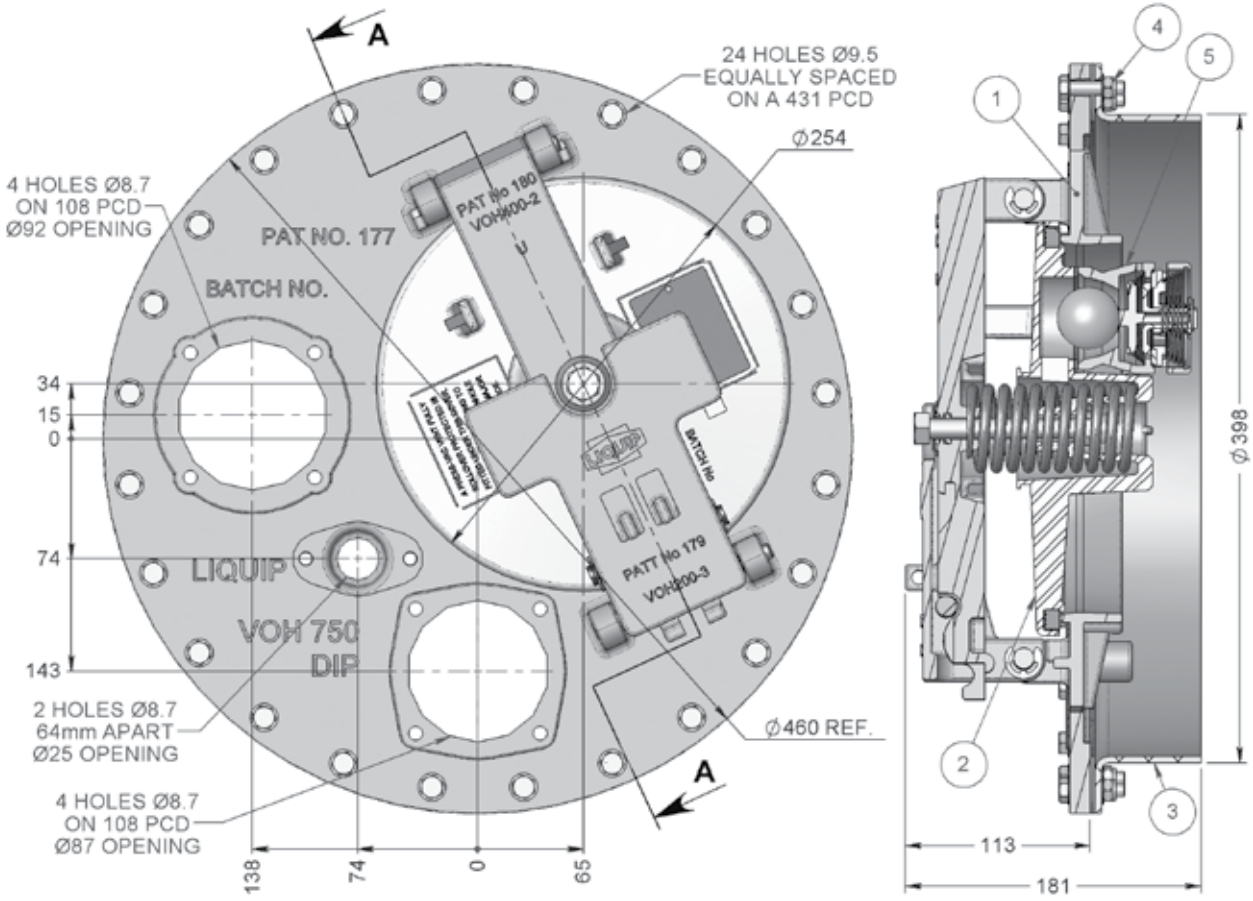
- **VOH7502A4A0:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) plain handle, PVV104, no Gravity latch.
- **VOH7502A4O0:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) plain handle, PVV blank plate, no Gravity latch.
- **VOH7502B4U0:** VOH750 Manhole 24 Bolt, Alum bridge (24kPa) plain handle, PVV104U, no Gravity latch.
- **VOH7502B4U1:** VOH750 Manhole 24 Bolt, Alum bridge (24kPa) plain handle, PVV104U, with Gravity latch.
- **VOH7502U4U0:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) plain handle, PVV104U, no Gravity latch.
- **VOH7502U4U1:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) plain handle, PVV104U, with Gravity latch.
- **VOH7503A4A0:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) lockable handle, PVV104, no Gravity latch.
- **VOH7503B4U0:** VOH750 Manhole 24 Bolt, Alum bridge (24kPa) lockable handle, PVV104U, no Gravity latch.
- **VOH7503B4U1:** VOH750 Manhole 24 Bolt, Alum bridge (24kPa) lockable handle, PVV104U, with Gravity latch.
- **VOH7503U4U0:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) lockable handle, PVV104U, no Gravity latch.
- **VOH7503U4U1:** VOH750 Manhole 24 Bolt, Alum bridge (30kPa) lockable handle, PVV104U, with Gravity latch.

Note: Refer for VOH Series ordering guide for all models available.

Associated Equipment

- **VOH700-26:** Aluminium Coaming.
- **VOH700-26M:** Mild Steel Coaming.
- **AVV3.0-10:** Vapour Recovery Blank Plate.
- **VOH700TH-13:** Dip & Fill Blank Plate.
- **VOH700TH-14:** Overfill Blank Plate.
- **VOH700-22:** Sight Glass.
- **UG101:** Ullage Gauge.

VOH750 MANHOLE ASSEMBLY



ITEM 2: MODEL SHOWN WITH PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-32A)
VARIANTS:PLAIN HANDLE, 24kPa (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32B)
PLAIN HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-32U).
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104 (SUB-ASSEMBLY VOH500-33A)
LOCKABLE HANDLE, 24kPa (3 PSI) SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-33B)
LOCKABLE HANDLE, 30kPa SPRING & LABEL FOR PVV104U (SUB-ASSEMBLY VOH500-33U)

ITEM 3: PRESSURE VACUUM VENT REQUIRED IS DETERMINED BY CONFIGURATION OF ITEM 2.

ITEM 4: MODEL SHOWN WITH ROLLED ALUMINIUM COAMING VOH700-26
VARIANT: MILD STEEL COAMING VOH700-26M
COAMING SUPPLIED SEPARATELY

ITEM 5: GASKET & FASTENER SUB-ASSEMBLY IS SUPPLIED SEPARATELY.

NOT SHOWN: GRAVITY LATCH SUB-ASSEMBLY (ADD IF REQUIRED - VOH500-34Z)

ITEM NO.	PART NUMBER	DESCRIPTION	VOH750	MATERIAL
1	VOH750-1	COVER MANHOLE	1	ALUMINIUM
2	VOH500-32A	EMERGENCY VENT PLAIN BRIDGE & HANDLE	1	ALUMINUM
3	VOH700-26	COAMING ALUMINIUM 24 BOLT	1	ALUMINIUM
4	VOH700-36Z	GASKET & FASTENER KIT	1	NBR CORK
5	PVV104	PRESSURE AND VACUUM VENT	1	ALUMINIUM



Swing Hatches

Liquip offers a range of 441mm swing easy access style manhole covers for tankers that carry dangerous goods and where frequent entry is required, such as for cleaning when changing loads.

Swing Hatches are supplied in Aluminium or Mild Steel and are fitted with an integral emergency vent and have a provision for a pressure vacuum vent.

Swing Hatches are also available in a clean skin configuration (no pressure vacuum vent).

Liquip offers various seal materials to suit a wide range of applications.

Features & Benefits

- Integral emergency vent and provision for a pressure vacuum vent.
- Swing hatches come complete with coaming in a range on materials.
- Allows for easy access for loading and cleaning.
- Suits a range of tank containers, road tankers and storage tankers.
- 4 fastening swing bolts.

Technical Information

Regulations

Passes Australian Drop Tests and complies with UK & US regulations. Australian drop tests.

Mounting

Via 4 wing nuts.

Venting

Emergency vent opens at 30 kPa.

Capacity

7450m³/hr at 45 kPa.

Ordering Information

MAIN SEAL MATERIAL
B = Buna (Nitrile)
V = Viton™(FKM)
T = Teflon™(PTFE)

SH303 - AA - BB

COAMING MATERIAL
A = Aluminium
M = Mild Steel

VENT SEAL MATERIAL
B = Buna (Nitrile)
V = Viton™(FKM)
T = Teflon™(PTFE)

Also, SH303-AA-BVPVV & SH303-AS-VTPVV as above but with PVV suffix indicates these are supplied with PVV104 pressure vacuum vents fitted.

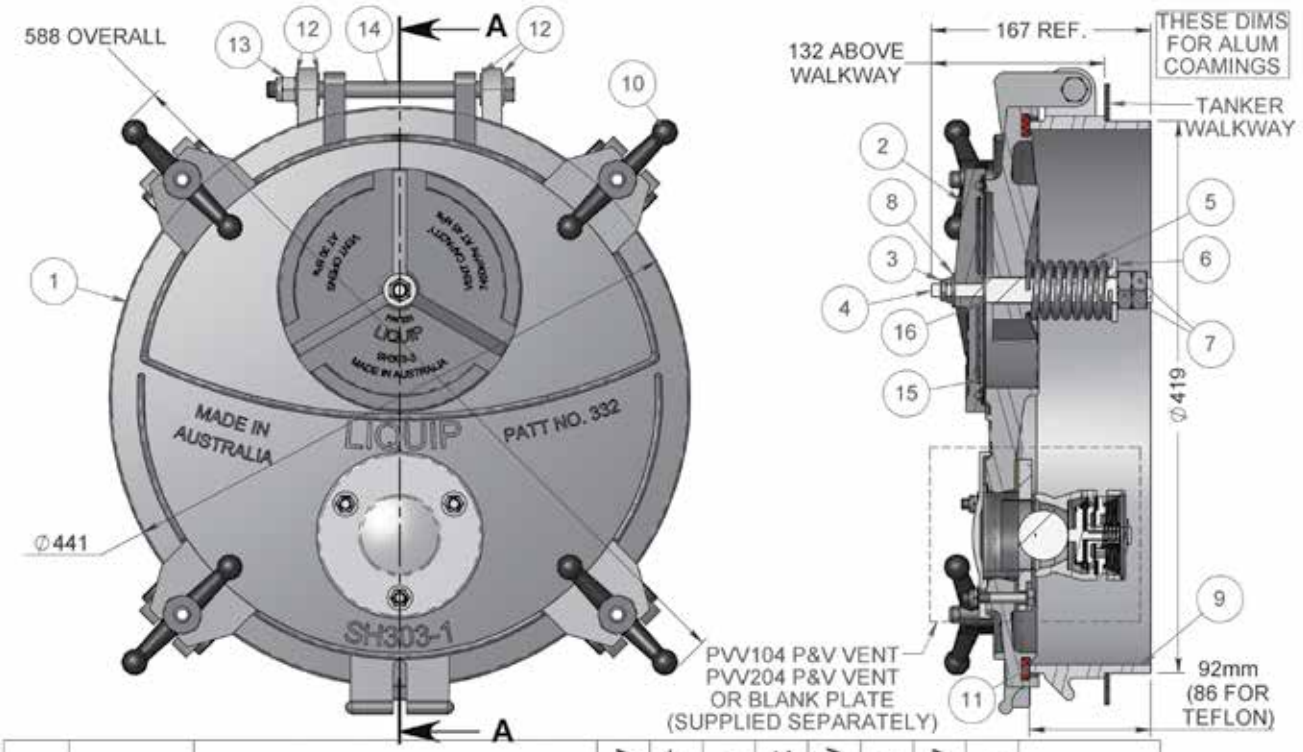
Coamings

- **SH302-2MY:** M/S coaming c/w bolts.
- **SH301-2Y:** Al coaming c/w bolts.
- **SH302-2MHY:** Taller M/S coaming c/w bolts.

Associated Equipment

- **PVV204:** Pressure Vacuum Vent.
- **HWC304Z:** Green Hatch Weather Cover for SH303.

SH303 SERIES SWING HATCHES



ITEM	PART NUMBER	DESCRIPTION	SH303-AA-BV	SH303-AA-VT	SH303-AA-V	SH303-AA-TX	SH303-AM-BV	SH303-AM-V	SH303-AS-BV	SH303-AS-V	MATERIAL
1	C0332	CHEMICAL SWING HATCH	1	1	1	1	1	1	1	1	ALUMINIUM
2	SH303-3	EMERGENCY VENT COVER	1	1	1	1	1	1	1	1	ALUMINIUM
3	0797	NUT GLENLOC IMP	1	1	1	1	1	1	1	1	ST STEEL
4	SH303-7	EMERGENCY VENT SPINDLE	1	1	1	1	1	1	1	1	ST STEEL
5	4413	SPRING COMPRESSION	1	1	1	1	1	1	1	1	ST STEEL
6	SH303-4	SPRING RETAINER FOR	1	1	1	1	1	1	1	1	ST STEEL
7	4384	NUT - HALF	2	2	2	2	2	2	2	2	ST STEEL
8	0812	WASHER FLAT LARGE	1	1	1	1	1	1	1	1	ST STEEL
9	SH301-2Y	ALUMINIUM COAMING ASSY	1	1	1	-	-	-	-	-	ALUMINIUM
	SH301-2YT	ALUMINIUM COAMING ASSY	-	-	-	1	-	-	-	-	ALUMINIUM
	SH302-2MY	MILD STEEL COAMING	-	-	-	-	1	1	-	-	STEEL
	SH301-2SY	COAMING ASSY	-	-	-	-	-	-	1	1	ST STEEL
10	SH301-4	TEE HANDLE FOR SWING HATCHES	4	4	4	4	4	4	4	4	SG IRON
11	0242	SEAL FOR SWING HATCH	-	1	1	-	-	1	-	1	VITON A
	0241	SEAL FOR SWING HATCH	1	-	-	-	1	-	1	-	NITRILE
	7604	SEAL FOR SWING HATCH	-	-	-	1	-	-	-	-	PTFE
12	5266	WASHER FLAT	4	4	4	4	4	4	4	4	Z/P STEEL
13	6001	NUT NYLOC	1	1	1	1	1	1	1	1	Z/P STEEL
14	6488	BOLT METRIC	1	1	1	1	1	1	1	1	Z/P STEEL
15	4608	SEALING DISC TO SUIT	-	1	-	1	-	-	-	-	PTFE
16	5307	WASHER FLAT	-	1	-	1	-	-	-	-	ST STEEL

ITEMS 1-8 MAKE UP SH303-1Y



9” Emergency Inspection Hatches

EH230 SERIES

Liquip offers a unique 225mm (9”) aluminium emergency inspection hatch with a quick opening lid that doubles as an emergency vent with pressure/vacuum relieving vent and rollover protection.

Features & Benefits

- Easy to open.
- Two stage opening for added safety.
- Operates as an emergency vent.
- Incorporates a standard Liquip pressure vacuum vent for thermal relief of the tanker (optional).
- Supplied as a complete unit ready for fitting to a tanker or storage tank.
- A wide variety of seals are available depending on the product being stored or transported.

Technical Information

Standards

Complies with Australian Standard AS2809 and USA standard NFPA 385 (1990).

Two-Stage opening

- For safety the hatch has a two-stage opening and also acts as an emergency vent.
- Supplied as a complete assembly.

Pressure and Capacity

For emergency vent opening pressure & capacity refer to individual data sheets for Emergency Vent configurations.

Coaming and Seals

- The Weld-in 150mm coaming is available in aluminium, mild steel or stainless steel.
- Wide variety of seals available to suit various applications & products.

PVV Valves

- Optional pressure & vacuum vent can be incorporated. For opening pressure & capacity see PVV104 series datasheet.
- PVV104 vent is standard for Australia & NZ.
- PVV104U is standard for most other countries.

Ordering Information

PVV VENT
2 = Blanking Plate
4 = PVV104 (Australian)
4U = PVV04U (rest of the world)

EH230 - A - 2AV - 2

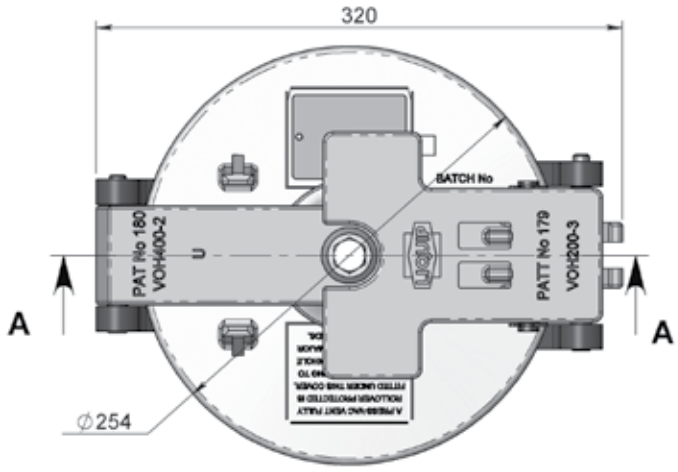
COAMING MATERIAL
A = Aluminium
M = Mild Steel

EMERGENCY VENT
2A = Nitrile Seal (Australian)
2AV = Viton™Seal (Australian)
2U = Nitrile Seal (rest of the world)
2UV = Viton™Seal (rest of the world)

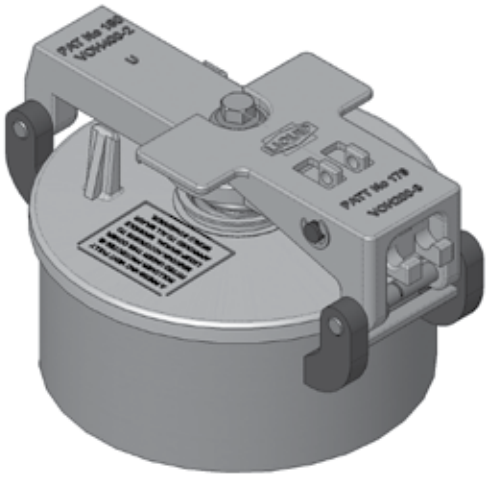
Associated Equipment

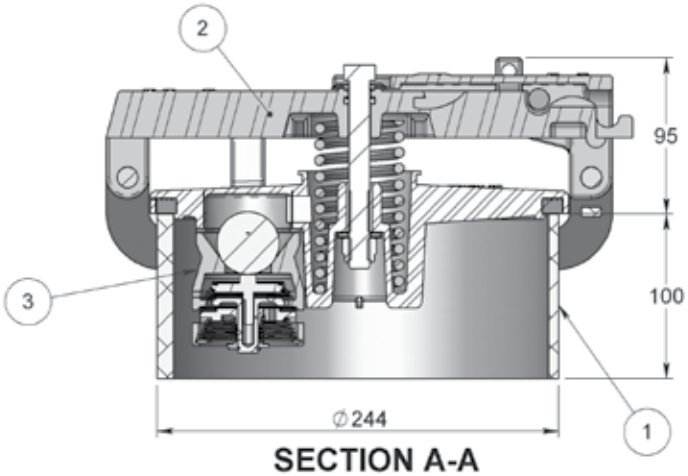
- **EH230-1M:** Steal Coaming (hole required :approx. 245mm).
- **EH230-1A:** Aluminium Coaming (hole required: approx. 245mm).

EH230 EMERGENCY HATCH ASSEMBLIES



TOP VIEW





SECTION A-A

ITEM	PART NUMBER	DESCRIPTION	DESCRIPTION (CONT')	MATERIAL
1	EH230-1A	COAMING ASSEMBLY	9" EMERGENCY HATCHES	ALUMINIUM
	EH230-1M	COAMING ASSEMBLY FOR 9"	EMERGENCY HATCHES	STEEL
2	VOH500-32A	EMERGENCY VENT PLAIN BRIDGE & HANDLE	AUST SPRING & LABEL	ALUMINIUM & NITRILE
	VOH500-32AV	EMERG. VENT, BRIDGE & PLAIN HANDLE VITON SEAL 0237	AUST SPRING & LABEL	ALUMINIUM & VITON
	VOH500-32U	EMERG. VENT BRIDGE & PLAIN HANDLE	CEN SPRING & LABEL	ALUMINIUM & NITRILE
	VOH500-32UV	EMERG. VENT BRIDGE & PLAIN HANDLE VITON SEAL 0237	CEN SPRING & LABEL	ALUMINIUM & VITON
3	PVV104	PRESSURE AND VACUUM VENT	AUST SPRING	ALUMINIUM
	PVV104U	PRESSURE AND VACUUM VENT	UK & US VERSION	ALUMINIUM
	PVV104-2	BLANKING PLATE	WHEN NO PVV FITTED	ALUMINIUM



9" Emergency Hatch Sub-assembly

Tanker top manhole Ø230mm quick-opening inspection hatch sub-assembly that doubles as emergency vent with provision for pressure/vacuum relieving vent and rollover protection. Must be fitted to a VOH manhole (supplied separately).

Features & Benefits

- Easy to open.
- Two-stage opening for added safety.
- Lightweight aluminium construction.
- Plain or lockable handle.
- A key (VOH400-10, ordered separately) is required to access inspection hatch when fitted with lockable handle.
- Pressure/vacuum vent mounts onto underside of the sub assembly (ordered separately).

Technical Information

Operation

Handle may be opened (a key is required for VOH500-33 lockable versions) to allow bridge & vent lid to swing away and make inspection hatch accessible.

Both handles may be locked with additional padlock (not supplied).

Mounting

Mounts onto all Liquip VOH series manholes with hinge pins provided.

Materials

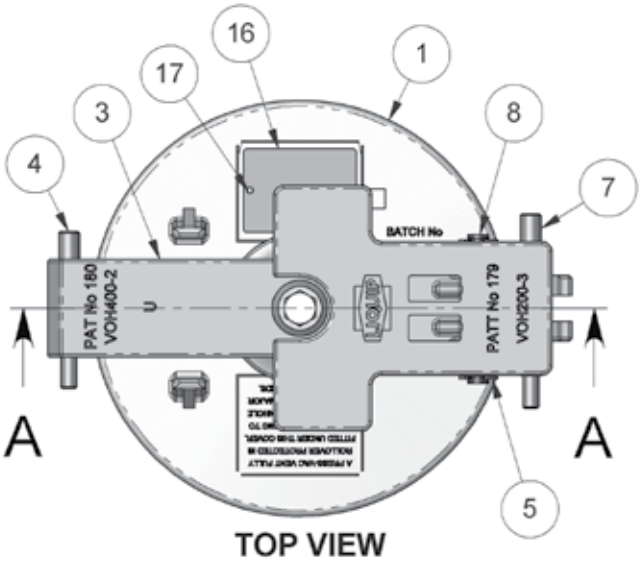
All major components are aluminium.

Vent seal is nitrile rubber.

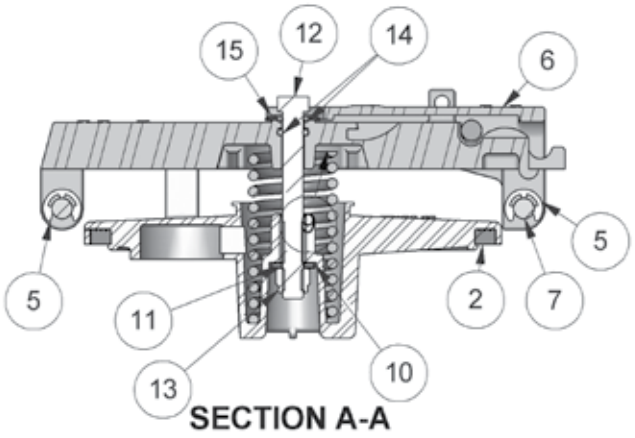
Ordering Information

	30kPa spring (6108) & label 7321 to suit PVV104	24kPa spring (4464) & label 7322 to suit PVV104U	30kPa spring (6108) & label 7324 to suit PVV104U
VOH200-3 Plain Handle	**VOH500-32A**	**VOH500-32B**	**VOH500-32U**
VOH400-7 Lockable Handle	**VOH500-33A**	**VOH500-33B**	**VOH500-33U**
PVV to be used	PVV104	PVV104U	PVV104U

VOH500-32A (PLAIN HANDLE)



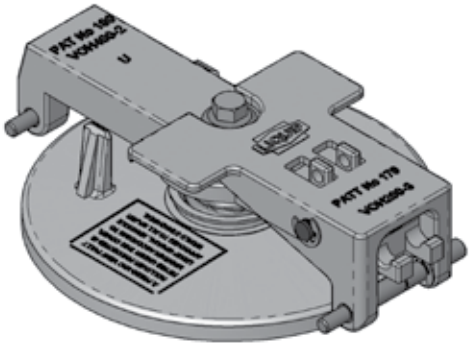
TOP VIEW



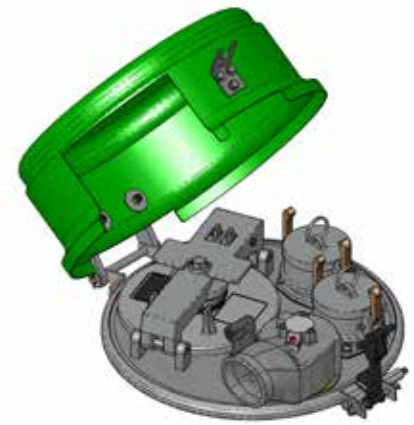
SECTION A-A

EMERGENCY VENT
Opens at: 30kPa
Capacity: 8500m³/hr at 45kPa

PRESSURE/VACUUM VENT
(Model PVV104, supplied separately)
Opens at: 15kPa pressure & 2kPa vacuum
Capacity: 98m³/hr at 35kPa



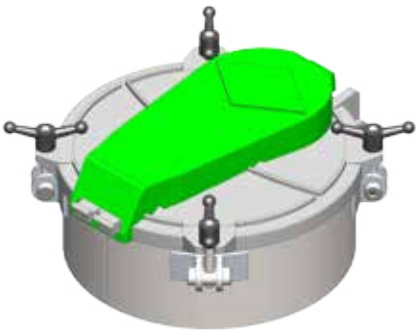
ITEM NO.	PART NUMBER	DESCRIPTION	VOH500-32A	MATERIAL
1	VOH700-4U	EMERGENCY VENT COVER 9"	1	ALUMINIUM
2	0236	SEAL 9" HATCH LID	1	HAN
3	VOH400-2U	BRIDGE - MANHOLE EMERGENCY VENT	1	ALUMINIUM
4	VOH200U-9	BRIDGE PIN	1	ST STEEL
5	0096	E-CLIP IMPERIAL	4	STEEL
6	VOH200-3	HANDLE FOR VOH MANHOLES	1	ALUMINIUM
7	VOH200-21	HANDLE PIN FOR GRAVITY LATCH	1	ST STEEL
8	VOH200-10	PINS (HANDLE, BRIDGE & CAM)	1	1/2" ST STEEL
9	6108	SPRING COMPRESSION	1	SPRING STEEL
10	0886	WASHER FIBRE	2	FIBRE
11	7477	WASHER FLAT IMPERIAL	1	ST STEEL
12	4863	BOLT HEX HD	1	Z/P STEEL
13	0152	NUT NYLOC	1	Z/P STEEL
14	0235	O-RING	2	VITON B70
15	7143	COVER for BOLT O-RING ON MANHOLE	1	ST STEEL
16	7321	LABEL f. EMERGENCY VENT	1	ALUMINIUM
17	6579	HAMMER DRIVE SCREW	2	Z/P STEEL



HWC301 suitable for VOH400 Hatches

Hatch Weather Covers

Liquip's hatch weather covers mount onto the manhole and protect against the ingress of water into compartments and deter unauthorised access to the compartment hatches.



HWC304Z suitable for Swing Hatches

Features & Benefits

- Fibreglass cover.
- Simple stainless steel split pins allow for easy removal for maintenance.
- Quick release rubber clamp allows for quick opening and closing of the cover.
- Cover has a cut out for AVV vent to connect to the vapour coaming.

Technical Information

Operation

Liquip hatch weather covers are hinged on one end with an over-centre rubber clamp latch on the opposite end.

To allow full access to the hatch cover, unhook the clamp and lift the cover.

Adjustment or Service

Latching end is self-centring.

Materials

Cover- Fibreglass.

Clampband & fasteners- Zinc plated mild steel.

Hinge bracket on cover- Cast aluminium.

Mounting

HWC301 has an integrated clampband which replaces the standard clampband to secure the VOH hatch.

Weight

2.6 kg.

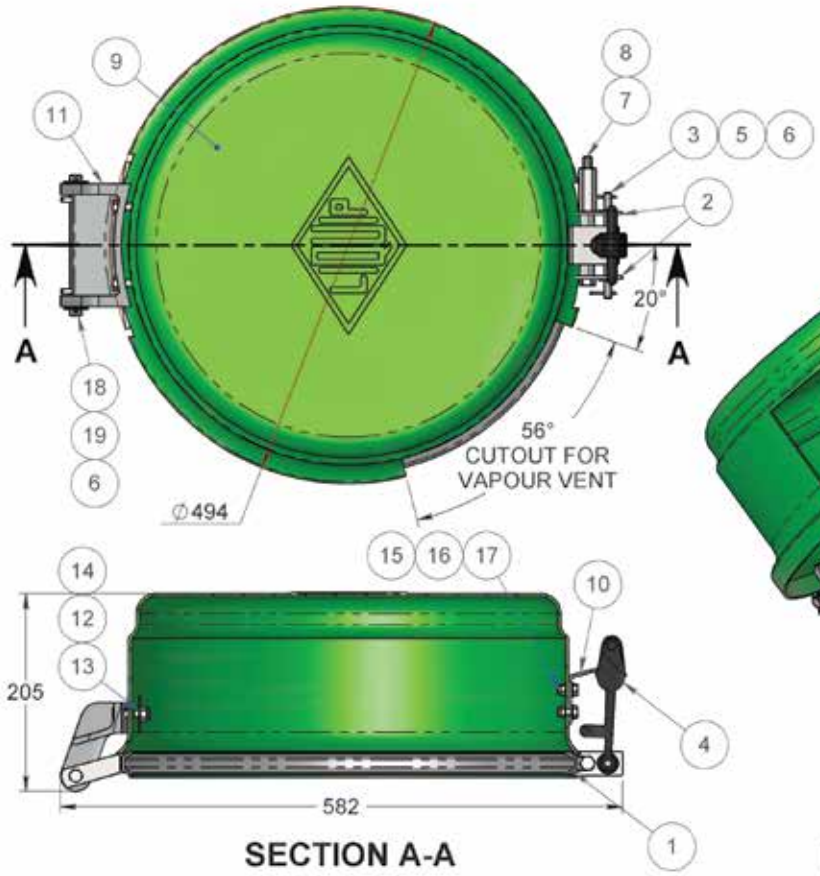
Ordering Information

- **HWC301:** Green Hatch Weather Cover for VOH400 Hatches.
- **HWC304Z:** Green Hatch Weather Cover for Swing Hatches.

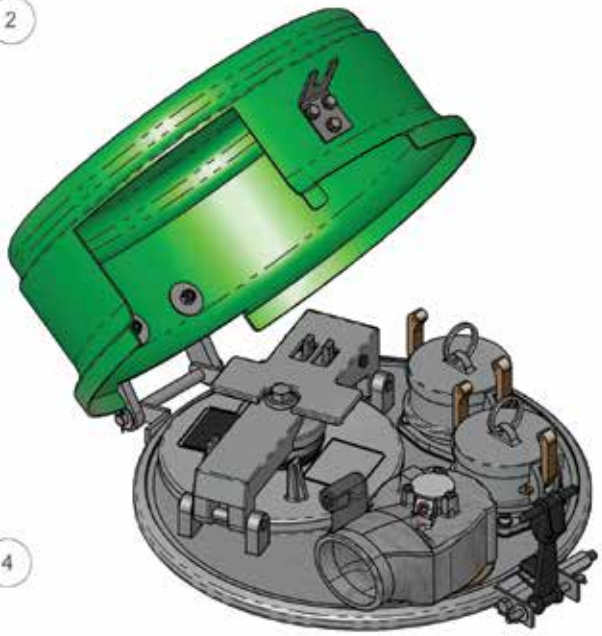
Associated Equipment

- **VOH4102A4N0:** Aluminium 18" manhole cover assembly.
- **VOH4102A4A0Z:** VOH4102A4N0 comes with clamp band assembly and PVV104 (vapour vent).
- **VOH4102A4N0Z:** VOH4102A4N0 comes with clamp band assembly and PVV blanking plate.

HWC301 HATCH WEATHER COVER



SECTION A-A



FITTED TO VOH410 HATCH

ITEM	PART No	DESCRIPTION	QTY	MATERIAL
1	HWC301-1	CLAMPBAND DETAILS	1	STEEL
2	HWC301-3	CLAMP BRACKETS	2	STEEL
3	HWC301-5	CLAMP PIN	1	ST STEEL
4	0987	5" RUBBER CLAMP BLACK	1	NAT RUBBER
5	0101	WASHER FLAT	2	Z/P STEEL
6	0764	SPLIT PIN	4	ST STEEL
7	4877	BOLT HEX HD IMP	1	Z/P STEEL
8	PH100-3	NUT - EXTENDED	1	Z/P STEEL
9	70036	HATCH WEATHER COVER	1	FIBERGLASS
10	HWC301-2	CLAMP DOWN BRACKET	1	STEEL
11	SH201-17	LARGE HINGE BRACKET FOR	1	ALUMINIUM
12	0500	WASHER FLAT LARGE OD	2	Z/P STEEL
13	0012	SETSCREW HEX	2	Z/P STEEL
14	0149	NUT NYLOC	2	Z/P STEEL
15	3090	SETSCREW HEX HD IMPERIAL	3	Z/P STEEL
16	0100	WASHER FLAT	3	Z/P STEEL
17	4399	NUT NYLOC	3	Z/P STEEL
18	SH201-13	HINGE PIN FOR	1	ST STEEL
19	0104	WASHER FLAT IMPERIAL	2	Z/P STEEL



Hatch Blank Plates

Liquip manufacture a range of blank plates that can be fitted to any unused mounting positions on Liquip manhole covers/hatches.

Features & Benefits

- Fastened from the underside of the manhole cover providing security and weather proofing.
- Gaskets & fasteners are supplied with each blank plate.

Ordering Information

Overfill Point blank plate

- **VOH700TH-14:** Overfill blank plate, blind tapped blank for VOH750 series manhole covers.
- **VOH200-14:** Overfill blank plate, through hole for VOH410 series manhole covers.

Dip & Fill Point blank plate

- **VOH700TH-13:** Dip & Fill blank plate, blind tapped blank for VOH750 series manhole covers.
- **VOH-16:** Dip & Fill blank plate, through hole for VOH410 series manhole covers.
- **7237Z:** Blank plate for VOH500 series manhole covers only.

Vapour point blank plate

- **AVV3.0-10:** Vapour point blank plate, blind tapped blank for VOH410 & VOH750 series manhole covers.
- **7237Z:** Blank plate for VOH500 series manhole covers only.



Ullage Gauge

The Liquip Ullage Gauge can be mounted to any Liquip manhole cover.

Once fitted and the compartment calibrated, it can be securely locked and sealed in position to allow easy verification from the ground of the product level within each compartment.

Features & Benefits

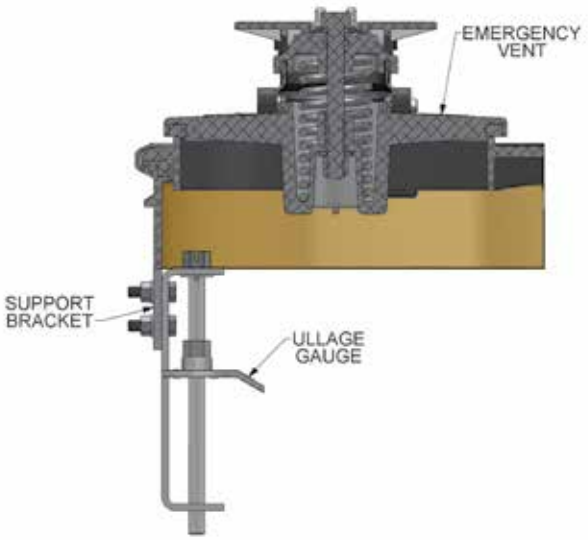
- A support bracket can be welded or bolted onto the bottom of the weld ring on the inside of the tank and the gauge is fitted so that it can be easily seen through the emergency vent.

Ordering Information

- **UG101:** Ullage Gauge.

Associated Equipment

- All Liquip Manholes/Hatches.





Clampbands

Liquip offers Mild Steel Clampbands to suit the 18" VOH410 Series manhole covers.

Clampbands secure clampband style hatches to weld in coamings.

Ordering Information

- **VOH300U-16:** Zinc plated Mild Steel Clampband to suit VOH410 Series hatches.
- **VOH400-35Z:** Nitrile Seal & M/S Clampband kit to suit VOH410 Series hatches.

Associated Equipment

- **VOH300-7:** VOH410 Main Seal (Nitrile).
- **4370:** Zinc plated flat washer 3/8 x 3/4 OD.
- **4877:** Zinc plated BSW Bolt 3/8 x 5 HX.
- **PH100-3:** Nut Clamp Band.



Emergency Hatch Coamings

Liquip offers a range of weld in coamings to suit the EH230 Series of emergency hatches.

Features & Benefits

- Coaming assemblies are available in Aluminium, Mild Steel or Stainless Steel.

Ordering Information

- **EH230-1A:** Aluminium Coaming to suit EH230 Series.
- **EH230-1M:** Mild Steel Coaming to suit EH230 Series.



Swing Hatch Coamings

Liquip offers a range of mild steel weld in coamings to suit the Swing Hatch (SH) series hatches/manlids.

Features & Benefits

- Coamings assemblies are supplied with bolts.
- Allows hatches to be mounted on to tanker.
- Can be supplied in Aluminium, Mild Steel or Stainless Steel.

Ordering Information

- **SH302-2MY:** Mild Steel Coaming c/w bolts.
- **SH302-2MHY:** Taller Mild Steel Coaming c/w bolts.
- **SH301-2SY:** Stainless Steel coaming c/w bolts. (made to order)
- **SH301-2Y:** Aluminium coaming c/w bolts.



Manlid/Hatch Coamings

Liquip offers a range of weld in coamings to suit the VOH series hatches/manlids

Features & Benefits

- Coamings to suit Liquip 18" and 20" manlids.
- Can be supplied in Aluminium or Mild Steel.
- Welded and tested to ensure the coaming passes Australian drop tests.
- Allow hatches to be mounted on to tanker.

Technical Information

Model	Material	Profile	OD - Body (mm)	Mount
VOH300-15	Al	Ribbed	447	Weld in
VOH300-15P	Al	Plain	447	Weld in
VOH300-17	M/S	Straight	447	Weld in
VOH500-14A	Al	Straight	513	Weld in
VOH500-17M	M/S	Straight	500	Weld in
VOH700-26	Al	Straight	398	Weld in
VOH700-26M	M/S	Straight	398	Weld in

Ordering Information

- **VOH300-15:** Aluminium coaming to suit VOH410 Series.
- **VOH300-15P:** Aluminium coaming to suit VOH410 Series.
- **VOH300-17:** Mild Steel coaming to suit VOH410 Series.
- **VOH500-14A:** Aluminium 24 bolt coaming to suit VOH500 Series.
- **VOH500-17M:** Mild Steel 24 bolt coaming to suit VOH500 Series.
- **VOH700-26:** Aluminium 24 bolt coaming to suit VOH750 Series.
- **VOH700-26M:** Mild Steel 24 bolt coaming to suit VOH750 Series.

COAMINGS FOR:

VOH400 SERIES







VOH500 SERIES





VOH700 SERIES

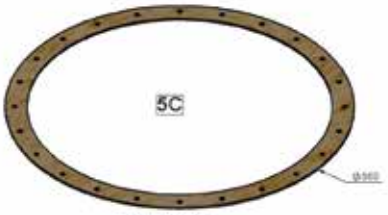




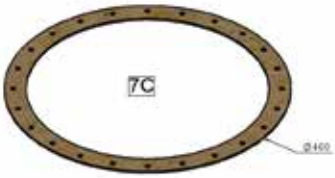
SEAL & CLAMPBAND KITS



VOH400-35Z
SEAL & CLAMPBAND
SUB ASSEMBLY FOR
VOH400 SERIES MANHOLES



VOH500-36Z
GASKET NUTS , BOLTS & WASHERS
TO BOLT DOWN MANHOLE
STANDARD LIQUIP COAMING



VOH700-36Z
GASKET NUTS , BOLTS & WASHERS
TO BOLT DOWN MANHOLE
STANDARD LIQUIP COAMING

0C

NONE SUPPLIED



Aluminium Air Operated Vapour Vents

AVV Series of aluminium sequential air operated vapour vents have a 90mm nominal diameter outlet and are sequentially air actuated to allow the venting of vapour from tanker truck compartments while loading or unloading.

The AVV series can be used in conjunction with an overfill protection interlock that prevents loading if the vapour recovery system has failed to fully activate.

Features & Benefits

- Aluminium construction with Viton™ seals as standard.
- The sequencing valve is offered to ensure the main poppet is fully open before next vent opens.
- Bolted from inside tank. Gauze in body prevents access through outlet spout in certain models (optional).
- The end signal can then be used to allow loading/unloading in the certainty that all vapour vent poppets are open.
- The sequencing valve can be blanked if not required.

Technical Information

Operating Pressure

Operating air pressure 120 kPa to 900 kPa. (Normal 500 kPa).

Air Consumption

1.0L free air per stroke.

Mounting

Directly on to manhole covers VOH410 and VOH750
or by weld flanges in aluminium or steel.

Materials

- Aluminium body.
- Acetal Piston with Viton™ seal, as standard.
- Teflon™Piston with FFKM seals are available (AVV075K).

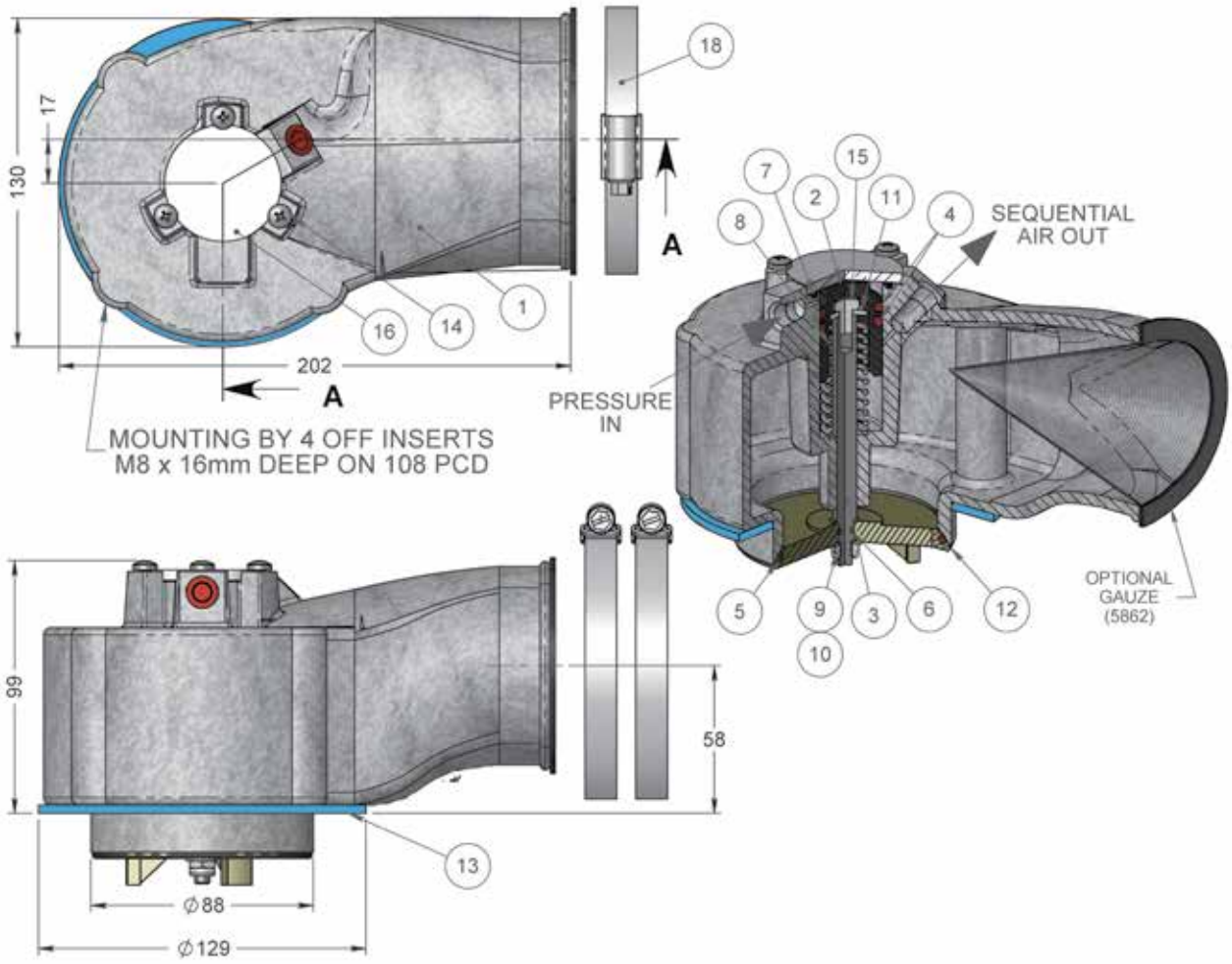
Ordering Information

- **AVV075V:** Sequential Vapour Vent with Viton™ O-rings.
- **AVV075K:** Chemical Version Sequential Vapour Vent with Kalrez O-rings.
- **AVV075VW:** Sequential Vapour Vent with through holes (Coaming mount).
- **AVVF075V:** Flange mounted sequential vapour recovery vent, mounts to VOH500 series only or separate weld in flanges.

Associated Equipment

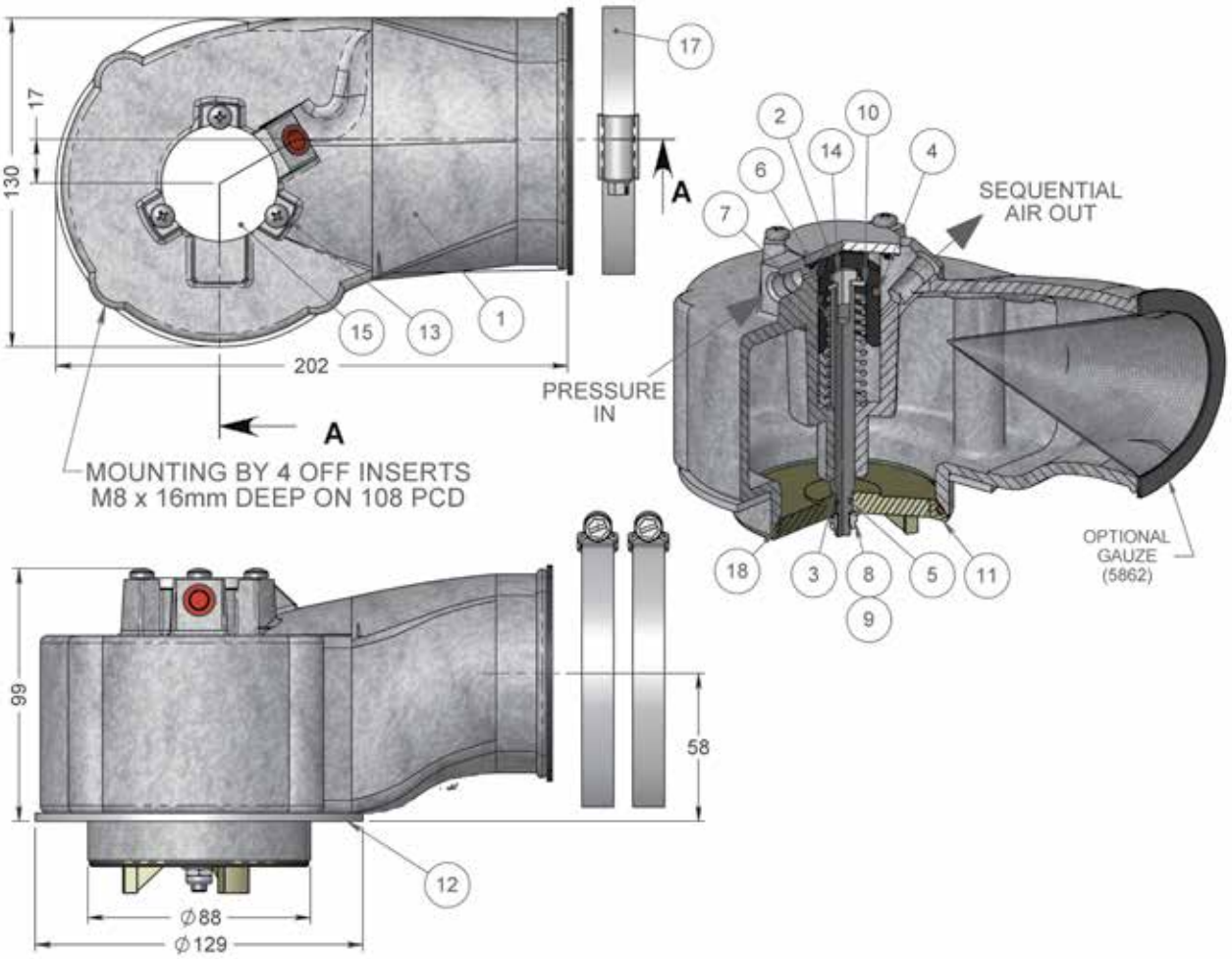
- **VRB3.5-1:** Aluminium Weld stub to allow venting into coaming.
- **AVV3-12:** Polyurethane louvre for weather & anti-spark protection.
- The poppet opens inwards to prevent leakage and spills from product surge in the event of a tanker rollover.

AVV075V VAPOUR VENT



ITEM NO.	PART NUMBER	DESCRIPTION	AVV075V	MATERIAL
1	AVV075V-1	BODY FOR LOW PROFILE	1	ALUMINIUM
2	AVV075V-3	PISTON	1	ACETAL
3	AVV075V-6	SHAFT - LOW PROFILE	1	ST STEEL
4	4574	O-RING	2	VITON A
5	4507	O-RING	1	VITON A
6	6088	O-RING	1	VITON A
7	6089	O-RING	1	NITRILE
8	6141	SPRING COMPRESSION	1	ST STEEL
9	4400	NUT HALF NYLOC	1	Z/P STEEL
10	5267	WASHER FLAT	1	Z/P STEEL
11	5329	WASHER FLAT	1	Z/P STEEL
12	AVV075V-4	POPPET	1	ALUMINIUM
13	3096	GASKET	1	NBR CORK
14	6501	SCREW METRIC	3	ST STEEL
15	6523	SETSCREW METRIC	1	Z/P STEEL
16	AVV075V-5	LID FOR LOW PROFILE VAPOUR VENT	1	ALUMINIUM
17	7294	INSTRUCTION LEAFLET	1	PAPER
18	2308	CLAMP HOSE No.5	2	Z/P STEEL

AVV075K VAPOUR VENT



ITEM NO.	PART NUMBER	DESCRIPTION	AVV075K	MATERIAL
1	AVV075V-1	BODY FOR LOW PROFILE	1	ALUMINIUM
2	AVV175V-3	PISTON	1	TEFLON
3	AVV075V-6	SHAFT - LOW PROFILE	1	ST STEEL
4	7569	O-RING	1	KALREZ
5	7581	O-RING	1	KALREZ
6	6089	O-RING	1	NITRILE
7	6141	SPRING COMPRESSION	1	ST STEEL
8	4400	NUT HALF NYLOC	1	Z/P STEEL
9	5267	WASHER FLAT	1	Z/P STEEL
10	5329	WASHER FLAT	1	Z/P STEEL
11	AVV075V-4	POPPET	1	ALUMINIUM
12	4297	GASKET	1	EXP-PTFE
13	6501	SCREW METRIC	3	ST STEEL
14	6523	SETSCREW METRIC	1	Z/P STEEL
15	AVV075V-5	LID FOR LOW PROFILE VAPOUR VENT	1	ALUMINIUM
16	7888	INSTRUCTION LEAFLET	1	PAPER
17	2308	CLAMP HOSE No.5	2	Z/P STEEL
18	7593	O-RING TO BS1806 & SAE AS568A	1	KALREZ



Anti-Sparking Louvre Kits

Liquip's polyurethane Louvre kits provide weather and spark protection for Liquip vapour vents.

Louvre kits are normally used on the vapour dump vent, but can be used for normal vapour venting applications if there is no vapour recovery operation.

Technical Information

Mounting

Mounts over the end of the vapour vent outlet and is fastened with a hose clamp.

Materials

Polyurethane body and stainless steel gauze.

Ordering Information

- **AVV3-12:** Polyurethane louvre for weather & anti-spark protection.
- **VRB-11:** Outlet louvre Cover.

Associated Equipment

- **VRB3.5-1:** Aluminium weld stub.
- **VRB3.5-2:** Mild Steel weld stub.



Mounting Flanges for AVV Vapour Vents

Liquip provides a range of AVV series vapour vent mounting flanges.

Flanges are available in a range of materials including: aluminium, mild steel and stainless steel.

Item	Mount	Material	Mounting Holes
AVV3L-7	Walkway	Aluminium	Through holes
AVV3L-8	Walkway	Mild Steel	Tapped through holes
AVV3L-9	Walkway	Aluminium	Tapped through holes
AVV3.0-9	Walkway	Stainless Steel	Tapped through holes
AVV3L-10	Walkway	Mild Steel	Tapped through holes
AVV3SS-10	Walkway	Stainless Steel	Blind tapped holes



Vapour Vent Hose

Liquip offers 1 metre buna hoses to connect the Vapour Vent to the Rollover coaming.

Ordering Information

- **VH3.5:** 1m vapour vent buna hose.

Associated Equipment

- **VRB3.5-1:** Stub Vapour, Aluminium.
- **VRB3.5-3:** 45° Stub Vapour, Aluminium.



Weld Stubs

Liquip's aluminium weld stubs make connecting the vapour vents to the rollover coaming a fast and simple exercise.

Ordering Information

- **VRB3.5-1:** 90mm Vapour Stub, Aluminium.
- **VRB3.5-3:** 90mm Vapour Stub, 45°, Aluminium.

Associated Equipment

- **VH3.5:** Hose 1m Long (Used to connect the Vapour Vent outlet to the coaming weld stub).

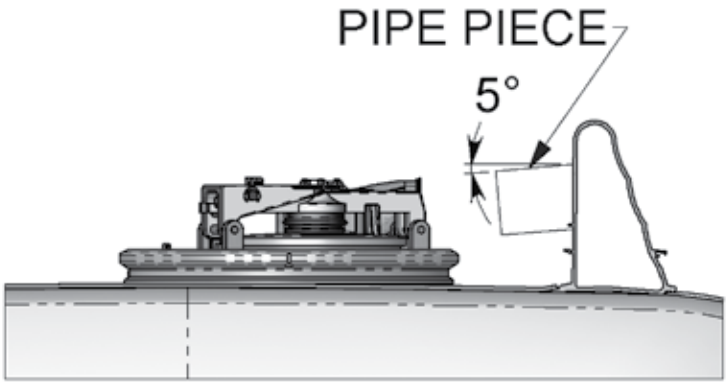
Vapour Vents

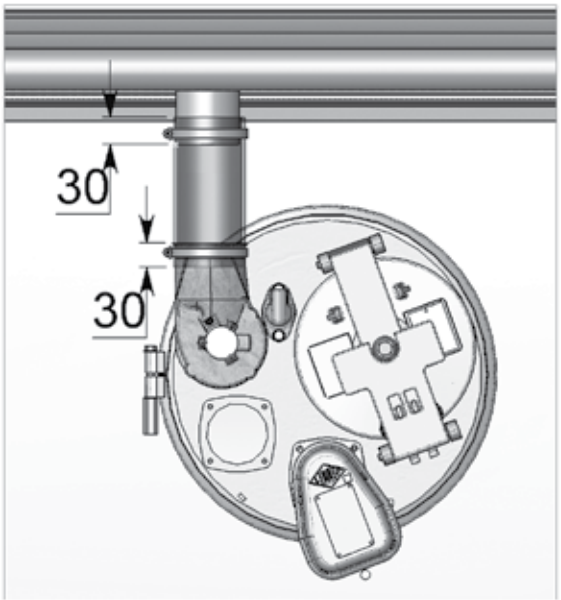
Vapour vents must be sited as near as possible to the compartment centre line to avoid problems when the tanker is not on a level surface. Vapour vents should never be sited adjacent to a bulkhead or too far to the left or right across the tank.

The pipe piece welded into the roll-over weld-ring of the tank should be inclined down towards the vapour vent approximately 5 degrees.

Weld Stub Installation

- When fitting the vapour vent to the manhole, position the vapour vent onto the manhole and cut a piece of 90mm ID hose allowing for approx. 30mm of hose to go onto the vent and another 30mm over the pipe piece on the rollover coaming.
- Fit the hose to the vent and attach with a hose clamp. Position the hose onto the pipe piece on the rollover coaming aligning the mounting holes in the vent with the holes in the manhole cover.
- Secure the vent to the manhole cover ensuring the screws that secure the vent to the cover and tighten to 10- 12 Nm.
- Secure the hose to the pipe-piece with a hose clamp.





Vapour Vent Positioning

- The vapour vent can be walkway mounted either directly in the case of a flat walkway, or by installing a weld flange.
- When installing a vapour vent to the walkway model vents must be used in conjunction with blind tapped weld flanges. These vent models allow mounting from above only so access from inside the tank compartment is not required. The vent must not be installed too close to a bulkhead and as close to the tank centre line as possible.
- It is essential the correct Liquip-designed weld flange be used otherwise venting may be severely restricted.

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



Stainless Steel Air Operated Vapour Vents

AVV3SST air operated chemical vapour vent has been designed for superior chemical compatibility and resistance.

The AVV3SST is a sequential vapour vent with the exhaust of the previous valve opening the next in line. The exhaust from the last vent can be used via a pressure switch to activate the overfill protection system once all vents are open.

It has a 90mm nominal diameter outlet for reduced pressure drop and increased vapour flow during loading and unloading.

Features & Benefits

- Adjustment free.
- Low maintenance.
- 90mm nominal diameter outlet for a minimum full 80mm flow throughout.
- Piston operation for sequential operation.
- Downward opening poppet to prevent leaks from product surge, in the event of a tanker rollover.
- The sequencing valve is offered to ensure the main poppet is fully open before next vent opens.
- The end signal can then be used to allow loading/unloading in the certainty that all vapour vent poppets are open.
- Air cylinder is serviceable without removing the valve from tank.

Technical Information

Operating Pressure

- Operating air cylinder pressure: 70 to 900 kPa (normal 500 kPa).
- Opening pressure: 7 kPa vacuum.

Air Consumption

1.0L free air per stroke.

Mounting

- Bolted from the outside to a blind Stainless Steel weld flange.
- Flange mount: 8 holes equally spaced, 11mm on a 130mm PCD. 154mm OD.

Materials

- 316 Stainless Steel body.
- 316 Stainless Steel trim with FFKM, Viton™and Teflon™encapsulated seals.

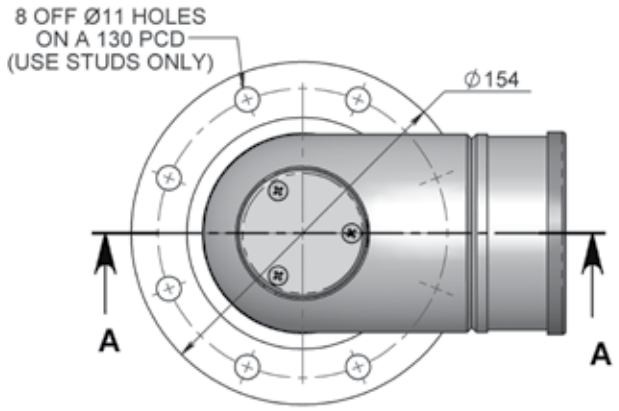
Ordering Information

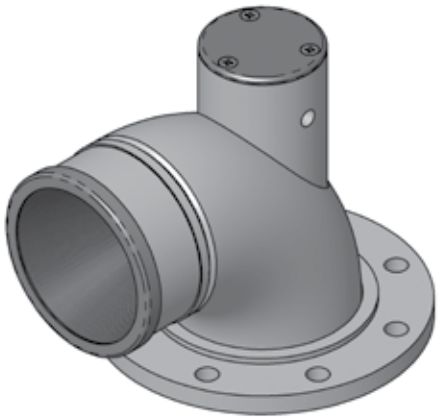
- **AVV3SST:** Chemical Vapour Vent.

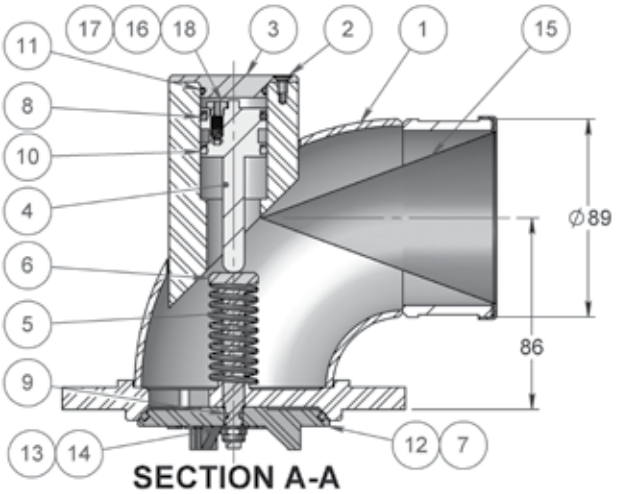
Associated Equipment

- **AVV3SS-10:** Stainless Steel weld in mount flange to mount on tank top.
- **AVV3SS-11:** 316 Stainless Steel Spark Arresting Gauze (optional).
- **AVV3-12:** Polyurethane louvre kit with spare arresting gauze.
- **VH3.5:** 90mm nitrile hose (check suitability for chemical products).

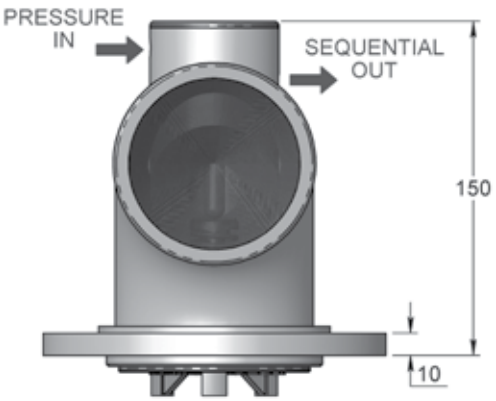
AVV3SST CHEMICAL VAPOUR VENT







SECTION A-A



ITEM	PART No	DESCRIPTION	QTY	MATERIAL
18	55083	SCREW RETAINING	1	BRASS
17	7617	SEAL, CHECK VALVE	1	VITON A
16	6183	SPRING COMPRESSION	1	ST STEEL
15	AVV3SS-11	FLAME ARRESTING GAUZE	1	ST STEEL
14	6550	WASHER FLAT	1	ST STEEL
13	6549	NUT HALF GLENLOC	1	ST STEEL
12	AVV3SS-8	POPPET FOR AVV3SST	1	ST STEEL
11	7004	O-RING	1	VITON A
10	7569	O-RING	1	KALREZ
9	6077	O-RING	1	TEFLON
8	4574	O-RING	1	VITON A
7	2487	O-RING	1	TEFLON
6	AVV3SS-4	POPPET SHAFT	1	ST STEEL
5	6130	SPRING	1	ST STEEL
4	AVV3SS-3	PISTON	1	ST STEEL
3	AVV3SS-2	END CAP	1	ST STEEL
2	6548	SCREW MET C/SUNK PH	3	ST STEEL
1	AVV3SS-1	BODY ASSEMBLY	1	ST STEEL

NOTES:
1. GAUZE IS AN OPTIONAL EXTRA AND MUST BE ORDERED SEPARATELY.



PV401 Series

PV401 series of pressure vents are often used on storage tanks and limit excess pressure within a tank to 30kPa max.

There are several different variations using combinations of aluminium, mild steel, stainless steel and 316 grade stainless steel together with either buna nitrile, Viton™or Teflon™encapsulated O-rings.

Special opening pressures can be supplied on request.

Features & Benefits

- Limits excess pressure within a tank to 30 kPa max.
- Range of materials and seals available.
- Simple and reliable emergency pressure relief venting.
- Special opening pressures can be supplied on request.

Technical Information

Opening Pressure

Standard setting vent opens at 30 kPa.

Capacity

3250m³/hr at a pressure of 45 kPa.

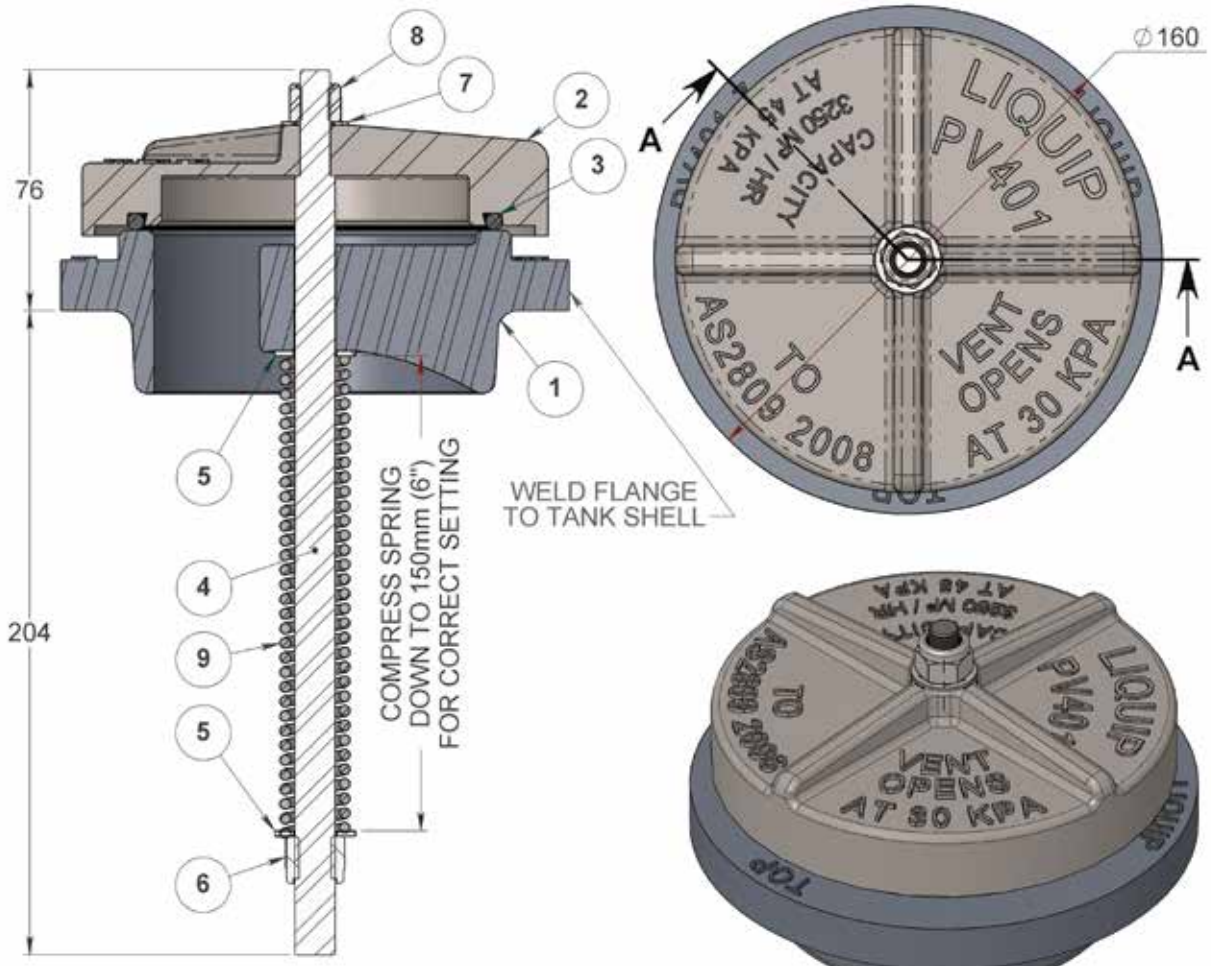
Mounting

Weld in flange.

Ordering Information

- **PV401-AA-B:** Aluminium cover, Aluminium flange, Nitrile O-ring.
- **PV401-AA-T:** Aluminium cover, Aluminium, flange Teflon™encapsulated O-ring.
- **PV401-AA-V:** Aluminium cover, Aluminium flange, Viton™O-ring.
- **PV401-AM-B:** Aluminium cover, Mild Steel flange, Buna O-ring.
- **PV401-AM-V:** Aluminium cover, Mild Steel, flange Viton™O-ring.
- **PV401-AS-V:** Aluminium cover, Stainless Steel 316 flange, Viton™O-ring.
- **PV401-SS-V:** Stainless Steel 316 cover, Stainless Steel 316 flange, Viton™O-ring.
- **PV401-SST316:** Stainless Steel 316 cover, Stainless Steel 316 flange, Teflon™encapsulated O-ring.
- **PV401-AM-BRC:** Aluminium cover, Mild Steel flange with MWP of 210 kPa for Rail car.
- **PV401-AS-BRC:** Aluminium cover, Stainless Steel flange with MWP of 210 kPa for Rail car.

PV401 PRESSURE VENT



SECTION A-A

ITEM	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	PV401-7	FLANGE WELD AL	1	ALUMINIUM
2	PV401-13	COVER AL	1	ALUMINIUM
3	0208	O-RING	1	NITRILE
4	PV401-3	SPINDLE	1	ST STEEL
5	0104	WASHER FLAT IMPERIAL	2	Z/P STEEL
6	0152	NUT NYLOC	1	Z/P STEEL
7	0116	WASHER SHK-PRF INT	1	Z/P STEEL
8	0150	NUT NYLOC	1	Z/P STEEL
9	4457	SPRING	1	ST STEEL
10	PV401-14	INSTRUCTION LEAFLET	1	PAPER



PVV100 Series

The PVV104 series pressure and vacuum relief vents are used on tank trucks and incorporate roll-over protection.

The PVV104 prevents the build up of pressure and vacuum caused by expansion, contraction and tanker movement.

The PVV104 is designed primarily for thermal relief. The vent incorporates rollover protection by locking shut at any angle greater than 60° from the vertical.

Features & Benefits

- Allow excess pressure and vacuum to be equalised through a gauzed flame proof opening.
- Aluminium body and Stainless Steel Springs.
- All models have roll-over protection ensuring compartment is sealed if tilted more than 60° from vertical.
- The PVV range of vents can be mounted inside the tank either on the manhole cover or on a separate flange.

Technical Information

Materials

- Aluminium body & poppets.
- Stainless steel springs.
- Bonded nitrile seals.
- Nylon coated bronze ball.

Mounting

Mounted directly to the manhole on the underside of the emergency vent.

PVV104 (Australia/NZ)

- Pressure: Opens at 16±1 kPa.
- Vacuum: Opens at 2±1 kPa.
- Capacity: 98m³/hr free air at 35 kPa.
- Locks shut at 60° from vertical.
- Approved to AS2809-1990.
- PVV104 is identified by the free air bleed hole in the body.

PVV104U (rest of world)

- Pressure: Opens at 8 to 12 kPa.
- Vacuum: Opens at-0.4 to-2.5 kPa.
- Capacity: 90m³/hr free air at 30 kPa inlet & 33m³/hr free air at 3 kPa pressure drop for vacuum.
- Locks shut at 60° from vertical Approved to UK requirements.
- PVV104U has no bleed hole and a very distinctive full circle marker groove around.

Ordering Information

- **PVV104:** PV vent suitable for Australia/NZ.
- **PVV104U:** PV vent suitable for rest of world.

Associated Equipment

- VOH400 series Hatch.
- VOH700 series Hatches.
- SH300 series swing back Hatches.



PVV Repair Kits

Liquip offer a Vapour Vent Repair Kit for PVV104 to ensure users are able to repair and rebuild their PVV104 every 2½ years in line with Australian Standards.

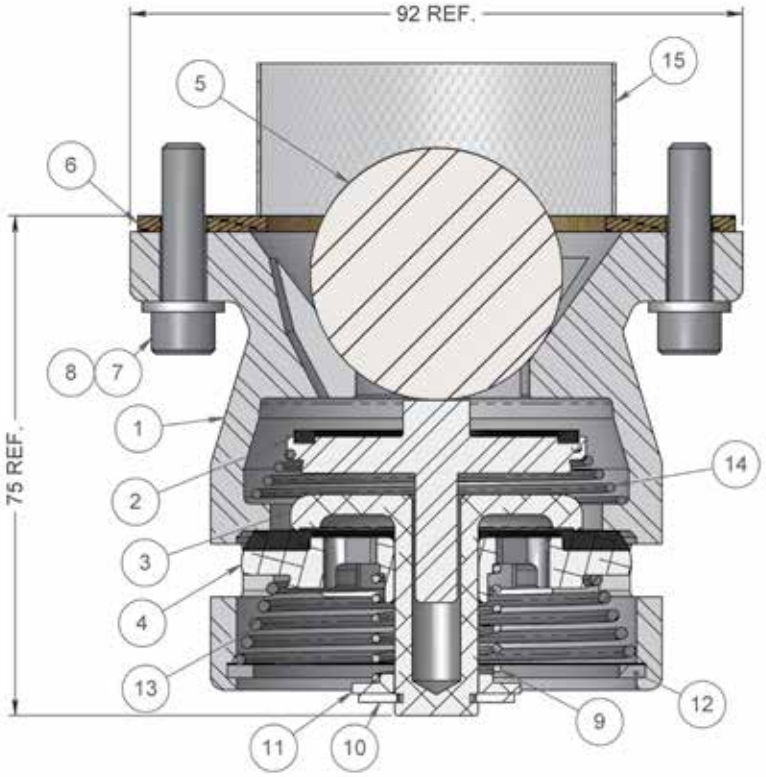
Ordering Information

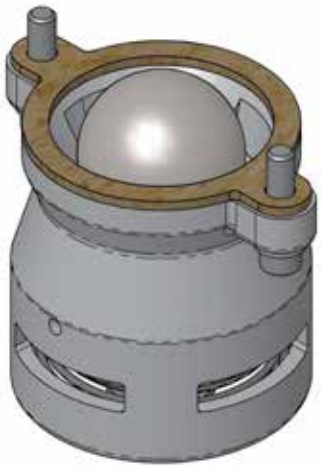
- **PVVREPKIT:** Repair kit for PVV104.

Associated Equipment

- **PVV104:** PV vent suitable for Australia/NZ.

PVV104 & PVV104U





SEE DATASHEET X952196
FOR MOUNTING OPTIONS

ITEM NO.	PART NUMBER	DESCRIPTION	PVV104	PVV104U	MATERIAL
1	PVV104-1	BODY - WITH HOLE	1	-	ALUMINIUM
	PVV104-1U	BODY - WITH GROOVE	-	1	ALUMINIUM
2	PVV104-7	ROLLOVER POPPET	1	1	ALUMINIUM
3	PVV104-8	PRESSURE POPPET	1	1	ALUMINIUM
4	PVV104-9	VACUUM POPPET	1	1	ALUMINIUM
5	PVV104-13	BALL Ø38	1	1	NYLON/BRONZE
6	4250	GASKET FOR PVV104	1	1	NBR-CORK
7	0714	CAPSCREW IMPERIAL	2	2	Z/P STEEL
8	0107	WASHER SPRING	2	2	Z/P STEEL
9	4420	SPRING	1	-	ST STEEL
	6109	SPRING	-	1	ST STEEL
10	0096	E-CLIP IMPERIAL	1	1	STEEL
11	PVV104-3	SPRING RETAINER	1	1	ALUMINIUM
12	4347	CIRCLIP INTERNAL	-	1	Z/P STEEL
13	4419	SPRING COMPRESSION	1	1	ST STEEL
14	4421	SPRING COMPRESSION	1	1	ST STEEL
15	VOH700-19	SPARK ARRESTOR	1	1	ST STEEL
16	6436	INSTRUCTION LEAFLET	1	1	PAPER
17	59052	LABEL	-	1	ALUMINIUM
18	55031	RIVET	-	1	STEEL
19	59051	TEST CERTIFICATE	-	1	PAPER



PVV200 Series

The PVV204 series vents are designed for use on tank trucks which load or discharge with fill caps closed and incorporates roll-over protection.

The PVV204s prevent the build up of pressure and vacuum caused by expansion, contraction and tanker movement.

The PVV204 is designed primarily for thermal relief. The vent incorporates rollover protection by locking shut at any angle greater than 60° from the vertical.

The vent may also be used on storage and blending tanks. It is important that the pressure/vacuum capability of the tank is known. Different settings may be required.

Features & Benefits

- Allow excess pressure and vacuum to be equalised through a gauzed flame proof opening.
- Aluminium body and poppets (S/S also available).
- All models have roll-over protection ensuring compartment is sealed if tilted more than 60° from vertical.
- The vent is normally mounted directly to the manhole on the underside of the emergency vent or on a separate weld flange.
- PVV vents for chemical and stainless steel tanks available.

Technical Information

Materials

- Aluminium body & poppets.
- Stainless steel housing, shafts and springs.
- Bonded nitrile seals.
- Nylon coated bronze ball.

Mounting

May be on a Liquip Manhole cover or on a separate weld flange.

PVV204 (settings comply with AS2809)

- Pressure Setting 15 kPa.
- Vacuum Setting 3 kPa.
- Capacity 240m³/hr free air at 35 kPa.
- Max recommended liquid loading rate 1,000 LPM.
- Free air bleed hole in body.

PVV204U (settings comply with international codes)

- Pressure Setting 10 kPa.
- Vacuum Setting 2 kPa.
- Capacity 240m³/hr free air at 35 kPa.
- Max recommended liquid loading rate 1,000 LPM.
- No bleed hole.

Ordering Information

- **PVV204:** Aluminium Pressure & Vacuum Vent with Nitrile seals (complies to AS2809).
- **PVV204U:** Aluminium Pressure & Vacuum Vent with Nitrile seals (complies to UK & USA codes).
- **PVV204-ST316:** 316 Stainless Steel Pressure & Vacuum Vent with Teflon™ seals (for S/S tanks).
- **PVV204-AT:** Aluminium Pressure & Vacuum Vent with Teflon™ seals (for chemical use).
- **PVV204U-AT:** Aluminium Pressure & Vacuum Vent with Teflon™ seals (for chemical use).

Associated Equipment

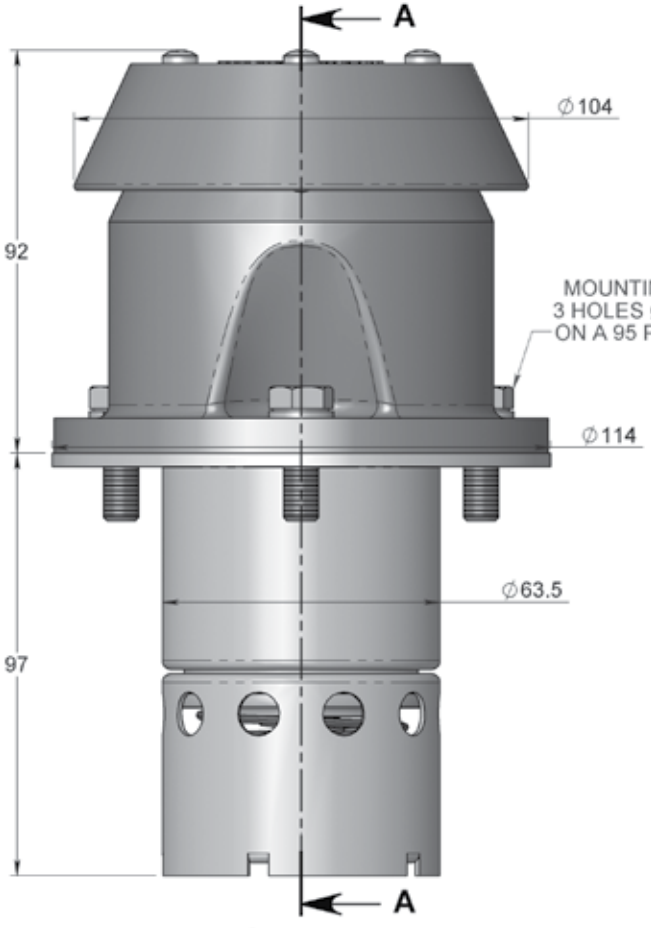
- VOH400 series Hatch.
- VOH700 series Hatches.
- SH300 series swing back Hatches.

PVV204 PRESSURE & VACUUM VENT

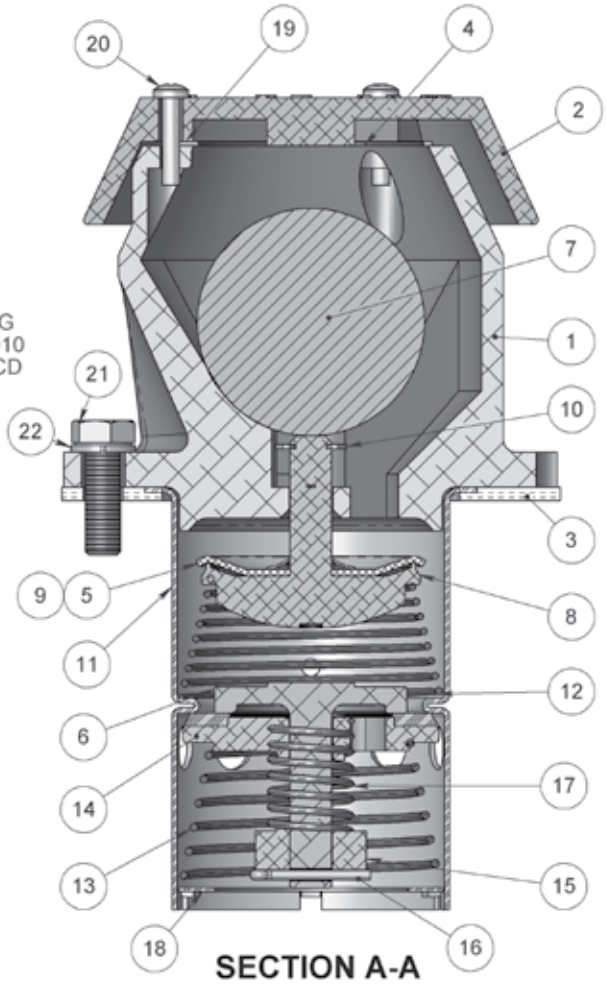


TOP VIEW
(AUSTRALIAN MARKINGS)

PART	COMPLIES TO	PRESSURE & VACUUM SETTINGS
PVV204	AUSTRALIAN STANDARD AS2809-2008	PRESSURE 15-17kPa VACUUM 2kPa±1
PVV204U	UK & USA CODES	PRESSURE 8-12 kPa VACUUM 2kPa±1



FRONT VIEW



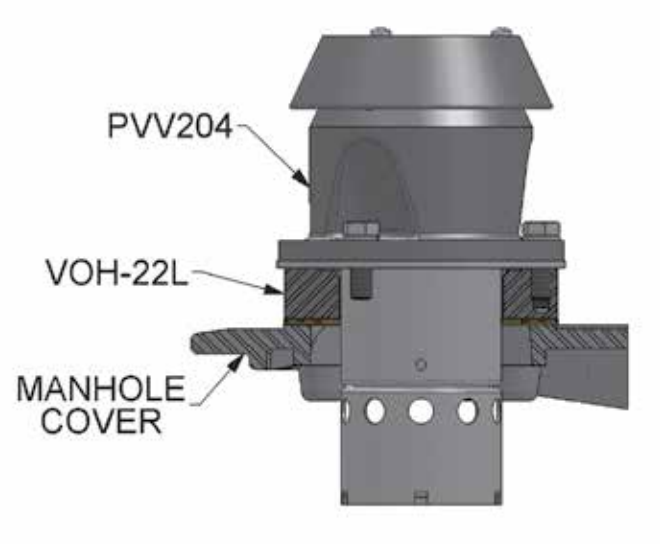
SECTION A-A

PVV204 PRESSURE & VACUUM VENT

ITEM	PART No.	DESCRIPTION	PVV204	PVV204-ST316	PVV204-AT	PVV204U	MATERIAL
1	PVV204-1	VENT BODY	1	-	1	1	ALUMINIUM
	PVV204-1S	VENT BODY	-	1	-	-	ST STEEL
2	PVV204-2	COVER	1	-	1	-	ALUMINIUM
	PVV204-2S	COVER	-	1	-	-	ST STEEL
	PVV204-2U	COVER USA MARKINGS	-	-	-	1	ALUMINIUM
3	0658	GASKET	1	-	-	1	NBR-CORK
	4293	GASKET	-	1	1	-	EXP-PTFE
4	PVV204-4S	GAUZE	1	1	1	1	ST STEEL
5	4645	ROLLOVER SEAL DISC	-	1	1	-	PTFE
6	PVV204-8	PRESSURE POPPET	1	-	1	1	ALUMINIUM
	PVV204-8S	PRESSURE POPPET	-	1	-	-	ST STEEL
7	PVV204-3	ROLLOVER BALL	1	-	1	1	LEAD
	PVV204-3S	ROLLOVER BALL	-	1	-	-	ST STEEL
8	PVV204-7	ROLLOVER POPPET WITH BONDED SEAL	1	-	-	1	ALUMINIUM
	PVV204-7S	STAINLESS STEEL ROLLOVER POPPET	-	1	-	-	ST STEEL
	PVV204-7C	ROLLOVER POPPET	-	-	1	-	ALUMINIUM
9	6545	PUSH-ON CLIP	-	1	1	-	ST STEEL
10	55026	E-CLIP METRIC	1	1	1	1	ST STEEL
11	PVV204-6-316	HOUSING SPUN	1	1	1	1	ST STEEL
12	0057	SPRING COMPRESSION	1	-	1	1	ST STEEL
	4435	SPRING COMPRESSION	-	1	-	-	ST STEEL
13	0058	SPRING COMPRESSION	1	-	1	1	ST STEEL
	4436	SPRING COMPRESSION	-	1	-	-	ST STEEL
14	PVV204-9	VACUUM POPPET	1	-	-	1	ALUMINIUM
	PVV204-9S	VACUUM POPPET	-	1	-	-	ST STEEL
	PVV204-9C	VACUUM POPPET	-	-	1	-	ALUMINIUM
15	PVV204-13	SPRING RETAINER	1	-	1	-	ALUMINIUM
	PVV204-15	SPRING RETAINER	-	-	-	1	ALUMINIUM
	4352	WASHER FLAT	-	1	-	-	ST STEEL
16	0764	SPLIT PIN	1	-	1	1	ST STEEL
	2764	ROD TIG (SPLIT PIN SUBSTITUTE)	-	1	-	-	ST STEEL
17	0302	SPRING COMPRESSION	1	-	1	-	ST STEEL
	4437	SPRING COMPRESSION	-	1	-	-	ST STEEL
	4447	SPRING COMPRESSION	-	-	-	1	ST STEEL
18	PVV204-20-316	SPRING RETAINER	-	1	-	-	ST STEEL
	PVV204-20	SPRING RETAINER	1	-	1	1	ST STEEL
19	PVV204-5	GAUZE RETAINER	1	-	1	1	STEEL
	PVV204-5S	GAUZE RETAINER	-	1	-	-	ST STEEL
20	6645	TAPTITE SCREW METRIC	3	-	3	3	Z/P STEEL
	4838	SETSCREW IMPERIAL	-	3	-	-	ST STEEL
21	55057	SETSCREW METRIC	3	3	3	3	ST STEEL
22	5362	WASHER SPRING	3	3	3	3	ST STEEL
23	PVV204-18	INSTRUCTION LEAFLET	1	1	1	1	PAPER
24	6425	INSTRUCTION LEAFLET	-	1	1	-	PAPER

Pressure & Vacuum Vents (PVV204)

- All manhole hatches can be supplied with 1 off PVV104 / PVV104U or 1 off PVV204 / PVV204U vent.
- Roll-over protection is built into the pressure and vacuum vent. A poppet completely seals off the vent if it reaches an angle of 60 degrees or more from the vertical. Flame proofing is provided by stainless steel gauze.
- The PVV204 series vents are designed for use on tankers which load or discharge at less than 500 litres/minute without any other free to air openings.
- The PVV204 provides more capacity than the standard PVV104, which accommodates only the thermal effects on the tanker. Roll-over protection is designed in and it locks shut at any angle greater than 60 degrees from vertical.
- The PVV204 vent can be fitted to the VOH200, VOH400 and VOH700 manhole cover using the VOH-22L adaptor flange.
- The PVV204 vent can be fitted to the walkway of the tank using the VRB-1 mounting flange. When the PVV204 is mounted to the walkway it must be as close to the centre of the compartment as possible and be mounted on a short pedestal above the walkway to lift it up above product surge effects.



Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



Dip & Fill Tubes

Dip Tubes

Dip Tubes are manufactured from aluminium extrusion with a 600 micron (30 mesh) gauze extending the full length of the tube.

Fill Tubes

Fill Tubes are manufactured from aluminium with solid sides to prevent splashing while filling is taking place.

Ordering Information

- **FTB3-2200:** Fill Tube 80mm x 2200mm.
- **DTS3-2200:** Dip Tube 80mm x 2200mm.

Associated Equipment

- **DTA80:** Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube.
- **FTA80:** Fill tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm fill tube.
- **FTA80-3:** Aluminium weld flange.
- **DP3L:** Dual Aluminium Dip & Fill Flange.



Camlock & Dust Caps

Liquip offers a range of Camlock dip & fill caps and bayonet caps for preventing leakage through Dip and Fill openings.

Features & Benefits

- Caps prevent leakage through Dip & Fill openings.
- Camlock dip caps allow for easy checking the entire walkway to ensure caps are closed and prevent levers being flipped open in the event of a tanker roll-over.
- The DBC series of Dip Caps are pressure relieving Dip Caps which enable pressure to be released before opening the cap, preventing possible operator injury.

Ordering Information

- **VOH-26:** 80mm Dip tube locking Camlock cap.
- **DBC50:** 50mm Dip tube bayonet cap assembly.
- **NA80-2AW:** 80mm Camlock Dust Cap.
- **NA65-2AW:** 65mm Camlock Dust Cap.

Associated Equipment

- **DTM80:** Venting Mandrel Dip assembly.



Dip & Fill Blanking Plates

Liquip offers a Dip & Fill blanking plate for use on Liquip hatches when Dip Tube or Fill Tubes may not be required.

Ordering Information

- **VOH-16:** Blanking kit for Dip and Fill points (to suit VOH410 hatches).
- **VOH700TH-14:** Blanking plate for Dip points (to suit VOH700 hatches).

Associated Equipment

- VOH400 Series Hatches.
- VOH500 Series Hatches.
- VOH700 Series Hatches.



Dip & Fill Adaptors

DTA80

The DTA series of Dip Tube adaptor bolts directly to the Liquip manhole cover or to a separate weld in flange. They have a standard mil-spec Camlock top with through hole square flanges.

The Dip Tube is either welded or pop riveted to the round section on the base of the Adaptor.

Suits VOH400 & VOH700 series Manhole Covers.



FTA80

The FTA series of Fill Tube adaptor bolts directly to the Liquip manhole cover or to a separate weld flange. They have a standard mil-spec Camlock top with through hole square flanges.

The Fill Tube is either welded or pop riveted to the round section on the base of the Adaptor.

Suits VOH410 & VOH750 Series Manhole Covers.

DBA50

The DBA adaptor is a 50mm Dip adaptor with bayonet fitting.

Ordering Information

- **DBA50:** 50mm Dip adaptor, bayonet type fastening with flange mount.
- **DTA65:** 65mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube.
- **DTA65-1ATZ:** 65mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube + Teflon™Kit.
- **DTA80:** 80mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube (Kit included).
- **DTA80-1ATZ:** 80mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube + Teflon™Kit.
- **DTA80-3:** 80mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube. Utilises an integral weld flange for use on low profile tanks (Kit included).
- **DTA80F:** 80mm Dip Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm dip tube on the VOH500 series manhole covers.
- **FTA65:** 65mm Fill Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm Fill tube.
- **FTA80:** Fill tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm fill tube (Kit included).
- **FTA80-1ATZ:** Fill tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm fill tube + Teflon™Kit.
- **FTA80F:** 80mm Fill Tube adaptor with through hole square flanges and 74.5mm diameter to suit standard 80mm fill tube on the VOH500 series manhole covers.

Associated Equipment

- **NA80-2AW:** 80mm Camlock Dust Cap.
- **NA65-2A:** 65mm Camlock Dust Cap.
- **FTB3-2200:** Fill Tube 80mm x 2200mm.
- **DTS3-2200:** Dip Tube 80mm x 2200mm.
- **FTA80-3:** Aluminium weld flange.
- **DP3L:** Dual Aluminium Dip & Fill Flange.
- **DBC50:** 50mm Dip tube bayonet cap assembly.



Dip Adaptor Venting Mandrel

Liquip's venting mandrels prevent any possibility of a liquid geyser from the dip hole due to internal pressure.

The venting mandrel fits into the dip hole and its flange is sandwiched underneath the dip adaptor on to the manhole cover. The Dip tube is attached to the boss on the mandrel via welding or pop riveting.

Features & Benefits

- 3 large gauzed port holes for venting from the normal ullage space.
- Prevents any possibility of a liquid geyser from the dip hole due to internal pressure.

Ordering Information

- **DTM80:** Dip adaptor mandrel assembly.



Dip & Fill Mount Pads

Liquip offers Dip & Fill remote mounting pads which are suitable for use on tankers with manhole covers that do not have integral dip & fill points.

Features & Benefits

- Can be welded direct to the tanker walkway to enable the use of Dip & Fill points.
- Available in a various configurations and materials to suit various tankers.

Ordering Information

- **DP3.0-1A:** Aluminium single flange for either dip or fill points.
- **DP3L:** Aluminium Double flange for both dip & fill points.
- **DP3M-1:** Mild Steel Single flange for either dip or fill points.



Anti-Rattle Dip Stick Kits

Liquip offers anti-rattle dip stick attachments which are located on the top of the dip stick and prevent it rattling within the dip tube while the tanker is in motion.

Features & Benefits

- Prevents the dip stick from bouncing within the compartment.
- Enables easy retrieval of the dip stick when checking compartment contents.
- Reduces wear on the dipstick.

Ordering Information

- **DSR21:** Viton™A Polyurethane ring for dipstick.
- **DSS21:** Stainless Steel Spring, ring pull for dipstick end.



Dip Tube Guides

Dip Tube Guides are installed in the base of the tanker and guide the Dip Tube to ensure it is kept in the perpendicular plane while the tanker truck is in motion.

Dip Tube Guides are welded to the floor of each compartment directly below the dip adaptors located on the tank top.

Ordering Information

- **DTG3-R:** Aluminium Dip Tube Guide with integral striker pad and elastomer bearing.
- **DTG3-R-AT:** Aluminium Dip Tube Guide with integral striker pad and Teflon™bearing.
- **DTG3-M:** Mild Steel Dip Tube Guide, no striker pad and plain bore.

Associated Equipment

- **DTS3-2200:** Dip Tube 80mm x 2200mm.



Dip Tube Steadies

Liquip offers Dip Tube and Fill Tube steadies to fasten Dip and Fill Tubes to the perpendicular plane.

Liquip steadies are suitable for use with VOH400 series manhole hatches and DP weld pads only.

Features & Benefits

- Securely braces the Fill Tube off the Dip Tube.
- Sturdy aluminium construction.
- Easy to install.

Ordering Information

- **TS3X3AT:** Aluminium tube steady 80mm x 80mm comes with stainless steel fasteners.

Associated Equipment

- **FTB3-2200:** Fill Tube 80mm x 2200mm.
- **DTS3-2200:** Dip Tube 80mm x 2200mm.



Manual Top Operators

The CL402RG is an industry leading and uniquely designed camlift that provides a "quick action" lifting mechanism for opening the internal valve from the walkway of a tanker.

Features & Benefits

- Encompasses an industry first unique safety guard for added operator protection (patent pending).
- Contains a bush/bearing and O-ring to seal in the event of a tanker rollover.

Technical Information

Lift

38mm.

Operation

- **To open:** rotate the handle 90° clockwise to open until the handle is in the upper locked position.
- **To close:** rotate the handle 90° anti-clockwise to close. A spring return on the camlift ensures the valve spring can operate unimpeded.

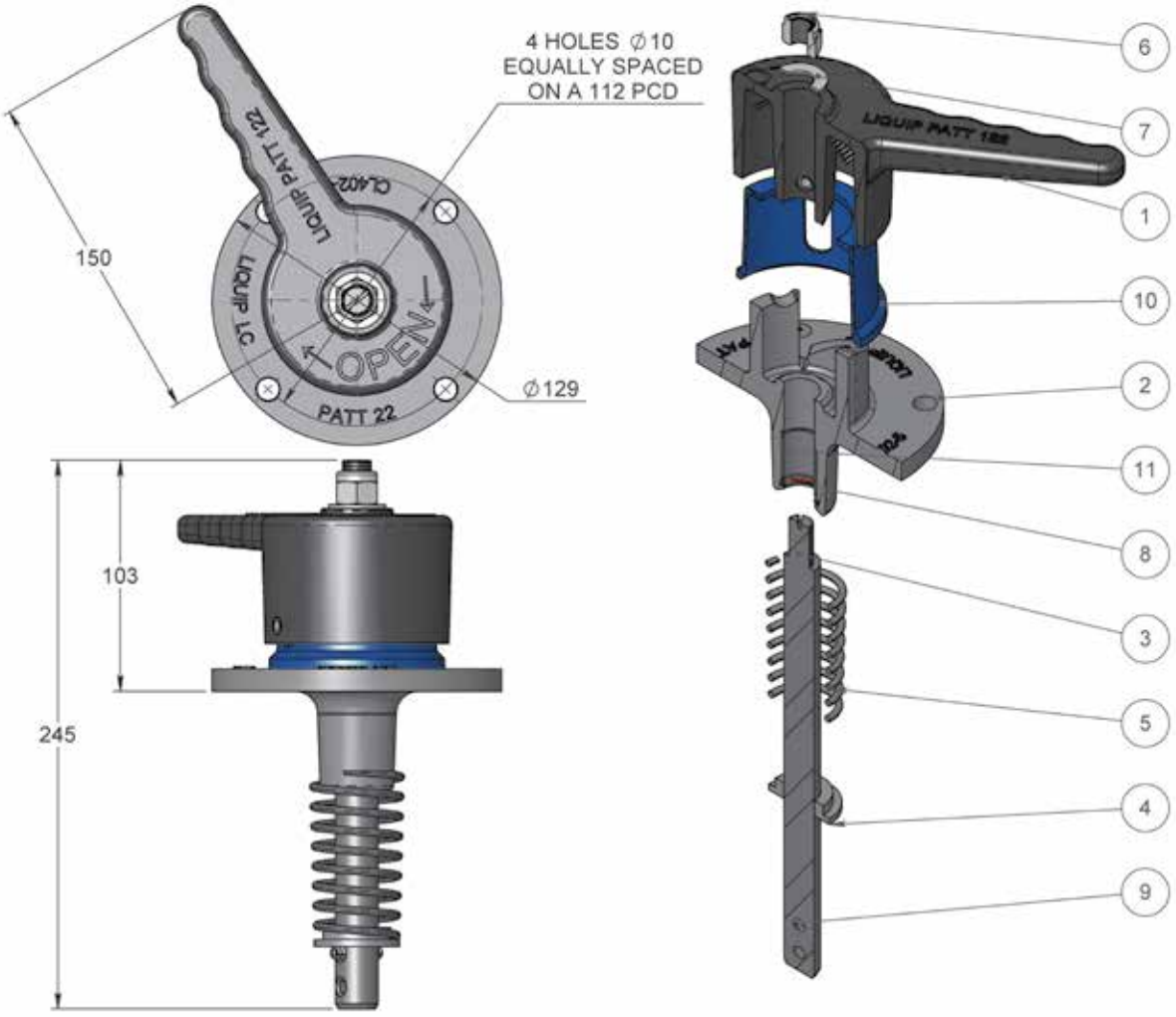
Ordering Information

- **CL402RG:** Manual top operator (Aluminium handle / body, Viton™A O-ring and Z/P steel internals).
- **CL402RGZ:** CL402RG comes with Nitrile gasket and fibre washers.
- **CL402RGAT:** Manual top operator (Aluminium handle / body, Teflon™O-ring and S/S steel internals).
- **CL402RGATZ:** CL402RGAT comes with Teflon™gasket.

Associated Equipment

- **LW410:** Lifting wire kit LW410.
- **CL402-1:** Aluminium mounting flange.
- **CL402-2:** Steel mounting flange.
- **SLV Series:** Liquip internal valves.

CL402RG MANUAL CAMLIFT



ITEM	PART No.	DESCRIPTION	CL402RG	CL402RGAT	MATERIAL
12	40243	INSTRUCTION LEAFLET	1	1	PAPER
11	4570	BUSH	1	1	TEFLON
10	CL402-3	GUARD	1	1	NYLON
9	0779	SPLIT PIN	-	1	ST STEEL
	0914	SPRING (ROLL) PIN	1	-	Z/P STEEL
8	4521	O-RING	-	1	TEFLON
	0278	O-RING	1	-	VITON A
7	0104	WASHER	1	1	Z/P STEEL
6	0152	NUT NYLOC	1	1	Z/P STEEL
5	4441	SPRING	-	1	ST STEEL
	4424	SPRING	1	-	STEEL
4	CL401-13S	SPRING	-	1	ST STEEL
	CL401-13	SPRING	1	-	Z/P STEEL
3	CL401-15	SPINDLE	1	1	ST STEEL
2	CL402-5	BODY FLANGED	1	1	ALUMINIUM
1	CL401-14	HANDLE	1	1	ALUMINIUM



Air Operated Top Operators

The ACL series provides a "quick action" lifting mechanism for opening the internal valve of a tanker from a pneumatic control box.

The pneumatic operation allows complete control of the loading and discharge operation from ground level without having to access the tank top.

The ACL series has been developed with stainless steel and Teflon™components for use with petroleum and/or chemical based

Features & Benefits

- Air operated or manually operated.
- Encompasses an industry first unique safety guard for added operator protection (patent pending).
- Contains a bush/bearing and O-ring to seal in the event of a tanker rollover.
- Can be bolted directly to the tank walkway or secured using a weld in flange.

Technical Information

Operation

- Switch air pressure to the inlet of the camlift via an air control box or push/pull valve.
- **To manually open:** rotate the handle 90° clockwise until the handle is in the upper locked position.
- **To manually close:** rotate the handle 90° anti-clockwise. A spring return on the camlift ensures the valve spring can operate unimpeded.

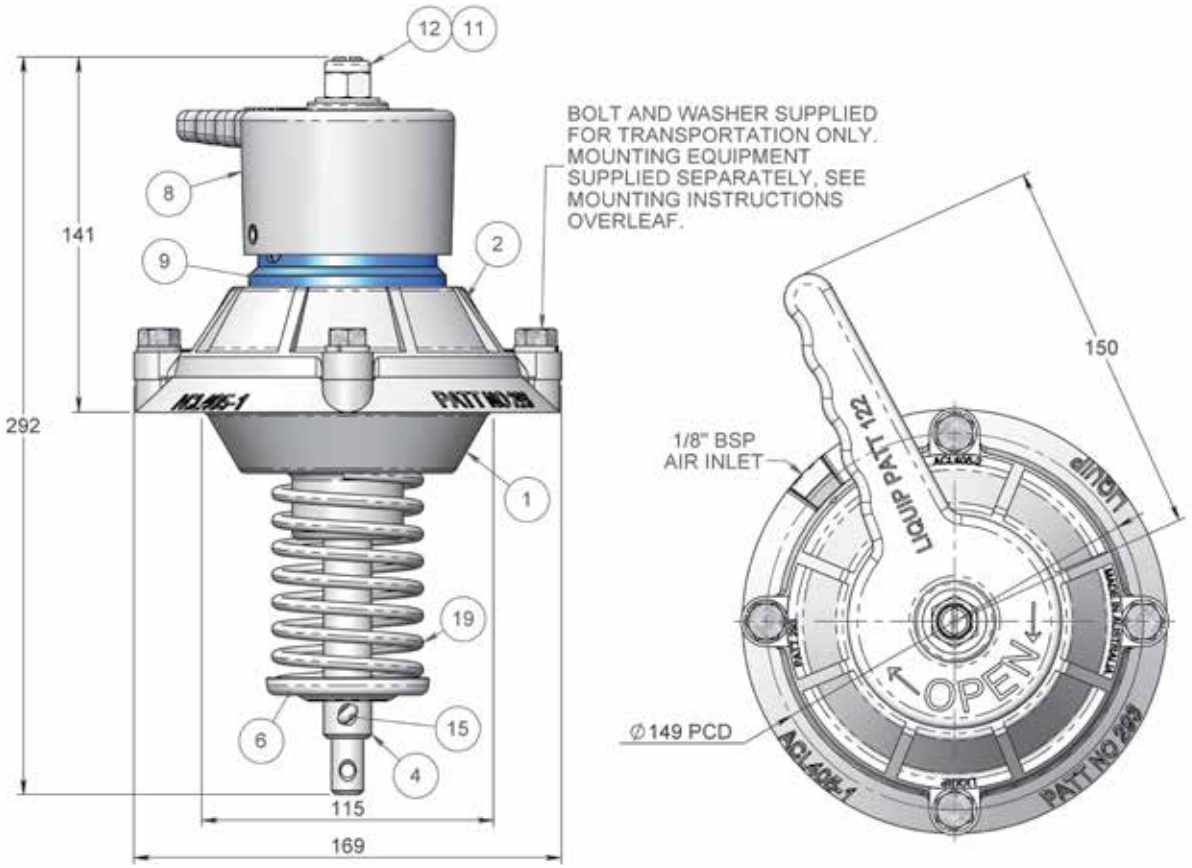
Ordering Information

- **ACL405RGAT:** Air operated camlift (Aluminium handle and body, Teflon™seals & stainless steel fasteners).
- **ACL405RGATZ:** ACL405RGAT comes with Teflon™Gasket.
- **ACL405RGATS:** Air operated camlift - S/S.

Associated Equipment

- **LW410:** 2.1m Lifting Wire Kit.
- **ACL405-11A:** Aluminium mounting flange.
- **SLV Series:** Liquip internal valves.

ACL405RGRAT AIR OPERATED CAMLIFT



ITEM	PART No.	DESCRIPTION	QTY	MATERIAL
20	5364	WASHER FLAT	1	Z/P STEEL
19	0917	SPRING	1	ST STEEL
18	40444	INSTRUCTION LEAFLET	1	PAPER
17	0109	WASHER SPRING	4	Z/P STEEL
16	0021	SETSCREW HEX HD	4	Z/P STEEL
15	0777	SPLIT PIN	1	ST STEEL
14	0915	SPRING	1	SPRING STEEL
13	0224	O-RING	1	NITRILE
12	0152	NUT NYLOC	1	Z/P STEEL
11	0104	WASHER	1	Z/P STEEL
10	0246	DIAPHRAGM	1	RUBBER
9	CL402-3	GUARD	1	NYLON
8	CL401-1R	HANDLE	1	ALUMINIUM
7	ACL404-9	NUT - HALF	1	Z/P STEEL
6	ACL404-6S	SPRING RETAINER	1	ST STEEL
5	ACL404-4	TOP PLATE	1	ALUMINIUM
4	ACL404-3AT	SPINDLE S/S	1	ST STEEL
3	ACL405-13	TRAVEL LIMITER	1	ACETAL
2	ACL405-2	TOP BODY AIR CAM LIFT	1	ALUMINIUM
1	ACL405-1AT	BASE AIR OPERATED CAMLIFT	1	ALUMINIUM



Lifting Wire

Stainless Steel Lifting wire that connects a road tanker walkway mounted camlift to the foot valve (internal valve) to lift the valve poppet to open.

Features & Benefits

- Lightweight, durable and low cost.
- Stainless steel construction.
- Commonly used in split compartment drops.
- Used in conjunction with manual top operators.

Technical Information

Operation

- Comes with Stainless Steel swivel to prevent cable 'wind up' which can cause the internal valve to be held open.
- Cable is marine standard stainless steel wire with breaking strain of over 8,000N (Newton).
- In-service stretch at typical working tensile force of 400N is negligible.

Ordering Information

- **LW410:** Stainless Steel Lifting Wire Kit.

Associated Equipment

- **CL402RG Series:** Liquip Manual top operators.
- **ACL405 Series:** Liquip Air operated top operators.
- **SLV5 Series:** All Liquip Internal Valves.

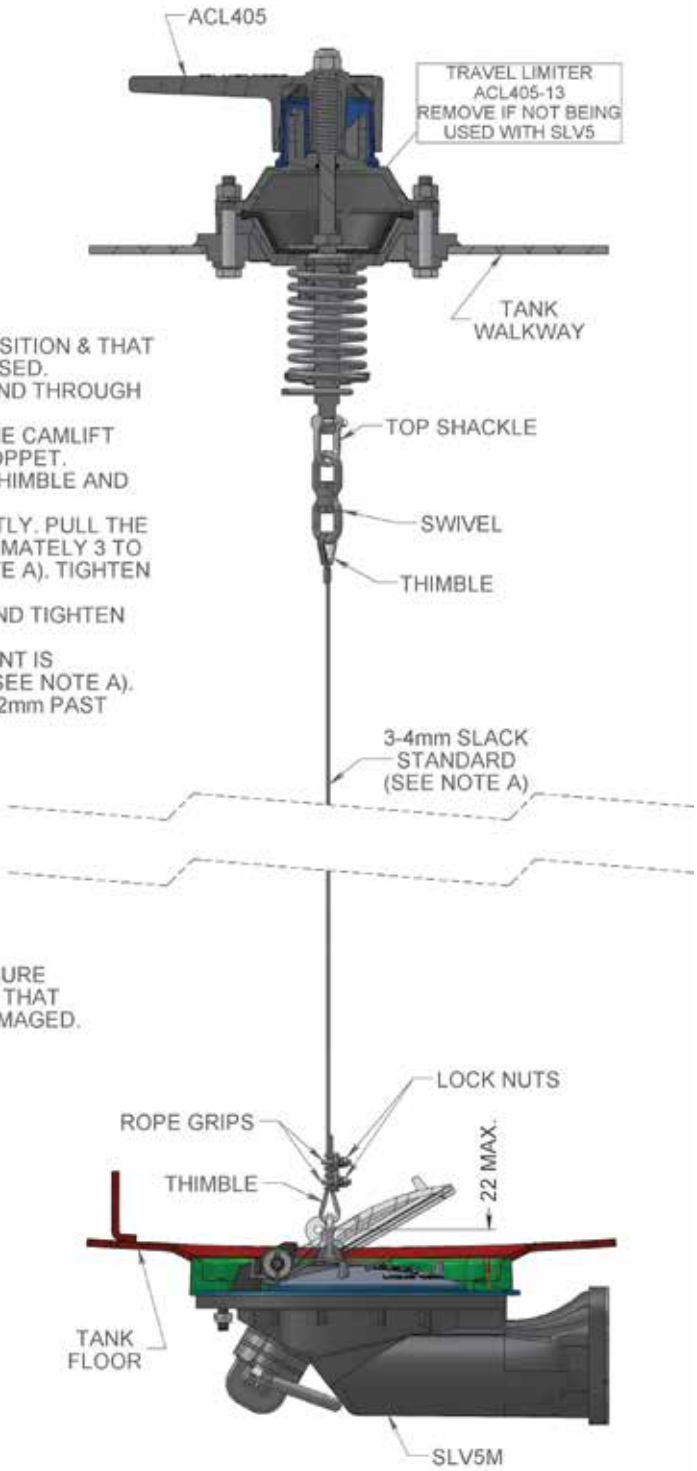
LW410 FITTING INSTRUCTIONS

STEPS:

1. MAKE SURE THE ACL405 IS IN ITS LOWERED POSITION & THAT THE SLV5M OR OTHER INTERNAL VALVE IS CLOSED.
2. PLACE SHACKLE THROUGH SWIVEL FOR TOP AND THROUGH THIMBLE IN WIRE FOR BOTTOM CONNECTION.
3. FIT TOP SHACKLE TO THE BOTTOM HOLE OF THE CAMLIFT SPINDLE AND FIT THE BOTTOM TO THE SLV5 POPPET.
4. THREAD THE END OF THE WIRE AROUND THE THIMBLE AND BACK UP TO FORM A LOOP.
5. FIT THE TWO ROPE GRIPS AND TIGHTEN SLIGHTLY. PULL THE LOOSE END OF THE CABLE TO ALLOW APPROXIMATELY 3 TO 4mm SLACK IN THE OVERALL LENGTH (SEE NOTE A). TIGHTEN ROPE GRIPS SECURELY.
6. ADD 4 OFF LOCK NUTS TO WIRE ROPE GRIPS AND TIGHTEN SECURELY.
7. OPERATE THE CAMLIFT TO ENSURE ADJUSTMENT IS CORRECT AND THE CABLE IS NOT TOO TIGHT (SEE NOTE A).
8. CUT OFF EXCESS CABLE APPROXIMATELY 10-12mm PAST ROPE GRIPS.

NOTES:

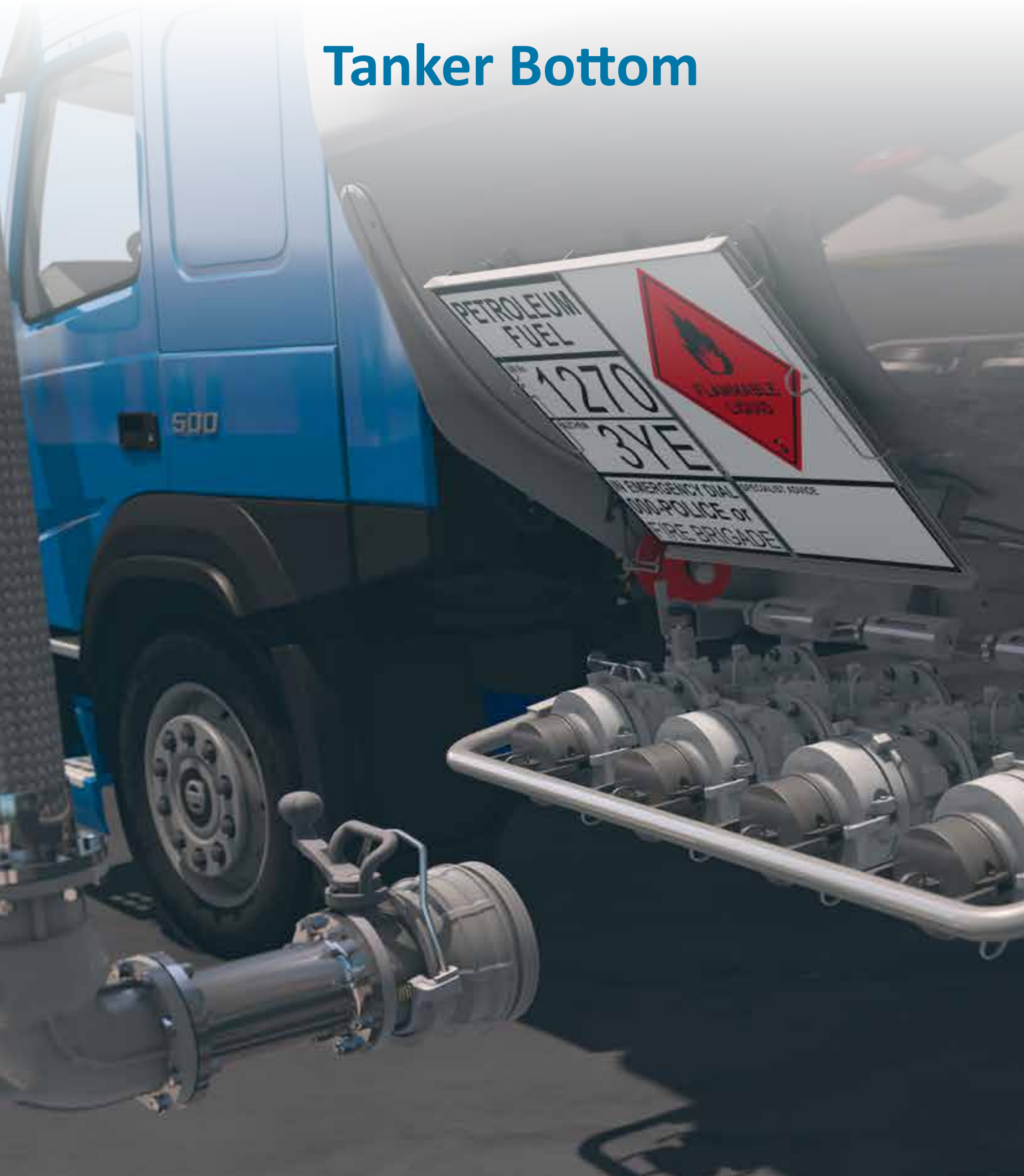
A. MAXIMUM LIFT FOR SLV5 VALVE IS 22mm. ENSURE THE SLACK IN THE CABLE ALLOWS FOR ONLY THAT TRAVEL OR THE INTERNAL VALVE MAY BE DAMAGED.



Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

LIQUIP
PART OF OPW A DOVER COMPANY

Tanker Bottom



API Adaptors 58-71
API Coupling Adaptors & Accessories..... 72-77
Internal/Bottom Valves 78-91
Vapour Gates & Air Interlock Valves 92-95
Vapour Adaptors & Couplers 96-101
Pneumatic Control Valves 101
Manifolds & Pneumatic Control Boxes..... 102-107
Static/Bonding Components..... 108-111





API Load/Unload Valve - API490 Series

API490 Series API adaptors are a precisely engineered and built bottom loading and discharge adaptor that conforms to API RP 1004 and provides total interchangeability with all API loading valves.

The API490 Series features a two-piece body with replaceable nosecone. API adaptors are available in various options and can be fitted with a range of seals to suit most applications.

Features & Benefits

- Aluminium components are heat treated for strength and hardness.
- Complies to API RP1004 – compatible with all API couplers.
- Ease of maintenance for reduced downtime.
- Set of mounts to match industry standard air interlock valves such as the Liquip AIV3.
- Ergonomically designed handle.
- Lightweight design – 4.8kg
- Borosilicate sight glass to visually check for retained product available.
- Flange is gramophone finish for improved sealing.
- Minimum pressure drop through a 100mm bore.
- Electrical continuity guaranteed by use of non-anodised nose cone.
- API496 variants have a 1" BSP threaded drain point at the bottom of the adaptor.
- Drain plug, ½" BSPT (when fitted).

Technical Information

Pressure Rating

- Pressure rated to API RP1004 standard (517 kPa).
- 100mm bore all through for minimum pressure drop.

Weight

4.8kg.

Materials

Main body is aluminium.

Poppet Travel

52mm.

Operation

Spring loaded poppet can be opened by the handle for discharge, or by an API coupler for bottom loading or unloading.

Continuity

Electrical continuity guaranteed by use of non-anodised nose cone.

Mounting

- Gramophone finished flange is 100mm TTMA.
- Mounts with handle on the right hand side.

API Adaptors

Ordering Information

- **API491:** No sight glass or drain.
- **API491D:** Handle moves down, no sight glass or drain.
- **API496:** Complete with sight glass & drain.
- **API496B:** Complete with blank plate & drain.
- **API496D:** Handle moves down, complete with sight glass and drain.
- **API496J:** Jet Selective, complete with sight glass & drain.
- **API496DJ:** Jet Selective, handle moves down, complete with sight glass & drain.
- **API496G:** Avgas Selective, complete with sight glass & drain.
- **API496DG:** Avgas Selective, handle moves down, complete with sight glass & drain.
- **API496C:** Aluminium/Stainless Steel components & FFKM seals complete with sight glass, handle moves down.

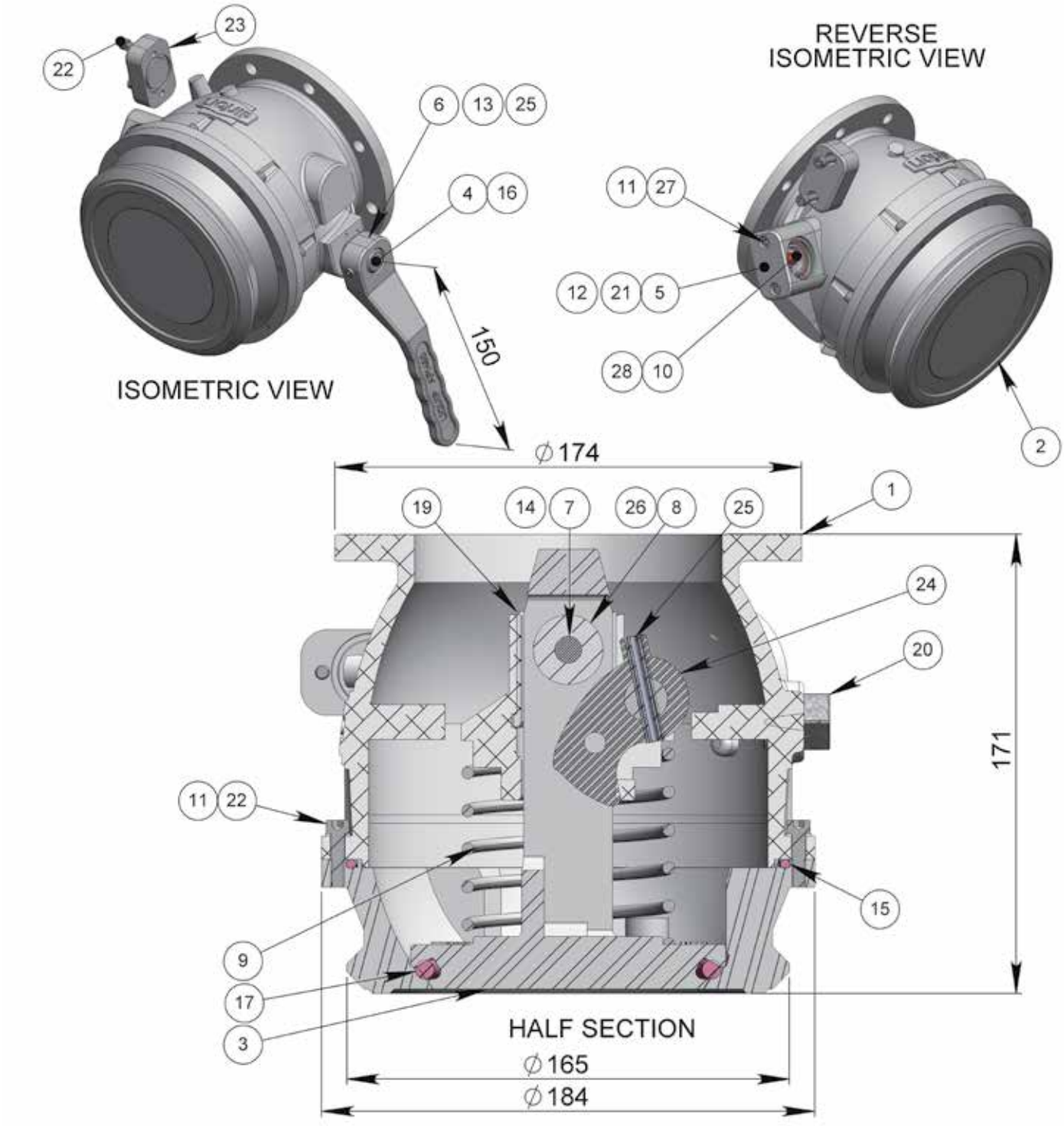
All models are also available in Z-Kit form, which come supplied with a NBR Cork, Viton™A or PTFE gasket.

Associated Equipment

- **API-DC:** Aluminium API Dust Cap with Camlocks.
- **API-DCLA:** Aluminium API Dust Cap with lockable levers.
- **0657:** 4" TTMA NBR Cork Gasket.
- **0657V:** 4" TTMA Viton™A Gasket.
- **4292:** 4" TTMA PTFE Gasket.
- **BF4-SG-25:** 4" TTMA Flange Sight glass 25mm thickness.
- **BF4-SG-40:** 4" TTMA Flange Sight glass 40mm thickness.

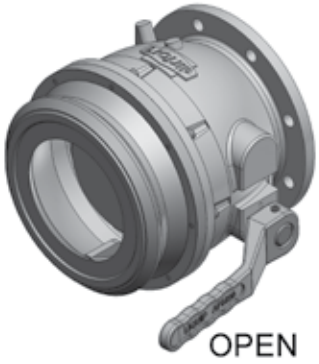


API49x SERIES



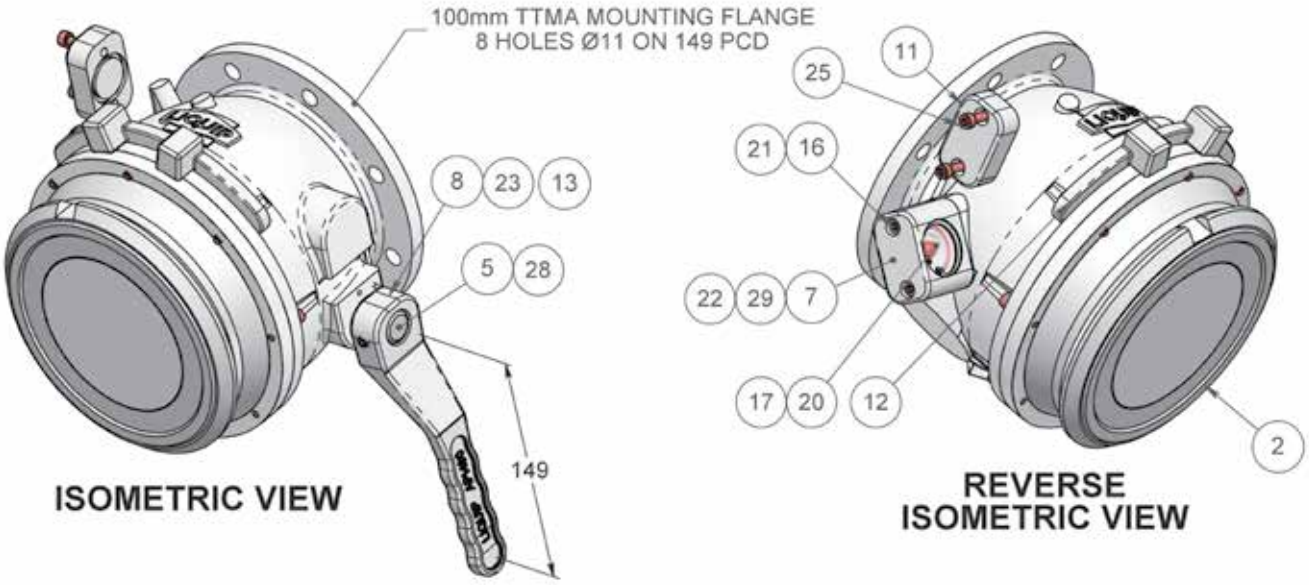
API49x SERIES

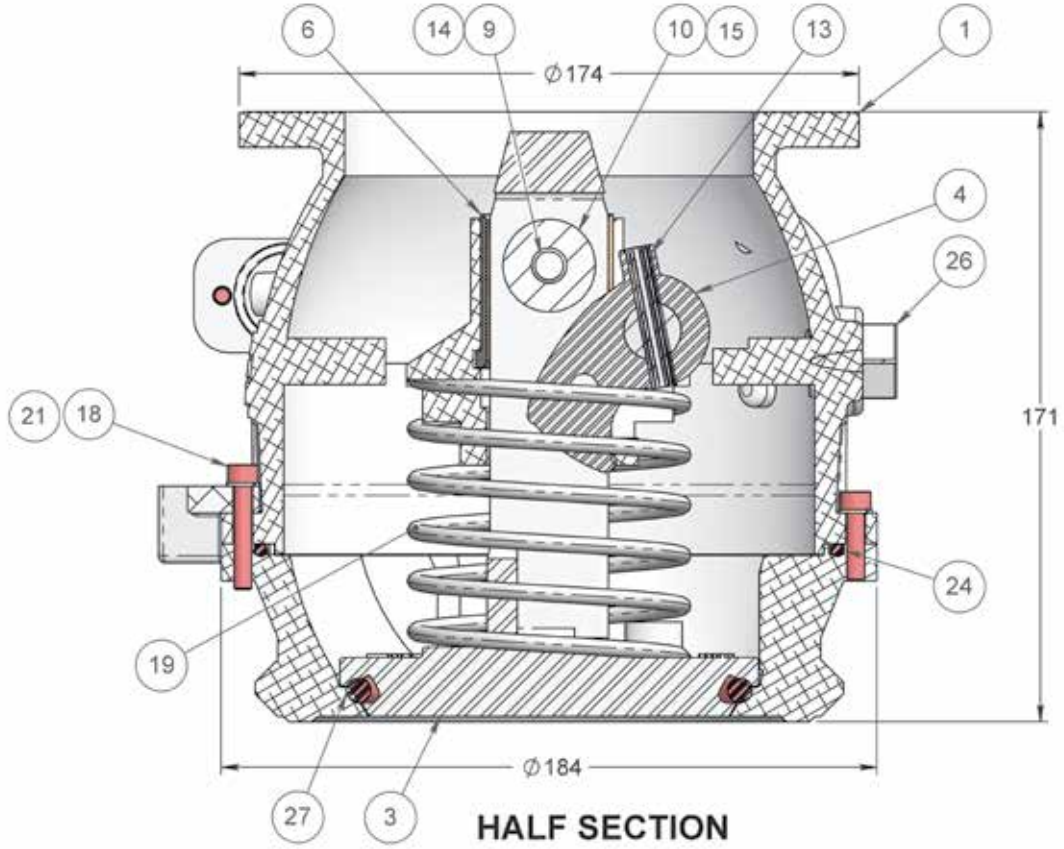




ITEM NO.	PART NUMBER	DESCRIPTION	API490	API491	API496	API497	MATERIAL
1	API490-1	VALVE BODY, API DRY BREAK	1	-	-	-	ALUMINIUM
1	API491-1	VALVE BODY, API DRY BREAK	-	1	-	-	ALUMINIUM
1	API496-1	VALVE BODY, API DRY BREAK	-	-	1	-	ALUMINIUM
1	API497-1	VALVE BODY, API DRY BREAK	-	-	-	1	ALUMINIUM
2	API490-2	NOSE CONE	1	1	1	1	ALUMINIUM
3	API490-3	POPPET VALVE DRY BREAK	1	1	1	1	ALUMINIUM
4	API490-5	SHAFT OPERATING	1	1	1	1	ST STEEL
5	API490-16	BODY SIGHT GLASS	1	-	1	-	ALUMINIUM
6	API490-17	HANDLE, ACTUATING	1	1	1	1	ALUMINIUM
7	API490-18	PIN FOR ROLLER	1	1	1	1	ST STEEL
8	API490-19	ROLLER	1	1	1	1	ST STEEL
9	6168	SPRING	1	1	1	1	ST STEEL
10	5725	BALL INDICATOR	1	-	1	-	POLYPROPYLENE
11	6498	WASHER SPRING	10	8	10	8	Z/P STEEL
12	7874	SIGHTGLASS	2	-	2	-	BOROSILICATE
13	6173	RETURN SPRING	1	1	1	1	ST STEEL
14	PURCHASED	CIRCLIP EXTERNAL	2	2	2	2	ST STEEL
15	0155	O-RING	1	1	1	1	FLUOROELASTOMER (FKM)
16	0235	O-RING (BS206)	2	2	2	2	VITON (FKM)
17	0289	O-RING - LIQUIP SPECIAL SIZE	1	1	1	1	VITON (FKM)
18	3395	GREASE SOLVENT RESIST ENERGREASE	1	1	1	1	GREASE
19	API490-6A	BUSH FOR API490 POPPET VALVE	1	1	1	1	DELRIN 500AL NC010
20	0614	PLUG BSP HEX -(1/2")	-	-	1	1	STEEL
21	4647	O-RING (BS119)	3	-	3	-	VITON A
22	6502	CAPSCREW METRIC	8	8	10	8	Z/P STEEL
23	API490-21	BLANK PLATE	-	-	1	-	ALUMINIUM
24	API490-4	CAM, OPENING	1	1	1	1	ST STEEL
25	4060	SPIROL PIN	2	2	2	2	ST STEEL
26	PURCHASED	WASHER FLAT	2	2	2	2	ST STEEL
27	PURCHASE	CAPSCREW METRIC	2	-	2	-	Z/P STEEL
28	55074	CIRCLIP INTERNAL	2	-	2	-	ST STEEL

API496J & G ADAPTORS

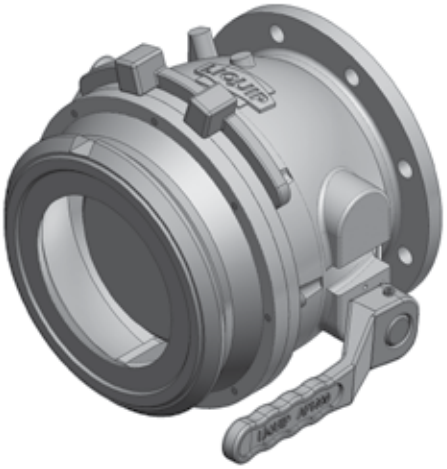




API496J & G ADAPTORS



CLOSED



OPEN

ITEM NO.	PART NUMBER	DESCRIPTION	API496J/ QTY.	API496G/ QTY.	MATERIAL
1	API496-1	VALVE BODY, API DRY BREAK	1	1	ALUMINIUM
2	API490-2J	NOSE CONE - API490 SERIES (FOR JET & AVGAS)	1	1	USE STANDARD NOSECONE API490-2
3	API490-3	POPPET VALVE DRY BREAK	1	1	ALUMINIUM
4	API490-4	CAM, OPENING	1	1	ST STEEL
5	API490-5	SHAFT OPERATING	1	1	ST STEEL
6	API490-6A	BUSH FOR API490 POPPET VALVE	1	1	DELRIN 500AL NC010
7	API490-16	BODY SIGHT GLASS	1	1	ALUMINIUM
8	API490-17	HANDLE, ACTUATING	1	1	ALUMINIUM
9	API490-18	PIN FOR ROLLER	1	1	ST STEEL
10	API490-19	ROLLER	1	1	ST STEEL
11	API490-21	BLANK PLATE	-	1	ALUMINIUM
12	API490-22J	BRACKET FOR API490	1	-	ALUMINIUM
	API490-22G	BRACKET FOR API490	-	1	ALUMINIUM
13	4060	SPIROL PIN	2	2	ST STEEL
14	PURCHASED	CIRCLIP EXTERNAL	2	2	ST STEEL
15	PURCHASED	WASHER FLAT	2	2	ST STEEL
16	PURCHASE	CAPSCREW METRIC	2	2	Z/P STEEL
17	55074	CIRCLIP INTERNAL	2	2	ST STEEL
18	55010	CAPSCREW METRIC	3	3	ST STEEL
19	6168	SPRING	1	1	ST STEEL
20	5725	BALL INDICATOR	1	1	POLYPROPYLENE
21	6498	WASHER SPRING	10	10	Z/P STEEL
22	7874	SIGHTGLASS	2	2	BOROSILICATE
23	6173	RETURN SPRING	1	1	ST STEEL
24	0155	O-RING	1	1	FLUOROELASTOMER (FKM)
25	6502	CAPSCREW METRIC	5	7	Z/P STEEL
26	0636	PLUG BSP HEX	1	1	ST STEEL
27	0289	O-RING - LIQUIP SPECIAL SIZE	1	1	VITON (FKM)
28	0235	O-RING (BS206)	2	2	VITON (FKM)
29	4647	O-RING (BS119)	3	3	VITON A
30	3395	GREASE SOLVENT RESIST ENERGREASE	1	1	GREASE



Chemical Trim API Load/Unload Valve - API496C

The API496C is a Chemical Trim (FFKM) API Adaptor that conforms to API RP1004. It has been designed to be compatible with various chemicals, engineered to offer quality bottom loading through excellent performance and maximum safety and is supplied with a drain plug (½" BSPT), sightglass and sightglass blanking plate.

FFKM (a perfluoroelastomer commonly known as Ekraz or Kalrez) is one of the most chemically resistant materials available and is suitable for some of the harshest chemical compounds. FFKM is commonly used with aggressive, corrosive and reactive chemicals.

Features & Benefits

- Complies to API RP1004 - compatible with all API couplers.
- Ease of maintenance for reduced downtime.
- Set of mounts to match industry standard air interlock valves such as the Liquip AIV3.
- The bulk of internal components are stainless steel for increased strength and product service life.
- Ergonomically designed handle.
- Lightweight design - 4.8kg
- Borosilicate sightglass to visually check for retained product (Blank plate also provided).
- Flange is gramophone finish for improved sealing.
- 100mm bore all through for minimum pressure drop.
- Electrical continuity guaranteed by use of non-anodised nose cone.



Technical Information

Pressure Rating

Pressure rated to API RP1004 standard (517 kPa).

100mm bore all through for minimum pressure drop.

Operating temperature range

10°C to +60°C.

Weight

4.8kg.

Chemical Compatibility

FFKM Seals.

Materials

- Aluminium body, nosecone and poppet.
- Stainless steel shaft, cam & roller.
- Perfluroelastomer (FFKM) main product seals.
- Teflon™poppet bush.

Poppet Travel

52mm.

Operation

The spring loaded poppet can be opened by the handle for discharge, or by an API coupler for bottom loading or unloading. For safety, the handle does not move when a coupler actuates the poppet. The handle is a “pull up-to-open” design, which when used rotates an internal cam to open the poppet. The cam uses the over-centre principle to hold poppet in its open position while unloading. Dual O-ring seals on shaft prevent leaks.

Continuity

Electrical continuity guaranteed by use of non-anodised nose cone.

Mounting

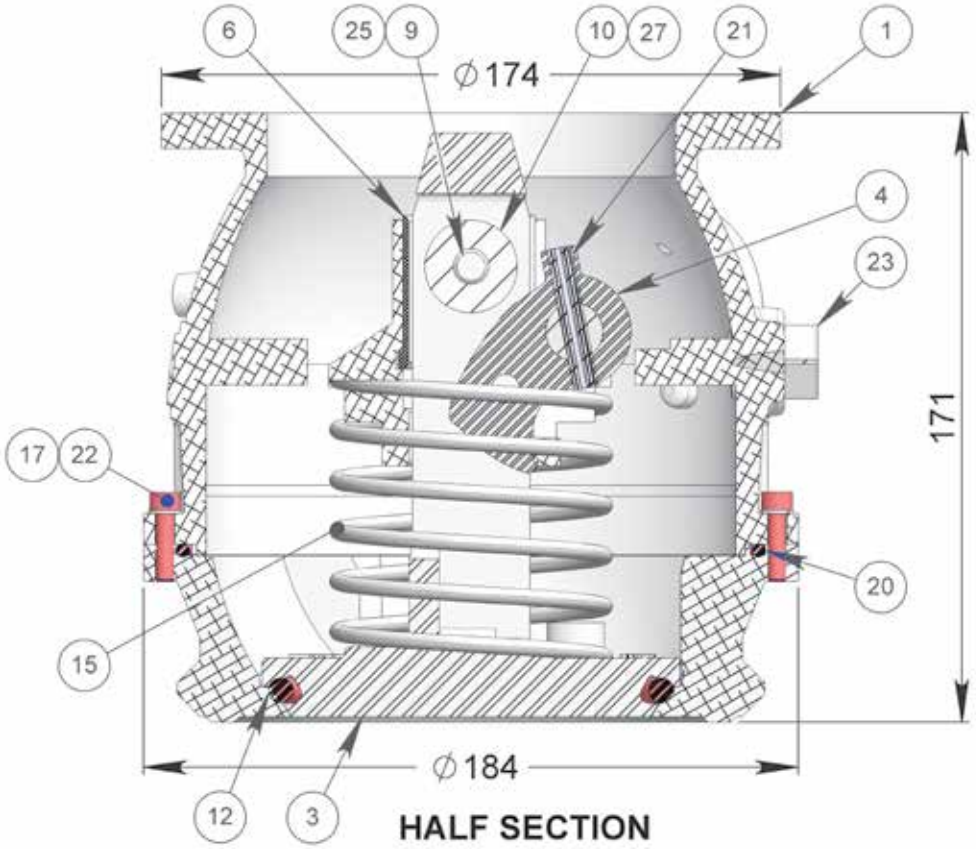
Flange is 100mm TTMA standard. Mount so that when viewed from the front, the handle is on the right hand side and pointing down.

Ordering Information

- **API496C:** Aluminium/Stainless Steel components & FFKM seals complete with sightglass, handle moves down.
- **API496CTZ:** API496C c/w 4" TTMA PFTE Gasket.
- **4292:** 4" TTMA PTFE Gasket.

API496C ADAPTOR

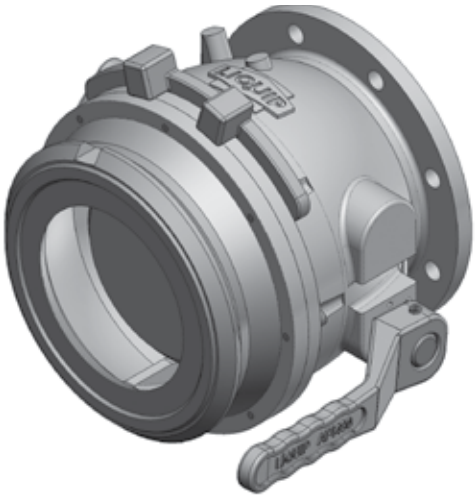




API496C ADAPTOR

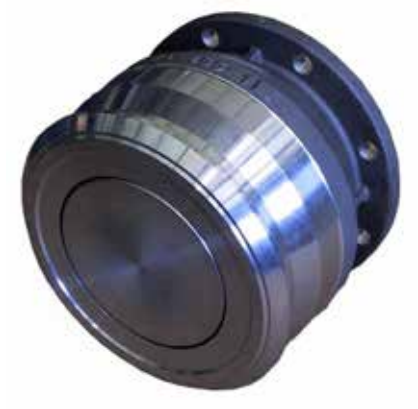


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OPEN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	API496-1	VALVE BODY, API DRY BREAK	1	ALUMINIUM
2	API490-2	NOSE CONE	1	ALUMINIUM
3	API490-3	POPPET VALVE DRY BREAK	1	ALUMINIUM
4	API490-4	CAM, OPENING	1	ST STEEL
5	API490-5	SHAFT OPERATING	1	ST STEEL
6	API490-6C	BUSH	1	PTFE
7	API490-16	BODY SIGHT GLASS	1	ALUMINIUM
8	API490-17	HANDLE, ACTUATING	1	ALUMINIUM
9	API490-18	PIN FOR ROLLER	1	ST STEEL
10	API490-19	ROLLER	1	ST STEEL
11	API490-21	BLANK PLATE	1	ALUMINIUM
12	0289K	O-RING SPECIAL	1	PERFLUOROELASTOMER (FFKM)
13	0235K	O-RING SPECIAL	2	PERFLUOROELASTOMER (FFKM)
14	4647K	O-RING SPECIAL	3	PERFLUOROELASTOMER (FFKM)
15	6168	SPRING	1	ST STEEL
16	5725	BALL INDICATOR	1	POLYPROPYLENE
17	6498	WASHER SPRING	10	Z/P STEEL
18	7874	SIGHTGLASS	2	BOROSILICATE
19	6173	RETURN SPRING	1	ST STEEL
20	0155	O-RING	1	FLUOROELASTOMER (FKM)
21	4060	SPIROL PIN	2	ST STEEL
22	6502	CAPSCREW METRIC	10	Z/P STEEL
23	0636	PLUG BSP HEX	1	ST STEEL
24	55074	CIRCLIP INTERNAL	2	ST STEEL
25	PURCHASED	CIRCLIP EXTERNAL	2	ST STEEL
26	PURCHASE	CAPSCREW METRIC	2	Z/P STEEL
27	PURCHASED	WASHER FLAT	2	ST STEEL



API Load/Unload Valve - API455

The API455 is a distinctive dry break adaptor with no built-in opening method, it can only be opened by an external source, such as an API coupler.

The API455 conforms to API RP 1004 and is completely interchangeable with all API adaptors.

Common applications:

- *Rail car applications*
- *Remote tanks.*
- *Theft prevention.*

Features & Benefits

- Light weight API adaptor for use where it is preferred to have the operation of the valve via a secondary method. e.g. LYNX coupler or the API-RC.
- Poppet can only be opened by an external source, such as LYNX coupler.
- Light weight: 2.35kg.
- 100mm bore all through for minimum pressure drop.
- Nose cone is heat-treated for increased product life.
- 4" TTMA flange is gramophone finish for improved sealing.
- Max. working pressure 700 kPa (100 PSI)
- Commonly used in rail car applications, theft prevention and remote tanks.

Technical Information

Pressure Rating

Max working pressure: 700 kPa (100 PSI).

Max. recommended internal pressure when connecting female coupling: 400 kPa (approx. 60 PSI).

100mm bore all through for minimum pressure drop.

Poppet travel

52mm.

Continuity

Electrical continuity guaranteed by use of non-anodised nose cone.

Mounting

- Gramophone finished flange is 100mm TTMA.
- Mounts with flat end facing ground to have full product drainage.

Ordering Information

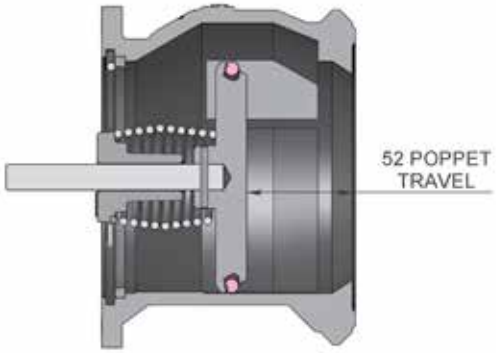
- **API455:** Non-openable API adapter fitted with Viton™B70 seals.

Associated Equipment

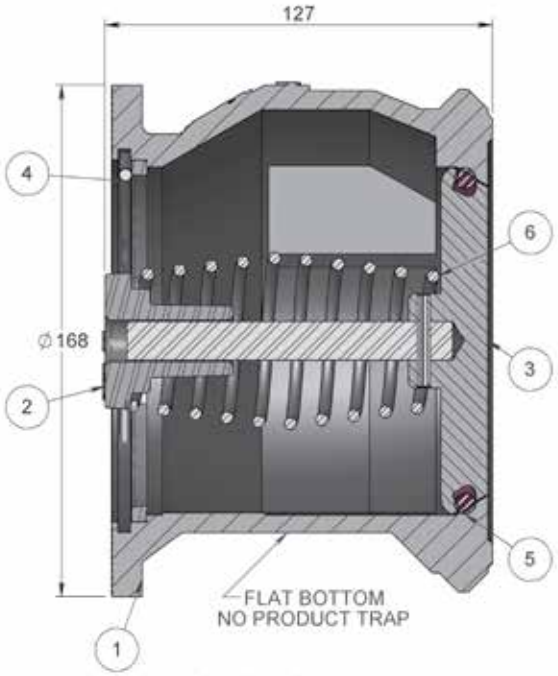
- **API-DC:** Aluminium API Dust Cap with Camlocks.
- **API-DCLA:** Aluminium API Dust Cap with lockable levers.
- **0657V:** 4" TTMA Viton™ A Gasket.
- **BF4-SG-25:** 4" TTMA Flange Sight glass 25mm thickness.
- **BF4-SG-40:** 4" TTMA Flange Sight glass 40mm thickness.

API455 NON-OPENABLE API ADAPTOR









SECTION A-A

ITEM	PART No.	DESCRIPTION	QTY	MATERIAL
1	API455-1	BODY	1	ALUMINIUM
2	API450-3	SPIDER, SPRING RETAINING	1	ALUMINIUM
3	API455-2	SHAFT/POPPET ASSEMBLY	1	ST STEEL/ALUM
4	4469	SPRING CLIP	1	ST STEEL
5	0289	O-RING SPECIAL	1	VITON B70
6	0330	POPPET SPRING	1	ST STEEL



Rail Car API Load/Unload Valve - APIRC

APIRC drybreak female adaptor is for gravity discharge and will fit to male API standard bottom loading adaptors. It is suitable for unloading rail cars and tank trucks or is commonly used on jumper hoses to pumping systems.

Operation of the handle on the coupler opens the poppet on the API adaptor.

Features & Benefits

- Unique one piece seal engages nose of API adaptor before the poppet opens to ensure no product loss.
- Seal can be replaced without stripping the coupler.
- The design of the seal with multiple lips gives the best ever tolerance to damage from dirt or other problems.
- Lightweight, Simple & Inexpensive API bottom loading coupler.
- Designed for Gravity Discharge but will operate up to 350 kPa (working pressure).
- The APIRC is straight through with 102mm FBSP thread.
- 100mm bore throughout.
- The handle has an over centre operation and also has locks in an open or closed position.

Technical Information

Materials

- Aluminium body with hard anodised bearing surfaces.
- Viton™ seals.

Pressure Rating

- 350 kPa max coupling pressure.

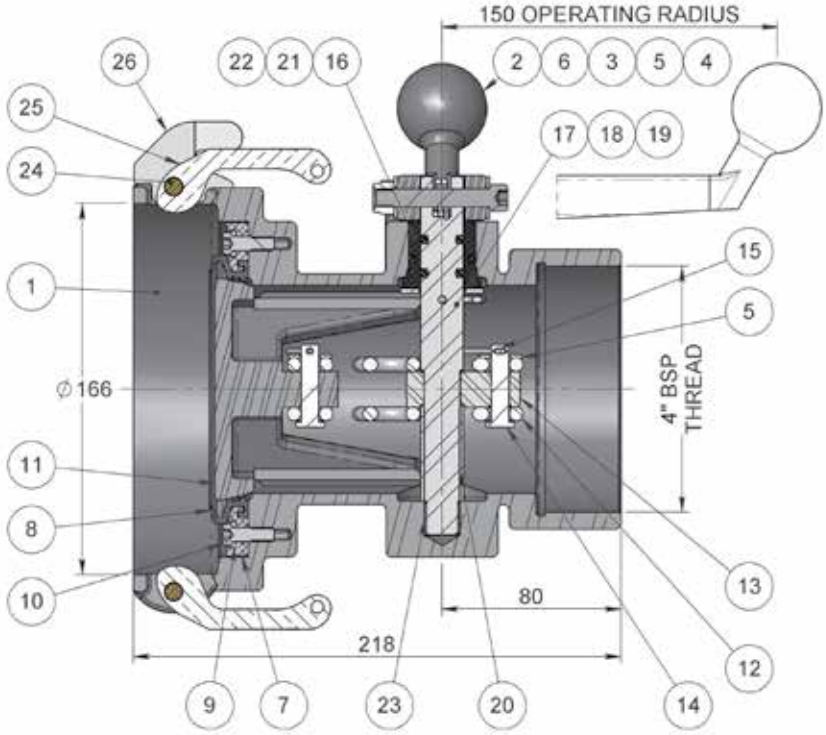
Ordering Information

- **APIRC:** Gravity Drop Female API coupler.

Associated Equipment

All API Male Adaptors.

APIRC API COUPLER FOR RAILCARS



ITEM	PART No	DESCRIPTION	QTY	MATERIAL
1	APIRC-1	BODY API RAILCAR DRYBREAK	1	ALUMINIUM
2	APINZ-7	OPERATING HANDLE	1	ALUMINIUM
3	0717	CAPSCREW IMPERIAL	1	Z/P STEEL
4	0149	NUT NYLOC	1	Z/P STEEL
5	0101	WASHER FLAT	4	Z/P STEEL
6	4415	SPRING HANDLE RETURN	1	Z/P STEEL
7	APINZ-4	RETAINING RING FOR SEAL	1	ALUMINIUM
8	4534	COMBINATION SEAL	1	VITON A
9	0107	WASHER SPRING	4	Z/P STEEL
10	4831	CAPSCREW IMPERIAL	4	Z/P STEEL
11	APINZ-2	POPPET PISTON	1	ALUMINIUM
12	4425	S SPRING	2	SPR STEEL
13	API513-7	CAM ECCENTRIC	1	ST STEEL
14	4830	CLEVIS PIN	2	STEEL
15	0764	SPLIT PIN	2	ST STEEL
16	APINZ-5	BUSH FOR SHAFT	1	ACETAL
17	APINZ-6	OPERATING SHAFT	1	ST STEEL
18	5311	WASHER FLAT	1	ST STEEL
19	0945	R-CLIP TO SUIT API450 SERIES	1	ST STEEL
20	APINZ-8	SPACER TUBE	1	ST STEEL
21	4501	O-RING	1	NITRILE
22	0235	O-RING	2	VITON B70
23	5607	TETRA BEARING	1	TEFLON
24	API-DC-3	PIN FOR CAMLEVERS	2	BRASS
25	CLC3.0-2	LEVER CAMLOCK	2	BRASS
26	4438	CLIP - CAMLOCK RETAINER	2	ST STEEL





API Dust Caps

API Dust Caps are suitable for use with any API adaptor built to the API RP1004 standard.

API-DC is a standard Camlock API dust cap, which can be attached to the tanker via a chain.

API-DCLA is a lockable API dust cap and includes a cable (as pictured) for attachments to the tanker.

Technical Information

Operation

Uses the same closure principle as a Camlock and has the same cam arms.

Materials

- Aluminium body, metal arms and pins.
- Buna seal as standard, but Viton™available on request.

Ordering Information

- **API-DC:** Aluminium API Dust Cap with Camlocks.
- **API-DCLA:** Aluminium API Dust Cap with lockable levers.



Dust Caps

Liquip offers a range of 3" and 4" Camlock Dust Caps.

Liquip's dust caps are made of high grade material to ensure superior protection and sealing and can be supplied in various material and seal configurations.

Ordering Information

3" Dust Caps

- **NA80-2AW:** 3" Aluminium Camlock Dust Cap.
- **NA80-2KA:** 3" Camlock Dust Cap (Lockable).
- **NA80-2KAT:** 3" Camlock Dust Cap with Teflon™ Seal (Lockable).

4" Dust Caps

- **NA100-2AW**- 4" Aluminium Camlock Dust Cap
- **NA100-2KA**: 4" Camlock Dust Cap (Lockable).
- **NA100-2J:** 4" Camlock Dust Cap (Jet A1 & AVGAS).
- **NA100-2JKA:** 4" lockable Camlock Dust Cap (Jet A1)

Associated Equipment

Angled Camlock adaptors

- **API-MC80:** API to 80mm male Camlock at 15 degree downward angle fitted with Nitrile seal.
- **API-MC80AT:** API to 80mm male Camlock at 15 degree downward angle fitted with Teflon™ seal.
- **API-MC100:** API to 100mm male Camlock at 15 degree downward angle fitted with Nitrile seal.
- **API-MC100AT:** API to 100mm male Camlock at 15 degree downward angle fitted with Teflon™ seal.

Straight Camlock adaptors

- **API-MC3J:** API to 75mm male Camlock, straight with selective slot for JetA1 fitted with Nitrile seal.
- **API-MC4:** API to 4" male Camlock, straight.
- **API-MC4J:** API to 100mm male Camlock, straight with selective slot for JetA1 fitted with Nitrile seal.
- **API-MC4G:** API to 100mm male Camlock, straight with selective slot for AVGAS fitted with Nitrile seal.
- **API-MC4AT:** API to 100mm Camlock, straight fitted with Teflon™ seal.
- **API-MC4-V:** API to 100mm Camlock adaptor, straight fitted with Viton™ seal.



API-Camlock Coupling Adaptors

Liquip offers a range of API to Camlock gravity discharge adaptors for use where it is preferred to use existing hose fitted with standard Camlocks.

API to Camlock adaptors are available at different angles and are fitted with a variety of seals to suit a wide range of products and market specific applications.

Ordering Information

Angled Camlock adaptors

- **API-MC80:** API to 80mm male Camlock at 15 degree downward angle fitted with Nitrile seal.
- **API-MC80AT:** API to 80mm male Camlock at 15 degree downward angle fitted with Teflon™seal.
- **API-MC100:** API to 100mm male Camlock at 15 degree downward angle fitted with Nitrile seal.
- **API-MC100AT:** API to 100mm male Camlock at 15 degree downward angle fitted with Teflon™seal.

Straight Camlock adaptors

- **API-MC3J:** API to 75mm male Camlock, straight with selective slot for JetA1 fitted with Nitrile seal.
- **API-MC4:** API to 4" male Camlock, straight.
- **API-MC4J:** API to 100mm male Camlock, straight with selective slot for JetA1 fitted with Nitrile seal.
- **API-MC4G:** API to 100mm male Camlock, straight with selective slot for AVGAS fitted with Nitrile seal.
- **API-MC4AT:** API to 100mm Camlock, straight fitted with Teflon™seal.
- **API-MC4-V:** API to 100mm Camlock adaptor, straight fitted with Viton© seal.

Associated Equipment

- All API male adaptors.



Flanges

Liquip offer a complete range of weld flanges for pipe and tube to suit 3" and 4" TTMA fittings.

Ordering Information

- **BF3:** 3" TTMA Aluminium Flange.
- **BF3-1:** 3" TTMA Mild Steel Flange.
- **BF3-1S:** 3" TTMA Stainless Steel Grade 304 Flange.
- **BF3-1S-316:** 3" TTMA Stainless Steel Grade 316 Flange.
- **BF4:** 4" TTMA Aluminium Flange.
- **BF4-1:** 4" TTMA Mild Steel Flange.
- **BF4-1S-316:** 4" TTMA Stainless Steel Grade 316 Flange.

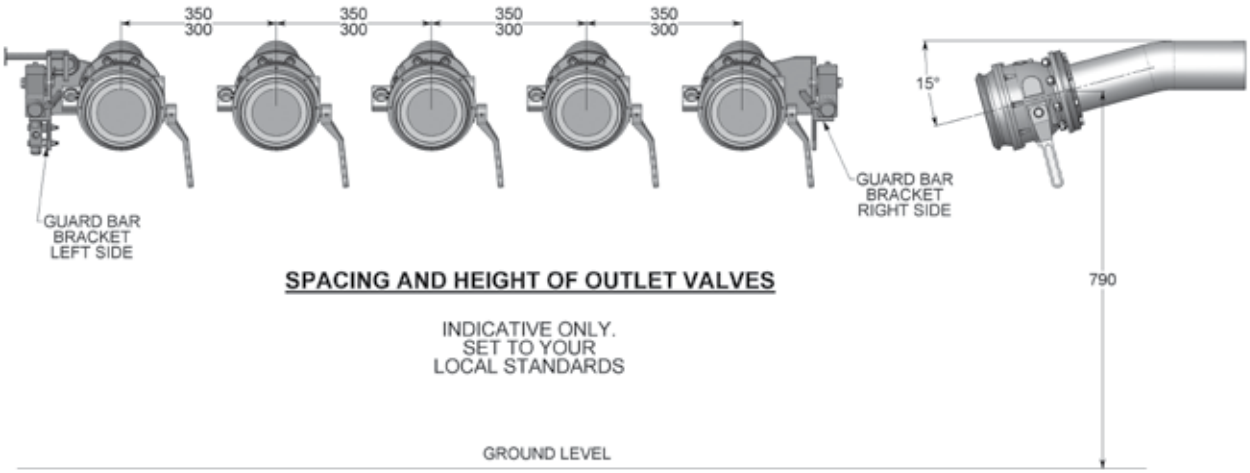
Associated Equipment

- **0656:** 3" TTMA NBR Cork Gasket.
- **0656V:** 3" TTMA Viton™Gasket.
- **0657:** 4" TTMA NBR Cork Gasket.
- **0657V:** 4" TTMA Viton™Gasket.

Pipelines Footvalve to API Outlet Valves

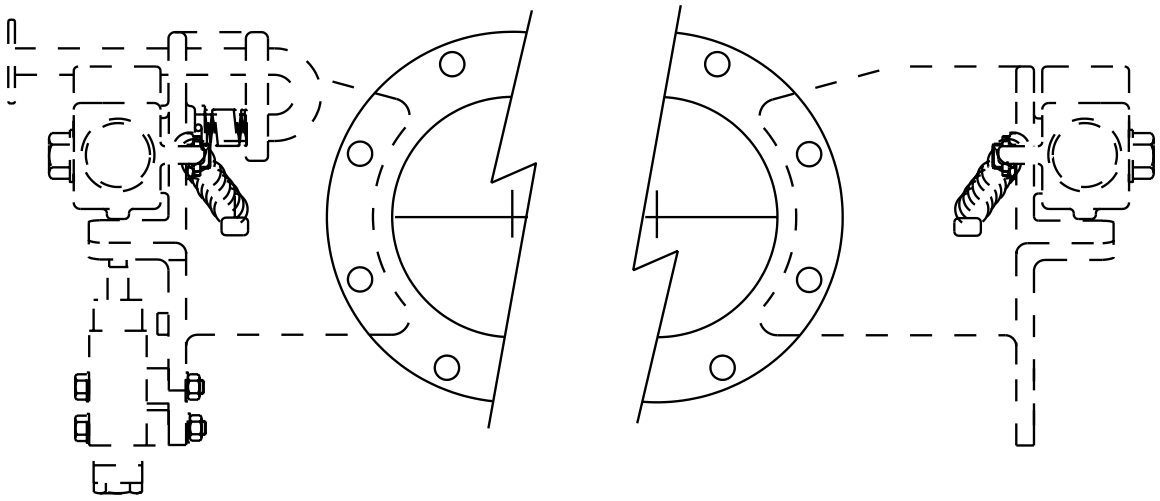
Pipeline between footvalve and API outlet valve should be 100mm tube.

We recommend that a standard jig for the API weld flanges be used so they can be positioned and fixed to the tank, the jig will hold the flange while the pipelines are fabricated.



Tack weld all flanges to outlet pipes and check position prior to removal for full seam welding and pressure testing.

Bolt completed pipelines to tanker, ensuring all pipelines have very little if any spring (3mm maximum) that could cause stress on the footvalve. Ensure that flange faces are clean and flat. Loosely bolt on all assemblies, remembering the outer 2 screws of the outer 2 API adaptors (left and right) need extra length to accept the guard bar brackets. When everything is positioned and checked to be correct, tighten fasteners to **24-27 Nm**.

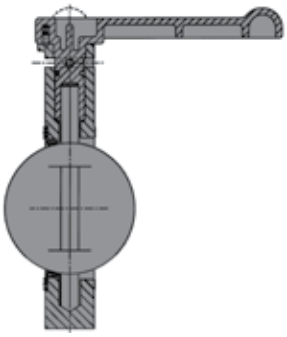


Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

Outlet Valves

Considerations on mounting the valves are:

- Clearance distance between each valve (eg. handle hitting tank runner or other equipment, female coupling cannot be connected for bottom loading)?
- Butterfly valves - 250mm separation?
- API adaptors - 330mm separation?
- Handles can be mounted at a direction that suits you (vertical or horizontal)?
- Angle valves are bolted on?
- Will bottom loading conversion be a possibility at a later date?





Mounting API490 Series Valves

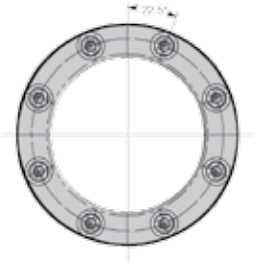
Note the holes in the API490 flange are offset at 22.5˚. This should be taken into account before welding on the pipe flange.

Insert bolts through holes in flange on end of pipeline and place on gasket, sightglass, gasket and valve, depending on which combination is used.

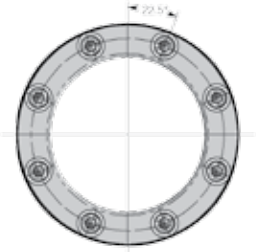
Before fixing valve in position with nuts supplied, it's best recommended to have the API valve with a 10˚ to 15˚ incline to the horizontal.
This will have to be considered when welding outlet flange to pipeline.

Nuts to be tightened to 10-12Nm.







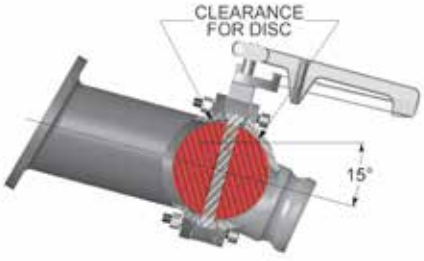


Mounting LBV Butterfly Valves

When a butterfly valve is to be used, a flange with an internal chamfer must be used to allow enough clearance for the opening of the butterfly.

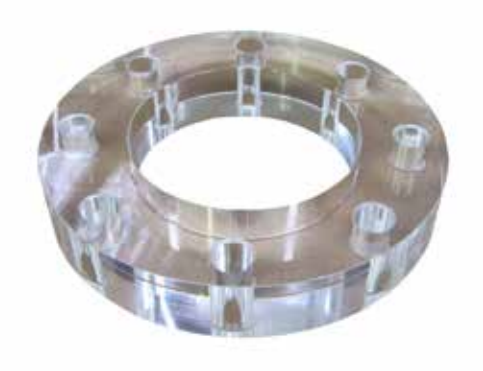
Before welding on flange, check the direction the nosecone will be and alter flange position as required.

BF3 and BF4 series flanges are suitable for mounting LBV Butterfly Valves.





Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



API Sightglasses

Liquip offers a range of 3" and 4" TTMA sightglass flanges which allow for visual identification of product in the run down piping prior to opening the API valve.

The standard drilling is TTMA, so the unit will fit behind an API adaptor as well as a Liquip butterfly valve.

Technical Information

Pressure
Max pressure 1000 kPa.

Temperature
Max temp 70°C.

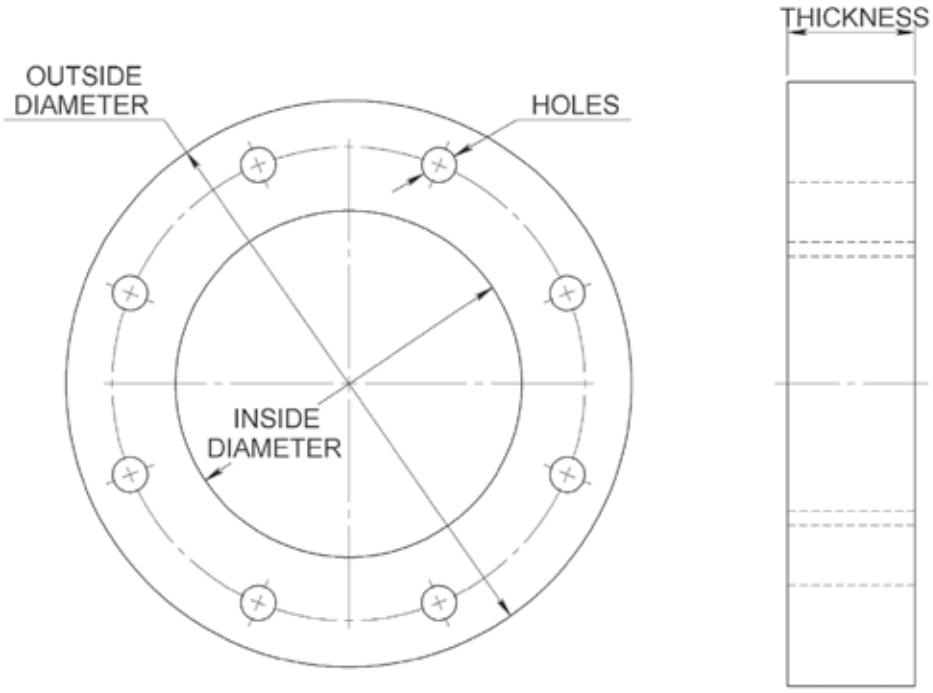
Mounting
4" TTMA.

Materials
Acrylic.

Ordering Information

- **BF3-SG:** 3" TTMA x 25mm thick.
- **BF4-SG-25 :** 4" TTMA x 25mm thick.
- **BF4-SG-40:** 4" TTMA x 40mm thick.
- **BF4-SG-25Z:** BF4-SG-25 c/w 1 x 4" TTMA NBR Cork Gasket.
- **BF4-SG-25VZ:** BF4-SG-25 c/w 1 x 4" TTMA Viton™Gasket.
- **BF4-SG-40Z:** BF4-SG-40 c/w 1 x 4" TTMA NBR Cork Gasket.
- **BF4-SG-40VZ:** BF4-SG-40 c/w 1 x 4" TTMA Viton™Gasket.
- **API-SG-150:** Sightglass ASA150 40mm 125ID.

SIGHTGLASS FOR FLANGES



Size	Part No	Outside Diameter	Inside Diameter	Thickness	Holes
4" ANSI125	API-SG-150	228	130	40	8 x Ø19 on 190 PCD
4" TTMA	BF4-SG-25	178	109	25	8 x Ø11 on 149.2 PCD
4" TTMA	BF4-SG-40	178	109	40	8 x Ø11 on 149.2 PCD
3" TTMA	BF3-SG	146	86	25	8 x Ø11 on 124 PCD

NOTES:
1. MATERIAL IS CAST ACRYLIC.
2. MOUNTING FLANGES TO BE FLAT TO WITHIN 1mm.
3. VITON (OR SIMILAR HARDNESS) GASKETS TO BE USED.
4. TIGHTEN MOUNTING BOLTS TO A TORQUE OF 20Nm.



SLV5 Air Operated Series

The SLV5-ARO pneumatic and sequential emergency valve incorporates the latest technical advancements to ensure high flow rates and the safe loading and discharge of road tankers.

The SLV-ARO has a specially designed poppet that provides a reduction in static electricity for fast and safe operation at high flow rates.

This valve is installed in the compartment floor and controls the flow of product from each compartment. It also incorporates a shear groove which is designed to break below the valve and retain the compartment contents in the event of accidental damage to the wet legs or API adaptors.

The 125mm diameter poppet has a concave design which operates as a deflector reducing splash, surge and static build up during loading and similarly during discharge. The unique design results in nil vortexing of the product meaning faster and safer loading and unloading.

Features & Benefits

- A unique hinged poppet design that acts as a splash deflector to eliminate vortexing of product surges and static build up.
- Minimal pressure drop across the system.
- Can be operated pneumatically or manually.
- Can be manually operated with a jack screw in the event of pressure loss.
- Air operator assembly is easily removable & replaceable.
- Specially bonded lip seal design for superior sealing and extended life.
- Fitted with Viton™A seals as standard for superior product compatibility.
- Incorporates a shear groove that is designed to retain the compartment contents in the event of accidental damage.
- Easily removed for routine maintenance.

Technical Information

Pressure Rating

Nominal Ø100mm flow area except poppet is Ø125 bore for minimum pressure drop. Needs a minimum of 350 kPa of air pressure.

Mounting

Bolted to sump or tank flange at the bottom of tank 8 holes Ø9.5 on a 210 PCD.

Air Consumption

Consumption 1.0L free air per stroke.

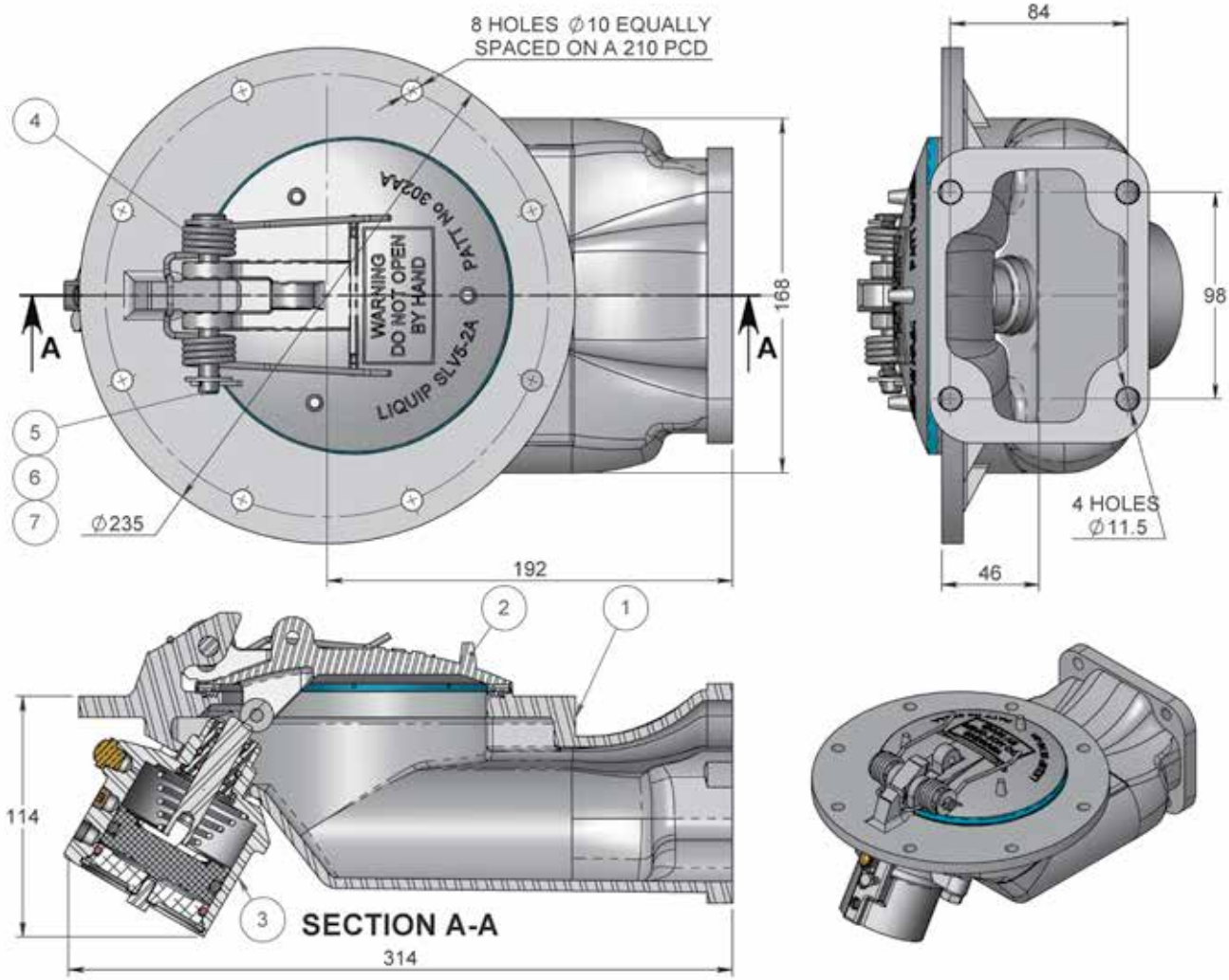
Ordering Information

- **SLV5-ARO:** Air Operated Internal Valve with Bonded Viton™A seal.
- **SLV5-AROZ:** SLV5:ARO comes with Neo Cork Gaskets (tank and pipe flange).
- **SLV5-AROVZ:** SLV5:ARO comes with Viton™A Gaskets (tank [3mm] and pipe [3mm] flange).
- **SLV5-AROTVZ:** SLV5:ARO comes with 1.6mm Viton™A Gaskets (tank [1.6mm] and pipe [3mm] flange).
- **SLV5-AROAVI:** Air Operated Internal Valve with Bonded Viton™A seal- Aviation Specification.
- **SLV5-AROAVIZ:** SLV5-AROAVI comes with NBR Corke Gaskets (tank and pipe flange).
- **SLV5-AROC:** Air Operated Internal Valve with Bonded FFKM seal- Chemical.

Associated Equipment

- **ARO100:** External Air Ram Assembly for SLV5 Foot Valves.
- **ACL405RGAT:** Air operated camlift (Aluminium handle and body, Teflon™ seals & stainless steel fasteners).
- **CL402RG:** Manual top operator (Aluminium handle and body, Viton™A O-ring and Z/P steel internals).
- **LW410:** Stainless Steel Lifting Wire Kit.
- **SLV5-13A:** Aluminium SLV5 Tank Flange c/w metric studs & nuts.
- **SLV5-13M:** Mild Steel SLV5 Tank Flange c/w metric studs & nuts.
- **SLV5-47:** 4" Mild Steel Adaptor Outlet to suit 4" steel tube.
- **SLV5-110:** Aluminium Adaptor Outlet to suit 100mm tube.
- **SLV5-114:** Aluminium Adaptor Outlet to suit 4" pipe.

SLV5-ARO EMERGENCY VALVE



ITEM	PART No	DESCRIPTION	SLV5-ARO	SLV5-AROC	MATERIAL
7	0764	SPLIT PIN	1	1	ST STEEL
6	0102	WASHER FLAT	2	2	Z/P STEEL
5	SLV5-8	PIN PIVOT OPERATING	1	1	ST STEEL
4	6154	SPRING DOUBLE TORSION	-	1	ST STEEL
	0323	SPRING DOUBLE TORSION	1	-	Z/P STEEL
3	ARO100C	PISTON AIR OPERATING CHEMICAL	-	1	ALUMINIUM
	ARO100Y	PISTON AIR OPERATING STANDARD	1	-	ALUMINIUM
2	SLV5-2ASK	LID & ROLLER ASSY - CHEMICAL	-	1	ALUM / FFKM
	SLV5-2AS	LID & ROLLER ASSY - STANDARD	1	-	ALUM / FKM
1	SLV5-1	ELBOW BODY	1	1	ALUMINIUM



Chemical Air Operated Emergency Valve

The Liquip SLV5-AROC pneumatic Chemical Trim (FFKM) Valve leads the industry with its low profile, low splash and vortex free design which minimises static and also enables faster tanker unloading than traditional mushroom poppet valves.

FFKM (a perfluroelastomer commonly known as Ekraz or Kalrez) is one of the most chemically resistant materials available and is suitable for some of the harshest chemical compounds. FFKM is commonly used with aggressive, corrosive and reactive chemicals.

Liquip also offers some spare parts for the obsolete SLC200 series bottom valve - contact Liquip for further details.

Features & Benefits

- Incorporates the latest technical advancements to ensure fast and safe loading and discharge of road tankers.
- The valve is installed underneath the compartment floor and controls the flow of product from each compartment individually.
- The 125mm dia.. poppet has a concave design which operates as a deflector reducing splash, surge and static build up during loading and similarly during discharge.
- Hinged poppet design gives minimum height, so valve requires very little clearance to drop out for servicing.
- Emergency jacking screw in the air ram allows drainage if air is unavailable.
- Can be used with top operator.
- FFKM seals can be distinguished by the white colour.

Technical Information

Pressure

Nominal Ø100mm flow area except poppet is Ø125 bore for minimum pressure drop. Needs a minimum of 350 kPa of air pressure.

Air Consumption

Consumption 1.0L free air per stroke.

Materials

Aluminium body. Stainless steel main spindle. Chemical Trim, FFKM main seal bonded to aluminium poppet. Aluminium air ram body with FFKM seals, Teflon™bush and gasket.

Weight

3.0 kg.

Mounting

Bolted to sump or tank flange at the bottom of tank 8 holes Ø9.5 on a 210 PCD. Outlet adaptor from rectangular to round is available in aluminium or steel.

Periodic Service

No routine maintenance required. Check sealing of valve as required by authorities.

Dismantle

Being a self-contained and externally mounted assembly, the air operated assembly is easily removable & replaceable.

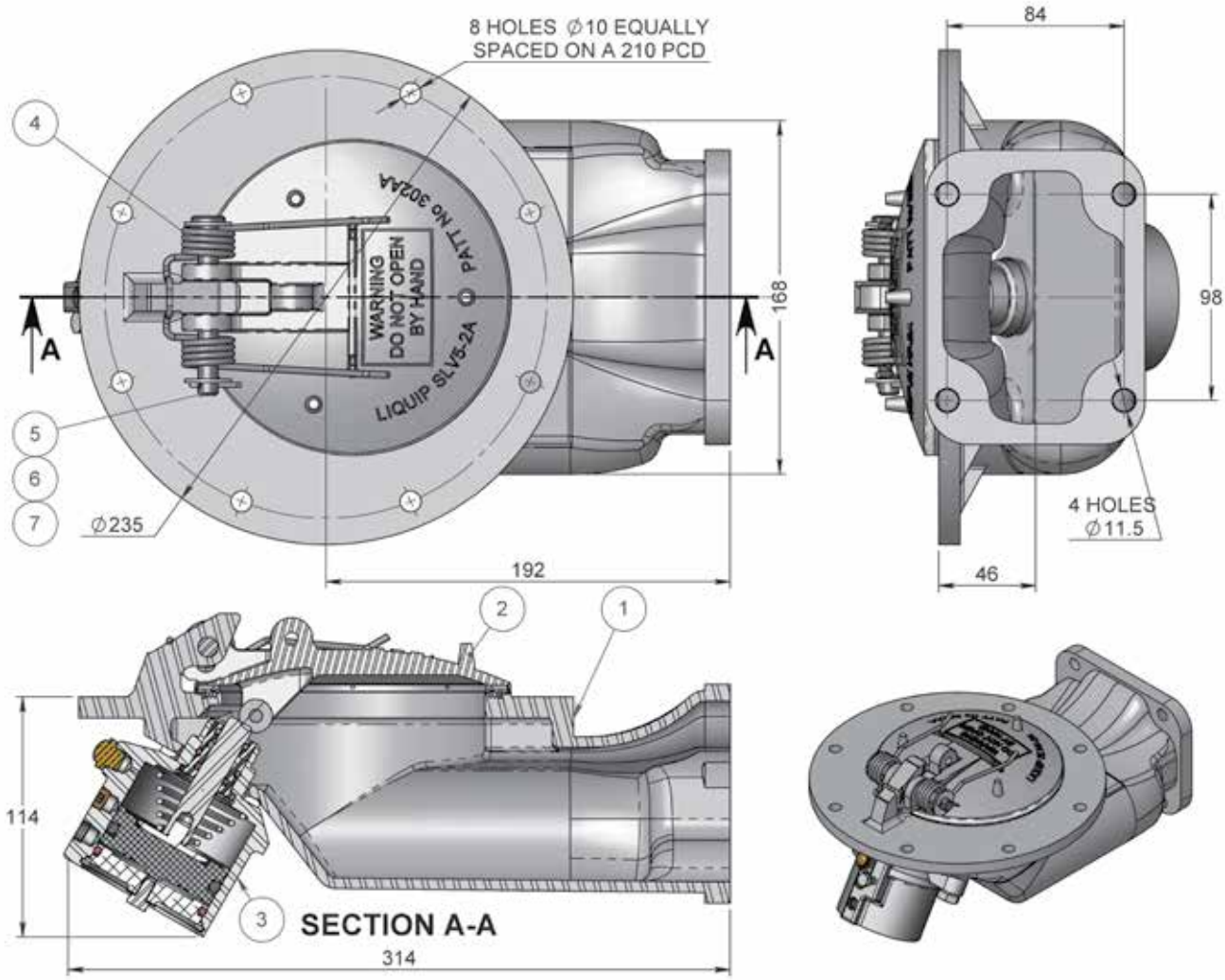
Ordering Information

- **SLV5-AROC:** Air Operated Internal Valve with Bonded FFKM seal - Chemical.

Associated Equipment

- **4646:** Teflon™gasket to suit SLV5 air ram.
- **6086:** Gore-Tex® Gasket to suit SLV5 Pipe Flange.
- **7591:** Gore-Tex® Gasket to suit SLV5 Tank Flange.

SLV5-AROC EMERGENCY VALVE



ITEM	PART No	DESCRIPTION	SLV5-ARO	SLV5-AROC	MATERIAL
7	0764	SPLIT PIN	1	1	ST STEEL
6	0102	WASHER FLAT	2	2	Z/P STEEL
5	SLV5-8	PIN PIVOT OPERATING	1	1	ST STEEL
4	6154	SPRING DOUBLE TORSION	-	1	ST STEEL
	0323	SPRING DOUBLE TORSION	1	-	Z/P STEEL
3	ARO100C	PISTON AIR OPERATING CHEMICAL	-	1	ALUMINIUM
	ARO100Y	PISTON AIR OPERATING STANDARD	1	-	ALUMINIUM
2	SLV5-2ASK	LID & ROLLER ASSY - CHEMICAL	-	1	ALUM / FFKM
	SLV5-2AS	LID & ROLLER ASSY - STANDARD	1	-	ALUM / FKM
1	SLV5-1	ELBOW BODY	1	1	ALUMINIUM



Air Rams - Standard and Chemical

The piston type air operated ram can be used in place of the standard diaphragm air ram used on Liquip foot valves.

The plunger is pushed forward by a piston when air is supplied to the air inlet. The air in the cylinder is expelled through the exhaust port. The air ram assembly also has a sequential port that can be connected to other air rams in series.

A jacking screw is provided to allow manual opening of the valve in the event of air pressure loss (note that this does not fully open the valve).

Technical Information

Materials

- Aluminium body.
- Stainless steel poppet.
- Viton™seals and gasket.
- Acetal piston.

Pressure

60mm bore.

Needs a minimum of 350 kPa of air pressure, to open the foot valve fully.

Dismantle

Air ram operator assembly is easily removable & replaceable, being a self-contained externally mounted assembly.

Mounting

Bolted to SLV5 body using M10 screws and spring washers with a sealing gasket.

Weight

0.65 kg.

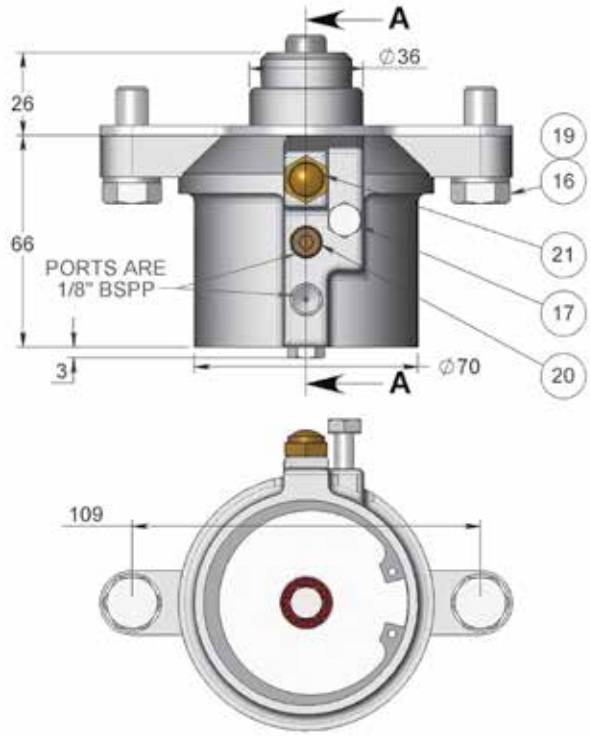
Ordering Information

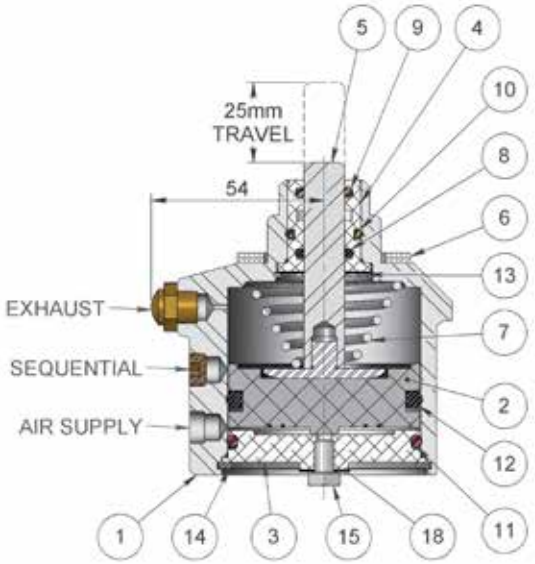
- **ARO100:** Air Ram Assembly for SLV5 series footvalve.
- **ARO100C:** Chemical Air Ram Assembly for SLV5-AROC footvalve.

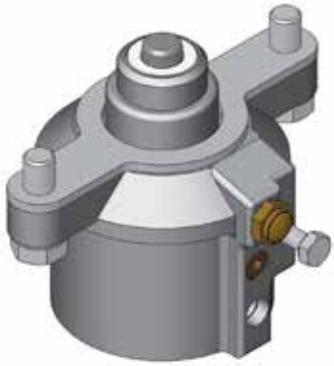
Associated Equipment

- **SLV5-ARO:** Air Operated Internal Valve with Bonded Viton™A seal.
- **SLV5-AROZ:** SLV5:ARO comes with Neo Cork Gaskets (tank and pipe flange).
- **SLV5-AROVZ:** SLV5:ARO comes with Viton™A Gaskets (tank [3mm] and pipe [3mm] flange).
- **SLV5-AROTVZ:**SLV5:ARO comes with 1.6mm Viton™A Gaskets (tank [1.6mm] and pipe [3mm] flange).
- **SLV5-AROAVI:** Air Operated Internal Valve with Bonded Viton™A seal- Aviation Specification.
- **SLV5-AROAVIZ:** SLV5-AROAVI comes with NBR Corke Gaskets (tank and pipe flange).
- **SLV5-AROC:** Air Operated Internal Valve with Bonded FFKM seal- Chemical.

AIR RAM OPERATOR ARO100 & ARO100C







ITEM	PART No	DESCRIPTION	ARO100	ARO100C	MATERIAL
1	ARO100-1	AIR RAM CYLINDER BODY	1	1	ALUMINIUM
2	ARO100-2	PISTON	1	1	ACETAL
3	ARO100-3	CAP END AIR RAM	1	1	ALUMINIUM
4	ARO100-4	AIR RAM PLUNGER BUSH	1	-	ACETAL
	ARO102-4	AIR RAM PLUNGER BUSH	-	1	PTFE
5	SLV5-5	OPERATING PLUNGER	1	1	ST STEEL
6	0273V	GASKET FOR AIR RAMS	1	-	VITON
	4646	GASKET FOR AIR RAMS	-	1	EXP-PTFE
7	6126	SPRING COMPRESSION	1	1	ST STEEL
8	0244	O-RING	2	1	VITON A
9	7589	O-RING	-	1	KALREZ
10	0278	O-RING	1	-	VITON A
	7590	O-RING	-	1	KALREZ
11	0137	O-RING	1	1	VITON A
12	0218	O-RING	1	1	NITRILE
13	4546	CIRCLIP INTERNAL	1	1	Z/P STEEL
14	5848	CIRCLIP INTERNAL	1	1	Z/P STEEL
15	6523	SETSCREW METRIC	1	1	Z/P STEEL
16	4947	SETSCREW METRIC	2	2	Z/P STEEL
17	4920	SETSCREW METRIC	1	1	Z/P STEEL
18	0889	WASHER FIBRE	1	1	RED FIBRE



SLV5 Cable Operated Series

Liquip offers a range of cable operated and manually operated emergency foot valves. Emergency valves are operated from the tank top or bottom of the tank and include the latest technical advancements in their designs to ensure high flow rates and safe loading and unloading is achieved.

All Liquip foot valves have a specially designed hinged poppet that provides a reduction in static electricity for fast and safe operation at high flow rates.

Features & Benefits

- A unique hinged poppet design that acts as a splash deflector to eliminate vortexing of product surges and static build up.
- Minimal pressure drop across the system.
- Can be operated via cable or manually from the ground or top of the tanker.
- Specially bonded lip seal design for superior sealing and extended life.
- Fitted with Viton™A seals as standard for superior product compatibility.
- Incorporates a shear groove that is designed to retain the compartment contents in the event of accidental damage.
- Easily removed for routine maintenance.

Technical Information

Pressure

Nominal Ø100mm flow area except poppet is Ø125 bore for minimum pressure drop. Needs a minimum of 350 kPa of air pressure.

Mounting

Bolted to sump or tank flange at the bottom of tank 8 holes Ø9.5 on a 210 PCD.

Air Operated Conversion

Can be converted to pneumatically operated valve.

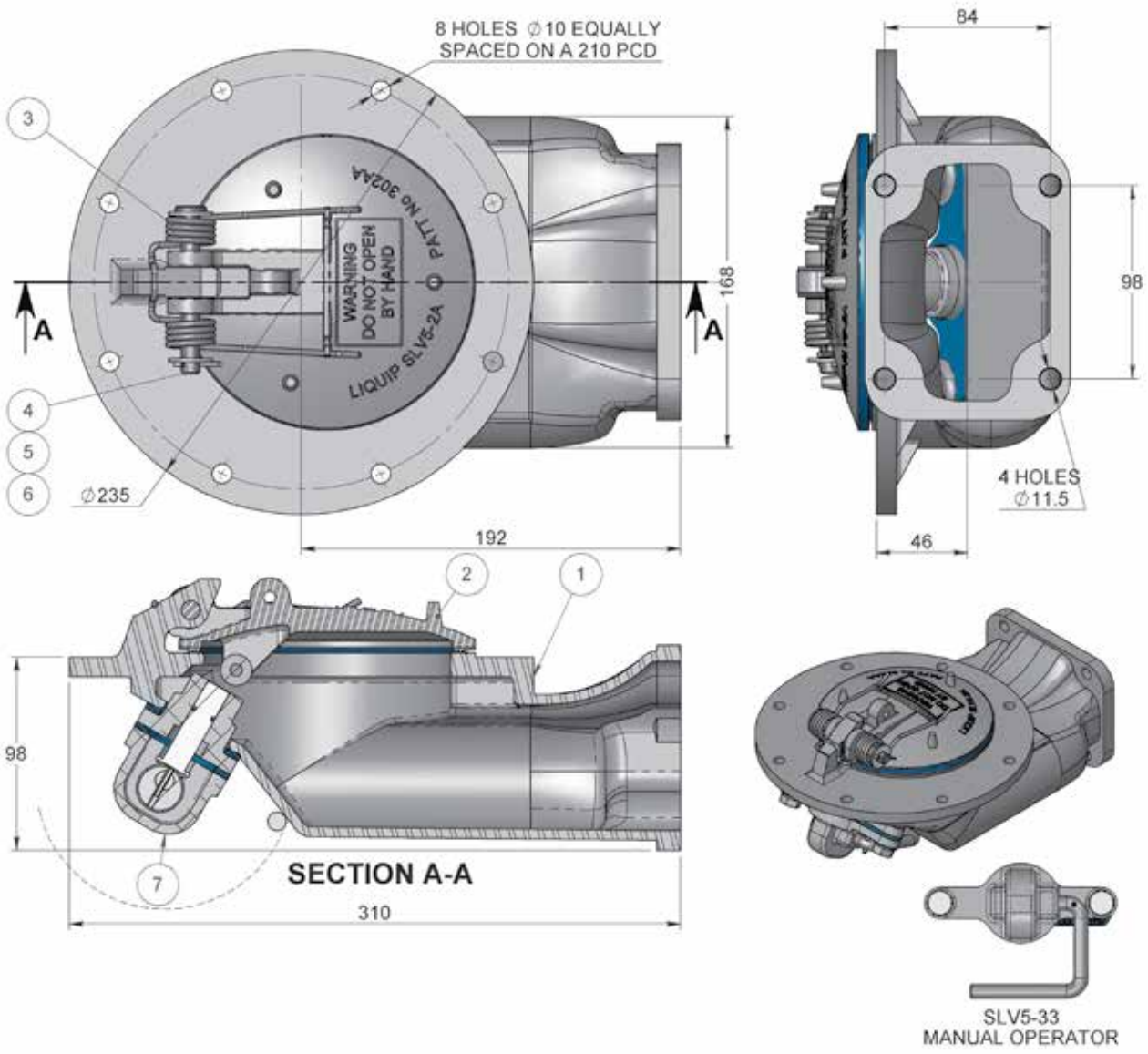
Ordering Information

- **SLV5CO:** Cable Operated Internal Valve with Bonded Viton™A seal.
- **SLV5M:** Cable Operated Internal Valve with Bonded Viton™A seal (top operated only).

Associated Equipment

- **ACL405RGAT:** Air operated camlift (Aluminium handle and body, Teflon™seals & stainless steel fasteners).
- **CL402RG:** Manual top operator (Aluminium handle / body, Viton™A O-ring and Z/P steel internals).
- **LW410:** Stainless Steel Lifting Wire Kit.
- **SLV5-13A:** Aluminium SLV5 Tank Flange c/w metric studs & nuts.
- **SLV5-13M:** Mild Steel SLV5 Tank Flange c/w metric studs & nuts.
- **SLV5-47:** 4" Mild Steel Adaptor Outlet to suit 4" steel tube.
- **SLV5-110:** Aluminium Adaptor Outlet to suit 100mm tube.
- **SLV5-114:** Aluminium Adaptor Outlet to suit 4" pipe.

SLV5M EMERGENCY VALVE



ITEM	PART No	DESCRIPTION	QTY	MATERIAL
7	SLV5-33	MANUAL OPERATOR ASSEMBLY	1	ALUMINIUM
6	0764	SPLIT PIN	1	ST STEEL
5	0102	WASHER FLAT	2	Z/P STEEL
4	SLV5-8	PIN PIVOT OPERATING	1	ST STEEL
3	0323	SPRING DOUBLE TORSION	1	Z/P STEEL
2	SLV5-2AS	LID & ROLLER ASSY - STANDARD	1	ALUM / FKM
1	SLV5-1	ELBOW BODY	1	ALUMINIUM



Tank Flanges

Liquip offers a range of tank flanges to suit the SLV5 Series of Internal Valves.

Tank flanges are welded into the floor of a tanker compartment to fix the SLV5 series internal valves in place.

Ordering Information

- **SLV5-13A:** Aluminium SLV5 Tank Flange c/w metric studs & nuts.
- **SLV5-13M:** Mild Steel SLV5 Tank Flange c/w metric studs & nuts.
- **0272:** 3mm NBR Cork Gasket- SLV5 Tank Flange.
- **0272V:** 3mm Viton™A Gasket- SLV5 Tank Flange.
- **7616V:** 1.6mm Viton™A Gasket- SLV5 Tank Flange.
- **7591:** Gore-Tex® Gasket- SLV5 Tank Flange.
- **7515:** 1.5mm Klinger Gasket- SLV5 Tank Flange.

Associated Equipment

- **SLV5-ARO:** Air Operated Internal Valve with Bonded Viton™ A seal.
- **SLV5-AROZ:** SLV5:ARO comes with Neo Cork Gaskets (tank and pipe flange).
- **SLV5-AROVZ:** SLV5:ARO comes with Viton™ A Gaskets (tank [3mm] and pipe [3mm] flange).
- **SLV5-AROTVZ:** SLV5:ARO comes with 1.6mm Viton™ A Gaskets (tank [1.6mm] and pipe [3mm] flange).
- **SLV5-AROAVI:** Air Operated Internal Valve with Bonded Viton™ A seal- Aviation Specification.
- **SLV5-AROAVIZ:** SLV5-AROAVI comes with NBR Corke Gaskets (tank and pipe flange).
- **SLV5-AROC:** Air Operated Internal Valve with Bonded FFKM seal- Chemical.
- **SLV5CO:** Cable Operated Internal Valve with Bonded Viton™ A seal.
- **SLV5M:** Cable Operated Internal Valve with Bonded Viton™ A seal (top operated only).



SLV5 Strainer Outlets

Strainers protect the emergency (internal) valves from solid contaminants which may cause jamming of the valve or damage to the valve's sealing surfaces.

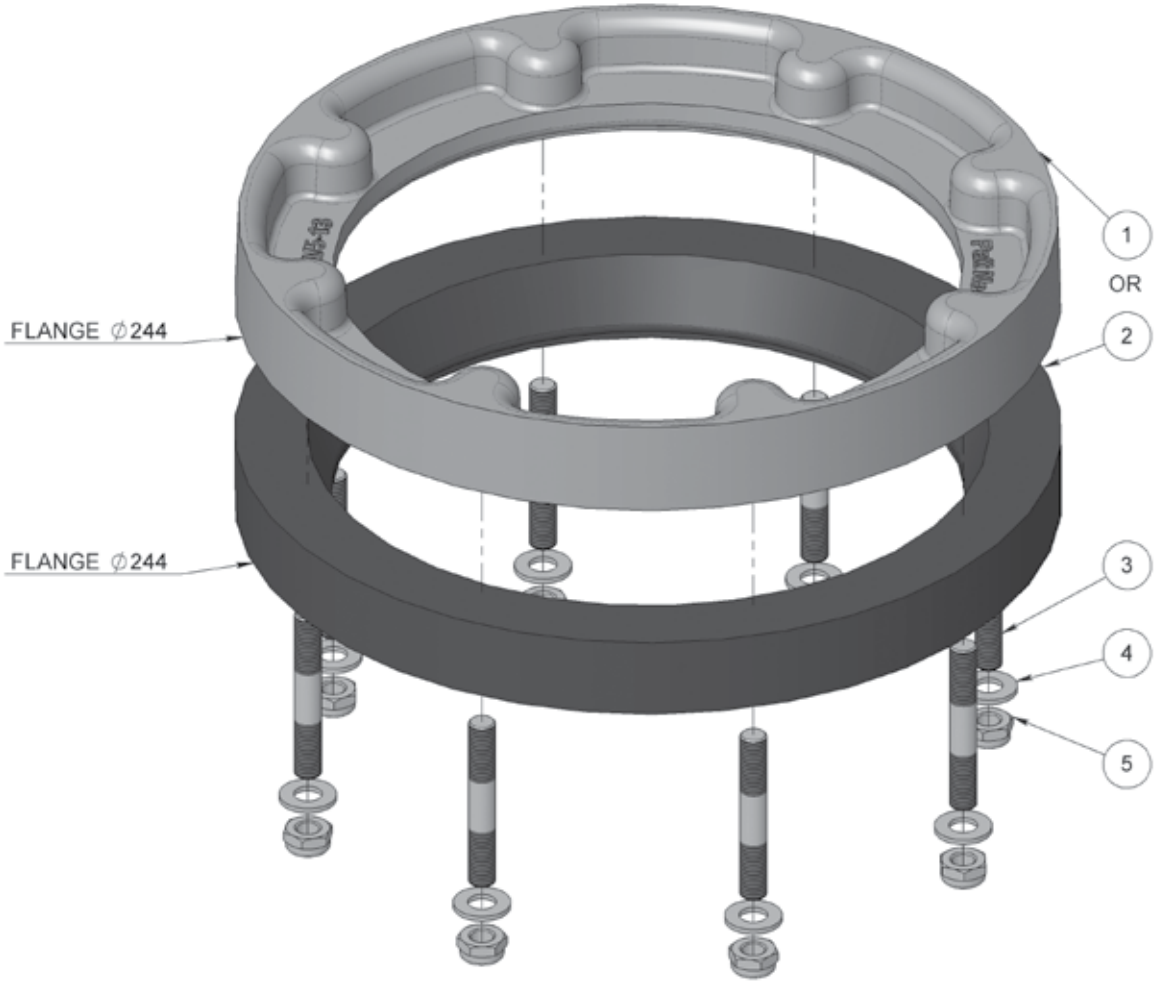
Ordering Information

- **SLV5-45:** Zinc Plated Strainer Outlet.

Associated Equipment

- **SLV5-ARO:** Air Operated Internal Valve with Bonded Viton™ A seal.
- **SLV5-AROZ:** SLV5:ARO comes with Neo Cork Gaskets (tank and pipe flange).
- **SLV5-AROVZ:** SLV5:ARO comes with Viton™ A Gaskets (tank [3mm] and pipe [3mm] flange).
- **SLV5-AROTVZ:SLV5:** ARO comes with 1.6mm Viton™ A Gaskets (tank [1.6mm] and pipe [3mm] flange).
- **SLV5-AROAVI:** Air Operated Internal Valve with Bonded Viton™ A seal- Aviation Specification.
- **SLV5-AROAVIZ:** SLV5-AROAVI comes with NBR Corke Gaskets (tank and pipe flange).

SLV5-13X MOUNTING FLANGE KITS



ITEM	PART No	DESCRIPTION	SLV5-13A	SLV5-13ATM	SLV5-13M	MATERIAL
1	C0248C	FLANGE TANK WELD	1	1	-	ALUMINIUM
2	70357	FLANGE TANK WELD METRIC	-	-	1	STEEL
3	SLV5-21M	STUD METRIC	8	-	8	Z/P STEEL
	SLV5-22M	STUD METRIC	-	8	-	Z/P STEEL
4	6667	WASHER FLAT	-	8	-	Z/P STEEL
5	6625	NUT HALF NYLOC MET	8	8	8	Z/P STEEL
6	59033	INSTRUCTION LEAFLET / DATASHEET	-	1	-	PAPER



Adaptor Outlets

Liquip offers a range of aluminium adaptors to provide a simple connection of the delivery pipe to the SLV5 Series emergency valves.

Outlet adaptors provide a cost effective and lightweight flanged connection of the delivery pipe (wet leg) to the emergency valve.

Technical Information

Pressure

100mm bore all through for minimum pressure drop.

Mild Steel adaptors

Mild Steel pipe is welded to the tapered side of the flange and the flange then bolted securely to the outlet of the emergency valve providing a clean efficient delivery/loading system.

Aluminium adaptors

Aluminium pipe is welded to the outlet side of the flange and the flange then bolted securely to the outlet of the emergency valve providing a clean efficient delivery/loading system.

Ordering Information

Mild Steel adaptors

- **SLV5-47:** 4" 4" Mild Steel Adaptor Outlet to suit 4" steel tube.
- **SLV5-43M:** Mild Steel 80mm outlet flange adaptor.

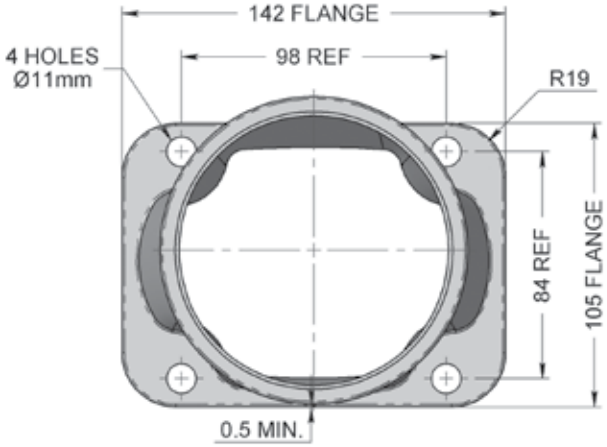
Aluminium adaptors

- **SLV5-110:** Aluminium Adaptor Outlet to suit 100mm tube.
- **SLV5-114:** Aluminium Adaptor Outlet to suit 4" pipe.

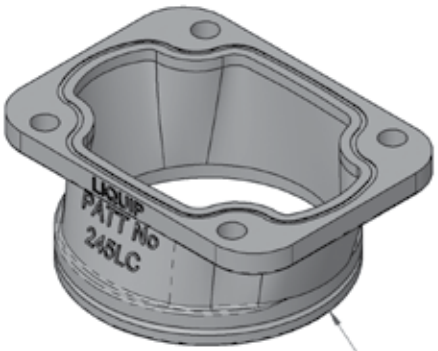
Associated Equipment

- **SLV5-ARO:** Air Operated Internal Valve with Bonded Viton™ A seal.
- **SLV5CO:** Cable Operated Internal Valve with Bonded Viton™ A seal.
- **SLV5M:** Cable Operated Internal Valve with Bonded Viton™ A seal (top operated only).
- **0200:** 3mm NBR Corke Gasket- SLV5 Pipe Flange.
- **0200V:** 3mm Viton™ A Gasket- SLV5 Pipe Flange.
- **6086:** PTFE Gasket- SLV5 Pipe Flange.
- **7514:** 1.5mm Klinger Gasket- SLV5 Pipe Flange.

SLV5-110 & SLV5-114 ADAPTORS

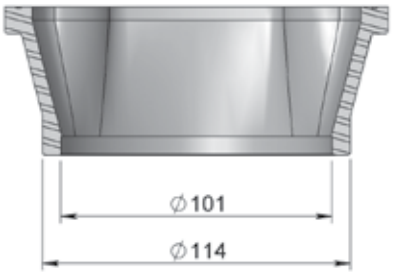


MOUNTING FLANGE DETAILS
TYPICAL FOR BOTH ADAPTORS



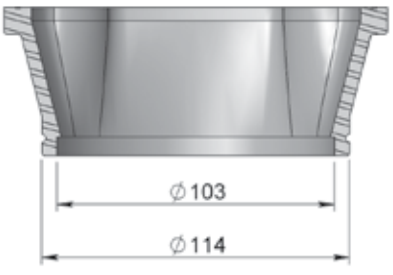
GROOVE AROUND OUTLET
IDENTIFIES SLV5-114





SLV5-110
TO SUIT Ø100mm ALUMINIUM TUBE





SLV5-114
TO SUIT Ø4" ALUMINIUM TUBE

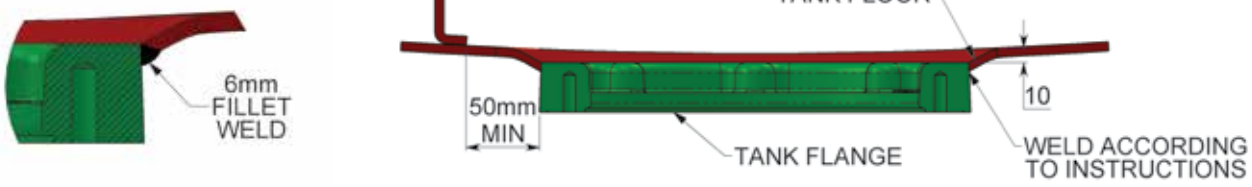
NOTES:
1- MATERIAL IS CAST ALUMINIUM AA601
2- ADAPTORS ARE IDENTICAL EXCEPT FOR THE OPENING
WHICH IS TO SUIT EITHER Ø100mm OR 4" (Ø101.6mm) TUBE

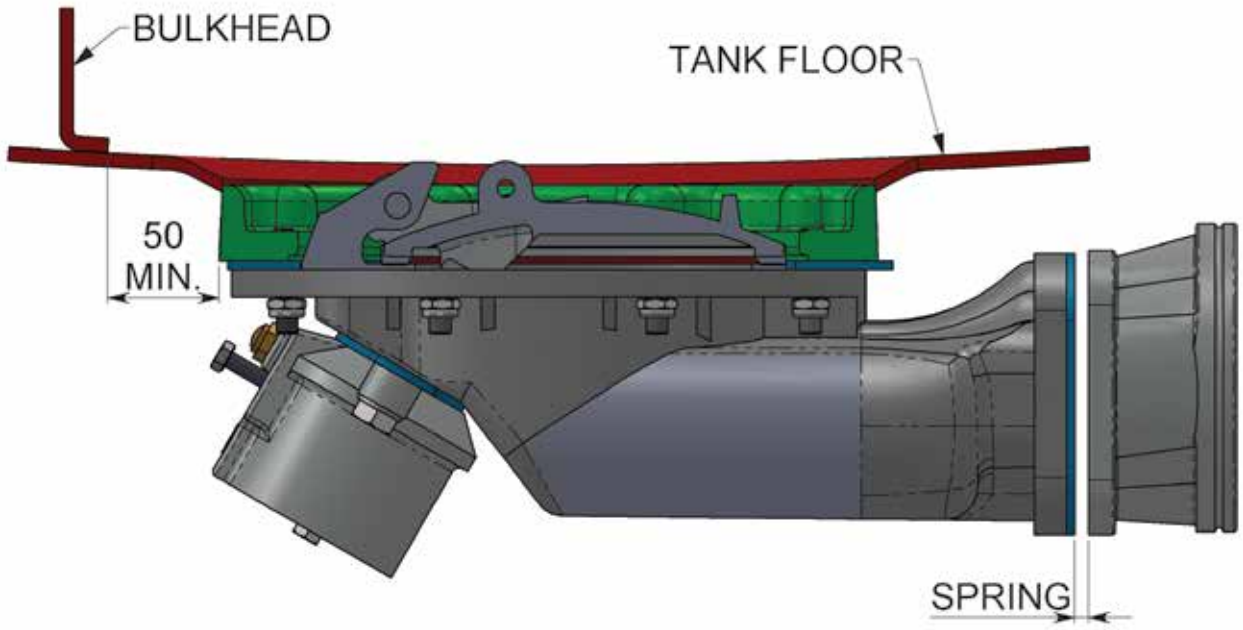
Internal / Emergency Valve SLV5

Due to its unique, low profile within the tank & patented method of operation, the SLV5 requires only 50mm of clearance under the body to enable removal from the tank.

It is essential that the Liquip manufactured tank weld flange (SLV5-13A - aluminium) be used as it is designed to provide a full cross-sectional liquid flow area. A tank flange cut with a simple parallel bore restricts the flow and can cause a hazard when bottom loading due to higher back pressures and higher velocities. The Liquip tank flange and flap valve provides the lowest pressure drop, lowest velocity and least vortexing when compared with any other internal valve in common use in the world.

Firstly, determine valve position giving consideration to where the outlet of the valve will lie (i.e. parallel with or 90 degrees to length of tank etc.) Weld in flange so that the studs line up with holes in the valve body.

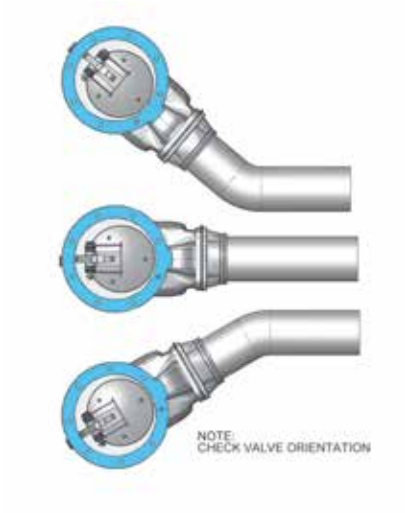




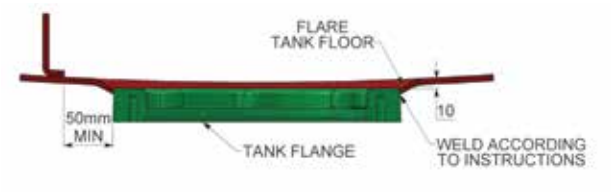
Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

Location

This equipment should be located at the lowest point of each compartment to ensure drainage. Leave at least 50mm clearance from the edge of the bulkhead weld to the edge of the tank flange to minimise stress.



Fitting To The Weld Flange

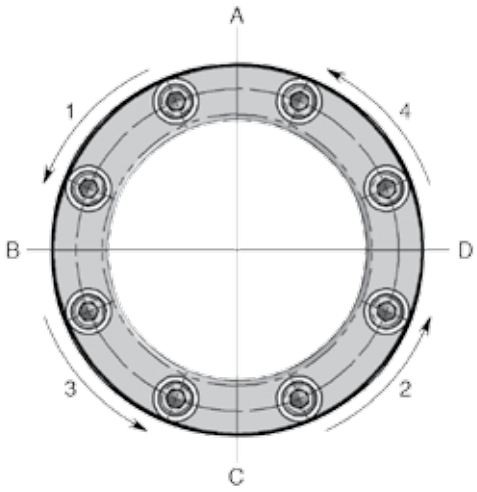


Cut a hole 242-244mm diameter and flare tank shell circumference outwards, for improved drainage and so the tank flange can be welded in easily. Continue flaring until tank flange can fit inside cut out.

Before welding in tank flange, assemble tank flange and outlet elbow and hold up in the hole previously cut and rotate assembly until outlet elbow is in the required direction. Using a suitable marker, place a mark on the side of the flange and the tank shell for re-alignment.

Flange Welding

Insert tank flange inside tank with stud holes facing out and markings lined up. Place 4 tack welds around tank flange inside of tank, make sure all studs are removed from flange, then fully weld around outside of flange to the following procedure.



Note 1: Follow sketch and the information below closely to ensure that distortion and stress is kept to a minimum.

Note 2: REMOVE ALL STUDS BEFORE WELDING.

Note 3: Ensure pipeline is supported/braced appropriately.

Fully weld the flange from the underside (outside) following this procedure.

1. WELD No. 1 A TO B
2. WELD No. 2 C TO D
3. WELD No. 3 B TO C
4. WELD No. 4 D TO A

Weld for maximum penetration but keep heat to a minimum to reduce stress and distortion.

When cool, remove all swarf, spatter and filings from tank to avoid damage to valve. Clean all sealing faces and test for flatness. Flatness must be within 0.5mm.

Screw studs into tank flange, fit gasket and valve with the valve outlet facing the required direction. Using supplied nuts, fit footvalve and tighten to 10-12 Nm.

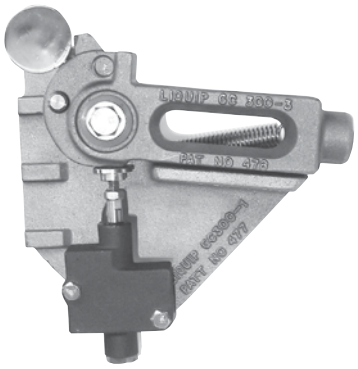
Note: When welding in flanges for any valve, they must have sufficient clearance all round the equipment poppet (eg SLV5 mentioned above) to provide full flow.

Care must be taken when fabricating pipe work to minimise stress onto outlet elbows and outlet valves.

Any “spring” when flanges are unbolted must be less than 3mm.



Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



Vapour Gates

Liquip offers a vapour gate/interlock bar that is installed over the bottom loading adaptors, overfill system connection and vapour recovery adaptor in order to provide drive-away protection.

The bar provides drive-away protection by ensuring drivers raise/drop the bar prior to connecting/disconnecting hoses.

An integral air interlock valve applies the vehicles brakes and can also open the vapour recovery vents.

Features & Benefits

- The interlock bar is positioned over the bottom loading API adaptors, overfill system connection and vapour recovery adaptor.
- The bar must be lifted for hose connections to be made.
- The pivot incorporates a cam that actuates a pneumatic valve (AVI3).
- An integral air interlock valve applies the vehicle brakes and can be set up to also open the vapour recovery vents.
- Supplied in component form so the vehicle manufacturer can easily adapt to suit the number of compartments.
- Brackets are available in different length configurations to suit both upward and downward operating API adaptors.

Technical Information

Operation

- The pivot incorporates a cam that actuates a pneumatic valve (P/N- AIV3) . This signal is used to apply the vehicle brakes that prevent the vehicle moving when hoses are connected.
- The signal is also used for other purposes such as opening vents and preventing access to the overfill protection plug.

Supply

- Supplied as a kit without the aluminium tube. Tube is supplied and welded on site by purchaser to custom fit each tanker.
- Air valve AIV3 must also be ordered separately.

Materials

- Brackets in cast aluminium AA601.
- Bushes Polyurethane.
- Purchaser supply to 34mm ID alum tube x approximately 3mm wall thickness in weldable grade.

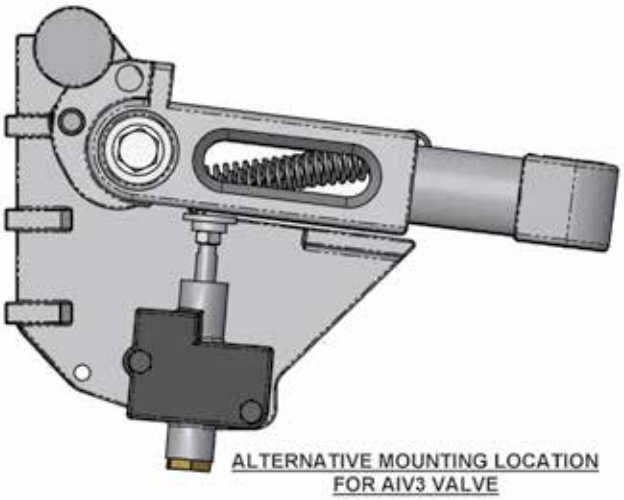
Ordering Information

- **GC300-1:** Left hand bracket - Standard Length.
- **GC300-2:** Right hand bracket - Standard Length.
- **GC300L-1:** Left hand bracket - Longer Length.
- **GC300L-2:** Right hand bracket - Longer Length.
- **GC300Z:** Vapour gate assembly c/w air interlock valve & components (Standard Length - LH/RH).
- **GC301:** Vapour gate assembly no air valve.

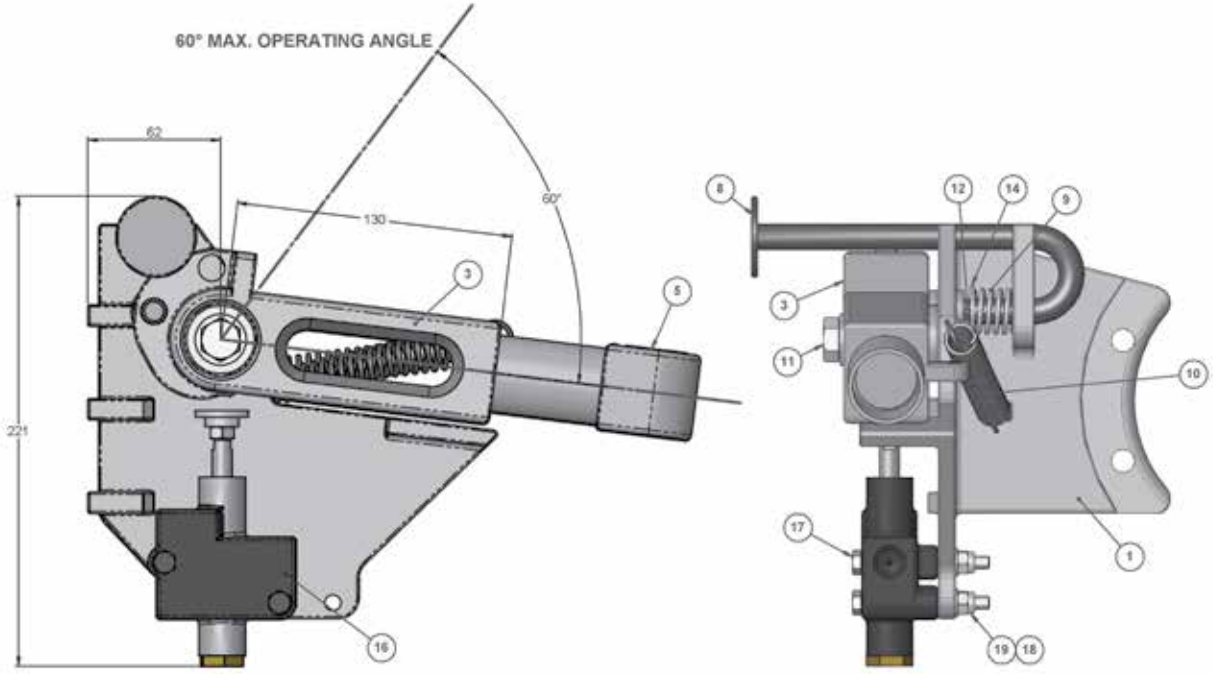
Note: Contact Liquip for further information.

Associated Equipment

- **AIV3:** Air Valve 3 Port with Push Button.
- **AVV07x:** Vapour Vent (Aluminium).
- **AVV3SST:** Vapour Vent (Stainless Steel).
- **MAC300 series:** Pneumatic tanker control box.
- **API49x series:** API loading adaptor (upward or downward operating).
- **SLV5-ARO series:** Internal foot valve.
- **TP10x series:** Liquip overfill truck plugs.



ALTERNATIVE MOUNTING LOCATION
FOR AIV3 VALVE



ITEM	PART NUMBER	DESCRIPTION	GC301	GC300Z	GC301L	GC301LZ	GC302	GC302Z	GC303	GC303Z	MATERIAL
1	GC300-1	MOUNTING BRACKET LH	1	1	-	-	-	-	1	1	ALUMINIUM
	GC300L-1	MOUNTING BRACKET LONG - LH	-	-	1	1	1	1	-	-	ALUMINIUM
2	GC300-2	MOUNTING BRACKET RH	1	1	-	-	1	1	-	-	ALUMINIUM
	GC300L-2	MOUNTING BRACKET LONG - RH	-	-	1	1	-	-	1	1	ALUMINIUM
3	GC300-3	OPERATING ARM LH	1	1	1	1	1	1	1	1	ALUMINIUM
4	GC300-4	OPERATING ARM RH	1	1	1	1	1	1	1	1	ALUMINIUM
5	G300-5	VAPOUR GATE ELBOW	2	2	2	2	2	2	2	2	CAST ALUMINIUM
6	GC300-6	BUSH FOR	4	4	4	4	4	4	4	4	POLYURETHANE (BLACK)
7	GC300-7	SPACER FOR	2	2	2	2	2	2	2	2	STEEL TUBE
8	GC300-8	LOCKING PIN	1	1	1	1	1	1	1	1	STAINLESS STEEL
9	4481	LOCKING LEVER SPRING	1	1	1	1	1	1	1	1	SPRING STEEL Z/P
10	4482	GATE TENSION SPRING	2	2	2	2	2	2	2	2	STAINLESS STEEL
11	4903	BOLT METRIC	2	2	2	2	2	2	2	2	Z/P STEEL
12	0897	SPRING (ROLL) PIN	1	1	1	1	1	1	1	1	Z/P STEEL
14	5266	WASHER FLAT	5	5	5	5	5	5	5	5	Z/P STEEL
15	6001	NUT NYLOC	2	2	2	2	2	2	2	2	Z/P STEEL
16	AIV3	AIR INTERLOCK VALVE	-	1	-	1	-	1	-	1	SEE TABLE
17	4901	BOLT METRIC	-	2	-	2	-	2	-	2	Z/P STEEL
18	5267	WASHER FLAT	-	2	-	2	-	2	-	2	Z/P STEEL
19	4399	NUT NYLOC	-	2	-	2	-	2	-	2	Z/P STEEL
20	EXT4030Q	ALUMINIUM TUBE Ø40 OD 3mm WALL	AS REQ'D FOR FABRICATION								ALUMINIUM
21	4772	INSTRUCTION & DATA	1								PAPER



Air Interlock Valves

Liquip's pneumatic interlock valve provides a pneumatic interlock on API adaptors, vapour adaptors or interlock bars.

The AIV3 3/2 way air valve is used to identify that a hose has been connected to the adaptor for either loading or discharge.

It can also form part of the pneumatic circuit to ensure the tank truck breaks are on, the emergency valve is open and the vapour vents are open before product can flow.

Commonly mounted to API490 series adaptors, VCM450 and GC300 series guard bar.

Features & Benefits

- 3 port pneumatic spool valve.
- Normally close operation.
- Air supply to Port 1.
- Actuated air signal out from Port 2.
- Exhaust from Port 3.

Technical Information

Ports

3 x ¼" BSP ports.

Operating Pressure

850 kPa maximum operating pressure.

Mounting

Standard Mounting to API490 adaptors VCM450 and GC300 guard bar.

Weight

200g.

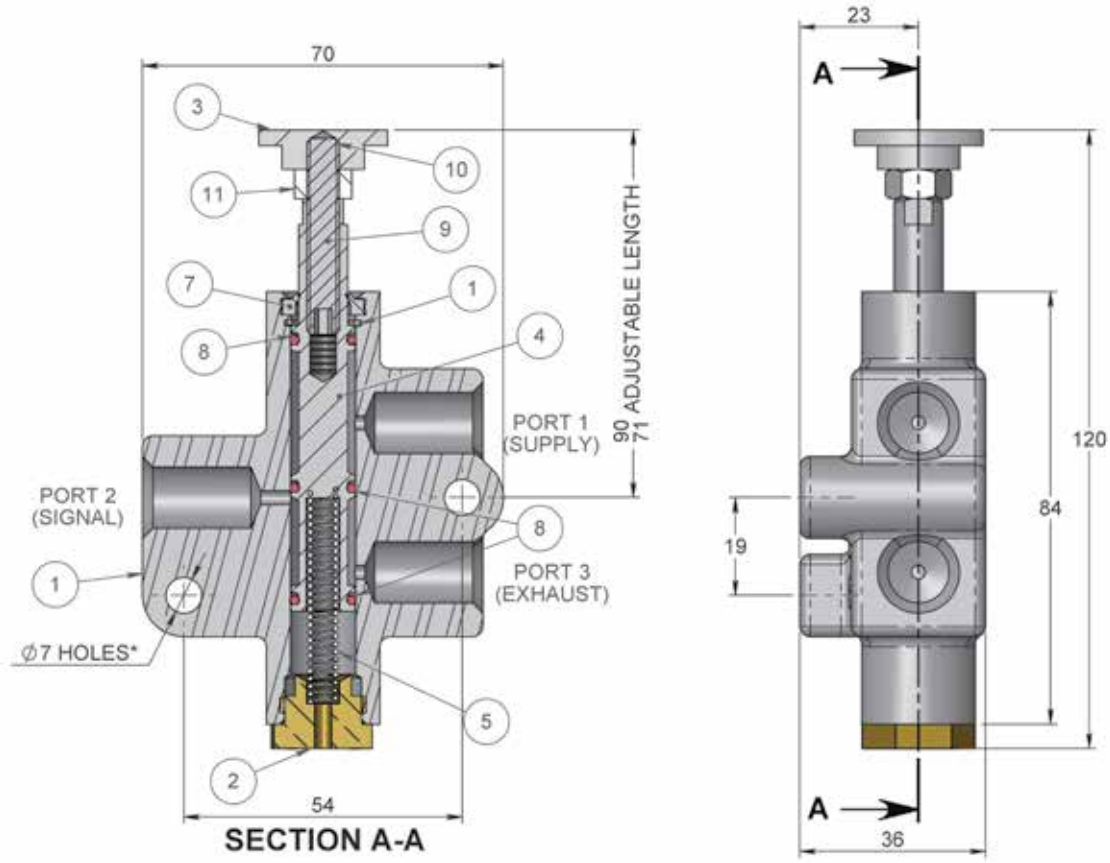
Ordering Information

- **AIV3:** Air Valve 3 Port with Push Button.

Associated Equipment

- **GC300 Series:** Vapour Gates
- **VCM450:** Vapour Adaptor 4" Camlock.
- **API490 Series:** API adaptors.

AIR INTERLOCK VALVE



* MOUNTING BOLTS SUPPLIED SEPARATELY

NOTES:
1. ALL PORTS G¼ (BSP)
2. BOLT 0002 (NOT SHOWN) SUPPLIED AS ALTERNATIVE BUTTON

ITEM	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
12	0002	BOLT	1	Z/P STEEL
11	0128	NUT HEX	1	Z/P STEEL
10	3361	LOCTITE	1	CYANOACRYLATE
9	6678	GRUBSCREW	1	Z/P STEEL
8	4512	O-RING	3	VITON A
7	4604	D STYLE ROD WIPER	1	POLYURETHANE
6	4362	CIRCLIP	1	SPRING STEEL
5	4432	SPRING RETURN	1	SPRING STEEL
4	AIV3-4	SPOOL	1	ST STEEL
3	AIV3-3	BUTTON ACTUATOR	1	ALUMINIUM
2	AIV3-2	PLUG NUT	1	BRASS
1	AIV3-1	BODY	1	ALUMINIUM

Vapour Adaptors

Liquip offers a range of vapour recovery adaptors which provide users with a safe and efficient method for handling and transferring of product vapour.



VCM450 Series

The VCM450 provides high flow rates into multiple compartments with minimal pressure drop across the adaptor and can be supplied with a proximity switch holder.

When connected to a female vapour coupler the adaptor poppet is pushed inwards to allow vapour flow and the coupler also pushes the striker plate of the adaptor forward to provide an electrical signal that the vapour recovery system is connected.

VCM3 Series

The VCM3 series is a poppet sealed cam and groove connection for truck vapour return lines.

The VCM3 series has an aluminium body with a 100mm (4") TTMA flange mounting. The seals are Viton™and the shaft runs in a Delrin bush. A standard Camlock will not fit into this adaptor, only an approved vapour coupler.

***NOTE:** VCM3 series for use in Australia and NZ only.*

Features & Benefits

- High flow rates and low pressure drop.
- Lightweight and study aluminium construction.
- Designed to work with flow rates of up to 600m³/hour (10,000 litres per minute) at 20°C.
- Automatic opening and closing.
- All aluminium construction with stainless steel springs and Viton™ poppet seal.
- Ability to add pneumatic or proximity switch (sold separately).
- Sightglass for visual check of product in the vapour line - VCM450 only.
- Universal connection - 100mm Camlock.
- Universal mounting - 100mm (4") TTMA flange.
- Drain plug - VCM450 only.

Technical Information

Pressure

- Poppet opens under external pressure of 4-6 kPa for vacuum relief.
- Pressure drop less than 4 kPa at 6,000 litres/min flow of free air across coupled connection.

Selectivity

- Nosecone is standard 4” NATO Camlock with interference selectivity ring to prevent wrong connection.
- **NOTE:** VCM450 is not suitable for use with AS 5602 compliant tankers which require interference selectivity ring for vapour adaptors (use VCM3 variants).

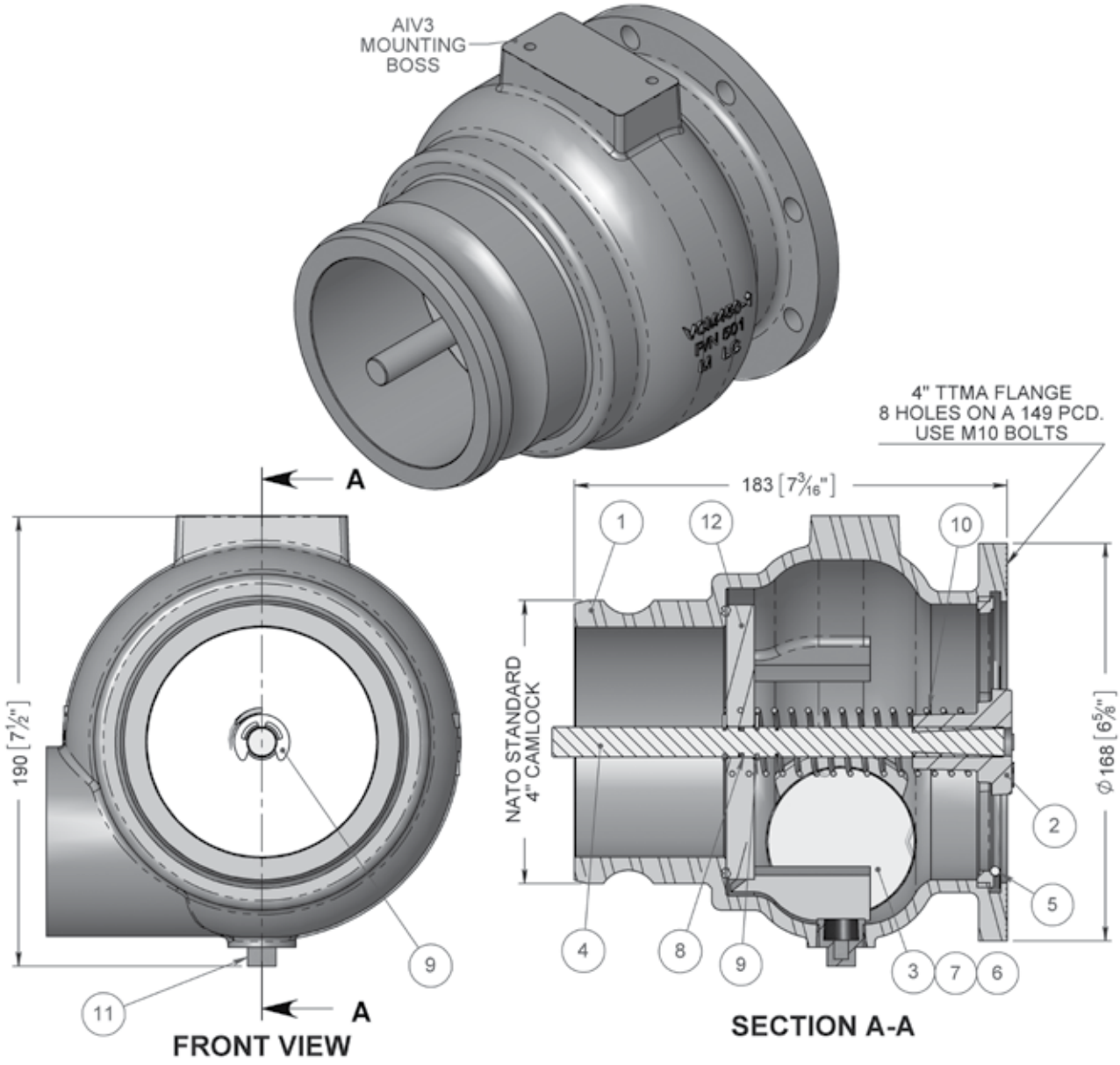
Ordering Information

- **VCM450:** Vapour adaptor 100mm (4") flow through.
- **VCM3P:** Vapour adaptor with proximity switch holder.
- **VCM3-F:** Al Vapour adaptor 100mm Male to 100mm TTMA flange.

Associated Equipment

- **5544:** Proximity switch (M30).
- **VCF075W:** Vapour Coupling 100mm female Camlock to 100mm hosetail.
- **VCF500:** 4" Vapour Coupler with dunny lid.
- **VCM-DC:** Aluminium Dust Cap to suit VCM3-F.

VCM450 VAPOUR ADAPTOR 4"



ITEM No.	PART No.	DESCRIPTION	QTY	MATERIAL
12	VCM450-2	POPPET	1	ALUMINIUM
11	5637	PLUG	1	PVC
10	4490	SPRING COMPRESSION	1	SPRING STEEL
9	0096	E-CLIP IMPERIAL	2	STEEL
8	0159	O-RING	1	NITRILE
7	0179	O-RING	1	NITRILE
6	4493	SPRING CLIP	1	ST STEEL
5	4469	SPRING CLIP	1	SPRING STEEL
4	VCM450-3	SHAFT	1	ST STEEL
3	5731	SIGHTGLASS	1	ACRYLIC
2	API450-3	SPIDER, SPRING RETAINING	1	ALUMINIUM
1	VCM450-1	BODY	1	ALUMINIUM





Vapour Couplers

Vapour couplers allow for vapour transfer between tanker trucks and loading/unloading tanks.

Liquip's vapour couplers automatically open when connected to a compatible vapour adaptor and automatically seal when disconnected.

Can be supplied with 75mm or 100mm bore.

Features & Benefits

- Will operate at flow rates up to 10,000 litres per minute at 20°C (4 compartments loading each at 2,500 LPM).
- Low pressure drop.
- Unique hinged poppet design provides lower pressure drops than standard poppets at high flows rates.
- Spring loaded poppet retains vapours until coupled to the male vapour adaptor.
- Automatically opens and closes when connected to male adaptor.
- Universal 4" (100mm) Camlock connection.
- 75mm or 100mm bores for flow are available.
- 75mm variant has a 100mm hose tail.
- Sight glass as standard on 100mm version to show vapour condensation.

Technical Information

VCF075W (75mm Version)

- Complies with Australian SLP.
- 25mm poppet travel.
- Open area = 4550mm² (equal to Ø76mm hole)
- Poppet opens between 4 to 6 kPa vacuum for tank protection
- Selectivity counter-bore provided as AIP CP6

VCF500 (100mm Version)

- 100mm (4”) bore all through for minimum pressure drop.
- Not compatible with AS5602 / Australian SLP. compliant vapour adaptors.
- Comes fitted with a 4" Dunny flap.
- **NOTE**: VCF500 is not suitable for use with AS5602 compliant vapour adaptors which require interference selectivity counter bore on the vapour couplers. (use VCF075W).

Ordering Information

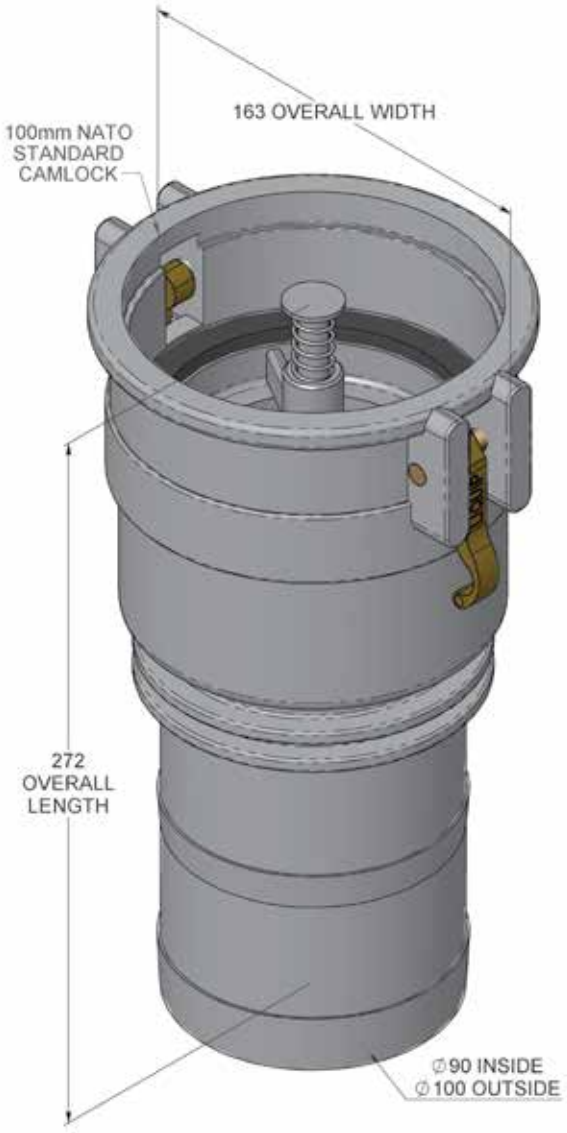
- **VCF075W:** Vapour Coupling 100mm female Camlock to 100mm hosetail.
- **VCF500:** 4" Vapour Coupler with dunny lid.

Associated Equipment

- **VCM450:** Vapour adaptor 100mm (4") flow through.
- **VCM3P:** Vapour adaptor with proximity switch holder.
- **VCM3-F:** Al Vapour adaptor 100mm Male to 100mm TTMA flange.
- **VCFPA:** Vapour parking adaptor with proximity switch holder.

VCF075W VAPOUR COUPLER FEMALE

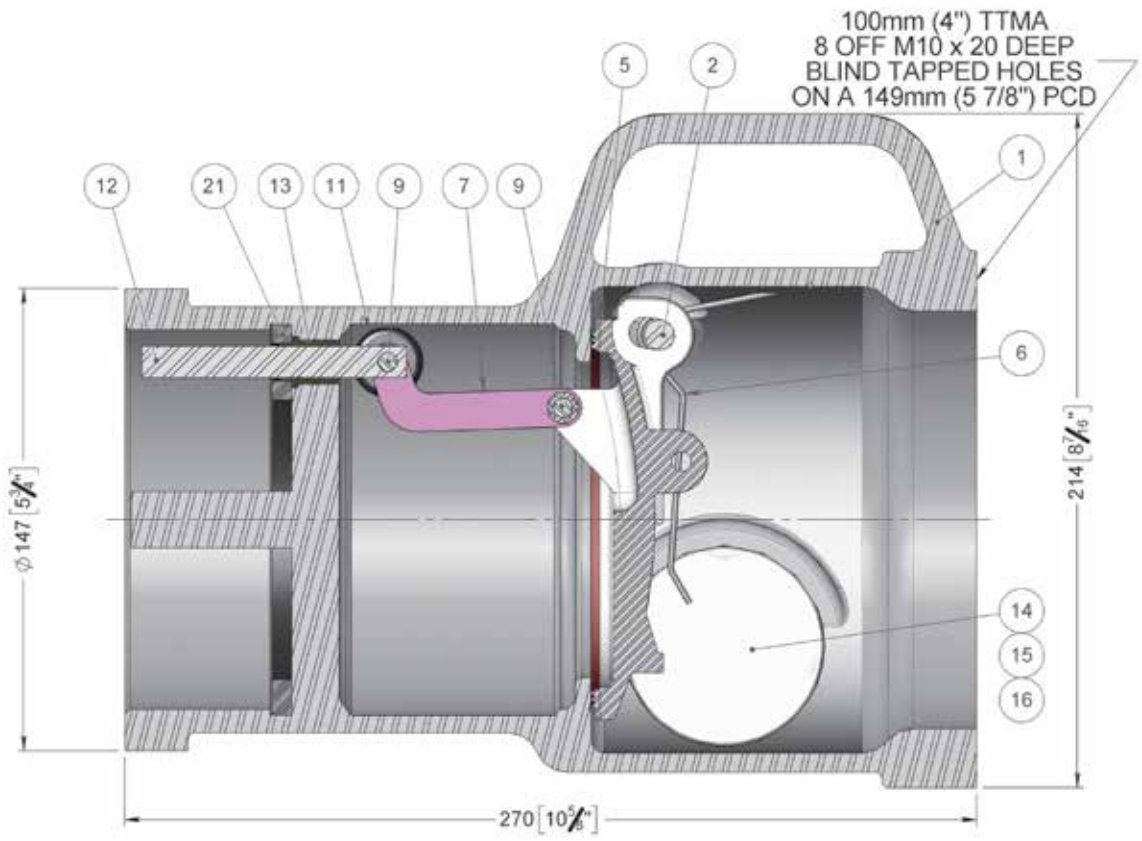




SPARE PARTS

ITEM	PART No	DESCRIPTION	QTY	MATERIAL
2	0207	O-RING	1	NITRILE
1	0433	SEAL CAMLOCK BLACK 4 "	1	NITRILE

VCF500 VAPOUR COUPLER





ITEM	PART No	DESCRIPTION	QTY.	MATERIAL
21	7516	SEAL CAMLOCK 4" WITH CUTOUT	1	HI-ACRYLONITRILE
20	978	KEY RING 1 1/2 Z/P	2	Z/P STEEL
19	0149	NUT NYLOC	2	Z/P STEEL
18	6554	CAPSCREW IMPERIAL	2	Z/P STEEL
17	CLC3.0-2	LEVER CAMLOCK	2	BRASS
16	4493	SPRING CLIP	1	ST STEEL
15	0179	O-RING	1	NITRILE
14	5731	SIGHTGLASS	1	ACRYLIC
13	VCF500-7	BUSH FOR PUSH ROD	1	BRASS
12	VCF500-5	PUSH ROD, PISTON	1	ST STEEL
11	7819	ROLLER	2	ACETAL
10	0756	SPLIT PIN	2	ST STEEL
9	SLV5-7	PIN	2	ST STEEL
8	7803	SPACER BUSH	1	ALUMINIUM
7	VCF500-3	LINKAGE FOR POPPET	2	ST STEEL
6	6151	SPRING TORSION FOR POPPET	1	ST STEEL
5	SLV100-2	POPPET MOLDED VITON SEAT	1	ALUMINIUM
4	PCU201-7	PLUG M16 CONDUIT	1	BRASS
3	0885	WASHER FIBRE	1	FIBRE
2	VCF500-2	SHAFT FOR POPPET	1	ST STEEL
1	VCF500-1	BODY	1	ALUMINIUM



Vapour Caps/Covers

Liquip offers durable vapour dust covers to fit all 4" vapour recovery adaptors.

The VCM-DC is a dust cap suited to match the VCM3-F.

Ordering Information

- **VCM-DC:** Aluminium Dust Cover to suit VCM3-F.
- **VCM-DCA:** Aluminium Vapour Dust Cover.

Associated Equipment

- **VCM3-F:** Al Vapour adaptor 100tmm Male to 100mm TTMA flange.



Push Pull Valves

Liquip offers an air push pull air valve that can be used in conjunction with Discharge Manifolds and Pneumatic Control Boxes.

Ordering Information

- **2234N:** Air Valve (push pull) or Air 3/2 valve 1/8 BSP ports.

Associated Equipment

- **DM104:** Discharge Manifold with open/closed indicator.
- **DM104-1Z:** Single compartment kit-DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-2Z:** Two compartment kit- DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-3Z:** Three compartment kit- DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-4Z:** Four compartment kit- DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-5Z:** Five compartment kit- DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-6Z:** Six compartment kit- DM104 c/w Viton™A gasket, vacuum breaker and aluminium blanking plates.



DM104 Manifold

Liquip offers a pneumatically operated manifold valve that allows the use of a permanently attached hose for discharge of "split drops" via pump or gravity.

The DM104 manifold system improves the speed and performance of metered truck tank product-delivery operations

The DM104 is a bolt up modular assembly system that is used per compartment and is bolted directly together to form the manifold.

Pneumatics allow the user a choice of control e.g. valves may be interlocked to allow only one manifold to open at a time or to prevent any manifold being open when bottom loading etc.

Features & Benefits

- Pneumatic operation provides easier and quicker operation through centralised control.
- Open/Closed indicator mounted at the top of the pneumatic actuator (**red** = closed, **green** = open).
- Allows the use of a permanently attached hose for discharge of 'split drops' via pump or gravity, deleting the need to change jumper hoses.
- Prevents spills and drips and saves considerable driver time.
- Two gallery design.
- Upper gallery is drained through to the lower gallery by pneumatic operation of the poppet in the manifold valve.
- Passed European CEN test for endurance to 25,000 cycles and subsequent leak test.
- A special 100mm TTMA blank flange (BF4-5) has a 3/4" BSP port to allow fitting of a vacuum breaker (VB100U) to allow the manifold to drain effectively.

Technical Information

Operation

- The upper gallery forms a Ø100mm pipe connecting a bolted-on API adaptor to the tanker pipe work, so allowing completely normal bottom loading & gravity discharge of individual compartments.
- A second, lower, gallery runs at right angles and when bolted together they form an Ø80mm pipe. Discharge from this lower gallery can be from an end fitting or from any of the bottom outlets on each valve.

Air Pressure

- Tanker air pressure 600 kPa to 800 kPa to operate.
- Poppet lifts at 120 kPa back pressure against spring only.

Materials

- Body and cover: Aluminium.
- Spindle: Stainless steel.
- Bonded Viton™ seal.
- Spring steel, zinc plated.

Mounting

- 100mm (4") TTMA to tank.
- 100mm (4") TTMA to API adaptor.
- 100mm (4") TTMA side to side.
- 75mm (3") TTMA bottom outlet.
- Centre-to-centre distance is 282mm. Fit spacers for other pipe centres.

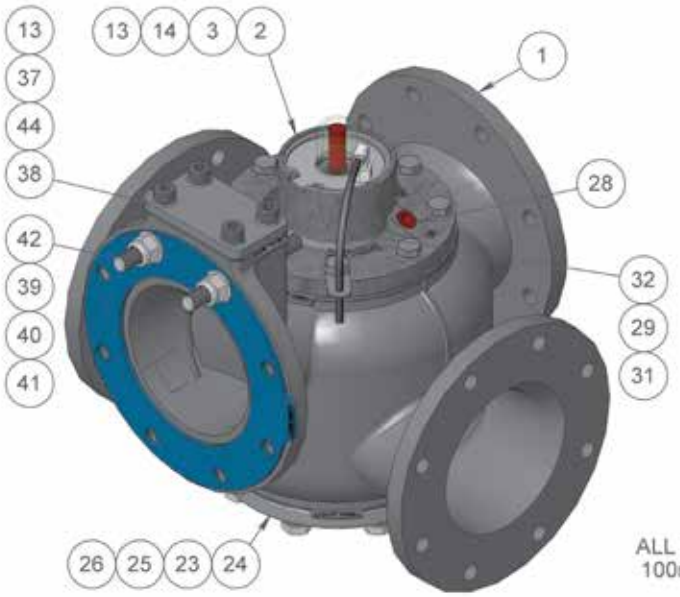
Ordering Information

- **DM104:** Discharge Manifold with open/closed indicator.
- **DM104-1Z:** Single compartment kit-DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-2Z:** Two compartment kit- DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-3Z:** Three compartment kit- DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-4Z:** Four compartment kit- DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-5Z:** Five compartment kit- DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.
- **DM104-6Z:** Six compartment kit- DM104 c/w Viton™ A gasket, vacuum breaker and aluminium blanking plates.

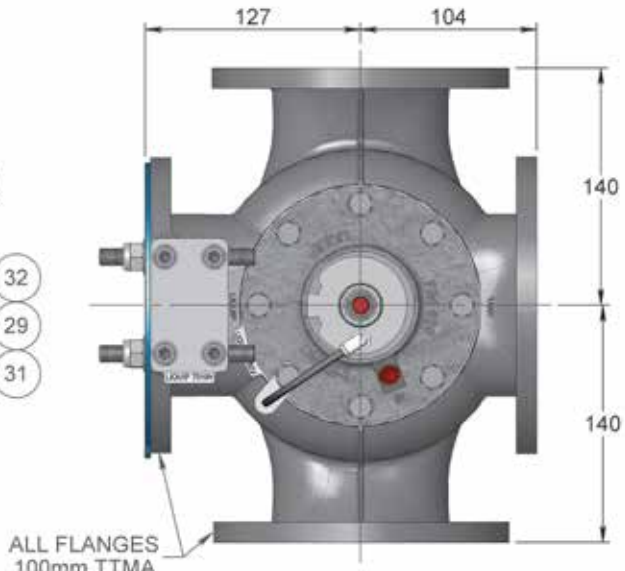
Associated Equipment

- **BF4-5:** blind flange with 3/4" BSP mount.
- **BF4-7:** Blanking flange, 100mm (4") TTMA flange.
- **VB100U:** Vacuum breaker.
- **MC4-V4A:** 4" Al Camlock adaptor to 100mm TTMA flange.
- **MC3-V4A:** 3" Al 10° Camlock adaptor to 100mm TTMA flange.
- **MC3-V3A:** 3" Al 10° Camlock adaptor to 75mm TTMA flange.
- **PFR114:** 1 1/4" product return flange assembly.
- **PFR112:** 1 1/2" product return flange assembly.
- **MAC1XX:** pneumatic control system.

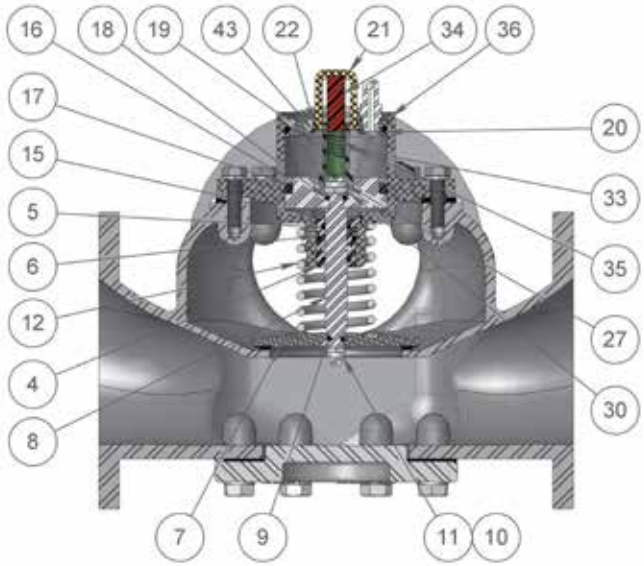
DM104 DISCHARGE MANIFOLD



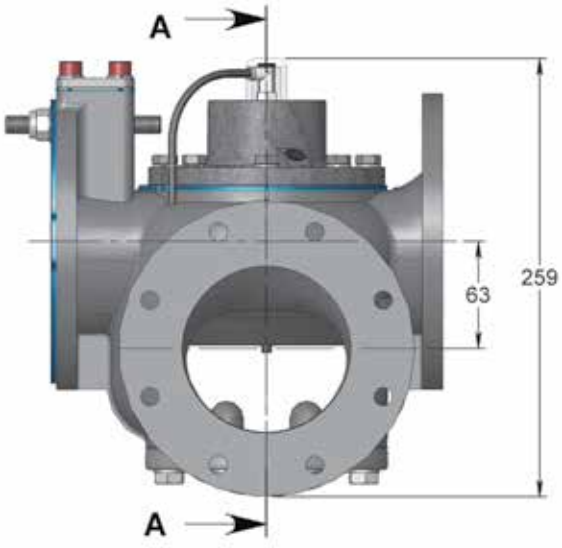
ISOMETRIC



TOP VIEW



SECTION A-A



SIDE VIEW

DM104 DISCHARGE MANIFOLD

ITEM	PART No.	DESCRIPTION	QTY	MATERIAL
1	DM104-1	100mm DISCHARGE MANIFOLD BODY	1	ALUMINIUM
2	DM102-2	AIR RAM CYLINDER BODY	1	ALUMINIUM
3	4282V	GASKET VITON	1	VITON A
4	ARO100-4	AIR RAM SHAFT BUSH	1	ACETAL
5	0244	O-RING	2	VITON A
6	0278	O-RING	1	VITON A
7	DM100-4	POPPET	1	ALUMINIUM
8	DM102-5	ACTUATING SPINDLE	1	ST STEEL
9	7008	O-RING	1	VITON A
10	5267	WASHER FLAT	1	Z/P STEEL
11	4400	NUT HALF NYLOC	1	Z/P STEEL
12	4483	SPRING COMPRESSION	1	SPRING STEEL
13	6586	WASHER SPRING	12	ST STEEL
14	4965	SETSCREW METRIC	8	Z/P STEEL
15	4546	CIRCLIP INTERNAL	1	Z/P STEEL
16	DM102-3	AIR RAM PISTON 60 mm	1	ACETAL
17	0218	O-RING	1	VITON A
18	4565	O-RING	1	VITON A
19	DM103-6	CAP PISTON OPEN/CLOSE INDICATOR	1	ALUMINIUM
20	0137	O-RING	1	VITON A
21	DM103-8	SIGHT GLASS OPEN/CLOSED INDICATOR	1	ACRYLIC
22	7536	O-RING	1	VITON A
23	0656V	GASKET VITON	1	VITON
24	BF3-7	BLANK FLANGE	1	ALUMINIUM
25	5261	WASHER SPRING	8	Z/P STEEL
26	4947	SETSCREW METRIC	8	Z/P STEEL
27	6625	NUT HALF NYLOC MET	1	Z/P STEEL
28	1310	CAP/PLUG	1	PVC RED
29	2221	AIR FITTING - ELBOW	1	BRASS
30	6620	WASHER FLAT	2	ST STEEL
31	DM102-7	BRACKET - AIR EXHAUST	1	ST STEEL
32	1961	AIR LINE	1	NYLON
33	DM103-9	INDICATOR OPEN GREEN	1	HDPE
34	DM103-10	INDICATOR CLOSED RED	1	HDPE
35	0315	SPRING COMPRESSION	1	ST STEEL
36	5848	CIRCLIP INTERNAL	1	Z/P STEEL
37	6582	CAPSCREW METRIC	4	ST STEEL
38	DM104-2	FLANGE BLANKING	1	ALUMINIUM
39	6673	STUD FOR DM104	2	STEEL
40	4981	NUT NYLOC	2	Z/P STEEL
41	5288	WASHER FLAT	2	Z/P STEEL
42	0657V	VITON GASKET TTMA 100mm (4")	1	VITON
43	7519V	GASKET VITON	1	VITON A
44	4346	CIRCLIP INTERNAL	1	ST STEEL



Vacuum Breaker

Vacuum breakers fit into top loading valves or the suction side of pumping systems. They ensure the piping systems are able to be drained quickly and completely.

The VB100 Series is 1/2" vacuum breaker that is fitted with Viton™ A seals and operates at 1-2 kPa (gravity) or 35 kPa (pump systems).

Technical Information

Pressure

VB100 and VB100SS open at 1-2 kPa (gravity).
VB100U and VB100USS opens at 35 kPa vacuum (Pump systems).
Orifice equal to 6mm dia. hole.

Operation

Spring loaded poppet opens at a set pressure to allow air into the high section of the system and removing any vacuum that may 'hang-up' a liquid column.

Mounting

Into 12mm BSP female socket. Ensure the poppet head is level with the inner end of the socket thread inside the pipe when fitted, in order to maximise flow area.

Materials

- Brass body, polyurethane cap, stainless steel spring.
- Poppet is acetal in VB100, stainless steel in VB100U.
- Seal is Viton™A standard (coloured red).
- VB100SS and VB100USS have a stainless steel body.

Weight

0.14 kg.

Ordering Information

- **VB100:** 1/2" BSP and NPT Vacuum Breaker Brass (1-2 kPa).
- **VB100U:** 1/2" BSP and NPT Vacuum Breaker Brass (35 kPa).
- **VB100SS:** 1/2" BSP and NPT Vacuum Breaker S/S (1-2 kPa).
- **VB100USS:** 1/2" BSP and NPT Vacuum Breaker S/S (35 kPa).



Pneumatic Operated Control Boxes

The MAC300 series of tanker manifold pneumatic control systems are available for 2 to 6 compartment systems and are incredibly simple to use.

The MAC300 series are lightweight air operated control systems that allow users to easily operate manifolds and valves. They also allow for simple and effective loading and unloading of compartment contents in either full or split delivery applications.

Features & Benefits

- Manifold and air control.
- Stop manifold 'shandies'
- Simple installation - one box only, not two.
- Emergency stop integrated with truck system.
- Footvalve control with shuttle valves for footvalve built into the control box.
- 'Vapour vent open' pressure indicator.
- Overfill pressure switch with gold contacts.
- Colour coded pneumatics.
- Brake and Gate inputs supported.
- Powder-coated aluminium enclosure.
- Brake release signal input.
- Air regulator/water separator and lubricator fitted to enclosure.
- Supported by pneumatic experts.
- Lightweight and small physical footprint.

Technical Information

Technical Data

Air tube connection: 6mm push-fit.

Lubrication oil: ISOVG32 or equivalent.

Adjustment

System pressure is to be maintained at 6 bar (600kPa). Adjustment is via turning knob on top of regulator.

Dismantle

Refer to Liquip before attempting any repairs or modifications. Enclosure opens by turning two front locks with a screwdriver.

Mounting

Enclosure is mounted from the rear using M8 bolts (refer to drawings overleaf). Seal off any holes not used to prevent dust & moisture ingress.

Ordering Information

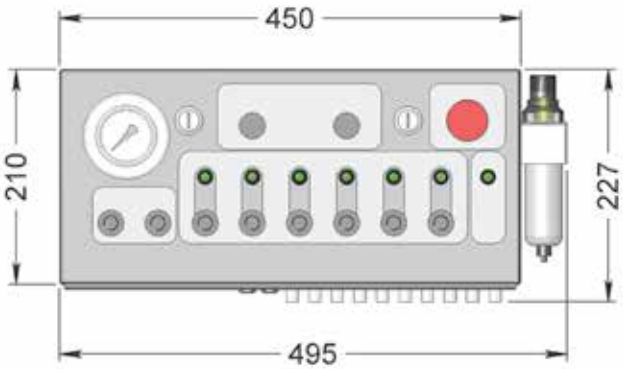
Number of compts	Dual product dispensing	Single product dispensing	Dog trailer (single prod"ct transfer)*	Dog trailer (dual product transfer)*
2	MAC302	MAC302SP	MAC302DOG	MAC302DUAL
3	MAC303	MAC303SP	MAC303DOG	MAC303DUAL
4	MAC304	MAC304SP	MAC304DOG	MAC304DUAL
5	MAC305	MAC305SP	MAC305DOG	MAC305DUAL
6	MAC306	MAC306SP	-	-

* With added control for pneumatic butterfly valve on transfer line (butterfly valve not supplied with MAC box).

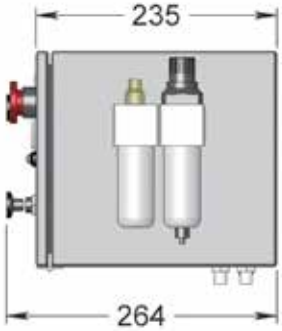
Associated Equipment

- **DM104 Series:** Liquip DM104 series manifold valves.
- **VB100U**: Vacuum breaker.
- **BF4-5:** End blanking plate (to suit VB100U).
- **BF4-7**: End blanking plate (standard).
- **BF4-SG-25Z:** 4" TTMA Sight glass 25mm thick.
- **4248:** 4" TTMA Gasket (Klinger).
- **0657V:** 4" TTMA Gasket (Viton™ A).
- **DM103-11:** Spacer Aluminium (solid) 40mm.
- **GC300Z:** Vapour gate assembly.

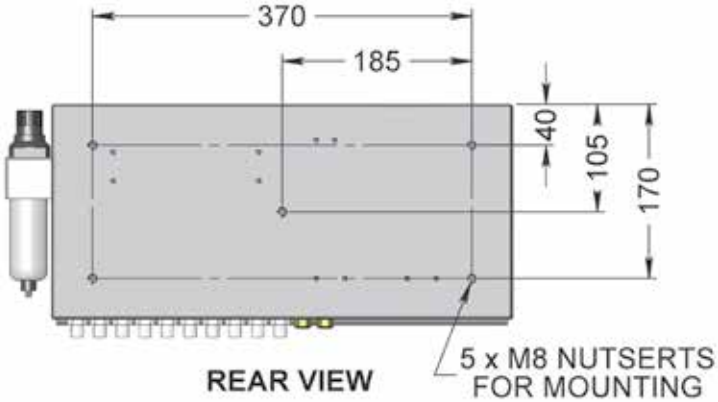
MAC300 SERIES AIR CONTROL BOX



FRONT VIEW



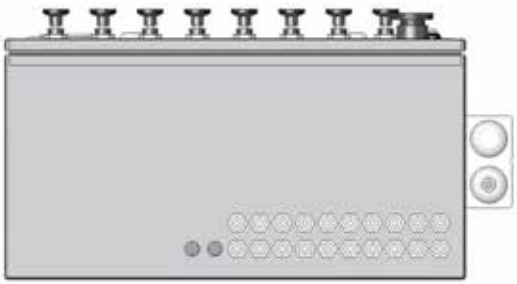
RIGHT SIDE VIEW



REAR VIEW



ISOMETRIC VIEW



BOTTOM VIEW

PART No	COMPARTMENTS
MAC302	2
MAC303	3
MAC304	4
MAC305	5
MAC306	6



Lockable Static Earthing Reels

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.

Features & Benefits

- Stainless steel components are used to ensure corrosion does not break continuity.
- Simple to use locking mechanism prevents the static reel from unwinding due to vibration.
- Reliable continuity is ensured through the use of a carbon brush on a stainless steel shaft.
- Manual operation as spring-rewind types have caused accidents when inadvertently released.
- Comes supplied with 30m of yellow cable for increased visibility at night.
- Dust seals protect the assembly internals and graphite grease ensures longer life and easy rotation without electrical resistance.
- Standard wire 2mm dia. Other types readily available.

Technical Information

Resistance

Nominal reel resistance is 5 ohms.

Standards

Meets AS 2809:2 – Maximum end-to-end resistance of 10 ohms.

Materials

- Carbon brush runs in sealed section to eliminate dirt and corrosion.
- Shaft has grease reservoir for all-of-life lubrication.

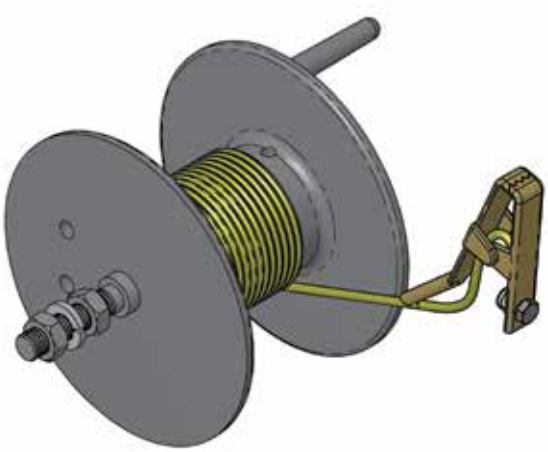
Ordering Information

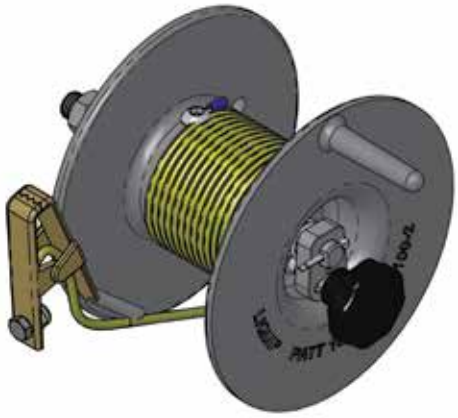
- **LSR100:** Lockable static reel complete with 30m of yellow cable and bonding clip.
- **LSR101:** Lockable static reel complete with 30m of orange cable and MIL spec aluminium static clip.

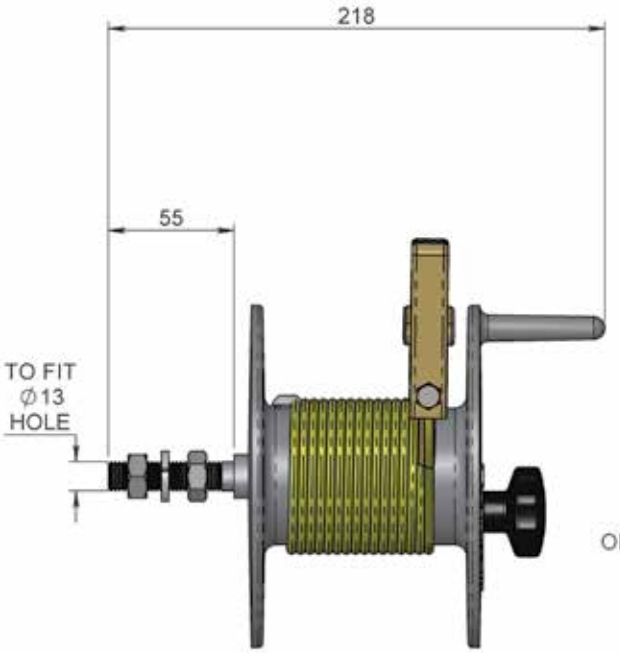
Associated Equipment

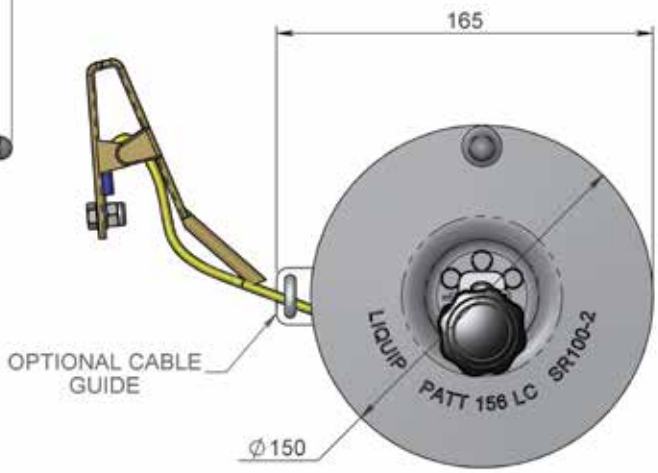
- **SR200-3:** Optional cable guide for LSR100.
- **7158**: Optional spacer for LSR100.

LSR100 - LOCKING STATIC REEL











OPTIONAL CABLE GUIDE



Static Earthing Reels - Large Drum

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 as standard.

Features & Benefits

- Large diameter drum means less turns are required to wind cable back onto reel.
- Free spinning handle and is comfortable to use.
- Stainless steel components are used to ensure corrosion does not break continuity.
- Reliable continuity is ensured through the use of a carbon brush on a stainless steel shaft.

Technical Information

Resistance

Maximum end-to-end resistance 2 ohms.

Wire/Cable Capacity

Can hold up to a max of 76m standard PVC coated wire (4mm diameter).

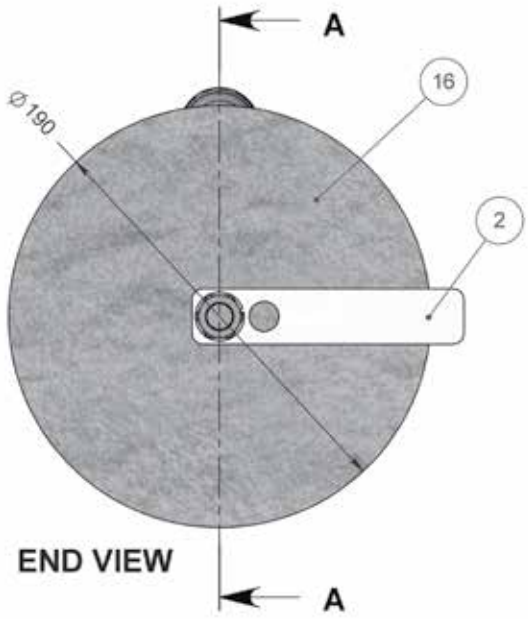
Materials

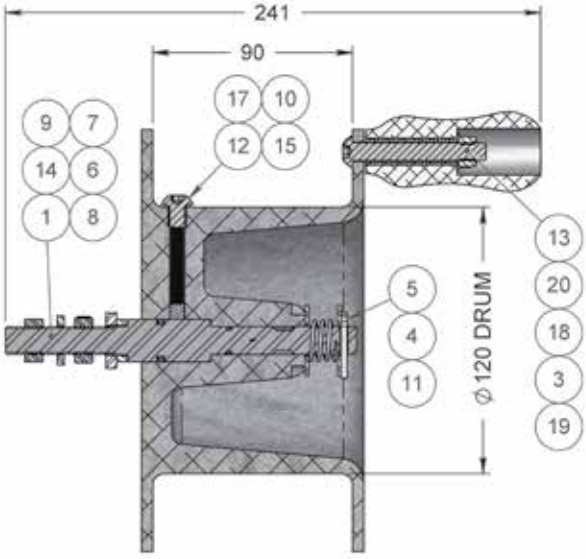
- Carbon brush runs in sealed section to eliminate dirt and corrosion.
- Shaft has grease reservoir for all-of-life lubrication.

Ordering Information

- **SR202:** Large diameter static reel comes with cable guide, manual operation (cable and static clamp supplied separately).

SR200 STATIC REEL





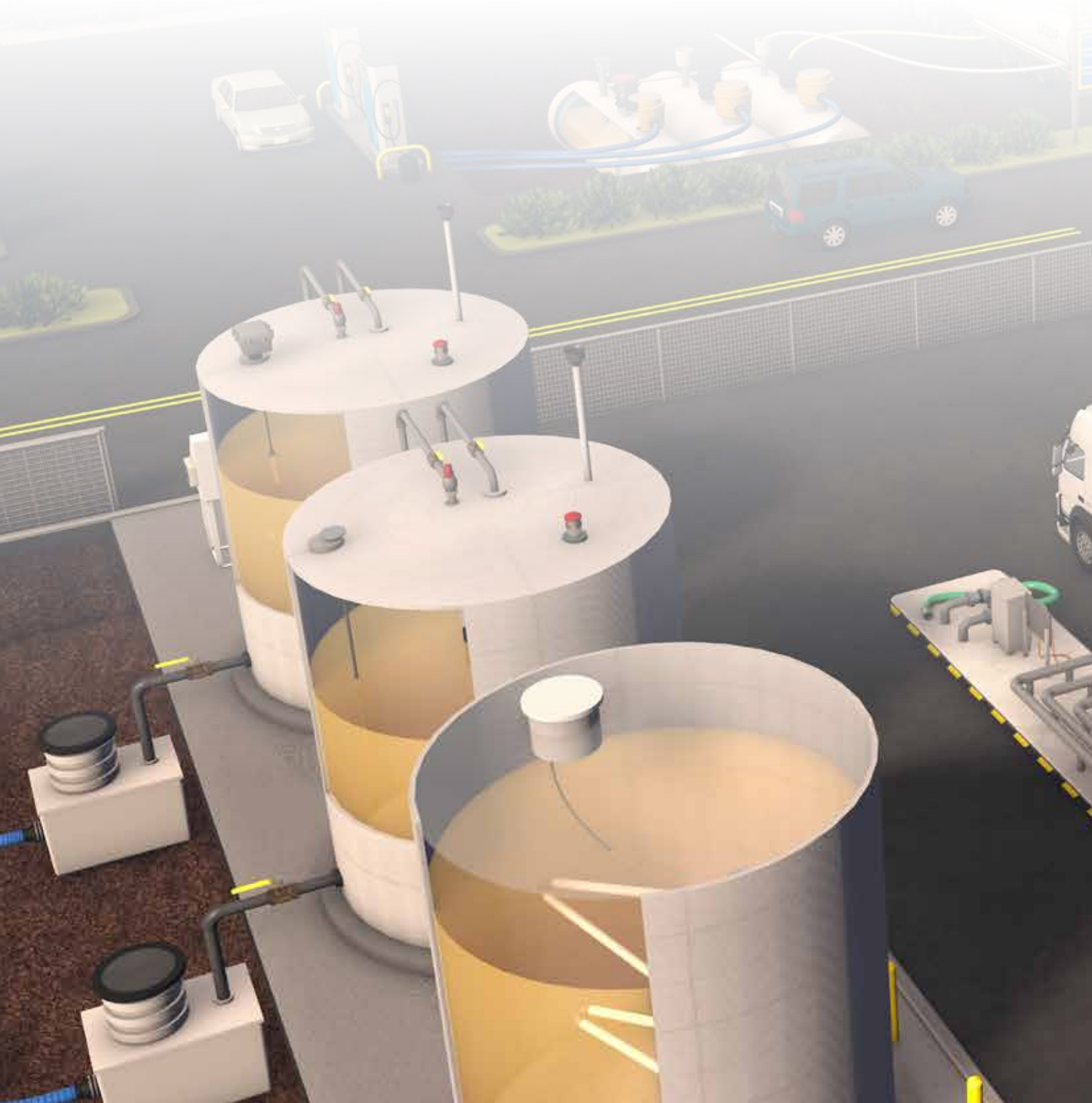
NOTE: CABLE & STATIC CLAMP SUPPLIED SEPARATELY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	SR100-7	SHAFT - MAIN	1	ST STEEL
2	SR200-3	CABLE GUIDE BRACKET	1	Z/P STEEL
3	SR200-6	HANDLE - ROTATING	1	ALUMINIUM
4	0814	WASHER FLAT	2	ST STEEL
5	0770	SPLIT PIN	1	ST STEEL
6	0805	NUT - HALF	2	ST STEEL
7	0822	WASHER SPRING	1	ST STEEL
8	0159	O-RING	1	NITRILE
9	0223	O-RING	1	NITRILE
10	SR100-4	CARBON BRUSH	1	CARBON
11	0436	SPRING - SHAFT	1	ST STEEL
12	0040	CAPSCREW MET BUTT HD	1	STEEL
13	6644	CAPSCREW MET BUTT HD	1	Z/P STEEL
14	7158	SPACER - CABLE GUIDE	1	ST STEEL
15	1409	EYE TERMINAL	1	Z/P STEEL
16	SR200-1	BODY LARGE DIA	1	ALUMINIUM
17	6147	SPRING CARBON BRUSH	1	ST STEEL
18	SR200-7	SPACER - HANDLE	1	ALUMINIUM
19	6620	WASHER FLAT	1	ST STEEL
20	4395	NUT NYLOC	1	Z/P STEEL
21	SR100-11	INSTRUCTION LEAFLET	1	PAPER

LIQUIP
PART OF OPW A DOVER COMPANY

Tanker Overfill Protection Systems



Overfill Protection Probes..... 114-119
Dummy Probes..... 120-121
Truck Plugs..... 122-125
On Board Monitors..... 126-127
Overfill System Testers..... 128-129
General Information..... 130
Installation Information..... 131





Aluminium Overfill Protection Probes

LDP Series of optic overfill sensors raise the bar for overfill protection safety with a self-checking design and unique glass prism design.

The LDP series overfill probes are fully compatible with all Liquip overfill equipment and can be interchanged with most 2 or 5 wire probes.

Features & Benefits

- Self Diagnostic function.
- Compatible with all systems built to the API code.
- A visible optic light in the sensor tip indicates whether it is dry and operational.
- Independent visual test for function when in or out of the tanker.
- Patented visible light- Technological breakthrough.
- Secondary protection with O-ring sealed tip.
- Built to comply with API RP1004 and EN13922.
- Three stage Viton™sealing.
- Glass prism is light-shielded by the retainer.
- Probe can be removed from tank top without having access to interior to remove a hood.
- Construction is fully sealed front.
- Self healing epoxy at rear on cable entry.
- Fully potted construction.
- Range of probe extensions to suit various probe lengths.

Technical Information

Electrical Parameters

IECEx & ATEX Approvals

- Ui = 30V, Ii = 500mA, Pi = 9W, Ci = 105pF, Li = 0mH.

FM Approvals

- Vmax = 30V, Imax = 691mA, Pi = 9W, Ci = 105pF, Li = 0mH.

Operating Temperature

-40°C to +65°C.

IP Rating

IP66.

Level Repeatability

±0.5mm.

Design Pressure

600 kPa.

Materials

- Body, retainer and extensions: Aluminium.
- Prism: Glass.
- O-rings: Viton.

Ordering Information

Single Probes

- **LDP202:** 2 wire Aluminium Overfill Probe.
- **LDP205:** 5 wire Aluminium Overfill Probe.
- **LDP202SS:** 2 wire Stainless Steel Overfill Probe.
- **LDP205SS:** 5 wire Stainless Steel Overfill Probe.
- **LDP202SC:** 2 wire Stainless Steel Overfill Probe w/ FFKM seals.
- **LDP205SC:** 5 wire Stainless Steel Overfill Probe w/ FFKM seals.

Probe Kits

- **LDP202Z:** LDP202 + 80mm Al Extension + Buna O-ring.
- **LDP202XLZ:** LDP202 + 222mm Al Extension + Buna O-ring.
- **LDP205Z:** LDP205 + 80mm Al Extension + Buna O-ring.
- **LDP205XLZ:** LDP205 + 222mm Al Extension + Buna O-ring.

Multi Compartment Probe Kits (Australian Spec)

Kits with 80mm Al Extension (LDP102-4)

- **LDPFILL-1Z:** 1 compartment LDP202 kit.
- **LDPFILL-2Z:** 2 compartment LDP202 kit.
- **LDPFILL-3Z:** 3 compartment LDP202 kit.
- **LDPFILL-4Z:** 4 compartment LDP202 kit.
- **LDPFILL-5Z:** 5 compartment LDP202 kit.
- **LDPFILL-6Z:** 6 compartment LDP202 kit.

Kits with 222mm Al Extension (LDP105-2)

- **LDPFILLXL-2Z:** 2 compartment LDP202 kit.
- **LDPFILLXL-3Z:** 3 compartment LDP202 kit.
- **LDPFILLXL-4Z:** 4 compartment LDP202 kit.
- **LDPFILLXL-5Z:** 5 compartment LDP202 kit.
- **LDPFILLXL-6Z:** 6 compartment LDP202 kit.

Associated Equipment

- **LD102-4:** Aluminium probe extension (80mm).
- **LDP105-2:** Aluminium probe extension (222mm).
- **7612:** O-ring Buna LDP Extension.
- **PJB500:** 2" Remote Probe holder.
- **VOH200-5:** Probe holder.
- **RM140 Series:** Overfill Rack Monitor.
- **DP300 Series:** Overfill dummy Probes.
- **TP100 Series:** Overfill Truck Plug.



Stainless Steel Overfill Protection Probes

Liquip's LDP200 Series Stainless Steel Overfill Probes are used in overfill prevention systems on road tankers and storage tanks to detect the presence of a liquid at a defined level.

The probe's stainless steel body and FFKM seals provide superior resistance to chemical corrosion, making them well-suited to Petroleum as well as Chemical Industry applications.

Features & Benefits

- Stainless steel body and FFKM seals provide superior resistance to chemical corrosion.
- Compatible with industry standard signal formats (EN 13922).
- A visible optic light in the sensor tip indicates whether it is dry and operational.
- Independent visual test for function when in or out of the tanker.
- Patented visible light - Technological breakthrough.
- Glass prism is light-shielded by the retainer.
- Probe can be removed from tank top without having access to interior to remove a hood.
- Construction is fully sealed front.
- Self healing epoxy at rear on cable entry.
- Fully potted construction.
- Range of probe extensions to suit various probe lengths.

Technical Information

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

600 kPa.

Power Limit

- (Pi = 9W) applies.
- Ii max = 690mA when Ui max = 13.04V OR
- Ii max = 300mA when Ui max = 30V.

Safety Certification

IECEx

- IECEx Certificate: IECEx ITA 14.0014X.
- Marking: Ex ia IIA T3 Ga IP66.
- Tamb =-40°C to +65°C.

ATEX

- ATEX Certificate TUV 15ATEX 7627X.
- Marking 0518 II 1 G Ex ia IIA T3 Ga.
- Tamb =-40°C to +65°C.

Ordering Information

Single Probes

- **LDP202SC:** 2 Wire Probe, SS-316 Body with FFKM Seals.
- **LDP205SC:** 5 Wire Probe, SS-316 Body with FFKM Seals.
- **LDP202SS:** 2 Wire Probe, SS-316 Body with Viton™Seals.
- **LDP205SS:** 5 Wire Probe, SS-316 Body with Viton™Seals

Probe Kits

- **LDP202SSZ:** LDP202SS + 80mm S/S Extension + Viton™O-ring.
- **LDP202SCZ:** LDP202SC + 80mm S/S Extension + FFKM O-ring.
- **LDP205SSZ:** LDP205SS + 80mm S/S Extension + Viton™O-ring.
- **LDP205SCZ:** LDP205SC + 80mm S/S Extension + FFKM O-ring.

Multi Compartment Probe Kits (Australian Spec)

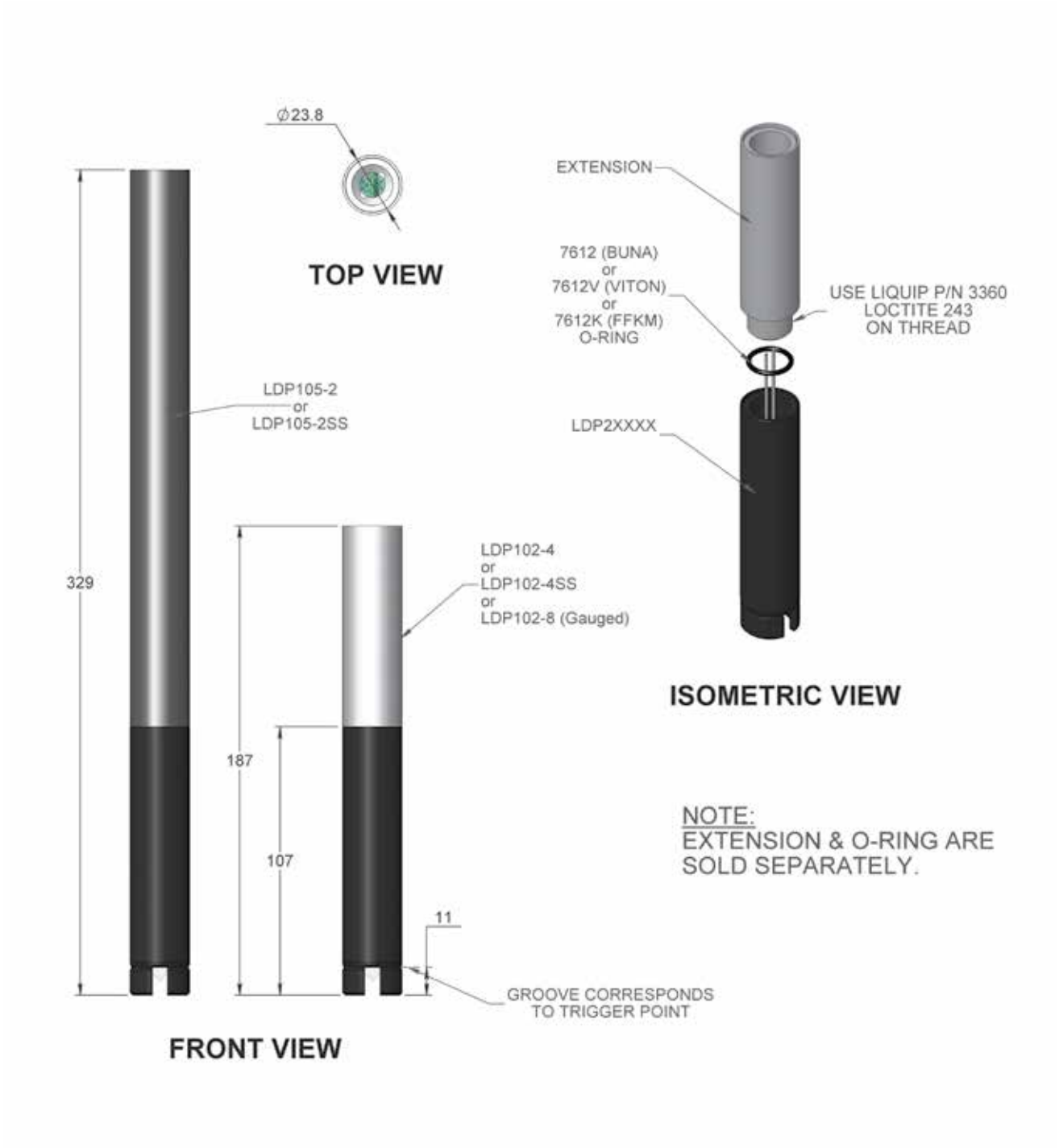
Kits with 80mm S/S Extension (LDP 102-4SS)

- **LDPFILL-1SCZ:** 1 Compartment LDP202SC kit.
- **LDPFILL-2SCZ:** 2 Compartment LDP202SC kit.
- **LDPFILL-3SCZ:** 3 Compartment LDP202SC kit.
- **LDPFILL-4SCZ:** 4 Compartment LDP202SC kit.
- **LDPFILL-5SCZ:** 5 Compartment LDP202SC kit.
- **LDPFILL-6SCZ:** 6 Compartment LDP202SC kit.

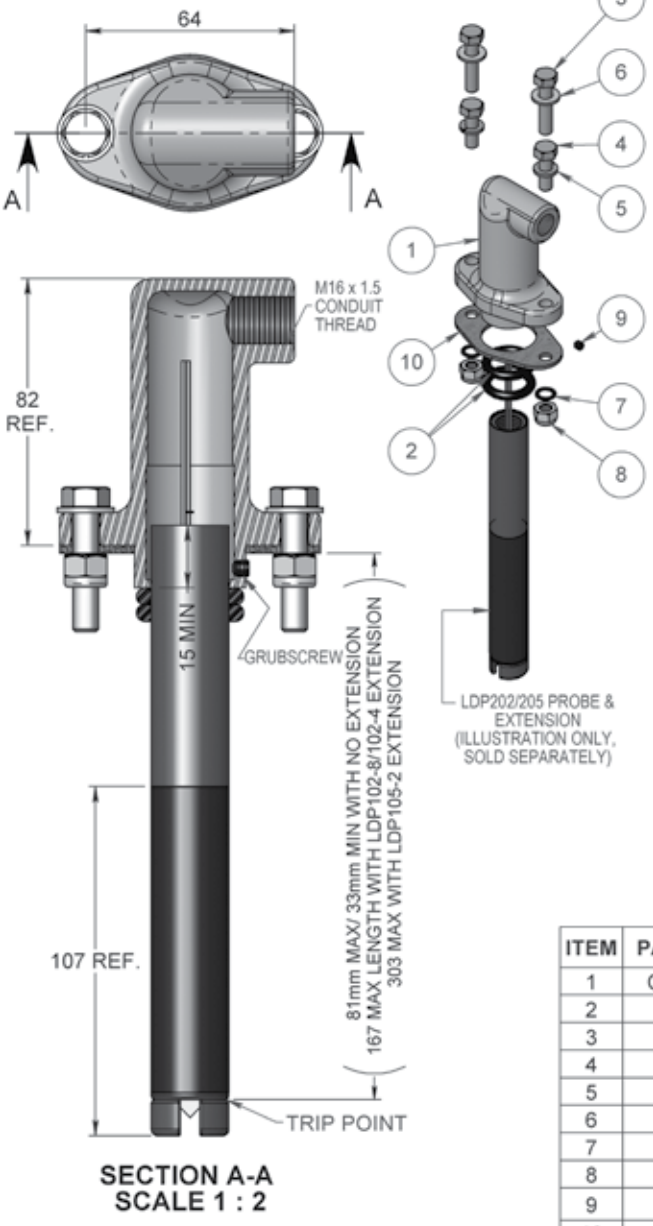
Associated Equipment

- **LDP102-4SS:** Stainless steel probe extension (80mm).
- **LDP105-2SS:** Stainless steel probe extension (222mm).
- **7612K:** O-ring FFKM.
- **PJB500:** 2" Remote Probe holder.
- **VOH200-5:** Probe holder.
- **RM140 Series:** Overfill Rack Monitor.
- **DP300 Series:** Overfill dummy Probes.
- **TP100 Series:** Overfill Truck Plug.

LDP202 & LDP205



VOH200-5 KIT & INSTALLATION



LDP200 SERIES ASSEMBLY PROCEDURE:

1. INSTALL EXTENSION AS REQUIRED (REFER TO LDP INSTRUCTION LEAFLET P59005).
2. SLIDE THE 2 O-RINGS (3114) OVER THE PROBE TIP AND ABOVE THE TRIP POINT AS INDICATED BY THE GROOVE. POSITION THE GASKET BETWEEN THE HOUSING AND THE MOUNTING POINT (MANHOLE COVER OR VRB-13).
3. INSERT THE PROBE (TIP) INTO THE MOUNTING POINT (MANHOLE OR VRB-13) AND PUSH PROBE DOWN TO THE DESIRED TRIGGER POINT. TOP OF THE PROBE MUST BE 15mm MIN ABOVE THE O-RINGS. FOR LOWER SETTINGS AN EXTENSION MUST BE USED.

   NOTE: HOLD ONTO THE PROBE WIRES AND TAKE CARE NOT TO DAMAGE TIP OR DROP PROBE.
4. CAREFULLY REMOVE THE PROBE FROM THE MOUNTING POINT AND SLIDE DOWN THE O-RINGS 3mm TOWARDS THE TIP TO ALLOW FOR O-RING BEDDING. ENSURE O-RINGS ARE STRAIGHT.
5. THREAD THE PROBE WIRES THROUGH THE VOH200-5 HOUSING WITH THE WIRES COMING OUT OF THE ENTRY AND SLIDE THE PROBE INTO THE HOUSING, TAKING CARE NOT TO DISTURB THE O-RINGS.
6. TIGHTEN GRUBSCREW (55056) TO APPROX 1Nm.
7. FIT THE 2 BOLTS WITH WASHERS AND TIGHTEN EVENLY TO A TORQUE OF 15-20 Nm.
8. CHECK THE PROBE HEIGHT.

NOTES:
1. WHEN MOUNTING USE APPROPRIATE FASTENERS FROM KIT (i.e. TO SUIT TAPPED OR THROUGH HOLES), DISCARD REMAINDER.
2. GRUBSCREW IN KIT IS FOR POSITIONING PROBE HEIGHT AND FOR LDP PROBE ATEX INSTALLATION REQUIREMENTS.
3. USE VRB-13 MOUNTING BASE IF NOT MOUNTING DIRECTLY TO A MANHOLE COVER.

ITEM	PART No.	DESCRIPTION	QTY	MATERIAL
1	C0338A	BOX JUNCTION	1	ALUMINIUM
2	3114	O-RING	2	NITRILE
3	0014	SETSCREW HEX	2	Z/P STEEL
4	0012	SETSCREW HEX	2	Z/P STEEL
5	0108	WASHER SPRING	2	Z/P STEEL
6	4334	WASHER FLAT	2	Z/P STEEL
7	4341	WASHER FIBRE	2	FIBRE
8	0149	NUT NYLOC	2	Z/P STEEL
9	55056	GRUBSCREW CUP POINT	1	ST STEEL
10	3097	GASKET	1	NBR CORK
11	6403	INSTRUCTION LEAFLET	1	PAPER

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



Overfill Probe Extensions

Liquip offers a range of probe extensions for LDP Series Overfill Probes.

Probe extensions are available in aluminium and can be either 80mm or 222mm in length.

Ordering Information

- **LD102-4:** Standard Aluminium probe extension (80mm).
- **LDP105-2:** Long Aluminium probe extension (222mm).
- **LDP102-4SS:** Stainless steel probe extension (80mm).
- **LDP105-2SS:** Stainless steel probe extension (222mm).



Overfill Probe Holders

Liquip offers aluminium overfill probe holders that can be mounted on to Liquip Hatches or welded direct to the tank top.

Probe holders can be fitted with Nitrile or Gore-Tex® seals to suit a range of applications.

Features & Benefits

- Lightweight and durable aluminium construction.
- Direct or weld in mounting to the tanker top.
- Standard or chemical versions available.

Ordering Information

- **VOH200-5:** Aluminium overfill probe holder with Nitrile seals.
- **VOH200-5AT:** Aluminium overfill probe holder with Gore-Tex® seals.

Associated Equipment

- **VRB-13:** Base weld on sensor, no holes.



VRB Probe Mounting Series

Liquip offers weld in/bolt on probe mounts for overfill protection probes.

Probe mounts are used with LDP200 series probes and are installed between the probe holder and the tank walkway.

Ordering Information

- **VRB-13:** Base weld on sensor.
- **VRB13-1:** Base weld on sensor for VOH200-5 probe holder.
- **VRB13S:** Base weld on senor 316 Stainless Steel.

Associated Equipment

- **TM3AT:** Camlock removable probe mounting assembly (probe excl).



Remote Probe Holders

Liquip offers a PJB500, remote probe holder, which is a walkway or manhole cover mounted overfill probe holder.

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

Features & Benefits

- Housing can be mounted through a hole and sealed with the locknut or screwed directly into a M60 X 2 thread.
- Adjustable height by loosening internal capscrews and sliding probe up or down to the correct sensing height.
- 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.

Technical Information

Probes

- Will accommodate probe diameters of 22.3mm to 25.5mm (such as Liquip LDP style).
- Maximum length of probe inside housing is 87mm.

Ingress Protection

IP66.

Mounting

- Plate thickness for mounting is from 4 to 17mm.
- Mounting via 50mm (2") BSP male thread or into 62mm dia. hole.

Height

- Overall height when mounted is 96mm, overall diameter is 110mm.

Materials

- Lid & Body: Aluminium
- Seals: Nitrile
- Screws & Washers: Zinc plated.

Ordering Information

- **PJB500:** Remote Overfill Probe Holder.



Removable Probe Mounting Kit

Liquip offers a Camlock removable mounting assembly kit that allows users to mount overfill probes into tanker compartments prior to loading as required.

This is predominantly used in applications where a probe is not required to be fixed to the tanker at all times.

Ordering Information

- **TM3AT:** Camlock removable probe mounting assembly (probe excl).

Associated Equipment

- **LDP202:** 2 wire Aluminium Overfill Sensor.
- **LDP205:** 5 wire Aluminium Overfill Sensor.



Overfill Dummy Probes

The DP300 Series is an accurate and reliable electronic dummy probe for 2-wire optic and thermistor overfill protection systems.

Dummy probes are used when a tanker has fewer compartments than the number of channels on the gantry overfill monitor. The DP30x provides a simulation signal to unused channels in order to obtain a permissive signal from the gantry monitor.

The DP300 Series can simulate up to 7 compartments and is available in both 5 channel and 7 channel models.

Note: Australia uses DP305 only.

Features & Benefits

- Designed in compliance with EN13922.
- Available with five channels (DP305) or seven channels (DP307).
- Power supply is intrinsically safe from industry standard 2 wire gantry monitor via gantry plug when truck is connected.
- IECEx and ATEX certification for installation in zone 1 hazardous areas.
- Can be mounted in truck plug or junction box.
- IP67 rated.
- Compatible with 2 wire optic and thermistor overfill systems.
- Can be used as replacement in other industry standard overfill systems.

Technical Information

Certifications

IECEx Certificate: IECEx ITA 13.0024X

- Marking: Ex ia IIA T3 IP67.
- Temperature: Ta=-25°C to 60°C.
- Parameters: Ui = 30V, Pi = 9W, Ii = 500mA, Ci = 0µF, Li = OmH.

ATEX Certificate: TUV 14 ATEX 7536X

- Marking: 0518 II 2 G Ex ia IIA T3 Gb.
- Temperature: Ta=-25°C to 60°C.
- Parameters: Ui = 30V, Pi = 9W, Ii = 500mA, Ci = 0µF, Li = OmH.

Mounting

Can be installed in zone 1 hazardous areas.

Mount inside Liquip TP100 Series truck plug or equivalent truck plugs.

Materials

- Plastic Body.
- Encapsulated electronic circuit board potted with epoxy.
- TFE, 20 AWG Wire.

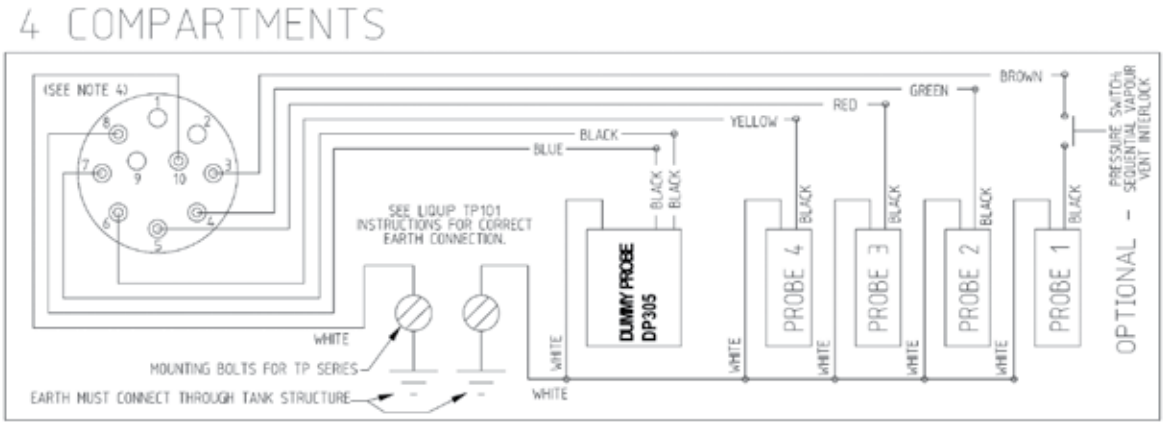
Ordering Information

- **DP305:** Dummy Probe with 5 Outputs.
- **DP307:** Dummy Probe with 7 Outputs.

Associated Equipment

- **TP100 Series:** Overfill Truck Plug.
- **LDP202:** 2 wire Aluminium Overfill Sensor.
- **RM140 Series:** Overfill Gantry Monitor.

OVERFILL DUMMY PROBES INSTALLATION



Wiring Diagram for a 4 Compartment Tanker using a 6 Channel Monitor

Where 8 channel monitors are being used, wire as above except start from pin 1 and use DP307.

The following table lists all possible combinations of tankers:

TRUCK PLUG PIN#	1 COMPT TANK	2 COMPT TANK	3 COMPT TANK	4 COMPT TANK	5 COMPT TANK	6 COMPT TANK	7 COMPT TANK
1	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe
2	DP307-Black	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe
3	DP307-Black	DP307-Black	LDP Probe	LDP Probe	LDP Probe	LDP Probe	LDP Probe
4	DP307-Black	DP307-Black	DP307-Black	LDP Probe	LDP Probe	LDP Probe	LDP Probe
5	DP307-Black	DP307-Black	DP307-Black	DP307-Black	LDP Probe	LDP Probe	LDP Probe
6	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black	LDP Probe	LDP Probe
7	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black	LDP Probe
8	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black	DP307-Black
9*							
10	Ground-White	Ground-White	Ground-White	Ground-White	Ground-White	Ground-White	Ground-White

***See "Ground Boss" wiring to ensure static dissipation from tank.**

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.



Truck Plugs

Liquip offers truck plugs with added ground assurance to suit 2 wire and 5 wire overfill systems with 3 or 4 pin bayonet fastening (J-slots).

The industry standard 10 pin overfill protection is interchangeable with others of the same type and incorporates no-cost wiring connectors which ensure the tanker is bonded to the gantry so long as the plug body is correctly mounted. This dissipates static electricity and prevents sparks due to differences in potential.

The design of truck plugs is unique in that it ensures grounding of the tanker to the gantry by using the mounting bolts inside the truck plug.

Features & Benefits

- 3 and 4 bayonet style J-slots fixing to industry standard.
- 10 pin as standard.
- Allows for overfill protection with added ground assurance.
- Sufficient room to easily install and mount dummy probe as required in 2 wire systems.
- Hard-coated nose ring and J-slots for longer service life.
- Offers compatibility with virtually all terminals built to EN13922 or API RP 1004.

Technical Information

Materials

- Aluminium nose-cone, hard anodised.
- Stainless steel pins and terminator.
- Acetal mounting block.
- Aluminium body and cover plate.
- PVC cap. Order separately, see below.

Mounting

- Mounting by 2 stainless steel bolts 8mm dia. via acetal insulating bushes.
- 3 and 4 bayonet fixing to industry standard.
- Conduit ports 1/2" NPT (straight) thread, two options. 10 pin as standard.

Weight

1.3kg.

Ordering Information

- **TP103:** Truck Plug with 3 pin bayonet fastening.
- **TP104:** Truck Plug with 4 pin bayonet fastening (use also for 2 pin).

Associated Equipment

- **5069:** Truck Plug Socket Dust Cap - Blue.
- **DP300 Series:** Overfill Dummy Probes.
- **LDP200 Series:** Overfill Probes.
- **GP100 Series:** Overfill Gantry Plugs.



Truck Plug Dust Cap

Liquip offers durable plastic/wired dust caps for use with truck mounted overfill sockets/truck plugs.

Features & Benefits

- Heavy duty wire connecting main body of the cap to the mounting eye.
- Thicker spacer supplied for mounting, to allow the cap to rotate freely, reducing wear.
- Blue colour coded cap to represent intrinsically safe equipment.
- Prevents environmental damage to truck plug socket.
- Will fit all overfill sockets built to EN13922 & API RP 1004.

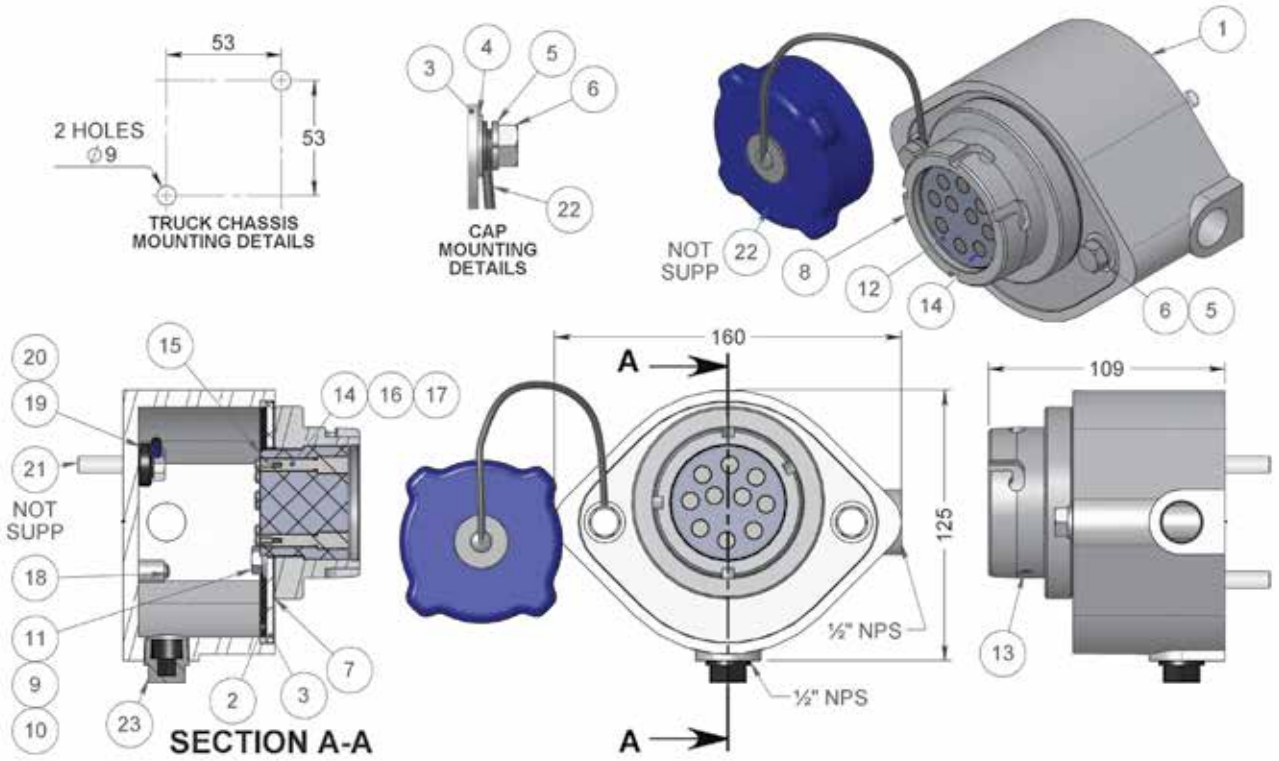
Ordering Information

- **5069:** Truck Plug Socket Dust Cap - Blue.

Associated Equipment

- **TP100 Series:** Truck Plugs.

TP103 & TP104 TRUCK PLUGS



ITEM	PART No	DESCRIPTION	TP104	TP103	TP104-8	MATERIAL
1	TP101-1	BODY	1	1	-	ALUMINIUM
2	4258	SEAL GASKET FOR TP	1	1	1	NITRILE
3	TP100-2	COVER PLATE	1	1	1	ALUMINIUM
4	0101	WASHER FLAT	2	2	2	Z/P STEEL
5	0108	WASHER SPRING	2	2	2	Z/P STEEL
6	0011	SETSCREW HEX	2	2	2	Z/P STEEL
7	4259	GASKET	1	1	1	BLACK FIBRE
8	TP104-3	PLUG 4-PIN	1	-	1	ALUMINIUM
	TP103-3	PLUG 3-PIN	-	1	-	ALUMINIUM
9	0100	WASHER FLAT	2	2	2	Z/P STEEL
10	0114	WASHER SHK-PRF	2	2	2	Z/P STEEL
11	4843	SETSCREW HEX	2	2	2	Z/P STEEL
12	TP100-5	SOCKET - STANDARD	1	1	1	ACETAL
13	4845	SCREW C/SUNK MET	1	1	1	ST STEEL
14	TP100-4	PIN CONTACT	10	10	10	ST STEEL
15	4728	IDENTIFICATION LABEL	1	1	1	POLYCARB
16	5238	WASHER SHK-PRF INT	10	10	10	ST STEEL
17	4844	SCREW METRIC	10	10	10	ST STEEL
18	3234	SELF TAPPING SCREW PAN/PH	2	2	2	ST STEEL
19	TP101-6	BUSH	2	2	-	ACETAL
20	4882	EYE TERMINAL	2	2	-	Z/P STEEL
21		HEX HEAD BOLT MAX Ø8 TO REQ'D LENGTH	NOT SUPPLIED		-	ST STEEL
22	5069	CAP	NOT SUPPLIED		-	PVC
23	5637	PLUG	1	1	-	PVC
24	4729	INSTRUCTION LEAFLET	1	1	-	PAPER
25	4666	WARNING LABEL	1	1	-	PAPER



Truck Plug with Electrical Pressure Switch

Liquip offers truck plugs with added pressure switch and ground assurance to suit 2 wire and 5 wires overfill systems with 3 or 4 pin bayonet fastening (J-slots).

A pneumatic pressure switch has been built into a standard truck socket so that the latest generation of tankers can use this switch to automatically link into the pneumatic logic and ensure the correct pressure keeps the system operating.

The design of truck plugs is unique in that it ensures grounding of the tanker to the gantry by using the mounting bolts inside the truck plug.

Features & Benefits

- Pressure switch can be used to prevent loading until all connections are made.
- 3 and 4 bayonet style J-slots fixing to industry standard.
- 10 pin as standard.
- Allows for overfill protection with added ground assurance.
- Sufficient room to easily install and mount dummy probe as required in 2 wire systems.

Technical Information

Materials

- Aluminium nose-cone, hard anodised.
- Stainless steel pins and terminator.
- Acetal mounting block.
- Aluminium body and cover plate.
- PVC cap. Order separately, see below.

Mounting

- Mounting by 2 stainless steel bolts 8mm dia. via acetal insulating bushes.
- 3 and 4 bayonet fixing to industry standard.
- Conduit ports 1/2" NPT (straight) thread, two options. 10 pin as standard.

Weight

1.3kg.

Ordering Information

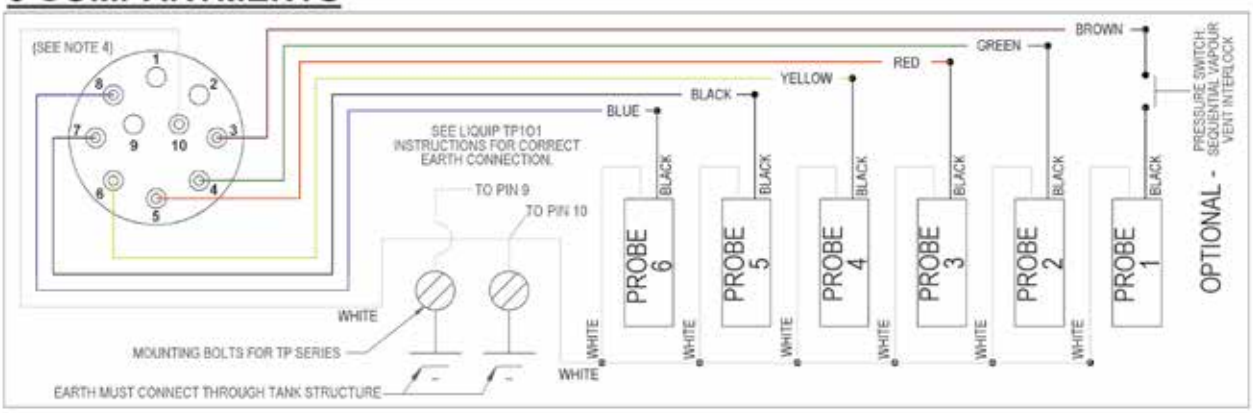
- **ITP113:** Truck Plug with electrical pressure switch and 3 pin bayonet fastening.
- **ITP114:** Truck Plug with electrical pressure switch and 4 pin bayonet fastening (use also for 2 pin).
- **ITP103:** 3 Pin bayonet fastening with pneumatic interlock.
- **ITP104:** 4 Pin bayonet fastening with pneumatic interlock .

Associated Equipment

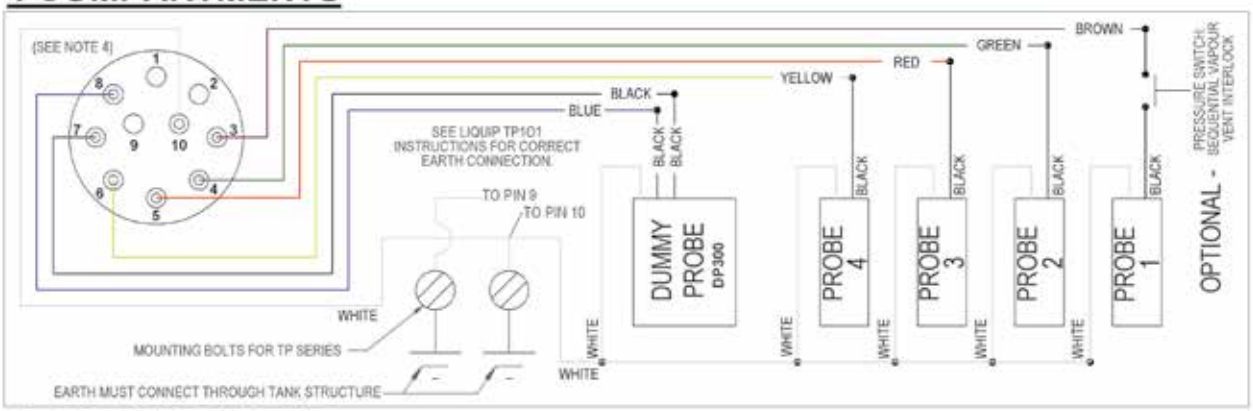
- **5069:** Truck Plug Socket Dust Cap - Blue.
- **DP305:** 5 Channel Dummy Probe for 2 wire systems.
- **DP307:** 7 Channel Dummy Probe.
- **LDP202:** Aluminium 2 wire Overfill Probe.
- **LDP205:** Aluminium 5 wire Overfill Probe.
- **GP100 Series:** Overfill Gantry Plugs.

OVERFILL PROTECTION WIRING (2-WIRE)

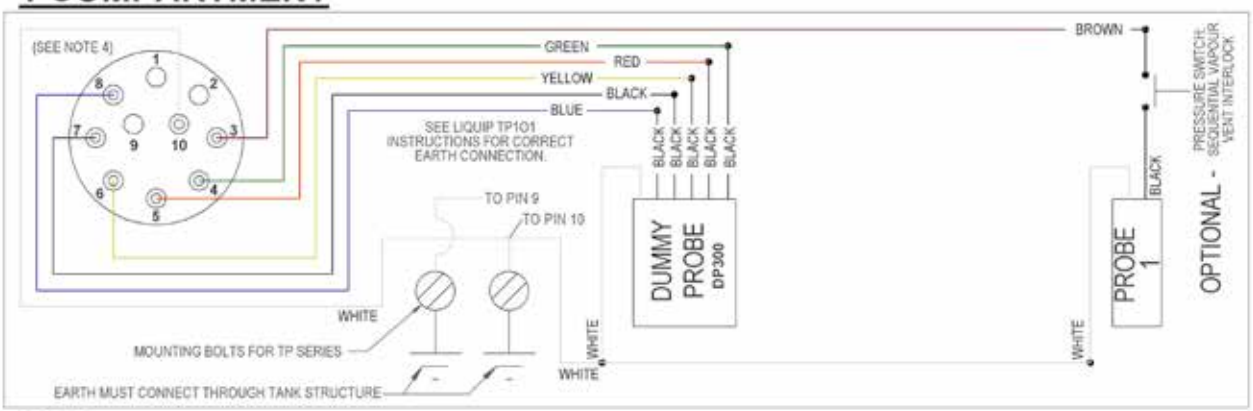
6 COMPARTMENTS



4 COMPARTMENTS



1 COMPARTMENT



NOTES:

1. ADDITIONAL WIRING INFORMATION ON DUMMY PROBE REFER TO DATA SHEET P4008.
2. INDUSTRY COLOUR CODING STANDARD FOR 6-COMPARTMENT TANKER IS SHOWN.
3. CHECK YOUR LOCAL COLOUR CODING STANDARD FOR 8-COMPARTMENT TANKER AND COMPATIBILITY.
4. CHECK YOUR LOCAL STANDARD ON 'TRUCK PLUG' & 'GANTRY SOCKET' FOR NUMBER OF BAYONET PINS; TP103 & GP103 HAVE 3-PIN BAYONETS AND TP104 & GP104 HAVE 4-PIN BAYONETS.
5. CHECK YOUR LOCAL REQUIREMENT FOR WIRING AND CONSIDERATION OF SPACING SHOULD BE MADE REGARDING INTRINSIC SAFETY.



Mini On Board Monitor

Liquip offer extremely small, lightweight single channel on board overfill protection monitors.

The MPP102 single channel monitor has been developed for sites or vehicles with one or two tanks or compartments only, but with a necessity for overfill protection and/or automatic reorder.

***Note:** IECEx safety approval only.*

Features & Benefits

- Extremely small, light and more economical to purchase than current 8 channel monitors.
- Versatility was the key word during development.
- Single 2 wire electronic overfill sensor.
- Can connect directly to a pump, control valve, alarm etc.

Technical Information

Outputs

- Output controls are by switches, one being intrinsically safe to switch via the truck plug and gantry monitor. The other being a 8A power switch capable of operating a small air valve or relay in order to cut off liquid flow.
- Switch provides both N/O and N/C outputs.
- All sensor outputs are intrinsically safe.
- Output signal by an integral relay rated at 24Vdc 8A or 12Vdc 8A.

Safety Approvals

IECEx.

Voltage range

11V to 30V DC.

Operating Temperature

-25 to +55°C.

Materials

Cast aluminium housing Poly-carbonate cover.

Wiring

Three wiring glands (either conduit or non conduit) are required and available as an option.

Weight

1.35kg.

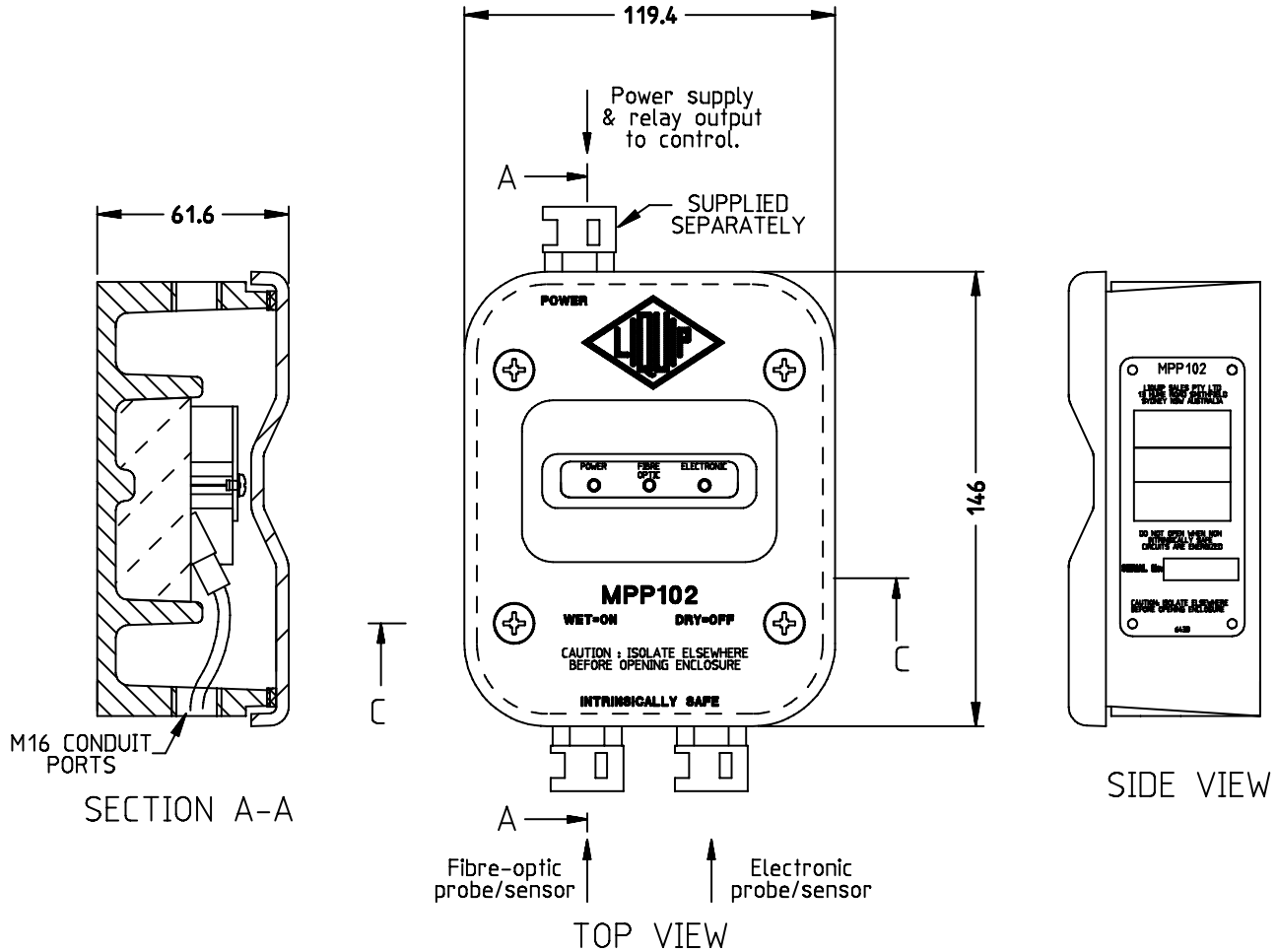
Ordering Information

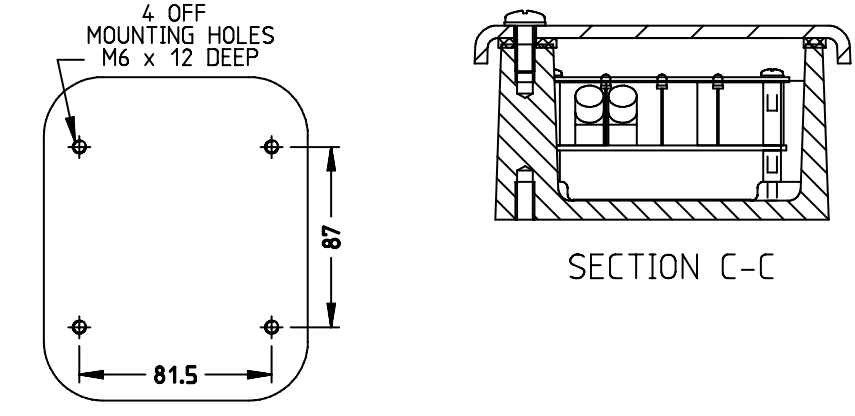
- **MPP102:** Mini On Board Overfill Monitor.

Associated Equipment

- **Probes:** LDP202 Aluminium and Stainless Steel Series.
- **EAC201:** Earth Assurance clamp.
- **JB100:** Junction Box.
- **DP305:** Dummy Probe.

MPP102 MINI ON BOARD MONITOR







Hand Held Probe Testers

The HHT Series of Hand Held Testers, check the operation of Liquip 2 wire (LDP202) and 5 wire (LDP205) optic overfill probes.

These simple to use testers easily allow you to check the operation of loose probe in a matter of seconds.

Features & Benefits

- Portable design, hand held.
- Test 2 wire or 5 wire optic probes.
- Simple and straightforward to use.

Technical Information

Weight

Approx. 160g.

Batteries

18 VDC (2 x 9V Batteries).

Ordering Information

- **HHT100:** Hand Held Tester for testing 2 wire Probe.
- **HHT500:** Hand Held Tester for testing 5 wire Probe.

Associated Equipment

- **LDP202:** 2 Wire Aluminium Overfill Probe.
- **LDP205:** 5 Wire Aluminium Overfill Probe.



Overfill System Tester

Liquip offers portable overfill system testers that completely test both 2 and 5 wire tank truck and terminal/depot overfill systems.

Users can test truck systems, gantry systems and individual probes for quick and effective fault-diagnosis.

With a superior design and easy to use functionality the HTA series testers provide effective testing and diagnostics of overfill protection and grounding/earthing systems.

Features & Benefits

- Diagnoses all common probes and gantry monitors including thermistor, optical and capacitive.
- Test 2 wire or 5 wire systems.
- Test gantry systems, truck systems and individual probes.
- Clearly labeled diagnostic lights indicate if there is a fault and what the fault is.
- Easy to operate.
- Portable design, comes with carry handle and locking latch.

Technical Information

Operating Temperature

-20°C to +70°C.

Battery

12 Volt Lantern type.

Materials

- Aluminium briefcase.
- Gantry plug and truck plug are polyurethane and anodised aluminium respectively with self-store 10 core cable.

Weight

6.0kg.

Ordering Information

- **HTA204:** 2 wire overfill system truck and terminal tester.
- **HTA503:** 5 wire overfill truck and terminal system tester.

Associated Equipment

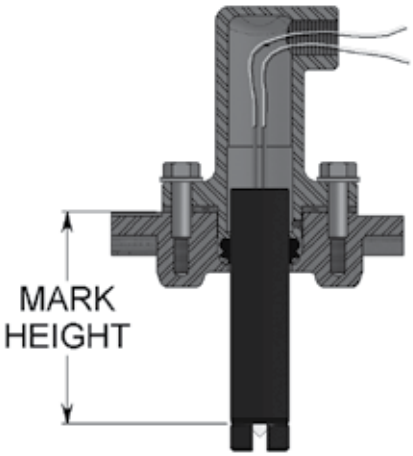
- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets).
- **LDP202:** 2 wire Aluminium Overfill Probe.
- **LDP205:** 5 wire Aluminium Overfill Probe.
- **GP103:** Gantry plug, 3-pin bayonet, Navy Blue, supplied with cable & gland.
- **GP104:** Gantry plug, 4-pin bayonet, Black, supplied with cable & gland.
- **GP114:** 4 pin gantry plug with self coiling cable. (Quick Release).
- **GP214:** 4 pin gantry plug with uncoiled cable. (Quick Release).

General Guidelines for Installing Liquip Electronics On Vehicles:

- Ensure tanker and vehicle are gas free.
- Ensure tanker and vehicle are in a non-hazardous area.
- Use anti-seize lubricant or waterproof grease on all screw-in equipment and fasteners.
- Never weld on a vehicle unless all electronic equipment is completely disconnected electrically from both the tanker and other equipment.
- Use high quality waterproof conduit and fittings to IP66 minimum for all wiring and junction boxes.
- Use waterproofing flexible compound such as silastic in all glands and joints not available as waterproof by design.
- Mount all equipment away from direct spray areas such as behind the tyres and out of direct sunlight. Always select the most sheltered aspect.
- Coat all terminals and cable end and joints with non-conducting grease or vasoline after final testing.
- Check entire electrical circuit and housings for potential water entry prior to sign off.
- Cable ends may be crimped with ferrules for better connection but do not just solder cable end (fatigues and corrodes). or, as a poor second choice, bend the bared wire back over itself to provide more clamping bulk.
- Common grounding of a system is most important. Do not rely on common chassis grounding at various points, run a full-length dedicated ground cable. Max resistance, battery-ground to any ground-point to be 1 ohm.
- Crimp joints are preferred to solder joints. Pre-coat with grease for corrosion protection.
- Always fit as much loose cable length into junction boxes and housings as practicable to allow for future servicing.
- When pulling multiple cables through conduit, always consider using cable with one or two extra conductors to allow for any future requirements.
- Always completely segregate power and intrinsically safe wires into completely separate conduit and in accordance with I.S. wiring rules.
- Carry out complete wiring check for accuracy and continuity before connecting power to any device.
- Observe international and local legal requirements. In the event of conflicting instructions seek qualified advice before proceeding.
- Apply cable relief inside all housing entries.
- All equipment to be supplied from a fused power supply.
- If no power, first check battery charge and fuses in supply line.
- Bags of desiccant are not effective- good water proofing is.
- Do not route communication cables past ‘noisy’ electrical apparatus such as solenoids and alternators.
- Check instruction manuals for recommended cable type.
- Use specialised, genuine tools for all electrical work.

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

Overfill Protection System



Overfill Protection Probe Junction Box (VOH200-5)

When installing the probe in the VOH200-5 housing on the manhole cover, it is essential that from the probe actuation point (trip point) there is at least 230 litres space remaining to allow for the normal delay in slow stopping. After setting, mark the probe body or extension so if replacement is required the new probe can easily be set to the required position. LDP probes have an extension with a scale engraved along the side to allow the set height value to be marked on the safe fill plate.

All electrical wiring should be in water-resistant and UV stabilised conduit and junction boxes. (IP66 min) When using the PJB500 probe housing it should be sited on the walkway as close to the centre of the compartment as possible.



Overfill Protection Probe Junction Box (PJB500)

The PJB500 can be fitted directly to a tanker with a flat walkway by drilling a 62mm hole in the desired position and securing the PJB500 with the locknut.

The PJB500 can be fitted to a curved walkway on a tanker by first installing a 2" BSP socket then screwing in the PJB500. The PJB500 can be fitted to Liquip VOH500 manholes or manholes made by other manufacturers. Using the PJB500 housing with its 2 off M20 threaded ports you eliminate the need to mount a tee with cover into the conduit line. This allows for better connection, easier fault finding and quicker installation.

Note: All installation information contained in this catalogue is a guide only. Ask Liquip for installation manual.

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Tanker Accessories



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3" Camlock Outlet to Flanged Adaptors

Liquip offers a range of 3" outlet adaptors that provide nose cones that bolt directly to a butterfly valve to allow for product discharge via gravity feed.

Features & Benefits

- Allows for simple and easy connection to discharge hoses.
- Flanges are 3" TTMA.
- Angled downwards for product drainage.
- Lightweight, sturdy and durable aluminium design.

Ordering Information

- **MC3-V3A:** 5° Aluminium Camlock Male 3" to 75 TTMA flange.
- **MC3-V4A:** 10° Aluminium Camlock Male 3" to 100 TTMA flange.
- **MC3-1A:** Aluminium Male Camlock Weld on.



4" Camlock Outlet to Flanged Adaptors

Liquip offers a range of 4" flanged Camlock outlet adaptors that provide nose cones that bolt directly to a butterfly valve to allow for product discharge via gravity feed.

Features & Benefits

- Allows for simple and easy connection to discharge hoses.
- Flanges are 4" TTMA.
- Straight connection.
- Lightweight, sturdy and durable aluminium design.

Ordering Information

- **MC4-V4A:** Aluminium Camlock 4" to 100mm TTMA flange.
- **MC4-V4G:** AV Gas Camlock male 4" to 100mm TTMA flange.
- **MC4-V4J:** Jet A1 Camlock male 4" to 100mm TTMA flange.



Vapour Dust Cap

Liquip offers a durable and lockable pull-out vapour dust cap to fit all 4" Vapour Recovery Adaptors.

Ordering Information

- **VCM-DCA:** Aluminium vapour dust cap.
- **VCM-DC:** Aluminium dust cap to suit VCM3-F.

Associated Equipment

- **VCM450:** Vapour adaptor 100mm (4") flow through.
- **VCM3P:** Vapour adaptor with proximity switch holder.
- **VCM3-F:** Al Vapour adaptor 100mm Male to 100mm TTMA flange.
- **VCFPA:** Vapour parking adaptor with proximity switch holder.



Product Delivery Adaptor Ring - Side Seal

LTA side seal brass tightfill adaptors provide the tank side (service station side) connection for the LTE series product delivery elbows.

Screwed into place on the storage tank inlet, the LTA adaptors are available in a variety of size combinations.

Ordering Information

- **LTA3X2:** Tightfill brass adaptor. 3" connection to 2" BSP threaded.
- **LTA3X3:** Tightfill brass adaptor. 3" connection to 3" BSP threaded.
- **LTA3X4:** Tightfill brass adaptor. 3" connection to 4" BSP threaded.
- **LTA4X3:** Tightfill brass adaptor. 4" connection to 3" BSP threaded.
- **LTAS4X4:** Tightfill brass adaptor. 4" connection to 4" BSP threaded.

Associated Equipment

- **LTE3X3:** Aluminium elbow 80mm male Camlock x 80mm titefill elbow.
- **LTE3X4:** Aluminium elbow 80mm male Camlock x 100mm titefill elbow.
- **LTE4X4:** Aluminium elbow 100mm male Camlock x 100mm titefill elbow.



Product Delivery Elbows

The LTE series product delivery elbows connect discharge hoses from a road tanker to a fill point on underground storage tanks fitted with Liquip tight fill adaptors or similar.

Liquip's product delivery elbows allow for quick and safe product transfer. Spring loaded levers allow the elbows to snap on securely to an side seal tight fill adaptor with minimal pressure.

Features & Benefits

- Spill free delivery during discharge of tank trucks.
- Sealing on the bottom connection is via lip seal on the side of the LTA adaptor as this surface is rarely worn.
- Ergonomic design for added operator safety.
- Incorporated sightglass to view product flow.
- Easy connection and disconnection.
- Quick release design.
- Connection at the top inlet is via standard Camlock.
- Spring loaded levers that snap onto adaptors with minimal pressure.
- 360° sight glass to easily view product flow.

Technical Information

Inlet

80mm or 100mm.

Bore

80mm or 100mm.

Mounting

Hand mounted push & click with quick release levers.

Materials

- Body- Aluminium
- Viton™- Seal
- Levers- Stainless Steel
- Sightglass- Acrylic

Weight

3.9kg.

Ordering Information

- **LTE3X3:** Aluminium elbow 80mm male Camlock x 80mm titefill elbow.
- **LTE3X4:** Aluminium elbow 80mm male Camlock x 100mm titefill elbow.
- **LTE4X4:** Aluminium elbow 100mm male Camlock x 100mm titefill elbow.

Associated Equipment

- **LTA3x3:** Tightfill brass adaptor. 3" connection to 3" BSP threaded.
- **LTA3x4:** Tightfill brass adaptor. 3" connection to 4" BSP threaded.
- **LTA4x4:** Tightfill brass adaptor. 4" connection to 4" BSP threaded.



Vapour Recovery Elbows

Liquip's Vapour Recovery Elbow (VTE-3) is made of a sturdy aluminium construction and is used to connect the truck vapour hose coupler to the vapour adaptor.

Features & Benefits

- Lightweight and sturdy aluminium design.
- Easy and secure connection and disconnection through the use of spring loaded levers.
- Ergonomic design supports the easy connection.

Ordering Information

- **VTE-3:** Vapour Elbow Assembly.



Engine Stranglers

Liquip offers a range of mechanical engine stranglers that can shut down the engine of fuel delivery trucks in an emergency situation such as roll over.

The engine strangler can be pneumatically or manually actuated to stop the engine in case of diesel runaway, and is easily re-set for continued use once activated.

The engine strangler can also be actuated by the rollover sensor via a solenoid valve. This provides a complete system of engine protection and electrical isolation for maximum vehicle safety.

Features & Benefits

- 100% reusable. Once installed, it never needs replacement, no matter how many times it is used to save the vehicle.
- Manual, cable or air operated for added convenience.
- Available in both 3" and 5"

Technical Information

Minimum operating pressure

400 kPa.

Maximum operating pressure

900 kPa.

Air fittings

2 x 1/8" BSP.

Maintenance

It is recommended that the valve operation be checked, using all the methods of actuation which may be fitted to particular vehicle, at normal service intervals.

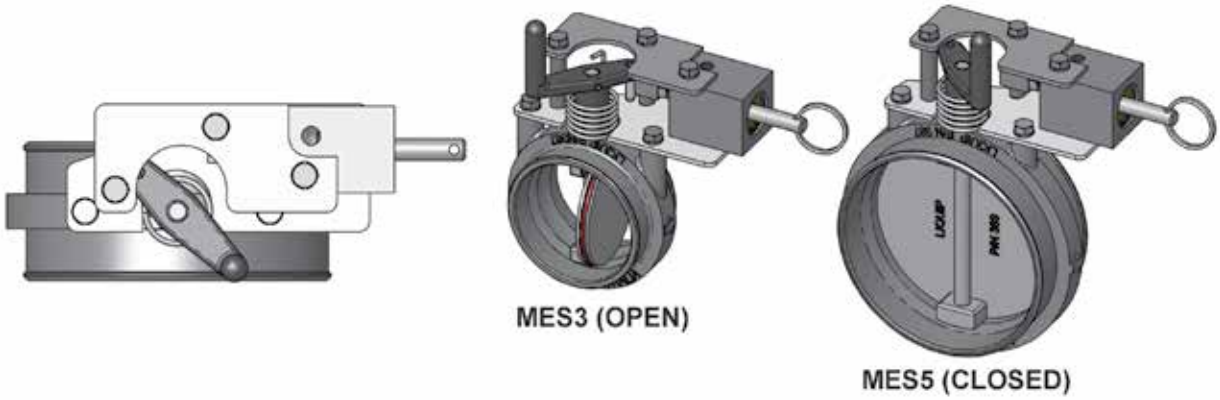
Ordering Information

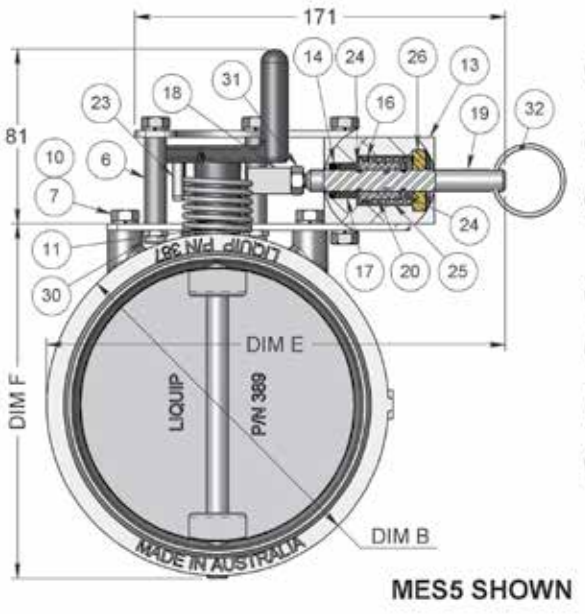
- **MES3:** 3" Mechanical Engine Strangler.
- **MES5:** 5" Mechanical Engine Strangler.
- **MES5MS:** Mechanical Engine Strangler Air/Mine Spec (contact Liquip for technical data).

Associated Equipment

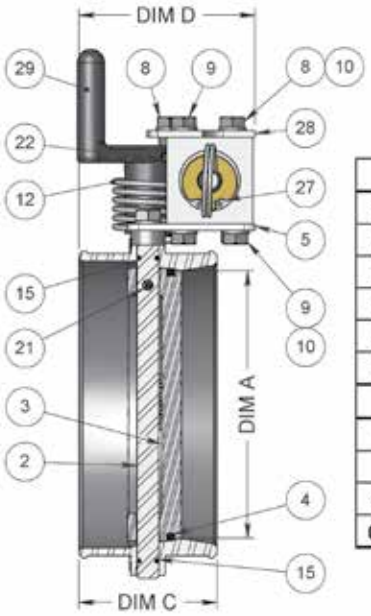
- **RS400:** Liquip Rollover Sensor.

MESx MECHANICAL ENGINE STRANGLER





MES5 SHOWN



	MES3	MES5
DIM A	Ø72.7	Ø123.5
DIM B	Ø108	Ø158
DIM C	51	64
DIM D	72.1	78.1
DIM E	185.5	211.9
DIM F	112.5	162.7
* DIFFERING PARTS		
BODY	MES3-1	MES5-1
DISC	MES3-2	MES5-2
SHAFT	MES3-4	MES5-4
O-RING	4616	4600

ITEM	PART No	DESCRIPTION	QTY	MATERIAL
1	MES5-1*	BODY 5"	1	ALUMINIUM
2	MES5-4*	OPERATING SHAFT 5"	1	ST STEEL
3	MES5-2*	BUTTERFLY DISC 5"	1	ALUMINIUM
4	4600*	O-RING	1	VITON A
5	MES3-5	BASE PLATE	1	Z/P STEEL
6	MES3-8	SUPPORT LATCH	2	ST STEEL
7	3090	SETSCREW HEX HD IMPERIAL	2	Z/P STEEL
8	6563	BOLT HEX	2	ST STEEL
9	3240	SETSCREW HEX HD IMP	3	ST STEEL
10	0107	WASHER SPRING	7	Z/P STEEL
11	0813	WASHER FLAT	1	ST STEEL
12	4426	RETURN SPRING	1	ST STEEL
13	MES3-10	AIR RAM BODY	1	ALUMINIUM
14	0409	O-RING	1	VITON A
15	0214	O-RING	2	NITRILE
16	0164	O-RING TO BS1806 & SAE AS568A	1	NITRILE

ITEM	PART No	DESCRIPTION	QTY	MATERIAL
17	5608	BUSH 16 OD x 10 ID x 8 LONG	1	BRONZE
18	MES3-9	LATCH MECHANICAL ENGINE	1	ST STEEL
19	MES3-12	SPINDLE - AIR RAM	1	ST STEEL
20	MES3-11	PISTON - AIR RAM	1	ALUMINIUM
21	0909	SPRING (ROLL) PIN	1	Z/P STEEL
22	0907	SPRING (ROLL) PIN	1	Z/P STEEL
23	0914	SPRING (ROLL) PIN	1	Z/P STEEL
24	0091	E-CLIP IMPERIAL	2	STEEL
25	4427	SPRING COMPRESSION	1	ST STEEL
26	MES3-13	END CAP	1	BRASS
27	4346	CIRCLIP INTERNAL	1	ST STEEL
28	MES3-6	TOP PLATE	1	Z/P STEEL
29	MES3-3	OPERATING HANDLE	1	ALUMINIUM
30	0148	NUT HALF NYLOC IMPERIAL	2	Z/P STEEL
31	0128	NUT HEX	1	Z/P STEEL
32	0980	KEY RING 1-½" Z/P	1	Z/P STEEL



RS400 Rollover Sensor

The RS400 is the fourth generation of Liquip Rollover Sensor and symbolises Liquip's constant drive for safety and continuous improvement.

Rollovers can occur in the blink of an eye and in the event of a rollover, the RS400 is a safe and effective way to ensure electrical sources of product ignition are isolated.

Features & Benefits

- Complies with AS2809- Vehicle Rollover Device.
- Solid state 3 axis accelerometer.
- The device will not be activated at less than 45° to the vertical.
- Inbuilt filter prevents accidental shutdowns by rejecting any readings that would not result in a rollover e.g. bumps.
- Resistant to power surges.
- Integrated hinge and indicator lights for easy in situ testing.
- 2 metres of colour coded cable for ease of installation.
- Can also be used to operate a Liquip engine strangler to ensure the vehicle engine stops.

Technical Information

Operating voltage range

9V to 32V DC, 1.5W maximum.

Operating temperature range

-20°C to +60°C.

Ingress Protection Rating

IP66 rated.

Standards Met

AS2809-2008.

Contact current rating

- 10A DC switching current (NOHP to 0V).
- 0.15A DC switching current (NO/NC to COM).

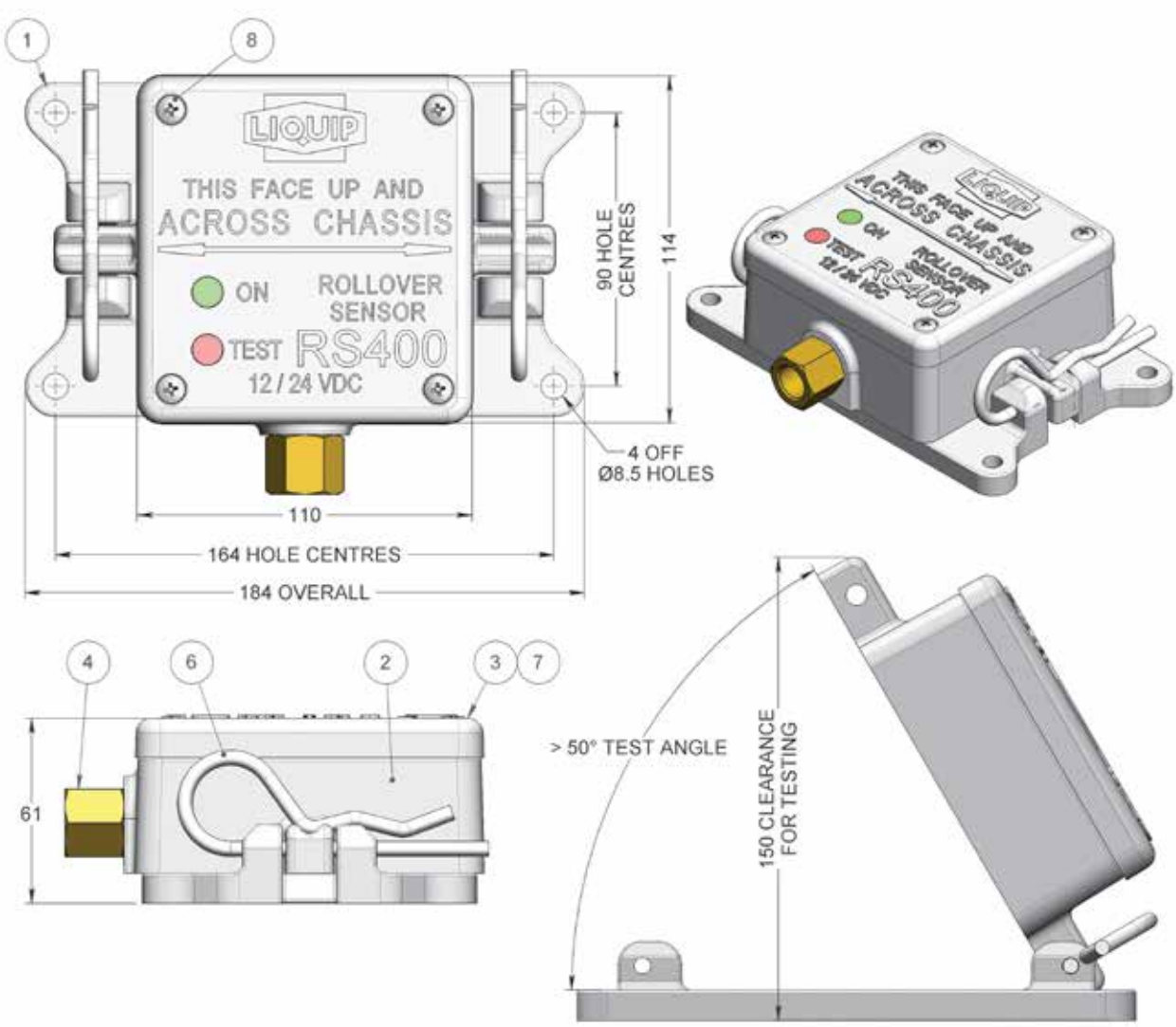
Ordering Information

- **RS400:** Liquip Rollover Sensor.

Associated Equipment

- **MES3:** 3" Mechanical Engine Strangler.
- **MES5:** 5" Mechanical Engine Strangler.
- **TSW12K:** Manual 500AMP Isolation Switch 12V and Harness Kit.
- **TSW24K:** Manual 500AMP Isolation Switch 24V and Harness Kit.
- **HM001:** Single Position Mounting Bracket.

RS400 ROLLOVER SENSOR



ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	RS201-1	BASE - HINGING	1	ALUMINIUM
2	RS400-2	BODY ROLLOVER SENSOR	1	ALUMINIUM
3	RS400-3	LID	1	ALUMINIUM
4	ERP200-3	ADAPTOR	1	BRASS
5	RS400-4	GROMMET	1	VITON
6	0880	HUMPBACK PIN	2	Z/P STEEL
7	4249	GASKET	1	NBR CORK
8	55069	SCREW METRIC	4	ST STEEL
9	59097	RS400 INSTALLATION INSTRUCTION	1	PAPER



Hazchem Sign Assemblies

The HLS102 hazardous chemical (Hazchem) meets Australian government regulations for the transport of dangerous goods.

Off the shelf the HLS102 can display: BLANK, PETROL, PETROLEUM FUEL & COMBUSTIBLE LIQUID, but can easily be configured to include special signs to meet your Hazchem needs.

Features & Benefits

- Lightweight and durable aluminium frame.
- Metal signage for weight reduction and long life.
- Sign inserts are easily replaced, changed or folders over to display alternate signage in compliance with hazardous transport signage regulations.

Technical Information

Standards

Complies with Australian Dangerous Goods Code, 7th Edition.

Operation

Change the display by lifting hinge and flipping sign.

Mounting

4 off M10 bolts. x 3 per tanker truck.

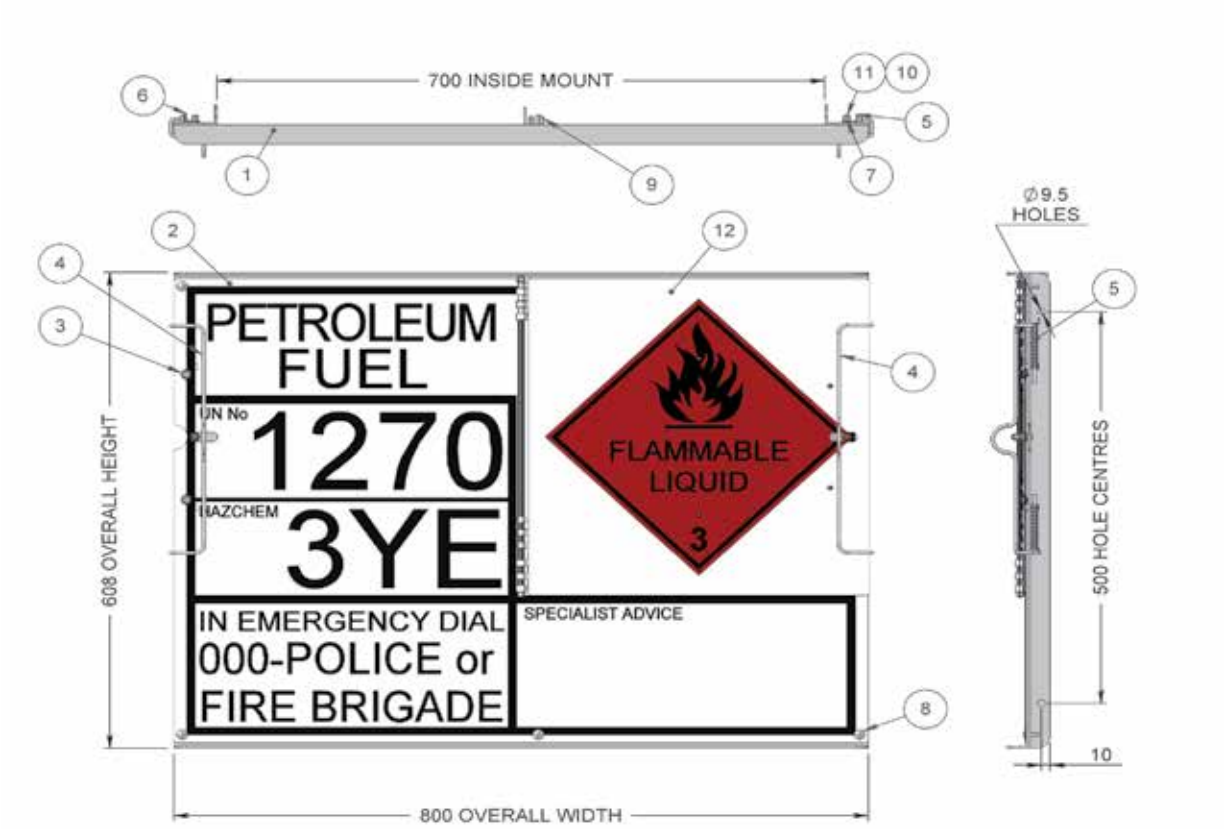
Ordering Information

- **HLS102:** Aluminium/Steel Hazchem sign assembly.
- **HLS102-BIT:** Alternative part for Bitumen products.

Associated Equipment

- **HLS102-8:** HLS special insert with text as required.
- **HLS102-9:** HLS special insert for Aviation Turbine Fuel and Aviation Gasoline.
- **HLS102-12:** HLS special insert for Ethanol & Methanol.

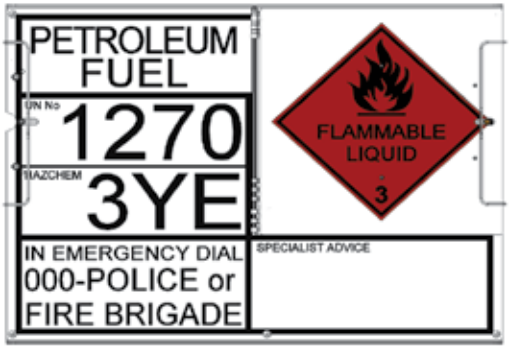
HLS102 HAZCHEM LIBRARY



ITEM NO.	PART NUMBER	DESCRIPTION	HLS102	HLS102-BIT	MATERIAL
1	HLS101-1	FRAME SIGN HAZCHEM ASSEMBLY	1	1	ALUMINIUM
2	HLS101-12	SIGN HAZCHEM 800 x 600 BITUMEN	-	1	ALUMINIUM
	HLS101-6	SIGN HAZCHEM 800 x 600	1	-	ALUMINIUM
3	7125	GROMMET BUFFER SIGN HAZCHEM	4	4	NEOPRENE
4	7146	LATCH WIRE HAZCHEM SIGN	2	2	STEEL
5	4431	SPRING SIGN HAZCHEM	2	2	STEEL
6	4430	SPRING SIGN HAZCHEM	2	2	STEEL
7	6541	WASHER FLAT	4	4	Z/P STEEL
8	5629	POP RIVET	5	5	ALUMINIUM
9	0008	POP RIVET	8	8	ALUMINIUM
10	0156	NUT NYLOC	4	4	Z/P STEEL
11	4983	SETSCREW METRIC	4	4	Z/P STEEL
12	HLS102-30	SIGN LEAVES SUB-ASSEMBLY	1	-	STEEL
	HLS102-20	BITUMEN HAZCHEM SIGNS	-	1	STEEL LEAVES

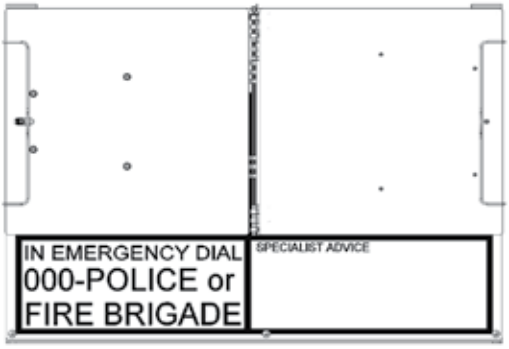
HLS102 HAZCHEM LIBRARY

FOUR OFF DISPLAYS POSSIBLE WITH HLS102



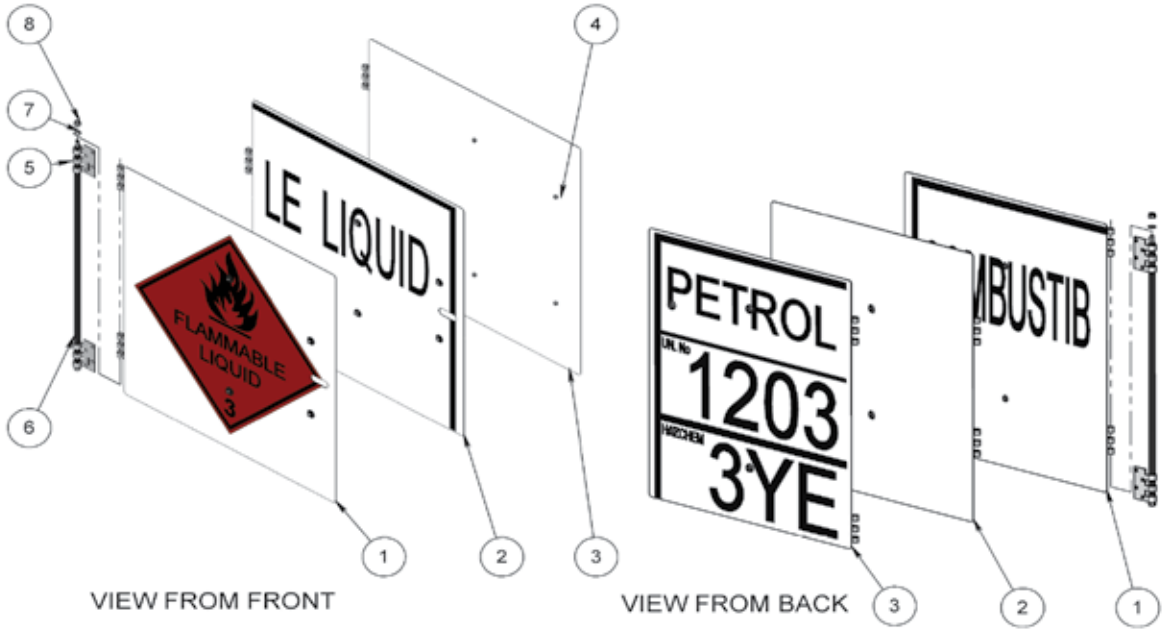






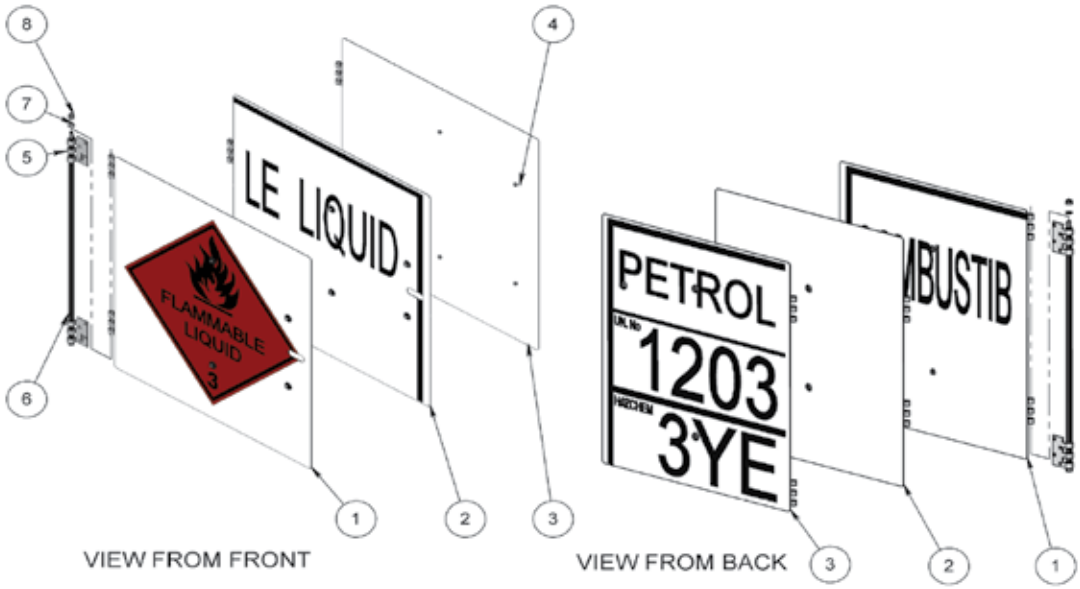
HLS102 HAZCHEM LIBRARY

SIGN LEAVES SUB-ASSEMBLY (HLS102-30)

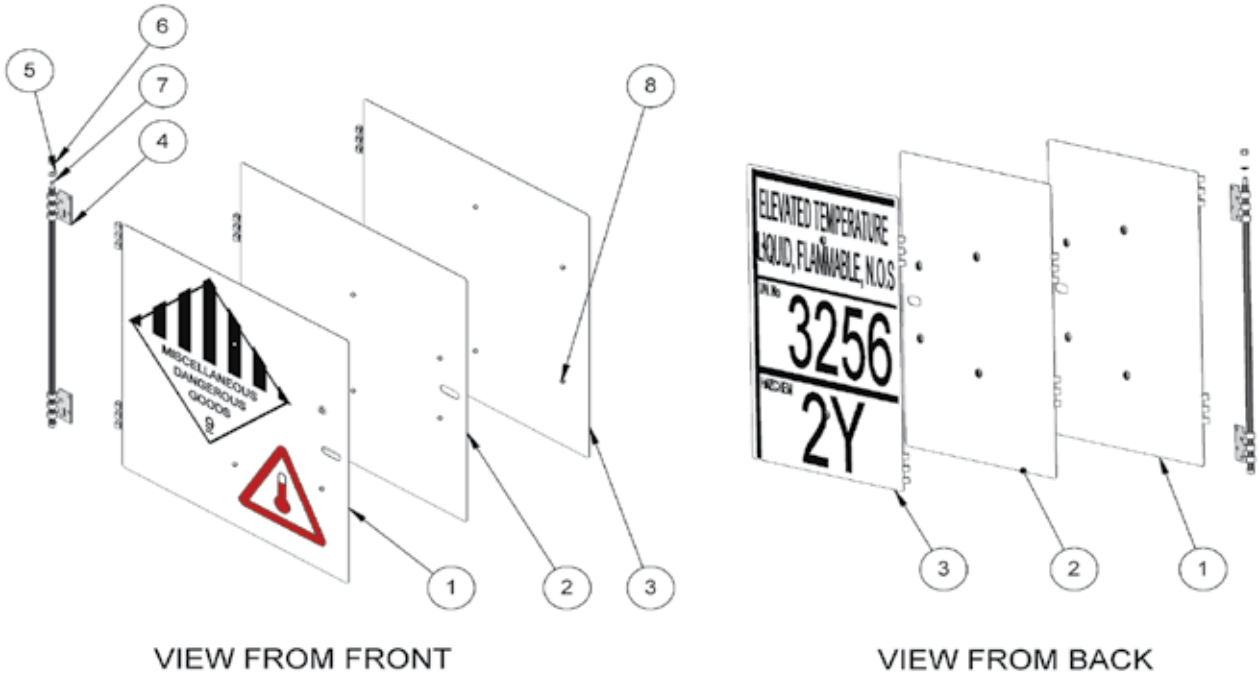


ITEM	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
1	HLS102-2	SIGN HAZCHEM 400 X 400	1	STEEL
2	HLS102-11	SIGN HAZCHEM 400 X400	1	STEEL
3	HLS101-4	SIGN HAZCHEM 400 X 400	1	STEEL
4	7125	GROMMET BUFFER SIGN HAZCHEM	12	NEOPRENE
5	7259	HINGE STRAIGHT SIGN HAZCHEM	2	STEEL
6	HLS101-5A	HINGE PIN WITH BEARING	1	ST STEEL
7	6541	WASHER FLAT	1	Z/P STEEL
8	0156	NUT NYLOC	1	Z/P STEEL

SIGN LEAVES SUB-ASSEMBLY (HLS102-30)



BITUMEN SIGN LEAVES ASSEMBLY (HLS102-30)





Hazchem Sign Inserts

Liquip offers a range of Hazchem sign inserts to suits a large variety of unique products.

Labels can also be made to order to suit individual products. Contact Liquip for further information.

Features & Benefits

- Lightweight and durable aluminium frame.
- Metal signage for weight reduction and long life.
- Sign inserts are easily replaced, changed or folders over to display alternate signage in compliance with hazardous transport signage regulations.

Ordering Information

- **HLS102-8:** HLS special insert with text as required.
- **HLS102-9:** HLS special insert for Aviation Turbine Fuel and Aviation Gasoline.
- **HLS102-12:** HLS special insert for Ethanol & Methanol.
- **HLS102-BIT:** Hazchem sign comes fitted with signs to suit bitumen products.

Associated Equipment

- **HLS102:** Aluminium/Steel Hazchem sign assembly.
- **HLS102-BIT:** Alternative part for Bitumen products.



Product Indicators

Liquip offers product indicators to be used on tank trucks with multi-use compartments to allow users to easily identify compartment contents.

Features & Benefits

- Can be loaded to display up to 12 products.
- Standard product label is fitted with 12 most common products (other labels available on request).
- Quick and easy changeover between labels.
- Lightweight & durable design.
- Commonly mounted to the 4" TTMA API adaptors flange for easy viewing.
- Cost effective way to indicate what product is in each compartment.

Technical Information

Product Display Options

PI1200 supplied complete with label displaying the following products:

- Diesel.
- Ethanol.
- Kerosene.
- Unleaded.
- Avgas 100.
- Heating Oil.
- Jet A-1.
- Hi-Octane.
- Unleaded / Ethanol Blend.
- Pulp.
- E-85.
- Blank.

Mounting

2 off hole mounting on the back of the API valves.

Ordering Information

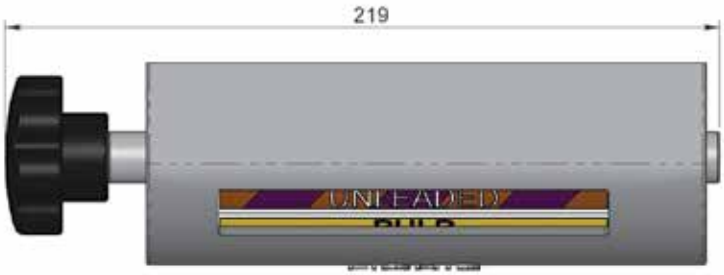
- **PI1200:** 12 position product indicator fitted with standard label.
- **PI1202:** 12 position product indicator without label.

For labels printed with custom labels, contact Liquip.

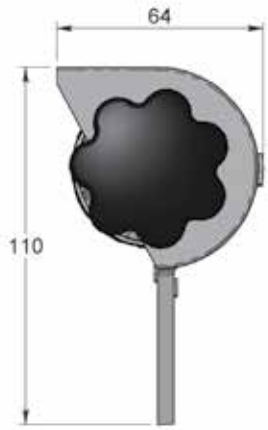
PRODUCT INDICATOR - PI1200



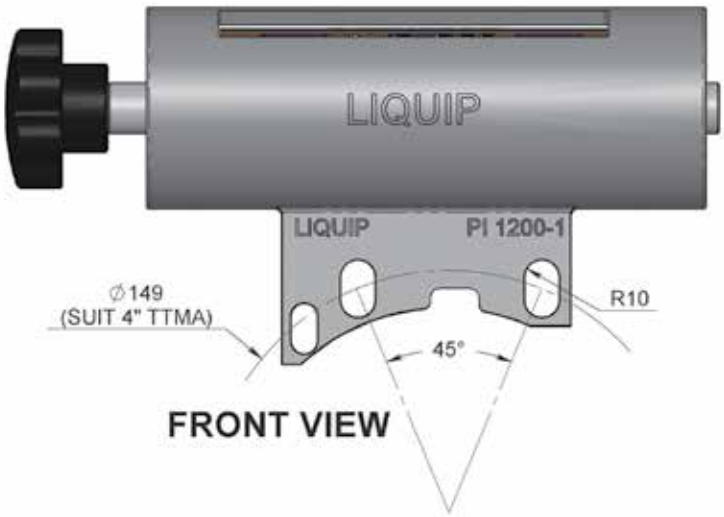
ISOMETRIC VIEW



TOP VIEW



SIDE VIEW



FRONT VIEW

ITEM NO.	PART NUMBER	DESCRIPTION	PI1200	PI1202	MATERIAL
2	59011	LABEL INDICATOR PRODUCT	1	-	POLYESTER
1	PI1202	PRODUCT INDICATOR PRESS FIT	1	1	ALUMINIUM



LBV350VG shown

3” Flanged Butterfly Valves

Liquip’s range of 3” butterfly valves provide and control full flow through pipelines fitted with 75mm (3”) TTMA flanges.

With a lightweight and durable design Liquip’s butterfly valves are the butterfly valve of choice.

Features & Benefits

- 4 stage opening/closing valve.
- 75mm (3") product flow.
- Industry Standard 3" TTMA Flange Mounting.
- Bonded Viton™ seal for increased durability.
- Lightweight aluminium body.
- Can be fitted with an Air Actuator or locking tab as required.

Technical Information

Working pressure

- 1,500 kPa (210 PSI) in open position.
- 700 kPa (101 PSI) in closed position.

Operating temperature

–10°C to 100°C.

Mounting

Mounts directly to Liquip 75mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Service

Periodically (approx. every 6 months), inspect butterfly seat.

Materials

- Body - Cast aluminium.
- Butterfly disc - Cast aluminium.
- Handle - Cast aluminium with zinc plated steel locking lever.
- Spindle - Stainless Steel.
- Seal - Bonded Viton™ A.

Weight

- 1.6kg - LBV300.
- 1.16kg - LBV3-LA.

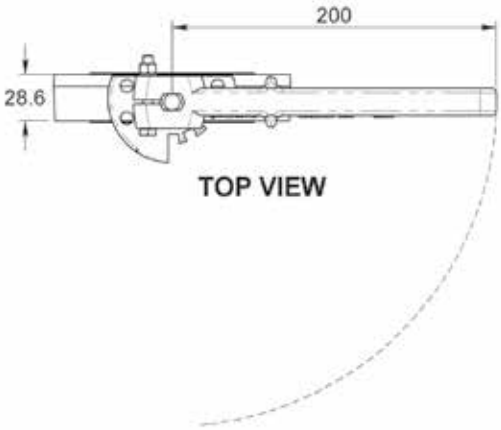
Ordering Information

- **LBV350VG:** 3” Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV300:** 3” Butterfly valve c/w bonded Viton™ seal.
- **LBV300Z:** LBV300 c/w 2 x 3” TTMA NBR gaskets.
- **LBV300VZ:** LBV300 c/w 2 x 3” TTMA Viton™gaskets.
- **LBV3-LA:** 3” Machined butterfly valve.
- **LBV3-AAZ:** 3” Butterfly Valve & Air Actuator.
- **LBV3-AASRZ:** 3” Butterfly Valve & Spring Return Actuator.

Associated Equipment

- **BF3:** 75mm TTMA aluminium flange (also available in mild & stainless steels).
- **0656:** 75mm TTMA NBR cork gasket.
- **4287:** 75mm TTMA Klingerite gasket.
- **0656V:** 75mm TTMA Viton™ gasket.
- **LBV4-7:** Locking tab.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.

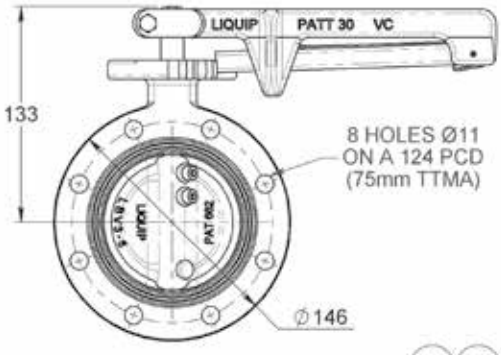
LBV300 BUTTERFLY VALVE 75mm TTMA



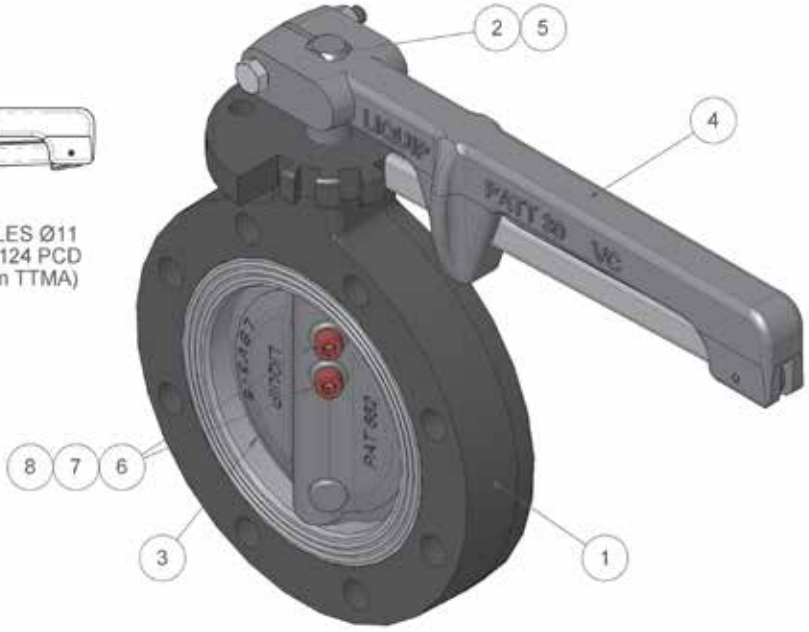
TOP VIEW



OPEN POSITION



FRONT VIEW



ISOMETRIC VIEW

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	LBV350-1	BODY WITH BONDED SEAL	1	ALUMINIUM
2	LBV3-6	SPINDLE	1	ST STEEL
3	LBV3-5	BUTTERFLY 3" DISC	1	ALUMINIUM
4	LBV3-1	HANDLE ASSY	1	ALUMINIUM
5	0225	O-RING	2	NITRILE
6	709	CAPSCREW METRIC	2	Z/P STEEL
7	0156	NUT NYLOC	2	Z/P STEEL
8	3368	PIPE SEALANT	1	SEALANT

LBV4-7 LOCKING TAB TO REPLACE HANDLE IS AVAILABLE AS A OPTION.



LBV450VG shown

4" Flanged Butterfly Valves

Liquip's range of 4" butterfly valves provide and control full flow through pipelines fitted with 100mm (4") TTMA flanges.

With a lightweight and durable design butterfly valves are the butterfly valve of choice.

Features & Benefits

- 4 stage opening/closing valve.
- 100mm (4") product flow.
- Industry Standard 4" TTMA Flange Mounting.
- Bonded Viton™ GFLT seal for increased durability.
- Lightweight aluminium body.
- Can be fitted with an air actuator or locking tab as required.

Technical Information

Working pressure

- 1,500 kPa (210 PSI) in open position.
- 750 kPa (123.25 PSI) in closed position.

Operating temperature

–40°C to 100°C.

Mounting

Mounts directly to Liquip 100mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Service

Periodically (approx. every 6 months), inspect butterfly seat.

Materials

- Body - Cast aluminium.
- Butterfly disc - Cast aluminium.
- Handle - Cast aluminium with zinc plated steel locking lever.
- Spindle - Stainless Steel.
- Seal - Bonded Viton™ GFLT.

Weight

- 1.8kg - LBV540VG.
- 1.45kg - LBV4-LA.

Ordering Information

- **LBV450VG:** 4" Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV450VGZ:** LBV450VG c/w 2 x 4" TTMA Viton™ gaskets.
- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™ GFLT seal and aluminium locking tab.
- **LBV4-LA:** 4" Machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.

Associated Equipment

- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steels).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.
- **LBV4-7:** Locking Tab.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.

Refer to page 254 for line drawing.



4" Lockable Flanged Butterfly Valves

Liquip's lockable 4" butterfly valves provide and control full flow through pipelines fitted with 100mm (4") TTMA flanges.

The Lockable feature ensures users don't inadvertently lock or open the butterfly valve.

Features & Benefits

- 100mm (4") product flow with locking tab.
- Bonded Viton™ GFLT seal for increased durability.
- Industry Standard 4" TTMA Flange Mounting.
- Lightweight aluminium body.
- Can be fitted with an Air Actuator as required.

Technical Information

Working pressure

- 1,500 kPa (210 PSI) in open position.
- 750 kPa (123.25 PSI) in closed position

Operating temperature

–40°C to 100°C.

Mounting

Mounts directly to Liquip 100mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Service

Periodically (approx. every 6 months), inspect butterfly seat.

Weight

1.8kg - LBV450VGL.

Ordering Information

- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™ GFLT seal and aluminium locking tab.

Associated Equipment

- **LBV4-LA**: 4" Machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.
- **LBV4-7:** Locking tab.
- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steels).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.

Refer to page 254 for line drawing.



Air Actuators

The LBV3-LA (3") and LBV4-LA (4") butterfly valves are machined to be fitted with either a double acting or spring return pneumatic actuator.

The LBV3-LA, LBV4-LA and pneumatic actuators can be purchased separately or as part of a 'Z-Kit', which includes a 3" or 4" machined butterfly valve and either a double acting or spring return air actuator, plus mount kit. These Z-kits are supplied unassembled.

These actuated butterfly valves can be operated in conjunction with a manifold (DM104) or a product transfer pipe.

Features & Benefits

- Double acting or spring return air actuators available.
- High performance in a compact design.
- High torque value.
- 75mm (3") or 100mm (4") product flow.
- Bonded Viton™ GFLT seal for increased durability.
- Industry Standard 3" or 4" TTMA Flange Mounting.

Technical Information

Air Actuator (LBV-AA)

Dimensions
172.6mm x 105.2mm x 82.7mm.

Supply Pressure Air
250 kPa- 800 kPa.

Temperature
-10°C to 80°C.

Minimum pressure to actuate
2.5 bar to open and close (providing 14Nm of torque).

Weight
1.99kg.

Spring Return Actuator (LBV-AASR)

Dimensions
242.0mm x 136.9mm x 109.2mm.

Supply Pressure
450 kPa- 800 kPa.

Temperature
-10°C to 80°C.

Minimum pressure to actuate
4.5 bar.

Weight
4.4kg.

Ordering Information

- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.
- **LBV3-LA:** 3" machined butterfly valve.
- **LBV3-AAZ:** 3" Butterfly Valve & Air Actuator.
- **LBV3-AASRZ:** 3" Butterfly Valve & Spring Return Actuator.
- **LBV4-LA:** 4" machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.

Associated Equipment

- **BF3:** 75mm TTMA aluminium flange (also available in mild & stainless steels).
- **0656:** 75mm TTMA NBR cork gasket.
- **4287:** 75mm TTMA Klingerite gasket.
- **0656V:** 75mm TTMA Viton™ gasket.
- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steel).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.



Pipe Bends

Liquip offers a range of aluminium pipe bends to make complicated pipe-work simple. Just cut the pipe bend to the required angle and butt-weld to the adjoining pipe ends.

Features & Benefits

- Minimises friction losses on corners.
- Reduces working times.
- Eliminates unsightly "lobster-backs" or heating or bending.
- Used on product lines, exhausts, air intakes and ventilation.

Ordering Information

Part Number	Material	Bend O/D	Bend I/D	Pipe size O/D
PB2.0-A	Alum	250	148	51
PB3.0-A	Alum	315	152	76
PB4.0-A	Alum	321	120	102



Klingersil Gaskets

Liquip offers a range of Klinger gaskets which provide excellent product sealing from flanged assemblies.

When installed and maintained correctly Klinger gaskets will ensure optimum performance is maintained throughout the entire working life of each gasket. They are commonly used in the fuel terminal industry and are considered the industry standard for premium sealing.

Ordering Information

- **5300:** Klinger Gasket to suit SLV5 Diaphragm.
- **4241:** Klinger Gasket to suit HP Hosereel.
- **4242:** 1.6mm Klinger Gasket 4" ASA150 F/Face.
- **4243:** 3.2mm Klinger Gasket 2" ASA150.
- **4248:** 1.6mm Klinger Gasket to suit 4" TTMA.
- **4276:** 1/8" Klinger Gasket to suit 3" ASA150 F/Face.
- **4281:** 1.6mm Klinger Gasket to suit AHR250-63H.
- **4287:** 1.6mm Klinger Gasket to suit 3" TTMA Flange.
- **4302U:** Klinger Gasket to suit AVV3.5.
- **5300:** Klinger Gasket to suit SLV5 Diaphragm.
- **7514:** Klinger Gasket to suit SLV5 Outlet.
- **7515:** Klinger Gasket to suit SLV5 Tank Flange.
- **7543:** Klinger Gasket to suit 3" ASA150 No holes.

For other Klinger Gaskets, please contact Liquip.



Neo Cork Gaskets

Liquip offers a full range of Neo Cork gaskets to suit a range of applications.

Neo Cork gaskets can be used on tank trucks in applications where specifications allow for cork gaskets to be used e.g. above the centre line on the truck in Australia for SLP tankers.

Ordering Information

- **0200:** Neo Cork Gasket to suit SLV5 Pipe Flange.
- **0272:** Neo Cork Gasket to suit SLV5 Tank Flange.
- **0273:** Neo Cork Gasket to suit SLV5 Diaphragm.
- **0652:** Neo Cork Gasket to suit inlet of Neptune meter.
- **0654:** Neo Cork Gasket to suit Ebsray V30 meter.
- **0656:** Neo Cork Gasket to suit 3" TTMA Flange.
- **0657:** Neo Cork Gasket to suit 4" TTMA Flange.
- **0658:** Neo Cork Gasket to suit PVV204.
- **0660:** Neo Cork Gasket to outlet Neptune meter.
- **0661:** Neo Cork Gasket to suit VOH-13.
- **0663:** Neo Cork Gasket to suit R12/12 Inlet.
- **0664:** Neo Cork Gasket to suit R12-11 Gooseneck.
- **0673:** Neo Cork Gasket to suit CL402RG and ACL404.
- **0684:** Neo Cork Gasket to suit AVV3RV Top.
- **1024:** Neo Cork Gasket to ASA 150 Flange.
- **1097:** Neo Cork Gasket to suit EBSRAY V20 & V15.
- **3096:** Neo Cork Gasket to suit AVV3R Base.
- **3097:** Neo Cork Gasket to suit VOH200-5/14.
- **4238:** Neo Cork Gasket to suit LTE4.
- **4249:** Neo Cork Gasket to suit RS400 rollover sensor.
- **4250:** Neo Cork Gasket to suit PVV104.

For other Neo Cork Gaskets, please contact Liquip.



PTFE Gaskets

Liquip offers a full range of PTFE gaskets to suit a range of chemical applications. We supply a mix of leading brands including Gore-Tex® and general PTFE gaskets.

Gore-Tex® gaskets are made from a tough grade of PTFE sheet which provides excellent, effective and long lasting sealing and are suitable for use on a wide range of chemical products or irregular flanges.

Features & Benefits

- Compatible with a wide range of chemicals.
- Excellent sealing capabilities with outstanding temperatures resistance and tensile strength.
- Gore-Tex® gaskets have significantly less creep than traditional PTFE gaskets.

Ordering Information

- **4292:** Teflon™ gasket 4" TTMA.
- **4293:** Teflon™ gasket to suit PVV204, PV2.
- **4301:** Teflon™ gasket to suit AVL404/CL402.
- **4315:** Teflon™ gasket to suit VOH200-5AT
- **4326:** Teflon™ gasket to suit AVV3SST.
- **4646:** Teflon™ gasket to suit SLV5 air ram.
- **6086N:** Gore-Tex® Gasket to suit SLV5 Pipe Flange.
- **7591:** Gore-Tex® Gasket to suit SLV5 Tank Flange.

For other PTFE Gaskets, please contact Liquip.



Viton™A Gaskets

Liquip offers a full range of Viton™ gaskets which provide excellent product sealing from flanged assemblies and can be used as a direct replacement or substitute for neo cork gaskets.

Viton™ gaskets are considered the industry standard in fuel haulage as they seal excellently with all fuels including pure ethanol and ethanol blends and they continue to seal even after periods of no fuel/product present.

Features & Benefits

- Extended product life of gaskets.
- Simple Installation.
- Viton™ gaskets continue to operate effectively, even after periods of no fuel present.
- Excellent for use with all fuels including pure ethanol and ethanol blends.

Ordering Information

- **0200V:** 3mm Viton™ A Gasket to suit SLV5 pipe flange.
- **7616V:** 1.5mm Viton™ A Gasket to suit SLV5 pipe flange.
- **0272V:** 3mm Viton™ A Gasket to suit SLV5 tank flange.
- **0273V:** 3mm Viton™ A Gasket to suit SLV5 diaphragm flange.
- **0657V:** 3mm Viton™ A Gasket to suit 4" TTMA flange.
- **0657DMV:** 1.6mm Viton™ A Gasket to suit 4" TTMA flange.
- **0656V:** 3mm Viton™ A Gasket to suit 3" TTMA flange.
- **0658V:** 3mm Viton™ A Gasket to suit PVV204.
- **0661V:** 3mm Viton™ A Gasket to suit VOH-16.
- **0673V:** 3mm Viton™ A Gasket to suit CL402RG.
- **3096V:** 3mm Viton™ A Gasket to suit AVV075V.
- **3097V:** 3mm Viton™ A Gasket to suit VOH200-5.
- **4250V:** 3mm Viton™ A Gasket to suit PVV104.
- **7519V:** 1.6mm Viton™ A Gasket to suit product return on DM104.

For other Viton™ A Gaskets, please contact Liquip.



3" Sightglasses and Flanges

Flanges provide the ability to make a removable connection between two points.

Sightlgasses that offer the ability to view product in piping to ensure if a compartment/tanker has product present or if it has been drained.

Ordering Information

Flanges

- **BF3:** Aluminium 80mm tube to 3" TTMA flange.
- **BF3-1:** Mild Steel 80mm tube to 3" TTMA flange.
- **BF3-1S:** Stainless Steel 80mm tube to 3"TTMA flange.

Sightglasses

- **BF3-SG:** 3" TTMA Sightglass Flange (25mm thick).
- **TW1-SG-25:** 3" TW1 Sightglass Flange (25mm thick).
- **TW1-SG-25VZ:** TW1-SG-25 c/w Viton™ A Gasket.

Associated Equipment

- **LBV350VG:** 3" Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV300:** 3" Butterfly valve c/w bonded Viton™ seal.
- **LBV300Z:** LBV300 c/w 2 x 3" TTMA NBR gaskets.
- **LBV300VZ:** LBV300 c/w 2 x 3" TTMA Viton™ gaskets.
- **LBV3-LA:** 3" Machined butterfly valve.
- **LBV3-AAZ:** 3" Butterfly Valve & Air Actuator.
- **LBV3-AASRZ:** 3" Butterfly Valve & Spring Return Actuator.



4" Sightglasses and Flanges

Flanges provide the ability to make a removable connection between two points.

Sightglass flanges bolt directly behind an outlet adaptor and provide the ability to view product in piping to ensure if a compartment/ tanker has product present or if it has been drained.

The standard drilling for sightglasses is TTMA, so the unit will fit behind an API adaptor as well as Liquip butterfly valve. (Max pressure - 1,000 kPa, Max temp - 70°C).

Ordering Information

Flanges

- **BF4:** Aluminium 100mm Tube to 4" TTMA Flange.
- **BF4-7:** Aluminium 4" TTMA Blank Flange.
- **BF4-1:** Mild Steel 100mm Tube to 4" TTMA Flange.
- **BF4-6:** Mild Steel 4" TTMA Blank Flange.
- **BF4-1S:** Stainless Steel 304,100mm Tube to 4" TTMA Flange.
- **BF4-1S-316:** Stainless Steel 316, tube to 4: TTMA Flange.

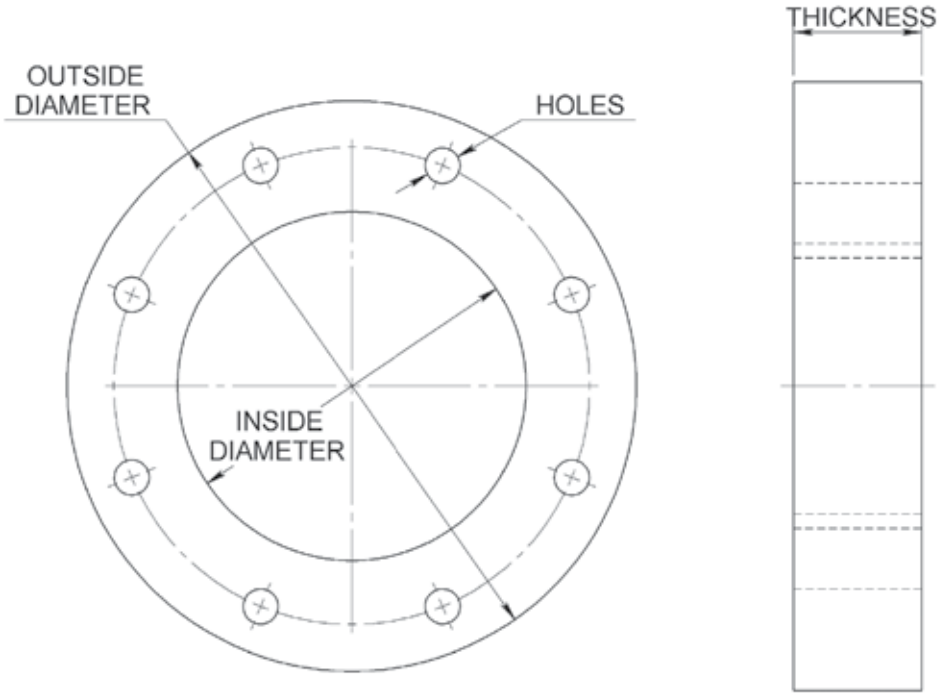
Sightglasses

- **BF4-SG-25:** 4" TTMA Sightglass flange (25mm thick).
- **BF4-SG-25Z:** BF4-SG-25 c/w 4" Neo Cork TTMA gasket.
- **BF4-SG-25VZ:** BF4-SG-25 c/w 4" Viton™A TTMA gasket.
- **BF4-SG-40:** 4" TTMA Sightglass flange (40mm thick).
- **BF4-SG-40Z:** BF4-SG-40 c/w 4" Neo Cork TTMA gasket.
- **BF4-SG-40VZ:** BF4-SG-40 c/w 4" Viton™A TTMA gasket.

Associated Equipment

- **API496:** Complete with sight glass & drain.
- **API496B:** Complete with blank plate & drain.
- **API496D:** Handle moves down, complete with sight glass & drain.
- **DM104:** Discharge Manifold with open/closed indicator.
- **LBV450VG:** 4" Butterfly valve c/w bonded Viton™GFLT seal.
- **LBV450VGZ:** LBV450VG c/w 2 x 4" TTMA Viton™gaskets.
- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™GFLT seal and aluminium locking tab.
- **LBV4-LA:** 4" Machined butterfly valve.

SIGHTGLASS FOR FLANGES



Size	Part No	Outside Diameter	Inside Diameter	Thickness	Holes
4" ANSI125	API-SG-150	228	130	40	8 x Ø19 on 190 PCD
4" TTMA	BF4-SG-25	178	109	25	8 x Ø11 on 149.2 PCD
4" TTMA	BF4-SG-40	178	109	40	8 x Ø11 on 149.2 PCD
3" TTMA	BF3-SG	146	86	25	8 x Ø11 on 124 PCD

NOTES:
1. MATERIAL IS CAST ACRYLIC.
2. MOUNTING FLANGES TO BE FLAT TO WITHIN 1mm.
3. VITON (OR SIMILAR HARDNESS) GASKETS TO BE USED.
4. TIGHTEN MOUNTING BOLTS TO A TORQUE OF 20Nm.



VCAF103

The VCAF103 is typically used at remote fuel storage facilities where a vapour recovery system is not available.

When truck delivers its load of fuel, the empty space in the tank is filled with air from around the tank. Without this

filter fitted, any particles (i.e. dust) in the air is sucked into the tank which mixes with the fuel and can then cause damage in vehicle engines.

The need was initiated by a mine site incentive to keep the fuel being delivered as clean as possible by significantly reducing ingress of particles larger than 5 microns.

Features & Benefits

- 4" Camlock fitting.
- 3 micron particle filter with clogging indicator
- 2,600 LPM capacity.
- Replaceable element.

Technical Information

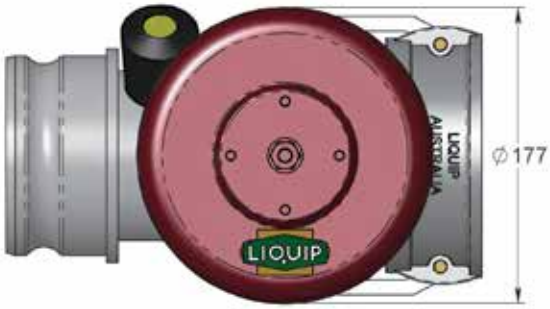
Clogging Indicator

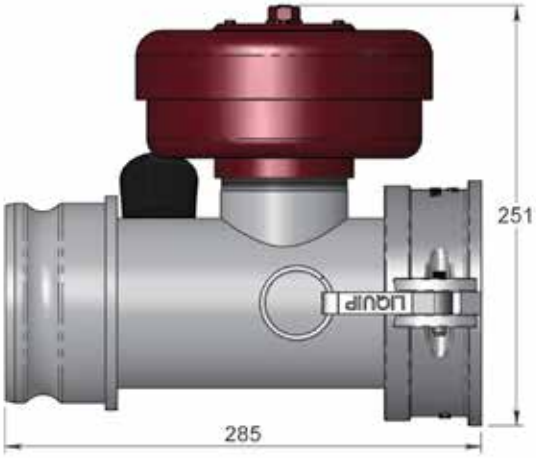
- No Yellow Visible- element is clear.
- Some Yellow Visible- element is clogging.
- Full Yellow Visible- Element requires replacement.

Ordering Information

- **VCAF103:** Vapour Recovery Air Filter.

VCAF103 VAPOUR CONNECTED AIR FILTER





CLOGGING INDICATOR
SHOWS BY PERCENTAGE THE INCREASE IN VACUUM PRESSURE DROP UP TO -35mbar (-3.5kPa).
PERCENTAGE REMAINS VISIBLE EVEN WHEN VACUUM IS REMOVED.
WHEN ELEMENT IS REPLACED, INDICATOR MUST BE MANUALLY RESET BY PRESSING YELLOW BUTTON ON TOP.



NO YELLOW INDICATES ELEMENT IS CLEAR



SOME YELLOW INDICATES ELEMENT IS CLOGGING



FULL YELLOW INDICATES ELEMENT NEEDS REPLACING



BREATHER, STEEL BODY, REPLACEABLE ELEMENT
2½" BSPP FEMALE THREAD,
3 MICRON FILTER
2600LPM CAPACITY

4" FEMALE CAMLOCK
NOT OPEN TO BREATHER
(USED FOR MOUNTING ONLY)

4" MALE CAMLOCK
OPEN TO BREATHER
(VAPOUR RECOVERY
HOSE CONNECTS HERE)

- UNIT IS TYPICALLY MOUNTED BETWEEN VAPOUR RECOVERY HOSE AND ITS PARKING ADAPTOR AT THE END OF THE HOSE TRAY. UNIT MAY BE MOUNTED ON ANY 4" MALE CAMLOCK.
- IT CAN REMAIN PERMANENTLY IN PLACE AS IT WILL ONLY BREATHE WHEN PRODUCT IS REMOVED FROM TANKER COMPARTMENTS WITH VAPOUR RECOVERY HOSE REMAINING CONNECTED, I.E. NOT WHEN VAPOUR RECOVERY HOSE IS CONNECTED TO A LOADING GANTRY OR STORAGE TANK AND NOT WHEN VEHICLE IS IN MOTION.
- WHEN SIDE WINDOW OF INDICATOR SHOWS ALL YELLOW, THE FILTER ELEMENT SHOULD BE REPLACED.



Type A Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type A Fittings - Cam and Groove Male Adapter x Female Thread.

Type A adapters are normally used with Type D couplers, but can be used with Type B and C couplers as well as Type DC (Dust Cap) of identical size.

Technical Information

Materials

Aluminium.

Sizes Range

1 ¼ " to 4".

Thread

BSP.

Ordering Information

MALE CAMLOCK TO FEMALE BSP THREAD

Item	Camlock	Thread
NA32-1A	1¼"	1¼"
NA40-1A	1½"	1½"
NA50-1A	2"	2"
NA65-1A	2½"	2½"
NA80-1A	3"	3"
NA80-23-50A	3"	2"
NA100-1A	4"	4"



Type AA Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type AA Fittings - Camlock Hose Joiners.

Technical Information

Materials

Aluminium.

Camlock Size Range

2" to 4".

Ordering Information

MALE CAMLOCK HOSE JOINER

Item	Size
NA50-4A	2"
NA65-4A	2½"
NA80-4A	3"
NA100-4A	4"



Type B Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type B Fittings - Aluminium Cam and Groove Female coupler x Male Thread.

Technical Information

Materials

Aluminium.

Sizes Range

1 ¼ " to 3".

Thread

BSP.

Ordering Information

FEMALE Camlock TO MALE BSP THREAD

Item	Size
NA25-3A	1"
NA32-3A	1¼"
NA40-3A	1½"
NA50-3A	2"
NA80-3A	3"



Type C Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type C Coupler - Aluminium Cam and Groove Female coupler x Hose Tail.

Type C couplers are normally used with Type E adapters but can also be used with Type A and F adapters and Type DP (Dust Plug) of identical size.

Technical Information

Materials

Aluminium.

Sizes Range

1 ¼ " to 4".

Ordering Information

FEMALE Camlock TO HOSE TAIL

Item	Camlock	Tail	Option*
NA40-9A	1½"	1½" Straight	N/A
NA50-9A	2"	2" Straight	N/A
NA65-13A	2½"	2½" at 68°	N/A
NA65-9A	2½"	2½" Straight	N/A
NA80-13A	3"	3" at 68°	N/A
NA80-9-50A	3"	2" Straight	N/A
NA80-9-65A	3"	2½" Straight	N/A
NA80-9A	3"	3" Straight	N/A
NA80-9E	3"	3" Straight	Static
NA80-9EW	3"	3" Straight	Static
NA80-9G	3"	3" Straight	Avgas
NA80-9J	3"	3" Straight	Jet
NA100-9A	4"	4" Straight	N/A
NA100-9EW	4"	4" Straight	Static
NA100-9G	4"	4" Straight	Avgas
NA100-9J	4"	4" Straight	Jet

*Static = Static safe connection allowing inner and outer wires of hose to positively connect to end fitting.

*Avgas = Selectivity for Aviation Gasoline

*Jet = Selectivity for Jet Fuel



Type D Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type D Coupler - Aluminium Cam and Groove Female Coupler x Female NPT Thread.

Type D couplers are normally used with type A adapters but can be used with Type E and F adapters and DP (Dust Plug) of identical size.

Technical Information

Materials

Aluminium.

Sizes Range

1 ¼ " to 4".

Thread

BSP.

Ordering Information

MALE CAMLOCK TO FEMALE BSP THREAD

Item	Size
NA32-20A	1¼"
NA40-20A	1½"
NA50-20A	2"
NA80-20A	3"
NA100-20A	4"



Type DA Camlock Fittings

DA Camlocks are built to suit couplers made to API RP 1004 and are made of aluminium construction.

Type DA Fittings - Female Camlock to Male Cam.

Technical Information

Standard

Camlock to suit API RP1004.

Materials

Aluminium.

Camlock Size Range

4".

Ordering Information

Item	Description	Size
API-MC4	Adaptor Male Camlock- API Coupler	4"
API-MC80	API CAamlock 15º	80mm



Type DC Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type DC - Dust Cap Aluminium Female End Coupler.

Dust Caps (DC) can be used with type A, E and F adapters to seal the end of the connection.

Technical Information

Materials

Aluminium.

Sizes Range

¾" to 3".

Ordering Information

Item	Description	Size
NA20-2A	Camlock Cap Dust.	¾"
NA25-2A	Camlock Cap Dust.	1¼"
NA32-2A	Camlock Cap Dust.	2½"
NA40-2A	Camlock Cap Dust.	1½"
NA50-2A	Camlock Cap Dust.	2"
NA50-2KA	Camlock Cap Dust (Lockable).	2"
NA65-2A	Camlock Cap Dust.	2½"
NA65-2KA	Camlock Cap Dust (Lockable).	2½"
NA80-2AT	Camlock Cap Dust (Tef Exp seal).	3"
NA80-2AW	Camlock Cap Dust.	3"
NA80-2J	Camlock Cap Dust (Jet-A1).	3"
NA80-2KA	Camlock Cap Dust (Lockable).	3"
NA100-2AT	Camlock Cap Dust (Tef Exp seal).	4"
NA100-2AW	Camlock Cap Dust.	4"
NA100-2J	Camlock Cap Dust (Jet-A1).	4"
NA100-2KA	Camlock Cap Dust (Lockable).	4"



Type DP Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type DP - Dust Plug Aluminium Male End Adapter.

Dust Plugs (DP) can be used with type B, C and D couplers to seal the end of the connection.

Technical Information

Materials

Aluminium.

Sizes Range

1" to 4".

Ordering Information

Item	Description	Size
NA25-8A	Camlock plug dust.	1"
NA32-8A	Camlock plug dust.	1¼"
NA40-8A	Camlock plug dust.	1½"
NA50-8A	Camlock plug dust.	2"
NA65-8A	Camlock plug dust.	2½"
NA80-8A	Camlock plug dust.	3"
NA80-8G	Camlock plug dust (AV-GAS).	3"
NA80-8J	Camlock plug dust (Jet-A1).	3"
NA100-8A	Camlock plug dust.	4"
NA100-8G	Camlock plug dust (AV-GAS).	4"
NA100-8J	Camlock plug dust (Jet-A1).	4"



Type E Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type E Adapter - Aluminium Cam and Groove Male Adapter x Hose Tail.

Type E adapters are normally used with Type C couplers, but can be used with Type B and D couplers or Type DC (Dust Cap) of identical size.

Technical Information

Materials

Aluminium.

Sizes Range

1 ½ " to 4"

Ordering Information

Item	Description	Size
NA40-22A	Camlock Male to Hosetail.	1½"
NA50-22A	Camlock Male to Hosetail.	2"
NA80-22A	Camlock Male to Hosetail.	3"
NA100-22A	Camlock Male to Hosetail.	4"



Type F Camlock Fittings

Liquip Camlocks are built to NATO specification MIL-C-27487 and are aluminium construction.

Type F Adapter - Aluminium Cam and Groove Male Adapter x Male Thread.

Type F adapters are normally used with Type B couplers, but can also be used with Type C and D couplers or DC (Dust Cap) of identical size.

Technical Information

Materials

Aluminium.

Sizes Range

1 ¼ " to 4"

Thread

BSP

Ordering Information

MALE CAMLOCK TO FEMALE BSP THREAD

Item	Camlock	Thread
NA20-10-15A	¾"	½"
NA20-10A	¾"	¾"
NA25-10A	1"	1"
NA32-10A	1¼"	1¼"
NA40-10A	1½"	1½"
NA50-10A	2"	2"
NA65-10A	2½"	2½"
NA80-10A	3"	3"
NA100-10A	4"	4"

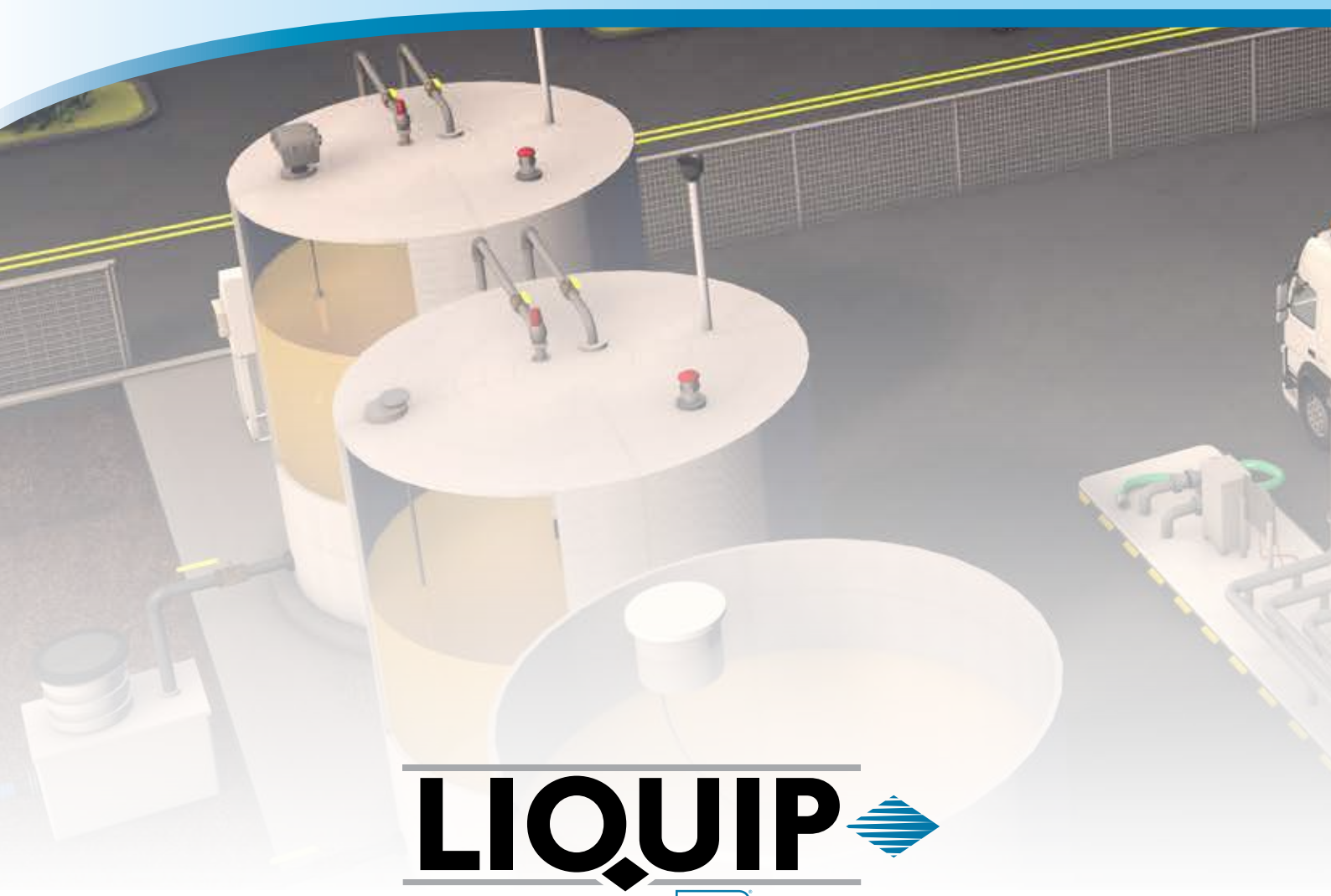
Billions of litres accurately metered... without compromise



DFV Series
Electronic Register
& Level Gauge Monitor

The smart choice for metering and gauging

- Tank gauging and electronic register in a combined unit
- Intuitive Operation
- Multi-product – NMI approved up to 12 products through 1 meter
- Bulk meter delivery and gravity meter delivery
- Large and easily viewed screen with an optional external display
- In-built self diagnostics
- Australia-wide technical and support network
- Zone 1 hazardous area safety approved (IECEx)



Further to offering customers with world class Liquip products Liquip also prides itself on the ability to offer the following market leading brands.

Our Brands



Aljac

Apollo Valves

AH Avery-Hardoll

Digital Dispatcher

EATON

ELAFLEX

i-meter

LIQUID CONTROLS

Peco Facet

PSG Ebsray

S.A.M.P.I

Turbines, Inc.

Note: Contact Liquip for Product Information and Accessibility.

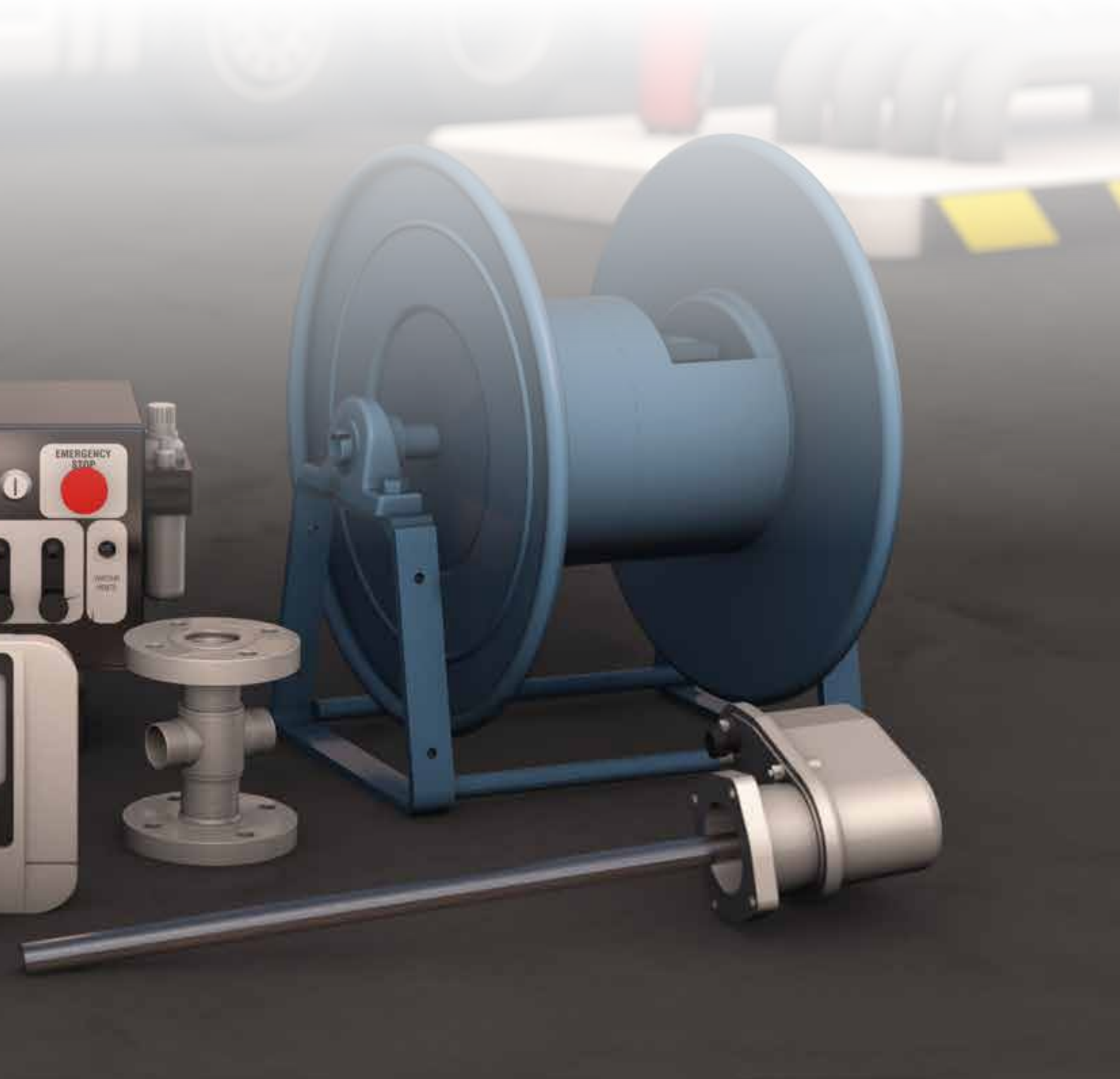
LIQUIP

PART OF OPW A DOVER COMPANY

Metering, Pumping & Gauging Equipment



Metering and Gauging Overview 172-175
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Fuel Tracking 212
Truck Mounted Dispenser Systems 213







Truck Mounted Metering & Pumping Systems

- Extensive range of high quality fluid transfer products.
- Pretested, modular and “plug and play” style pumping systems.
- Decades of dispenser systems installed and still in service worldwide.
- Flow rate of up to 340 LPM (nozzle) and 500 LPM (unmetered bypass).
- Turbine meter (LPG) or Positive Displacement meters (standard fuels).



Large External Display Options

- High readability in all lighting conditions.
- IP66 protection reading.
- ATEX conformity for use in hazardous areas and harsh environments.





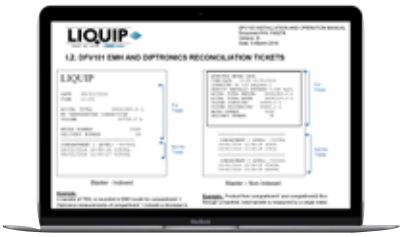
Bulk Drops Split Deliveries & Diptronic Level Gauging

- Can read up to 6 probes in 1mm increments.
- Accurate level readings (NMI approved).
- Real time automatic level gauging.
- Volume displayed at operator level.
- Increased safety and less costs.
- Batching from level gauge.
- Split deliveries.

24/7 Online Fuel Tracking

- Real time GPS tracking.
- 24/7 cloud based dashboard using Google Maps.
- Constant vehicle tracking with GPS coordinates.
- Capture the Start Time, End Time, Ticket Number, Product, Qty and Location.
- Delivery information displayed in E-ticket format.





Register and Gauging

- Combined level gauging and register.
- Up to 12 products through a single meter.
- Large screen with an optional external display.
- Bulk meter delivery and gravity meter delivery.
- Zone 1 safety and NMI approved.
- 2 stage solenoid outputs.
- In-built self diagnostics.
- Preset / batch control.
- Intuitive operation.

Reconciliations & Data Recording

- External downloadable history files (CSV format) allowing reconciliation between pump and level gauging.
- Reconciliation detailed on print out.
- Up to 4,000 transfers are logged.
- Measurements are taken for all compartments in register or gauging mode.

Metering

- Positive displacement product meters.
- Weights & Measures approved.
- Remote Pulser input.







1. Bulk Drops
2. Split Deliveries
3. Diptronic Level Gauging





24/7 Online Fuel Tracking iMeter



Sampi Meter



Electronic Pulser (ERP200)

One Stop For All Your Fluid Handling Needs



Large External Display
(LFD-6)



Pumping Systems



Ebsray Pump



190 High-Flow Nozzles



Combined Electronic Register
& Gauging



Electronic Register & Diptronic Level Gauge

Liquip have uniquely developed the DFV series which has become the most technically advanced Register and level gauging unit available on the market.

Available as a standalone Register, Diptronic level gauge CPU or combined unit, the DFV combines long service life with simple operation and reliability.

The DFV is a lightweight unit and is approved for use in Zone 1 hazardous areas (IECEx & ATEX) truck mounted or fixed site product transfer applications.

The DFV has various metrological approvals for use in a variety of geographical locations including but not limited to: Australia, USA, Europe, New Zealand.

Features & Benefits

- Functions as a Electronic Register, dedicated Diptronic level gauge CPU or combined unit.

All Potted Units (DFV100/101/103)

- Safety Approved for use in Zone 1 locations.
- Weights & Measures Approved: Australia, Europe (MID), New Zealand, USA.
- Large display to easily view multiple information simultaneously.
- RS232 and CAN communication.
- Intuitive set up and programming.
- Can be connected to a large digit display.

For full features download the DFV101 datasheet.

Register (DFV100/101)

- Preset functionality / batch control.
- Solenoid outputs are voltage free and can perform a 2 stage ramp up and ramp down.
- For full features download the DFV100 Datasheet.

Diptronic CPU (DFV103/DFV101)

- ±1mm accuracy, with no moving parts for minimal maintenance.
- Automatic level gauging updated in real time to reduce delivery times.
- Eye level display of compartment volume to keep operators off the top of the tank and removing the need for ladders and hand rails.
- Can read up to 6 probes/compartments.
- Volume shown in 1L increments.
- Temperature compensated deliveries.
- Enables split deliveries to maximise fleet utilisation and efficiency.
- Compatible with E705 Diptronic level gauge probes (pots).
- Range of probe lengths available - up to 3m individual probes.

Technical Information

Metrological Approvals

Please download DFV overview bulletin.

Overall Size

Approx, 245 x 200 x 140mm.

Displays

1 line x 14 characters 14 mm high & 4 lines 24 characters 8 mm high.

Power Input

9 to 32Vdc (safety approved) or 9 to 45V (operational) @ 250mA polarity protected. External in-line fuse (rated 1.8A, antisurge) is a mandatory condition of safe use.

Operating Temperature

-20°C to +60°C.

Temperature Correction

-40°C to +60°C for all petroleum products.
(Extended ranges available according to local regulations)

Ingress Protection

IP66.

Product Density

0.500 - 0.600kg/L for LPG.

0.653 - 1.075kg/L for other products.

Weight

4.6 kg.

Communication

Two RS232C ports to be used to communicate with a PC or other serial device such as a modem or printer. One CAN port.

Printer

Epson CTM-290 or TM-295, Blaster Printer.

Relay Outputs

Up to 4 Relay Outputs. Current sink, 2A max. Solenoid to be connected between this output and the positive of the power supply. Additional in-line fuse (2A, antisurge) is a mandatory condition of safe use.

Program Memory

MicroSD card.

Safety Approvals

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) CE 0518 Ex 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

Ordering Information

- **DFV100:** DFV100: Register for use in zone 1 hazardous locations.
- **DFV100H:** Register with heated display (no approvals).
- **DFV103:** Diptronic Level Gauging CPU for use in zone 1 hazardous locations.
- **DFV101:** Combined register & Diptronic level gauging CPU for use in zone 1 hazardous locations.

Associated Equipment

- **Expansion modules:** Expansion modules: Contact Liquip.
- **ERP200:** Remote Pulser to be used with DFV units.
- **DFV101-UP:** DFV101 and DFV103 upgrade to DFV101.
- **4155:** Temperature Probe.
- **DFV100-23:** DFV Front mount bracket to suit various meters.
- **DFV100-18:** DFV Top mount bracket to suit various meters.

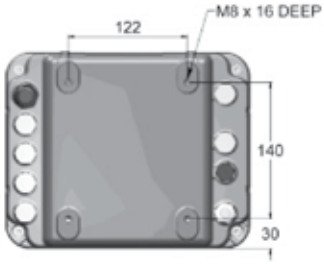
Mounting Instructions

The DFV100 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.

Scan this code with a QR Reader App on your smartphone to find out more about DFV Series Products.







	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)	✓	✗	✓+
NTEP	✓	✗	✓+
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.



DFV100-18SS shown

Mounting Brackets

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

When mounting the DFV101 to a meter, Liquip offers a top mount and front mount adaptor bracket to suit a range of meters.

Ordering Information

Adaptor Bracket: Front Mount To Various Meters

When direct front 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

When direct top mounting to a meter is unavoidable

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

For mounting to other meters please contact Liquip.



DFV100-18SS – DFV mounting shown for illustration purposes only

Associated Equipment

- **DFV10x:** Combined Register and Level Gauging CPU for use in zone 1 hazardous locations.
- **ERP200:** Electronic meter remote Pulser.



Temperature Sensors

Liquip offers temperature sensors to allow for temperature compensation for fleets fitted with DFV level gauging systems.

Ordering Information

- **4155:** 316 Stainless Steel 3 wire temperature probe.

Associated Equipment

- **DFV103:** Level Gauging CPU for use in zone 1 hazardous locations.
- **DFV101:** Combined register & level gauging CPU for use in zone 1 hazardous locations.



Pulsers

Liquip offers an electronic remote Pulser to be used in conjunction with electronic registers that are not located on the meter or where a register has no in-built pulse generator.

The ERP200 uses opto sensors to convert the rotational movement of the meter shaft into an electronic signal to the register.

With Australian NMI approval and ATEX and IECEx approvals for use in hazardous areas, the ERP200 is the ideal solution for all your metering and registering needs.

Features & Benefits

- Australian NMI approved.
- ATEX and IECEx approved for use in zone 0 hazardous locations.
- 3 opto sensors allowing for 150 pulses per revolution, allowing the detection of flow direction, faulty opto sensors and/or loss of power.
- Fully solid state electronic circuit.
- Full weather sealed to IP66.
- Lightweight assembly.

Technical Information

Operating Temperature

- -20°C to +60°C (Certification parameters).
- -40°C to +80°C (Safe zone parameters).

Rotation

Bi-directional.

Input Shaft Speed

1000 rpm maximum.

Output Pulse (P1, P2, P3)

- Push-Pull Outputs.
- 0V to +5VDC with in-line resistor 100R per channel. Square wave.

K-Factor

$K = \frac{N \text{ pulses}}{\text{litre}}$

pulses/rev/single channel = 25.

pulses/rev/combined 3 channel =150.

Ordering Information

- **ERP200:** Electronic meter remote Pulser.

Associated Equipment

- **DFV100:** Register for use in zone 1 hazardous locations.
- **DFV100H:** Register with heated display (no approvals).
- **DFV103:** Level Gauging CPU for use in zone 1 hazardous locations.
- **DFV101:** Combined register & level gauging CPU for use in zone 1 hazardous locations.
- **DFV100-18:** DFV Top mount bracket to suit various meters.

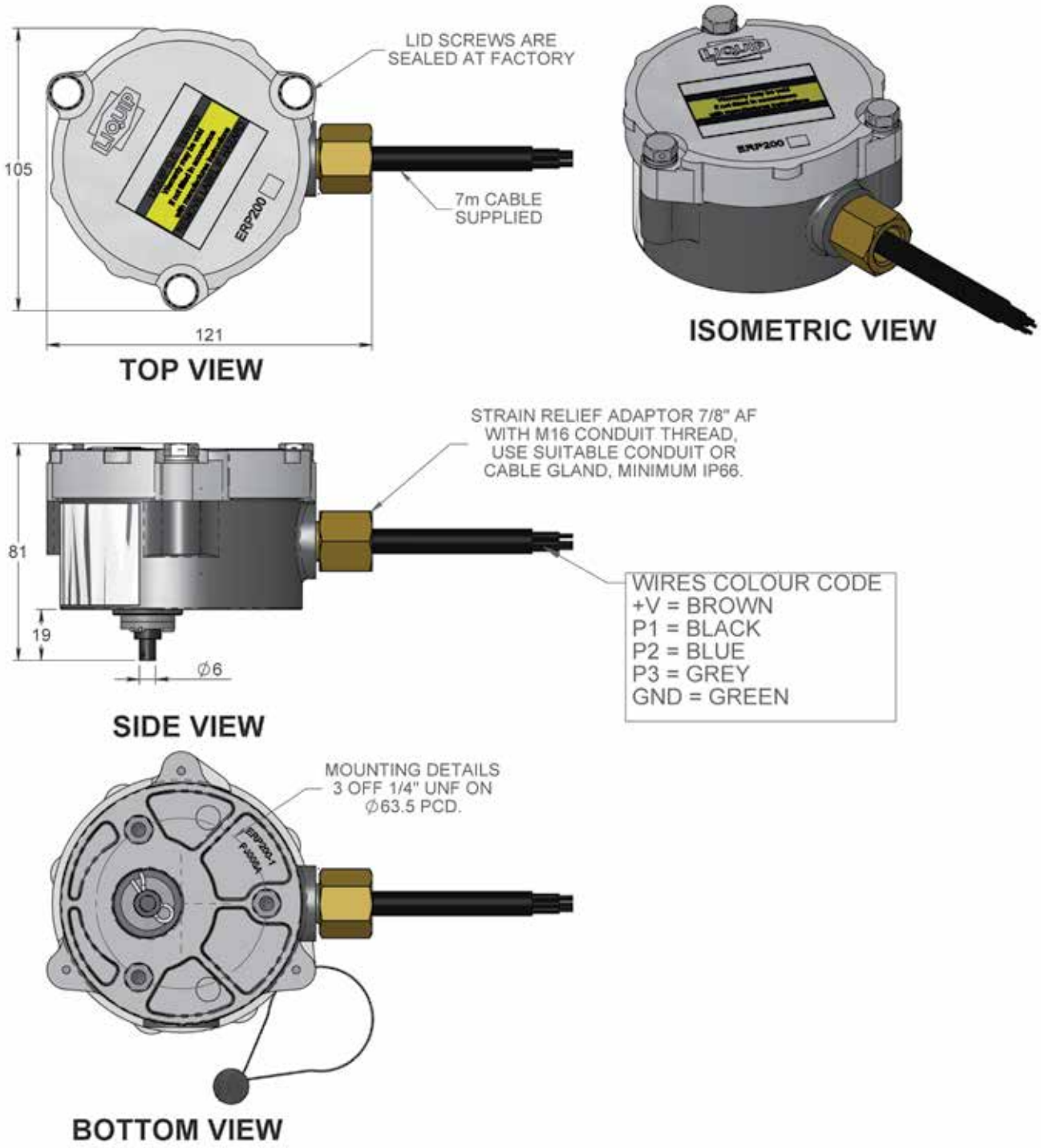
Kits Top Mount

- **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 Direct Mount

- **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 REMOTE PULSER ERP200





Level Sensor Assemblies

Liquip offers a range of electronic level sensor assemblies that measure the contents of a tanker's compartments and provides a reading on the DFV103 or DFV101 monitor.

Level sensor assemblies provide an accurate measure of compartment contents in real time and keep operators from having to climb on top of tanks.

Features & Benefits

- Radar transmitters ensures high tech and accurate measuring of tanker contents.
- Measurement and eye-level display of all compartment contents in litres.
- No need for operators to climb on top of tanks to measure hazardous substances.
- Length and range of the sensors can be made to suit height of the compartment on order.
- ±1mm accuracy.
- Can suit walkway or hatch mount applications.

Technical Information

Length and Range

Determined by the height of the compartment: 0.6-2.5m.

Accuracy

±1mm.

Repeatability

0.05% or better over the range.

Maximum height of the housing above the walkway

147mm.

Type of liquid to be detected - all petroleum products

Dielectric constant approx. 1.7- 2.1.

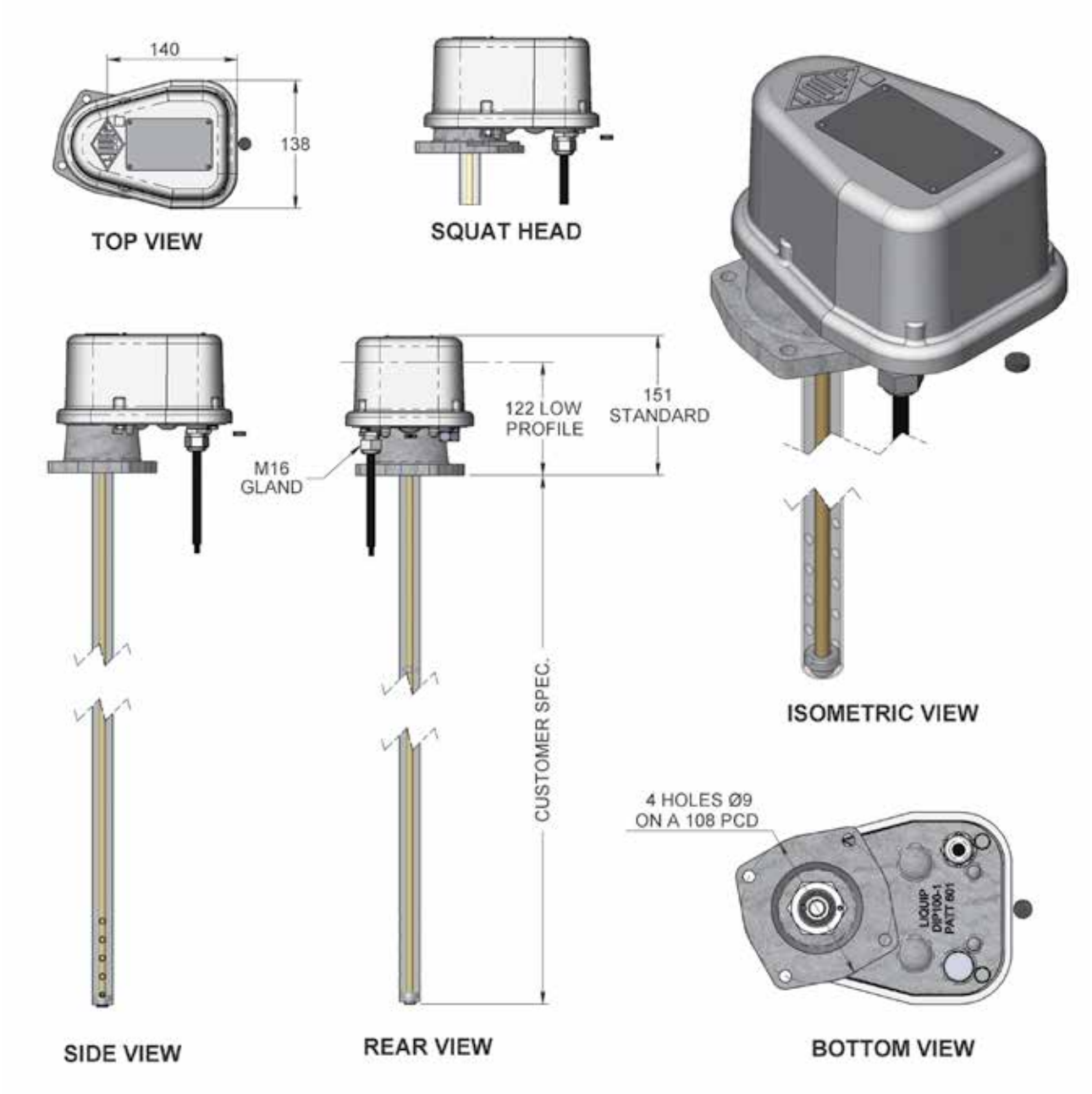
Ordering Information

- **DIP130:** Level sensor assembly walkway mount (compatible with DIP200 CPU).
- **DIP150:** Level sensor assembly Hatch mount (compatible with DIP200 CPU).
- **DFV130:** Level sensor assembly walkway mount (compatible with DFV10x CPU).
- **DFV150:** Level sensor assembly Hatch mount (compatible with DFV10x CPU).

Associated Equipment

- **DFV103:** Level Gauging CPU for use in zone 1 hazardous locations.
- **DFV101:** Combined register & level gauging CPU for use in zone 1 hazardous locations.

DIP100 SERIES LEVEL SENSOR

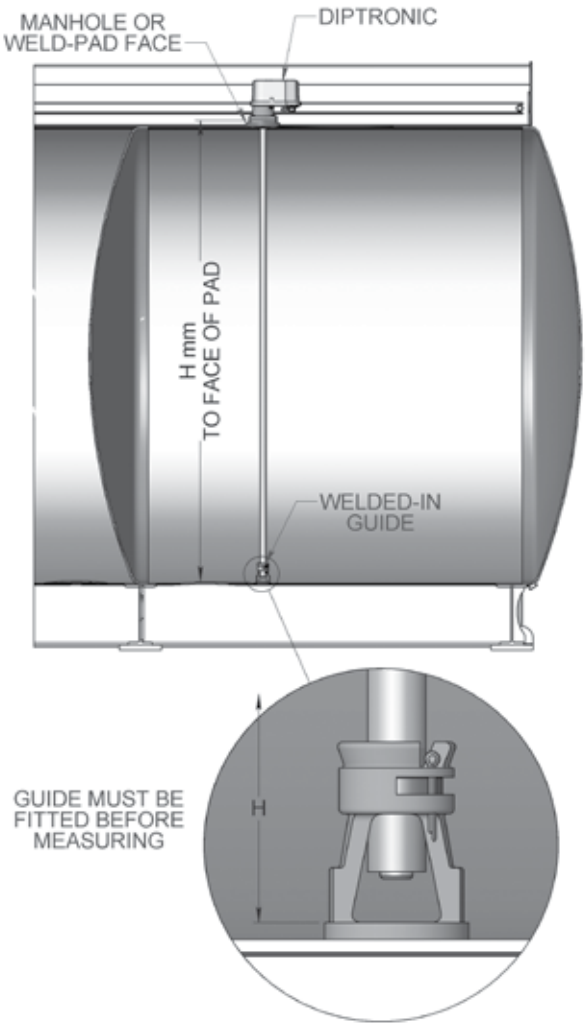


E.3. DETERMINING THE LENGTH OF SENSOR

Before installing the DIP130/ DIP150 sensor, the depth of the compartment or "Tank Height" must be first measured. The sensor is then made to suit the compartment. Determining the required length of the sensor is critical for correct fitting and operation.

Check that the pad and guide will meet your regulations for positioning & construction. Liquip recommends welded-on pads and guides, mounted direct to the tanker shell, which provides metal-to-metal mounting faces. To measure required length:

1) Use a firm straight rod (not a tape measure) and pass the rod through the mounting pad and into the dipstick guide on the floor of the tank.
2) When the rod is sitting on the bottom of the guide and is within 2° of vertical, mark the rod to indicate the top of the mounting pad.
3) Remove the rod and measure the marked length and note in the provided table under 'H(mm)'
4) Repeat for all compartments



E.4. COMPARTMENT HEIGHT TABLE

CUSTOMER CONTACT DETAILS: *TRUCK NUMBER:*	
Compartment Number	H (mm) (to within 1mm)
1 (prime mover end)	
2	
3	
4	
5	
6 (Rear end)	
Customer signature: Name and position:	

NOTE:

H MUST BE DETERMINED FOR ALL USED COMPARTMENTS.
RETURN THE COMPLETED FORM TO LIQUIP



Power Filters

Liquip offers the DCC100, a electrical power conditioner that protects connected equipment from surges and voltage spikes generated by vehicle operation.

The DCC100 supplies 12V DC out with low noise and a wide range of input voltage from 9V to 36V DC.

Features & Benefits

- Protects up to 50V/100ms spike.
- Wide range of input voltage.
- Less than 0.1V output voltage noise.
- IP20 ingress protection.
- Light weight design, 100 grams.

Technical Information

Mounting

- 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)
- Ensure cable glands are rated for a minimum IP66.
- Wire as per wiring diagram attached.
- Ensure IP66 rated blanking plugs are used in any unused holes in junction box.

Input Voltage

9V-36V DC.

Output Voltage

12V DC.

Maximum Load

Total 1.67A Continuous.

Recommended Fuse Rating

3.15A slow blow.

Cable Size

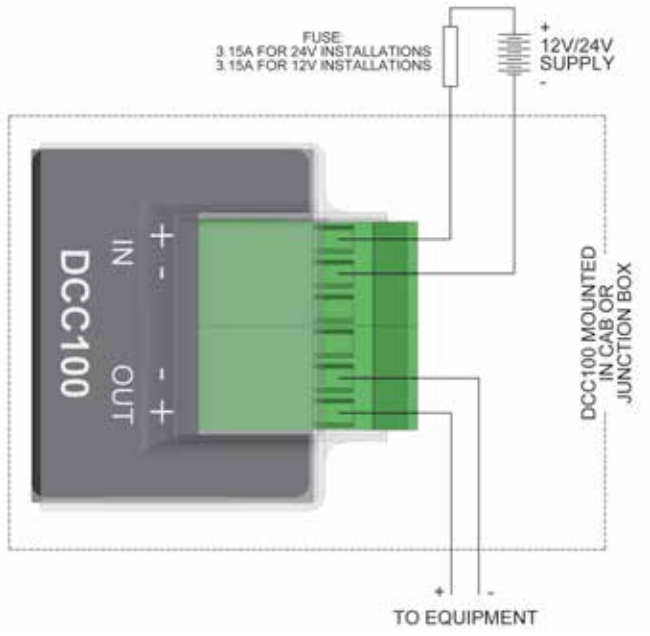
0.2– 2.5mm², strip length 6mm.

Ordering Information

- **DCC100:** Power filter conditioner.

Associated Equipment

- **DFV100:** Register for use in zone 1 hazardous locations.
- **DFV100H:** Register with heated display (no approvals).
- **DFV103:** Level Gauging CPU for use in zone 1 hazardous locations.
- **DFV101:** Combined register & level gauging CPU for use in zone 1 hazardous locations.



NOTE: THIS IS A GENERAL WIRING DIAGRAM ONLY.
ANY WIRING INSTRUCTIONS FOR SPECIFIC EQUIPMENT SUPERSEDE THIS DIAGRAM.



Proudly servicing all your fluid handling needs for 48 years.

One stop for all your fluid handling needs.

When you buy Liquip products, you're buying a trusted heritage of solutions from the company that's been quietly setting industry standards for over four decades, in Australia and beyond. Our comprehensive product line means you can get absolutely everything you need from a single source, with equipment that exceeds expectations and offers exceptional whole-of-life value. As systems become more complex, Liquip makes things easier. Because staying fluid is the key to success in fluid handling.



Sampi Meters

SAMPI meters are known worldwide for exceptional accuracy, reliability and longevity in a broad range of applications. Meters provide exceptionally accurate service when using unique positive displacement metering principle, even under variable operating conditions.

The SAMPI PD meter consists of a housing in which two vanes and a rotor turn in synchronised relationship within three cylindrical bores with no metal-to-metal contact within the meter element.

Typical products measured are: adhesives, agricultural chemicals, asphalt, animal feeds, aviation, beverages, concrete add mixtures, cosmetics, crude oil, dairy products, fuel, fuel oil, industrial chemicals, liquid fertilizers, liquefied gasses, lube oils, pharmaceutical chemicals, paints and varnishes, printing ink, processed foods, refined petroleum products, and so on.

Typical industry applications are:

- Truck
- Aviation
- Terminal & Bulk Plant
- General Industrial
- Marina
- Other Mobile Applications

Features & Benefits

- **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.
- Low Maintenance cost.
- Low pressure loss.
- Self-contained operation without electrical power.
- Available with traditional mechanical seals or with glandless magnetic driven pulse output device.
- Weights & Measures approval (world-wide) for custody transfer.
- Electronic accessories designed and approved to ATEX 94/9 normative.

Technical Information

Sizes

1" 1/2 up to 4".

Flow Rates

19 L/min- 3,780 L/min.

End Connections

ANSI Flanged, NPT, BSPT, Slip Weld.

Pressure Ratings

Cast Case: 10 & 25 bar (150 & 350 PSI) non-shock working pressure.

Two Case Steel Case: 10/10, 10/21, 20/20, 20/50 bar (150/150, 150/275, 300/300, 300/720 PSI); 40/100 bar (600/1440 PSI) ANSI non-shock working pressure.

Materials

-Meter Body, Rotor and Vanes: Aluminium, Hard Anodized Aluminium, Cast Iron, Steel, Stainless Steel.

-Seals: Buna "N", Viton®, Teflon™.

Accuracy (Mechanical Registration)

Capable of ±0.125% over a 5:1 range.

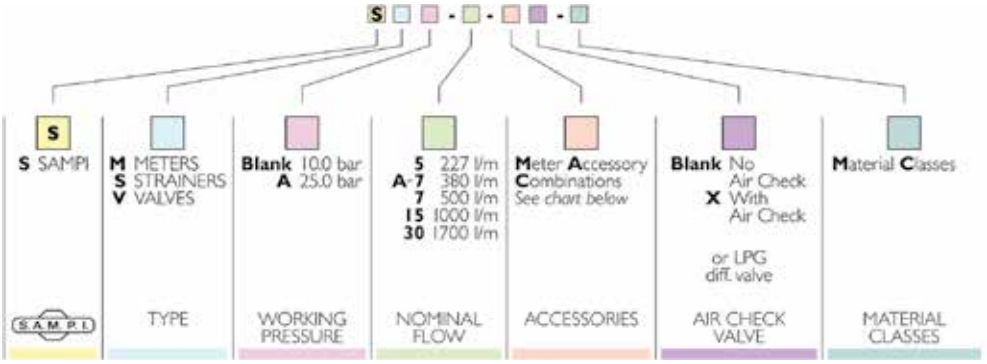
Capable of ±0.22% over a 10:1 range.

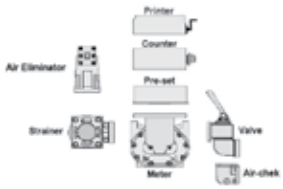
Capable of ±0.5% over a 40:1 range.

Repeatability (Mechanical Registration)

0.05% (±0.025%) of reading over entire range.

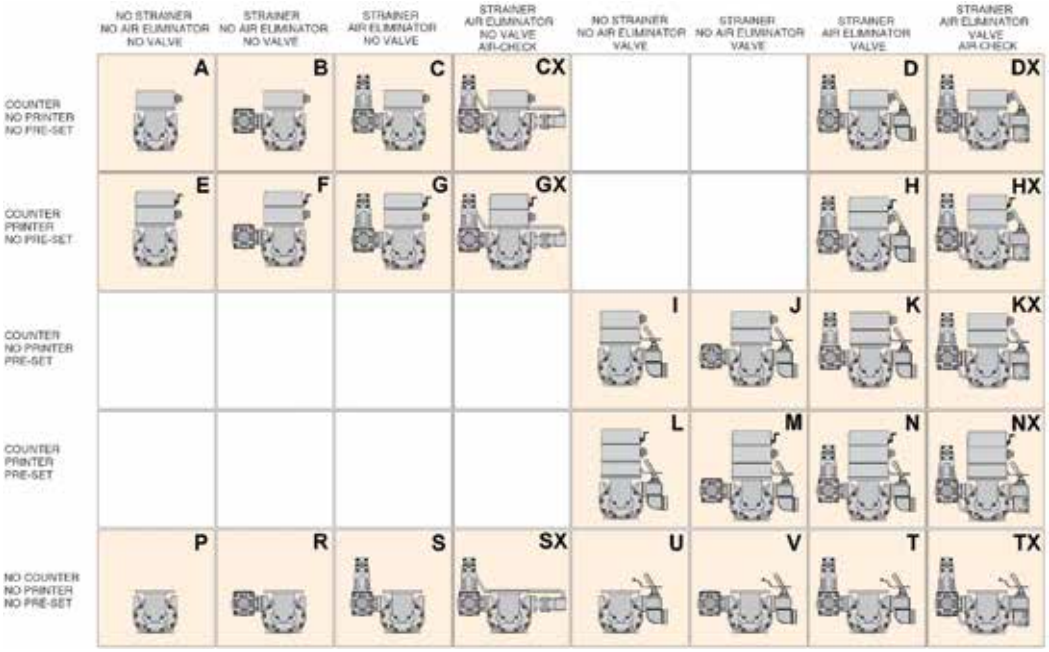
Ordering Information





Meter Classes

1 – Refined Petroleum Products	7 – Chlorinated Solvents	15 – Oil or water-based latex products, polymer resins, adhesives, herbicides, nitrogen fertilizers	30 – Herbicides
2 – Aviation and Jet Fuel	8 – Acid pH liquids includes: nitric, phosphoric, glacial acetic acids, citric juices, vinegar	16 – General solvents	37 – Sodium Hydroxide solutions, high sulphur crude oil, alkaline pH liquids
3 – Variety of products include: liquid sugars, sweeteners, syrups, vegetable oils	10 – LPG	20 – Batch process water meter service	47 – Mildly abrasive liquids
4 – Treated waters and solvents where no red metals are allowed	14 – Crude Oil	27 – Alkaline pH liquids: latex products, adhesives, liquid fertilizers	





LC Meters

Liquip are product distributors of LC's range of high quality meters and accessories for liquid and gas measurement.

Meters provide exceptionally accurate service when using Liquid Controls' unique positive displacement metering principle, even under variable operating conditions (changes in temperature, pressure and viscosity).

Typical applications: Adhesives, Agricultural, Chemicals, Asphalt, Animal Feeds, Aviation Fuels, Beverages, Concrete, Add Mixtures, Cosmetics, Crude Oil, Dairy Products, Fuel, Fuel Oil, Industrial, Chemical, Liquid Fertilizers, Liquified Gasses, Lube Oils, Paints and Varnishes, Printing Ink, Processed Foods, Refined Petroleum Products.

Features & Benefits

- High accuracy and repeatability.
- Low maintenance, no metal-to-metal contact in measuring chamber.
- Low pressure loss, a true gravity flow meter.
- Choice of aluminium, cast iron, and stainless steel materials of construction.
- Self-contained operation without electrical power or signal conditioning (for units equipped with mechanical registers, printers or presets); no special piping requirements.
- Electronic output and registration equipment where enhanced accuracy and electronic communications are needed.
- Weights & Measures approval (world-wide).

Technical Information

Sizes

1 ½" to 6".

Flow Rates

19 L/min to 3,780 L/min.

End Connections

ANSI Flanged, NPT, BSPT, Slip Weld.

Pressure Ratings

M-Series and MA-Series Cast Case: 150 & 350 PSI non shock working pressure.

MS-Series Two Case Steel Case: 150/150, 150/275, 300/300, 300/720 PSI; 600/1440 ANSI non-shock working pressure.

Materials

M-Series: Aluminium, Cast Iron or Stainless Steel.

MA-Series: Aluminium.

MS-Series: Steel with Aluminium metering chamber.

Seal materials: Buna "N"; Viton®; PTFE

Accuracy (Mechanical Registration)

Capable of ±0.125% over a 5:1 range.

Capable of ±0.22% over a 10:1 range.

Capable of ±0.5% over a 40:1 range .

Repeatability

Capable of 0.02% or better at any flow rate over entire range.

Ordering Information

Model number coding description

MSA-7-A-10

Meter Type
M = meter

Case Material
Blank = other than steel
S = steel case

Working Pressure
Blank = 150 psi
AA = 275 psi*
A = 350 psi
B = 720 psi*
C = 1440 psi*

Meter Size
4 = 40 gpm
5 = 60 gpm
7 = 100 gpm
10 = 150 gpm
15 = 200 gpm
25 = 300 gpm
30 = 350 gpm
40 = 450 gpm
60 = 600 gpm
75 = 700 gpm
80 = 800 gpm
120 = 1000 gpm

Accessory Configuration
A, C, I, K
see chart below

Construction/ Application Class
1, 2, 3, 10, etc.
see table on p. 9

* *AA, B, and C pressures available in steel case (S) meters only*

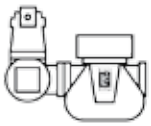
Standard accessory configurations

A Meter with counter



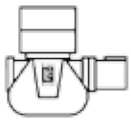
Optional Accessories: Printer, Strainer

C Meter with counter, strainer and air eliminator



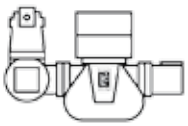
Optional Accessories: Printer

I Meter with counter, preset counter and preset valve



Optional Accessories: Printer, Strainer

K Meter with counter, preset counter, preset valve, strainer and air eliminator



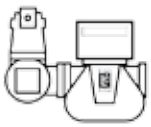
Optional Accessories: Printer

ALI Meter with electronic register



Optional Accessories: Printer, Strainer, Valve, ETVC

CLI Meter with electronic register, strainer, and air eliminator



Optional Accessories: Printer, Valve, ETVC

MSA-7-A-10

Meter Type
M=Meter

Case Material
Blank = other than steel
S = steel case

Working Pressure
Blank = 150 PSI
AA = 275 PSI
A = 350 PSI
B = 720 PSI
C = 1440 PSI

Material Class
(see below)

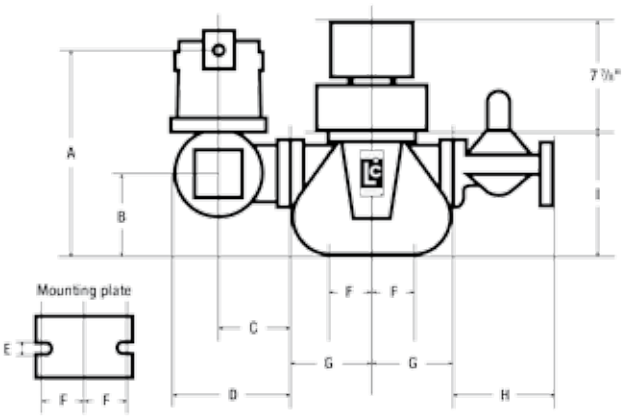
Meter Accessories
(See chart below)

Meter Size

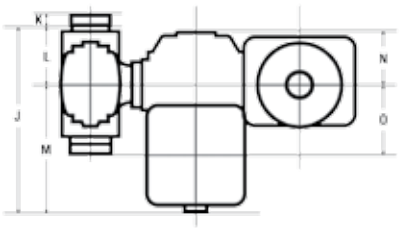
4 = 150 L/min	15 = 757 L/min	60 = 2,270 L/min
5 = 227 L/min	25 = 1,135 L/min	75 = 2,650 L/min
7 = 378L/min	30 = 1,325 L/min	80 = 3,028 L/min
10 = 567L/min	40 = 1,700 L/min	120 = 3,780 L/min

*AA, B & C pressures available in steel case (S) meters only

Front View



Top View



Dimensions: flow meters with electronic registration

Note: Dimensions shown are not for construction use.
Consult factory when certified engineering prints are required.

Model	Flange size	Max. nom. Flow rate	Working pressure		Dimensions															Net Wt
					A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
M-5	1 1/2" or 2"	60 GPM	150 PSI	in	14.2	5.3	4.1	6.8	0.56	1.9	4.9	8.3	8.6	13.9	0.9	4.7	9.2	3.2	4.6	14 lbs
		(227 L/min)	(10.5 BAR)	mm	360	135	105	172	14	48	125	213	219	352	24	119	233	81	116	(6.4 kg)

Ordering Information

Model : _____ - _____ - _____ - _____

Description : _____

Flow rates: Max. _____ Normal _____ Min. _____

Operating temperatures: Max. _____ Normal _____ Min. _____

Maximum non-shock operating pressure: _____

Maximum viscosity: _____ @ _____ (Temp°/F or C)

Specific gravity: _____ @ _____ (Temp°/F or C)

Construction class: (1, 2, etc.)_____

Seal material: ☐ Standard Buna/Viton ☐ All Viton ☐ All Teflon

Direction of flow: ☐ L to R ☐ R to L

Read out: ☐ Gallons ☐ Liters ☐ Pounds ☐ Other_____

Mechanical counter and printer ☐ Zero/Face up ☐ Zero/Face down ☐ Accumulative

Strainer basket : ☐ 40M ☐ 80M ☐ 100M ☐ Other_____

Flange size: _____

Flange type: ☐ NPT ☐ BSPT ☐ Slip weld ☐ ANSI ☐ DIN ☐ Other_____

Options: _____

Class	Description	Bearing Material
1	Refined petroleum products	Ni-Resist[1]
2	Aviation and jet fuel	Ni-Resist[1]
3	Variety of products includes: liquid sugars, sweeteners, syrups, vegetable oils	Ni-Resist[1]
4	Treated waters and solvents where no red metals are allowed	Carbon
8	Acid pH liquids includes: nitric, phosphoric, glacial acetic acids, citric juces, vinegar	Carbon[2]
14	Crude oil	Ni-Resist
16	General solvents	Carbon
30	Herbicides	Carbon

[1] Carbon bearings are standard on some meter sizes of this class. Consult factory.
[2] Teflon bearings optional on some meter sizes. Consult factory.



Avery Hardoll Bulk PD Meters

Liquip are product distributors of Avery-Hardoll's range of high quality and precision meters for liquid measurement.

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 refuelling vehicles.
- Repeatability better than 0.02%.
- Serviceability: designed for quick and easy maintenance.

Technical Information

Pressures Ratings

Maximum working pressure: 150 psi.

Test pressure: 300 psi.

Temperature range

-28ºC to 100ºC.

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.

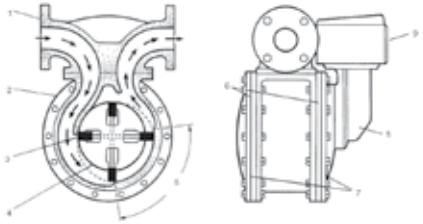
-Inner Covers: Ni-Resist cast iron.

-Bearings: Stainless steel.

-Seals: High nitrile or fluorocarbon.

Operation

- The positive displacement principle is the ONLY accurate method of measuring fluid flow. No other technology can achieve such accuracy because measurement becomes inferred, that is indirect and subject to assumption. The Avery-Hardoll® bulk meter directly converts volume to rotational output with minimum scope for error and with minimal disturbance from surrounding conditions, e.g. turbulence from nearby valves, bends, etc.
- The product enters the meter through the inlet manifold (1) and causes the rotor (4) to revolve by pressure on the vanes (3).
- The proximity of the rotor (4) to the body (2) forms an efficient seal, whilst the profile of the casing ensures that the vanes (3) are guided through the measuring crescent (5), where the volume of product is accurately measured.
- Product at line pressure fills the spaces between the inner (6) and outer (7) end covers providing pressure balanced inner end covers' which are therefore protected from distortion due to changes in line pressure.
- An extension shaft driving through a pressure tight gland in the meter front cover, transmits the rotor revolutions to the calibrating gearing (8) which drives the counter (9).



Ordering Information

Contact Liquip for ordering information.



Turbine Inc. LPG Turbine Meters

Liquip are the exclusive Australia/New Zealand distributor for USA based Turbines Inc's LPG metering product line.

Turbines, Inc., is a leader in the design and manufacture of accurate turbine flow metering solutions. Their flow meters are field-proven to deliver performance in volatile environments with unmatched reliability, greater efficiency and higher value.

HA Series - High Accuracy LPG meters

Turbines' High Accuracy turbine flow meters are built with extremely tight tolerances only achievable through precision manufacturing and stringent quality control.

Note: IECEx approval pending for turbine magnetic pick up coils.

Features & Benefits

- Aust W&M (NMI) approved for use with Liquip's electronic registers (DFV series).
- Suitable for use in applications where hosereel flowrates between 15 - 500 LPM are required.
- Customers now have a choice of meter for LPG use thanks to Turbine's mounting footprint which allows for direct drop in replacement of other meters.
- Standard or IECEx approved coils available.
- 1" or 1½" models available.
- All HA meters are bi-directional.
- Meters available with either 150lb or 300lb flanges.

Technical Information

Calibration
±0.5% over standard flow range.

Repeatability
±0.1% over standard flow range.

Linearity
±0.5% over flow range.

Operating Temperature
-268°C to +232°C

End Connection
Flanged 150 or 300 lb (same mounting and overall length as many similar LPG meters on the market for direct drop in replacement).

Flow Rate
HA0100-F150: 15 to 280 LPM
HA0150-F150: 30 to 500 LPM

Pressure Rating
1,900 kPa (275 PSI)

Materials
Meter Body: 316 Stainless Steel
Rotor: 17-4PH, Nickel 200
Bearings: 440C SS raceways and balls, self-lubricating retainer

Certifications
ISO9001, NIST, CRN, AS 9100
Aust W&M (NMI) approved for use with Liquip's electronic registers (DFV series).

Ordering Information

HA Series Meters

- **HA0100-F150:** 1" 150 lb Flanged S/S turbine with dual coil and quadrature output
- **HA0150-F150:** 1½" 150 lb Flanged S/S turbine with dual coil and quadrature output.
- **HA0100-F300:** 1" 300 lb Flanged S/S turbine with dual coil and quadrature output.
- **HA0150-F300:** 1½" 300 lb Flanged S/S turbine with dual coil and quadrature output.

Spare Parts

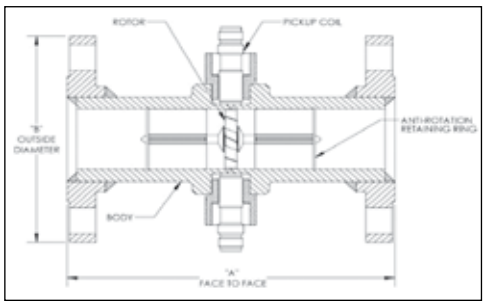
- **HA-901430:** Standard Magnetic pickup coil for Turbine Inc HA Series (1 piece).
- **HA-901447:** IECEx approved Magnetic pickup coil for Turbine Inc HA Series (1 piece).

Note: IECEx approval pending for turbine magnetic pick up coils.

Installation

1. Magnetic pickup coils included with each turbine meter at no extra charge;
2. Turbine meter is linear and accurate over its designed operating range;
3. Minimum recommended piping installation: 10 diameters upstream and 5 diameters downstream;
4. Locate valves or chokes downstream;
5. For best meter performance and to avoid bearing wear, do not exceed maximum rate flow for long periods of time;
6. Consult Liquip for warranty details.

For additional local output, the HA Series can be combined with Liquip's reliable monitors for a complete and accurate solution.



Installation Dimensions

Nominal Meter Size	150# A im (mm)	150# B in (mm)	300# A im (mm)	300# B in (mm)
100	5.295 (134.5)	4.25 (107.9)	5.295 (134.5)	4.88 (123.9)
150	6.889 (175)	5.0 (127)	6.889 (175)	6.12 (155.4)
200		6.0 (152.4)		6.5 (165.1)

Hose Reels



High Pressure Hose Reels

Liquip offer two types of High Pressure Hose Reels - The FR and HR Series.

The FR series are a manual rewind and the HR series are a hydraulic rewind. Both are suitable for petroleum products and are available in different sizes.

The hose reels have robust construction – stiffened cheek plates, extremely sturdy thick wall manifold with added strength from steel inner drum, steel base frame and self aligning bearing.

Features & Benefits

- Flow area is equal to 38mm throughout.
- All components are easily replaced as required.
- Sealing is by lip seal.
- Built tough to last in the harshest conditions.
- All models are delivered in primed condition, ready for painting.
- Optional anti-rotation lock to prevent hose unravelling.



Technical Information

Pressure tested & rating
Up to 2,100 kPa.

Periodic Service
Quarterly grease plummer block bearing.

Mounting
4 x M10 Bolts.

Variants
Can suit 25mm (1”), 32mm (1¼”) & 38mm (1½“) diameter hoses

Rewind Mechanism
HR Series - Hydraulic

FR Series - Manual

Drum widths
300mm (12"), 400mm (18") or 600mm (24").

Ordering Information

FR 12 HP2 M M

REWIND MECHANISM	WIDTH (DRUM)	HIGH PRESSURE	FRAME	GOOSENECK
FR (Manual)	12	HP2	M -Mild Steel	M - 1½” Mild Steel
HR (Hydraulic)	18		G - Galvanised	NP - 1½” Nickel Plated
	24		NP - Nickel Plated (Aviation)	NP32 - 1¼” Nickel Plated
				LPG - 1” High Pressure
				LPG32 - 1¼” High Pressure

Options Available

Gooseneck
- **R12-11:** 1½” Mild Steel.
- **R12-11NP:** 1½” Nickel Plated.
- **R12-11-32NP:** 1¼” Nickel Plated.
- **R12-11-LPG:** 1” LPG.
- **R12-11-LPG32:** 1¼” LPG.

Motor
- **LIQ5411:** Hyd Motor (WP & LPG Disp Pump).
- **LIQ5473:** Hyd Motor Charlynn 185CC.
- **LIQ1295:** Hyd Motor Danfoss (Hosereel).

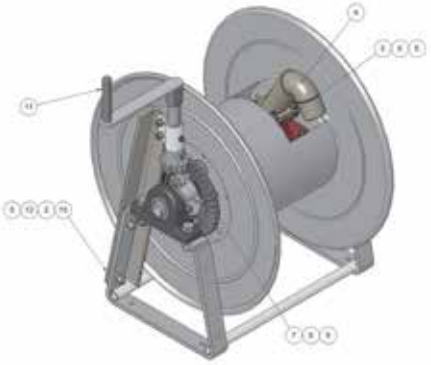


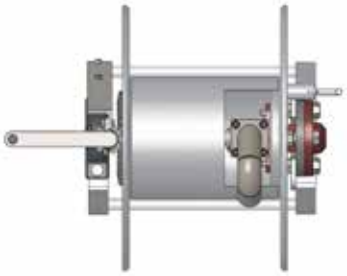
HR Series



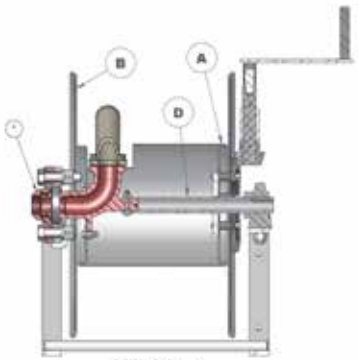
FR Series

MANUAL REWIND HOSEREEL

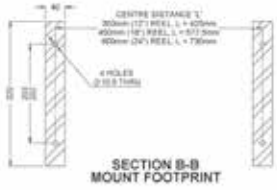


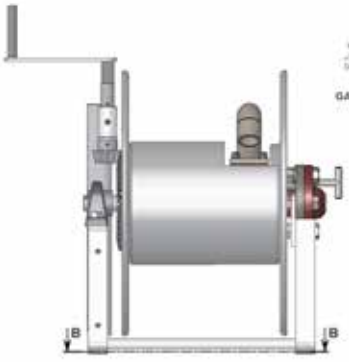


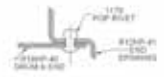
ASSEMBLY	WIDTH OF HOSE DRUM
FR12HP2	310 - 375mm
FR18HP2	460 - 465mm
FR24HP2	610 - 615mm











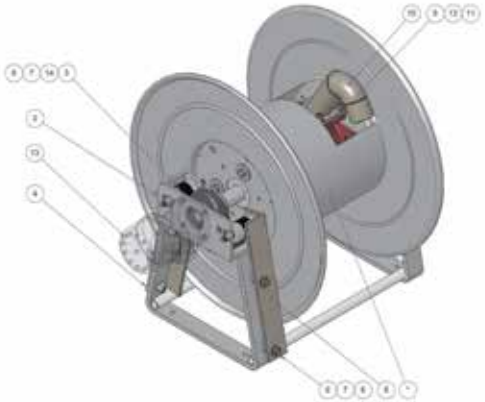


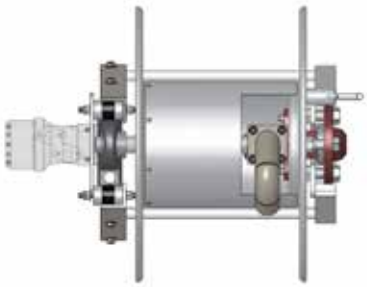
ITEM	PART NUMBER	DESCRIPTION	DESCRIPTION (CONT)	FR12HP2	FR12HP2NP	FR18HP2	FR18HP2NP	FR24HP2	FR24HP2NP	MATERIAL	GRADE	MASS (kg)	DWG No
1	R12HP2	HYDRAULIC HOSEREEL ASSEMBLY	12" HIGH PRESSURE	1	1	-	-	-	-	MILD STEEL		30.80	R000018
	R18HP2	HYDRAULIC HOSEREEL ASSEMBLY	18" HIGH PRESSURE	-	-	1	1	-	-	MILD STEEL		38.77	R000018
	R24HP2	HYDRAULIC HOSEREEL ASSEMBLY	24" HIGH PRESSURE	-	-	-	-	1	1	MILD STEEL		38.20	R000018
2	0022	SETSCREW HEX HD	3/8" BSW x 1 1/4" LONG	2	2	2	2	2	2	ZP STEEL	FC4-8	0.0265	
3	0864	GASKET	FOR HOSEREEL GOOSENECKS	1	1	1	1	1	1	NBR CORK	ACM60	0.02	P864
4	SEE NOTE	GOOSENECK ASSEMBLY	FOR HIGH PRESSURE HOSEREEL	1	-	1	-	1	-	STEEL	250	1.39	R003
	R12.11-32NP	GOOSENECK 1½" BSPP	FOR AVIATION	-	1	-	1	-	1	N/P STEEL	250	1.37	R003
5	0156	WASHER SPRING	3/8" ASA WLS	6	6	6	6	6	6	ZP STEEL	WLS	0.005	
6	0716	CAPSCREW IMPERIAL	3/8" BSW x 1" LONG	4	4	4	4	4	4	ZP STEEL	ASTM A574	0.023	
7	FR12-5	CROWN WHEEL	FOR FR12 HOSEREEL	1	1	1	1	1	1	ALUMINIUM	AA601	0.70	F1250
8	0015	SETSCREW HEX HD (NP)	5/16" BSW x 1 3/4" LONG HX HD	6	6	6	6	6	6	ZP STEEL	250	0.0038	
9	0158	WASHER SPRING	5/16" SLX WLS	6	6	6	6	6	6	ZP STEEL	WLS	0.002	
10	FR12HP-23	BRACKET FRONT REWIND	HP WITH HIGH PRESSURE HOSEREELS	1	1	1	1	1	1	STEEL	250	0.02	F1053
11	R12-36	REWIND HANDLE FOR HP HOSEREEL		1	1	1	1	1	1	ZP MILD STEEL	250	0.68	R09
12	3130	NUT HEX	3/8" BSW	2	2	2	2	2	2	ZP STEEL	250	0.008	
13	R12HP2-36	SEAL FLANGE	HIGH PRESSURE HOSEREEL	-	1	-	1	-	1	STAINLESS STEEL	316	2257.28	R000018

FOR GALVANISED ASSEMBLIES (WITH G SUFFIX) SUBSTITUTE THE FOLLOWING COMPONENTS
A- DRUM AND END SPINNING WITH RxxHP-40
B- END SPINNING WITH R12HP-41
C- A-FRAME ASSEMBLY WITH RxxHP-42
D- BEARING SUPPORT PIPE WITH RxxHP-43
E- LOCK PIN ASSEMBLY WITH R12HP-44
F- REWIND BRACKET WITH R12HP-45
WHERE xx IS THE SIZE OF THE ASSEMBLY (12, 18 OR 24")

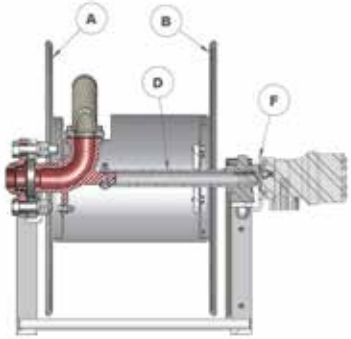
NOTES:
1. ASSEMBLY NUMBERS AND SUFFIXES ARE DESCRIBED BELOW
e.g. FR12HPLPOZ
"12" - DENOTES SIZE OF REEL: 12, 18 or 24"
LPG - DENOTES SERVICE, LPG or NP FOR NICKEL PLATED (AVIATION)
"M" - DENOTES "LESS MOTOR", i.e. HYDRAULIC REWIND MOTOR NOT SUPPLIED
G - DENOTES GALVANISED STEEL COMPONENTS
2. FOR GOOSENECK USE
R12-11 1¼" BSPT (STANDARD)
R12-11NP 1¼" BSPT (NICKEL PLATED)
R12-11-LPG 1" NPS FEMALE (HIGH PRESSURE)
R12-11-LPG32 1½" NPT FEMALE (HIGH PRESSURE)
R12-11.32NP 1½" BSPP AVIATION (NICKEL PLATED)
3. TEST REWIND HANDLE AND LOCKING BOLT FUNCTIONS CORRECTLY

HYDRAULIC REWIND HOSEREEL

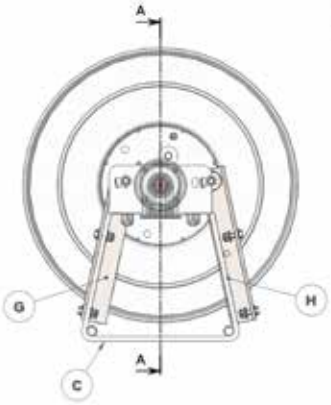


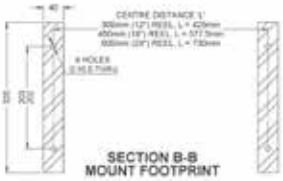


ASSEMBLY	WIDTH OF HOSE DRUM
HR12HP2	310 - 315mm
HR18HP2	460 - 465mm
HR24HP2	610 - 615mm

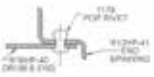


SECTION A-A

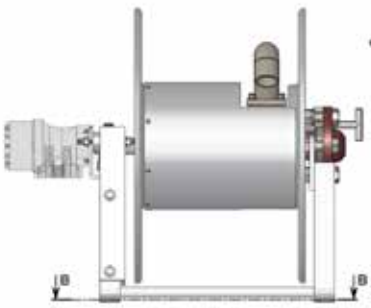


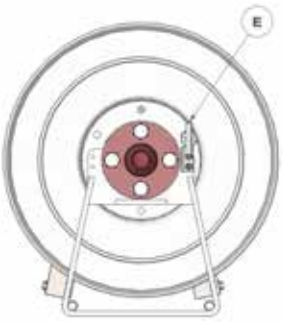


SECTION B-B
MOUNT FOOTPRINT



RIVET DETAIL FOR GALVANISED DRUMS ONLY (SEE NOTE 4)





ITEM	PART NUMBER	DESCRIPTION	DESCRIPTION (CONT)	HR12HP2-LM	HR18HP2-LM	HR24HP2-LM	MATERIAL	GRADE	MASS (kg)	DWG No
1	R12HP2	HYDRAULIC HOSEREEL ASSEMBLY	12" HIGH PRESSURE	1	-	-	MILD STEEL		33.65	R00016
	R18HP2	HYDRAULIC HOSEREEL ASSEMBLY	18" HIGH PRESSURE	-	1	-	MILD STEEL		35.77	R00018
	R24HP2	HYDRAULIC HOSEREEL ASSEMBLY	24" HIGH PRESSURE	-	-	1	MILD STEEL		38.20	R00014
2	HR12HP-3	BRACKET MOTOR MOUNT	HYDRAULIC REWIND HOSEREEL	1	1	1	STEEL	250	0.66	H1988
3	R12HP-14	RUBBER MOUNT	FOR HYDRAULIC MOTOR	2	2	2	RUBBER/STEEL		0.30	R00013
4	HR12HP-46	MOUNTING BRACKET FOR HYDRAULIC MOTOR	LEFT HAND SIDE	1	1	1	STEEL	300PLUS	1.35	H1957
5	HR12HP-48	MOUNTING BRACKET FOR HYDRAULIC MOTOR	RIGHT HAND SIDE	1	1	1	STEEL	300PLUS	1.35	H1957
6	0102	WASHER FLAT	5/8" x 1 1/4" OD	12	12	12	ZP STEEL	250	0.004	
7	0180	NUT HYLOC	5/8" SWH	8	8	8	ZP STEEL	250	0.014	
8	0022	SETSCREW HEX HD	3/8" SDH x 1 1/4" LONG	4	4	4	ZP STEEL	PC4.6	0.0089	
9	0664	GASKET	FOR HOSEREEL GOOSENECKS	1	1	1	NBR CORK	ACN60	0.02	P004
10	R12-11	GOOSENECK 1½" BSPT	FOR HIGH PRESSURE HOSEREEL	1	1	1	STEEL	250	1.39	R003
11	0128	WASHER SPRING	3/8" ASA MED	4	4	4	ZP STEEL	MED	0.003	
12	0219	CAPSCREW IMPERIAL	3/8" SWH x 1" LONG	4	4	4	ZP STEEL	ASTM A574	0.007	
13	1286	MOTOR HYDRAULIC DANFOSS	OMR300 151-1286/01, 1" SHAFT	AS REQD	AS REQD	AS REQD	STEEL		10.00	
14	HR12HP-18	SPACER	FOR HR12HP	4	4	4	STEEL	ZINC PLATE CR3 CHROMICA	0.13	H1958

FOR GALVANISED ASSEMBLIES (WITH G SUFFIX) SUBSTITUTE THE FOLLOWING COMPONENTS:
A- DRUM AND END SPINNING WITH R12HP-45
B- END SPINNING WITH R12HP-41
D- A/F RAMS ASSEMBLY WITH R12HP-42
E- BEARING SUPPORT PIPE WITH R12HP-43
F- LOCK PIN ASSEMBLY WITH R12HP-44

NOTES:
1. ASSEMBLY NUMBERS AND SUFFIXES ARE DESCRIBED BELOW.
e.g. HR12HP2LPG-LM2
12 - DENOTES SIZE OF REEL: 12, 18 or 24"
LPG - DENOTES SERVICE. LPG or NP FOR NICKEL PLATED (AVIATION)
LM - DENOTES "LESS MOTOR". i.e. HYDRAULIC REWIND MOTOR NOT SUPPLIED
G - DENOTES GALVANISED STEEL COMPONENTS
2. FOR GOOSENECK USE:
R12-11 1½" BSPT (STANDARD)
R12-11NP 1½" BSPT (NICKEL PLATED)
R12-11-LPG 1" NPS FEMALE (HIGH PRESSURE)
R12-11-LPG32 1¼" NPT FEMALE (HIGH PRESSURE)
R12-11-32NP 1¼" BSPP AVIATION (NICKEL PLATED)
3. FOR LPG VERSIONS, REPLACE NBR CORK GASKET FOR GOOSENECK (0664) WITH KLINGER GASKET 4241.



Hydraulic Rewind Hose Reels

The HR150 series of hose reels are suitable for petroleum products and are available with hand or hydraulic rewind and in different sizes.

They have robust construction – stiffened cheek plates, extremely sturdy thick wall manifold with added strength from steel inner drum, steel base frame and self aligning bearing.

Features & Benefits

- Flow area is equal to 38mm throughout.
- All components are easily replaced as required.
- Sealing is by lip seal.
- Built tough to last in the harshest conditions.
- All models incorporate an optional lock.

Technical Information

Pressure tested & rating

Up to 2,100kPa.

Periodic Service

Quarterly grease plummer block bearing.

Mounting

4 x M10 Bolts.

Variants

Can suit 25mm, 32mm & 38mm diameter hoses.

Rewind Mechanism

Hand or Hydraulic Rewind.

Ordering Information

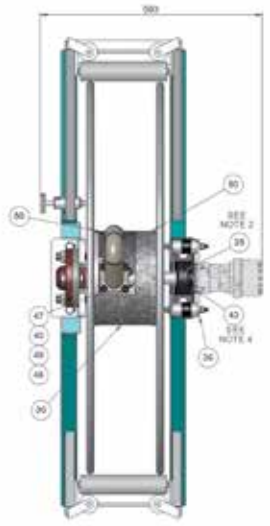
- **HR152:** Petroleum hose reel comes with hydraulic rewind motor.
- **HR152-LM:** Petroleum hose reel (manual rewind).

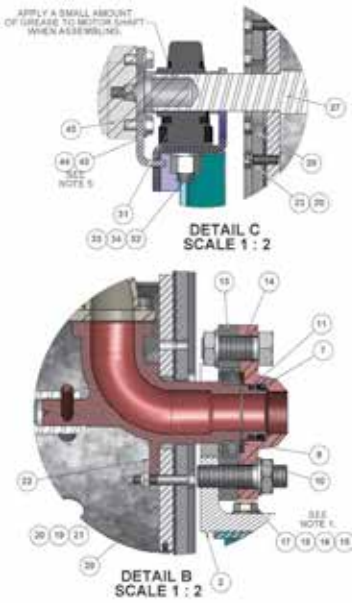
Please CONTACT LIQUIP for all further models or information.

Associated Equipment

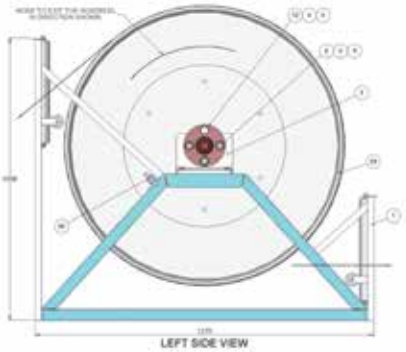
- **AHR250D:** Aviation drum style hose reel.
- **AHR250:** Cartwheel type hosereels:
- **295SACJ-0200:** Aviation spec nozzle.
- Nickel plated steel gooseneck with st steel inlet flange available.
- Nickel plated gooseneck with 1 ¼" MBSPP thread available for aviation and water use.
- Rollers and guides.

HR152 HIGH PRESSURE HOSEREELS

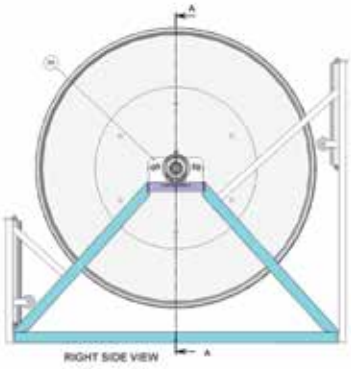














ITEM NO.	PART NUMBER	DESCRIPTION	DESCRIPTION (CONT.)	HR152	HR152-LM	MATERIAL	DWG No
1	HR150-2	FRAME ASSEMBLY	HOSEREEL	1	1	STEEL	H105205
2	HR150-11	BRACKET INLET	HOSEREEL	1	1	STEEL	H105135
3	8362	LOCTITE	SUPER RETAINING COMPOUND	1	1	CYANOACRYLATE	
4	6346	WASHER SPRING	M20 MED	4	4	ZnP STEEL	
5	4348	NUT METRIC THN	M20 x 2	4	4	ZnP STEEL	
6	6110	STUD METRIC	M20 x 80 LONG	4	4	ZnP STEEL	
7	7629	SEAL LIP HOSEREEL	HIGH PRESSURE	1	1	URETHANE	N/A
8	7999	LOCTITE	RETAINING COMPOUND	1	1	CYANOACRYLATE	
9	4139	GREASE NIPPLE EXTERNAL METRIC	M8C - AM1/8SS-0139B	1	1	ZnP STEEL	
10	4515	BEARING BALL DEEP GROOVE	6310LLU/C4E	1	1	STEEL	
11	7623	O-RING	4 RADIUS	1	1	NITRILE	
12	6212	SETSCREW METRIC	M12 x 30 HX	1	1	ZnP STEEL	
13	R152HP-13	FLANGE SUPPORT BEARING	FOR HIGH PRESSURE HOSEREELS	1	1	STEEL	R25
14	R152HP-12	SEAL FLANGE	HIGH PRESSURE HOSEREEL	1	1	STEEL	R55216
15	4071	NUT METRIC	M12	2	2	ZnP STEEL	
16	6093	WASHER SPRING	M12 MED	2	2	ZnP STEEL	
17	6122	SETSCREW METRIC	M12 x 40 HX	2	2	ZnP STEEL	
18	6096	WASHER FLAT	M12 x 24 OD	2	2	ZnP STEEL	
19	4365	NUT NYLOC	M8	3	3	ZnP STEEL	
20	6092	WASHER SPRING	M8 MED	8	8	ST STEEL	
21	6052	BOLT METRIC	M8 x 50 HX	5	5	STAINLESS STEEL	
22	R12-2-36	MANIFOLD	FOR HIGH PRESSURE HOSEREELS	1	1	SG IRON	R55216
23	6005	SETSCREW METRIC	M8 x 25 HX	6	6	ST STEEL	
24	4081	NUT NYLOC	M10	1	1	ZnP STEEL	
25	0813	WASHER FLAT	M10 x 21 OD	1	1	ST STEEL	
26	6118	CAPSCREW METRIC	M10 x 50	1	1	STEEL	
27	HR150-9	BEARING SUPPORT TUBE	FOR HP HOSEREELS	1	1	STEEL	H105605
28	HR150-10	DRUM SUPPORT	FOR INLET SIDE OF HOSEREEL	1	1	STEEL	H105605
29	HR150-12A	CHEEKPLATE & SUPPORT PLATE	SUB-ASSEMBLY	2	2	ALUMINIUM	H105605
30	HR150-17	DRUM	FOR HR150 HOSEREEL	1	1	2mm STEEL	H105305
31	4521	BEARING PILLOW BLOCK	UCP207-104, Ø33.33, 127mm CENTRES	1	1	S.G. IRON	
32	6006	SETSCREW METRIC	M16 x 50 HX	1	1	ZnP STEEL	
33	6096	WASHER SPRING	M16 HVY	1	1	ZnP STEEL	
34	4076	NUT METRIC	M16	1	1	ZnP STEEL	
35	5723	CAPSTUD	OPU - PLUG 7.5-8 S CAP 6-7-1	1	1	PVC RED	
36	HR152HP-5	BRACKET MOTOR MOUNT	HYDRAULIC REWIND HOSEREEL	1	1	STEEL	H1066
37	HR152HP-18	SPACER	FOR HR152HP	1	2	STEEL	H1058
38	R152HP-14	RUBBER MOUNT	FOR HYDRAULIC MOTOR	2	2	RUBBER/STEEL	R55213
39	HR150-8	WASHER FOR MOTOR MOUNT	ON HR150 HOSEREELS	2	2	MILD STEEL	H105405
40	0109	WASHER SPRING	M12 MED	2	2	ZnP STEEL	
41	0130	NUT HEX	1/2" BSW	4	4	ZnP STEEL	
42	8361	LOCTITE	SUPER STUD LOCK	1	1	CYANOACRYLATE	
43	0602	SETSCREW HEX	1/2" BSW x 3/4" LONG	4	4	ZnP STEEL	
44	0130	WASHER FLAT	1/2" x 1" OD	4	4	ZnP STEEL	
45	1295	MOTOR HYDRAULIC DANFOSS	OMR200 151F0600, 1" SHAFT	1	1	STEEL	
46	R11-11	GOOSENECK 1½" BSPT	FOR HIGH PRESSURE HOSEREEL	1	1	STEEL	R101
47	0718	CAPSCREW IMPERIAL	1/2" BSW x 1" LONG	4	4	ZnP STEEL	
48	7664	GASKET	FOR HOSEREEL GOOSENECK	1	1	NBR CORK	R464
49	HR150-6	LOCK ASSY	FOR HR150 HOSE REEL	1	1	STEEL	H105605
50	6714	HAMMER DRIVE SCREW	#10 x 3/8" LONG	14	14	ZnP STEEL	

NOTES:
1. BEARING TO BE A SLIDE FIT ONTO THE MANIFOLD. USE LOCTITE 641 (7955) TO SECURE BEARING TO MANIFOLD.
2. DRILL HOLES FOR HAMMER DRIVE SCREWS (6714) AFTER ASSEMBLING DRUM ONTO DRUM SUPPORTS. DRILL 8 HOLES ON ONE SIDE & 6 ON SIDE WITH MANIFOLD. USING A #20 DRILL (Ø4.05mm) BY 10mm DEEP EQUALLY SPACED.
3. TIGHTEN M10 CAPSCREW SO THAT THE PIPE COMPRESSES ONTO THE MANIFOLD TO ACT AS A DRIVE. THEN BACK NUT OFF BY 1/4 TURN.
4. PILLOW BLOCK BEARING (4523) TO BE MOUNTED WITH GRUBSCREW ON MOTOR SIDE (I.E. ON THE OUTSIDE).
5. HYDRAULIC MOTOR TO BE MOUNTED USING 4 OFF SETSCREWS (0020). APPLY LOCTITE 262 (3381) AND TIGHTEN TO 17 Nm. MOTOR AND MOUNTING SCREWS ARE NOT SUPPLIED WITH MODEL HR150-LM.



190 High-Flow Nozzles

For High-Flow, Bulk Fuel Oil Delivery Service Designed to handle high flow when line pressure is not a critical consideration or otherwise absorbed.

For applications over 50PSI, please use 210 Series Nozzles.

Features & Benefits

- **Aluminium Body** - lighter weight, easier to manoeuver.
- **Dual Poppets** - allow for low flow metering (this nozzle is not intended for high pressure pump applications).
- **Replaceable Hold** - Open Rack - for use when fuelling large-capacity tanks. Nozzle must be attended at all times during usage.
- **Right Angle Design** - provides larger lever area for better grip and easier control; permits nozzle to fit into awkward spaces close to walls and into corners.
- **Drag Lugs** - protect the nozzle when dragged across rough surfaces; enhances long-life durability.
- **Easily Replaced Spout** - the spout is easily threaded into the body. Replacement spouts are readily available from OPW.
- **NPT Female Threads at Inlet End** - standard pipe threads accept all standard 1", 1-1/4", 1-1/2" and 2" male connections.

Technical Information

Design working pressure

50 PSI maximum pressure.

Materials

Body: Cast aluminium.

Main Stem: Stainless steel.

Stem Seal: Graphite with Teflon™.

Disc: Viton®.

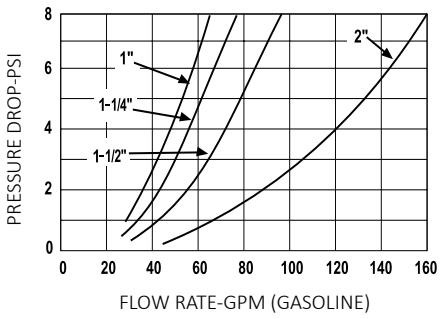
Spout: OPW 296 brass or 297 aluminium (optional).

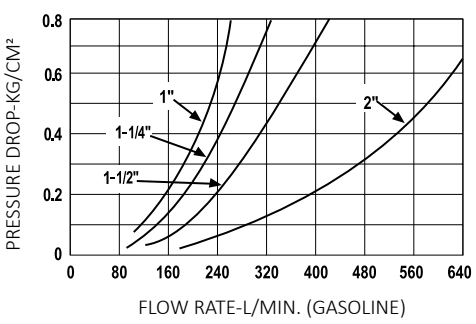
Ordering Information

- **190L-584LLIQUIP:** Nozzle 1¼" C/W Spout.
- **190L-586LLIQUIP:** Nozzle 1½" C/W Spout.
- **190S-7063-114Z:** Strainer & Spacer Kit For 1¼" Nozzle.

Please CONTACT LIQUIP for all ordering information.

Performance







210 High-Flow Nozzles

For High-Flow, Bulk Fuel Oil Delivery Service.

Features & Benefits

- **Aluminium Body** - lighter weight, easier to manoeuver.
- **Dual Poppets** - allows for low-flow metering.
- **Replaceable Hold**-Open Rack- for use when fuelling large-capacity tanks. Nozzle must be attended at all times during usage.
- **Dash Pot -** non-adjustable, to minimize closing line shock.
- **Right Angle Design**- provides larger lever area for better grip and easier control; permits nozzle to fit into awkward spaces close to walls and into corners.
- **Drag Lugs** - protect the nozzle when dragged across rough surfaces; adds to long life with rough usage.
- **Easily Replaced Spout** - the spout is simply threaded into the body. Replacement spouts are readily available from OPW.
- **NPT Female Threads at Inlet End**- standard pipe threads accept all standard 1-1/4" and 1-1/2" male connections.

Technical Information

Design working pressure

50 PSI maximum pressure.

Materials

Body: Cast aluminium.

Main Stem: Stainless steel.

Stem Seal: Graphite with Teflon™.

Disc: Viton®.

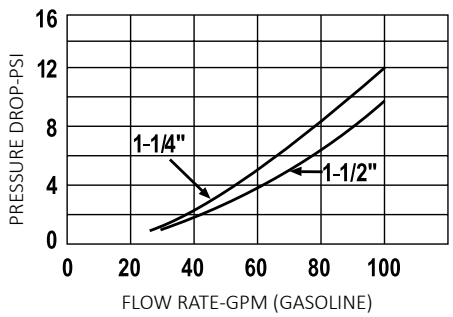
Spout: OPW 296 brass or 297 aluminium (optional).

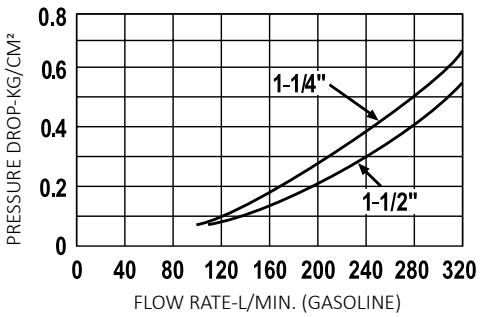
Ordering Information

- **210L0104LLIQUIP:** Nozzle 1 ¼" 210 BSPP W/ Spout.
- **210L0105LLIQUIP:** Nozzle 1½" 210 BSPP W/ Spout.

Please CONTACT LIQUIP for all ordering information.

Performance







Aviation Style Nozzle

Liquip are proud to offer OPWs range of 295 series overwing aircraft refuelling nozzles.

A lightweight aluminium design and dual poppets allow for an easy to open nozzle against high inlet pressures.

Note: For Liquip AVN nozzles and all other Aviation equipment please contact Liquip

Features & Benefits

- Lightweight and durable aluminium design.
- Dual poppets to allow for an easy to open nozzle against high inlet pressures.
- Vinyl-coated lever.
- Colour-coded composite lever guard to distinguish between AVGAS and Jet A1.
- Right angle design which provides larger lever area for better grip and easier control.
- 100 mesh strainer to prevent foreign matter from entering fuel tank (easy to remove and clean).
- Dust cap keeps spout free from dirt and stop fuel drippage when connected.
- Adjustable dash pot which permits adjusting the main poppet closure rate over a wide range of flows to overcome line shock with minimum after flow.
- Built in swivel to eliminate twisting and kinking of the hose.
- NPT female threads at inlet end- accepts all 1 1/2" male connections.
- Grounding wire assembly included on all aviation nozzles.

Technical Information

Design working pressure

50 PSI (3.45 bar) maximum pressure.

Materials

Body: Cast aluminium.

Main stem: Stainless steel.

Stem seal: Buna-N O-ring.

Disc: Viton.

Spout: Aluminium.

Ordering Information

- **295AF-0100:** OPW Aircraft Nozzle 40mm (1½") - Artic guard.
- **295SA-0135:** OPW Overwing Nozzle (1" x 25mm) - AVGAS Spout.
- **295SA-0136:** OPW Overwing Nozzle (1¼" x 32mm) - AVGAS Spout.
- **295SA-0137:** OPW Overwing Nozzle (1½" x 38mm) - AVGAS Spout.
- **295SAC-0157:** OPW Overwing Nozzle (1½" x 25mm) - AVGAS Spout c/w check valve spool.
- **295SAC-0158:** OPW Overwing Nozzle (1½" x 38mm) - AVGAS Spout c/w check valve spool.
- **295SACJ-0200:** OPW Overwing Nozzle (1½" NPT x 38mm) - AVGAS Spout c/w check valve spool.

Note: For Liquip AVN nozzles, please contact Liquip



Isoil Digital Display - LFD-6

The Isoil LFD-6 remote display unit has been designed for use in applications that require the volume measured by the PD meter to be repeated and easily read from a reasonable distance within the working area.

Such applications include:

- *Top loading of tank trucks.*
- *Loading of rail cars.*
- *Loading of barges and ships.*
- *Truck mounted pumping systems.*

Features & Benefits

- 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).
- 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.
- Self adjusted LED's provide a high level of brightness for easy reading in all lighting conditions.
- The LFD-6 is suitable for use in explosive areas and harsh environments.
- ATEX conformity and IP66 protection rating.

Technical Information

Reading
N° 6 digit 63(H)x30(L) mm– Red L.E.D. high efficiency type + decimal point.

Brightness
Self adjusting according to the environmental conditions.

Mains
10-30VDC.

Power
10 W max.

Working temperature
-25÷55°C.

Stock temperature
-40÷65°C.

Relative humidity
0÷95% without condensation.

Housing's material
Anodised aluminium alloy.

Environmental protection
IP66.

ATEX conformity
For category II 2 G protection mode Ex IIB T6- EC type examination certificate: INERIS 08ATEX0028.

Cable entries (standard)
From the bottom, 2 holes ½" NPT.

Cable clamps
In the bottom side, spring terminals for wires 1,5mmq max.

Mounting facilities
N° 6 screwed holes M6x10 on the back and lateral sides for wall or bracket mounting.

Equipped with silent block supports.

Dimensions /Weight
388x148x49mm / 5 Kg.

Contact Liquip for further technical information.

Ordering Information

- **LFD-6:** Remote Digital Display



In-line Strainers

Liquip offers a range of lightweight in-line strainers that are typically mounted on prime movers or in mobile pumping systems to protect downstream equipment from debris and foreign objects.

Features & Benefits

- Protects down stream equipment such as meters and pumps from debris and foreign objects.
- Lightweight inexpensive aluminium suction line strainer.
- Available with a variety of filter mesh sizes to suit various applications.
- Durable cast aluminium design.
- Low pressure drop.
- 100mm (4") TTMA flanged for easy installation.
- Easy cleaning via access through a quick release lid.

Technical Information

Maximum vacuum

90 kPa.

Maximum working pressure

700 kPa.

Mounting

Strainer basket can only be fitted for correct direction of flow via 4" TTMA flanges.

Seals

Nitrilie Seal.

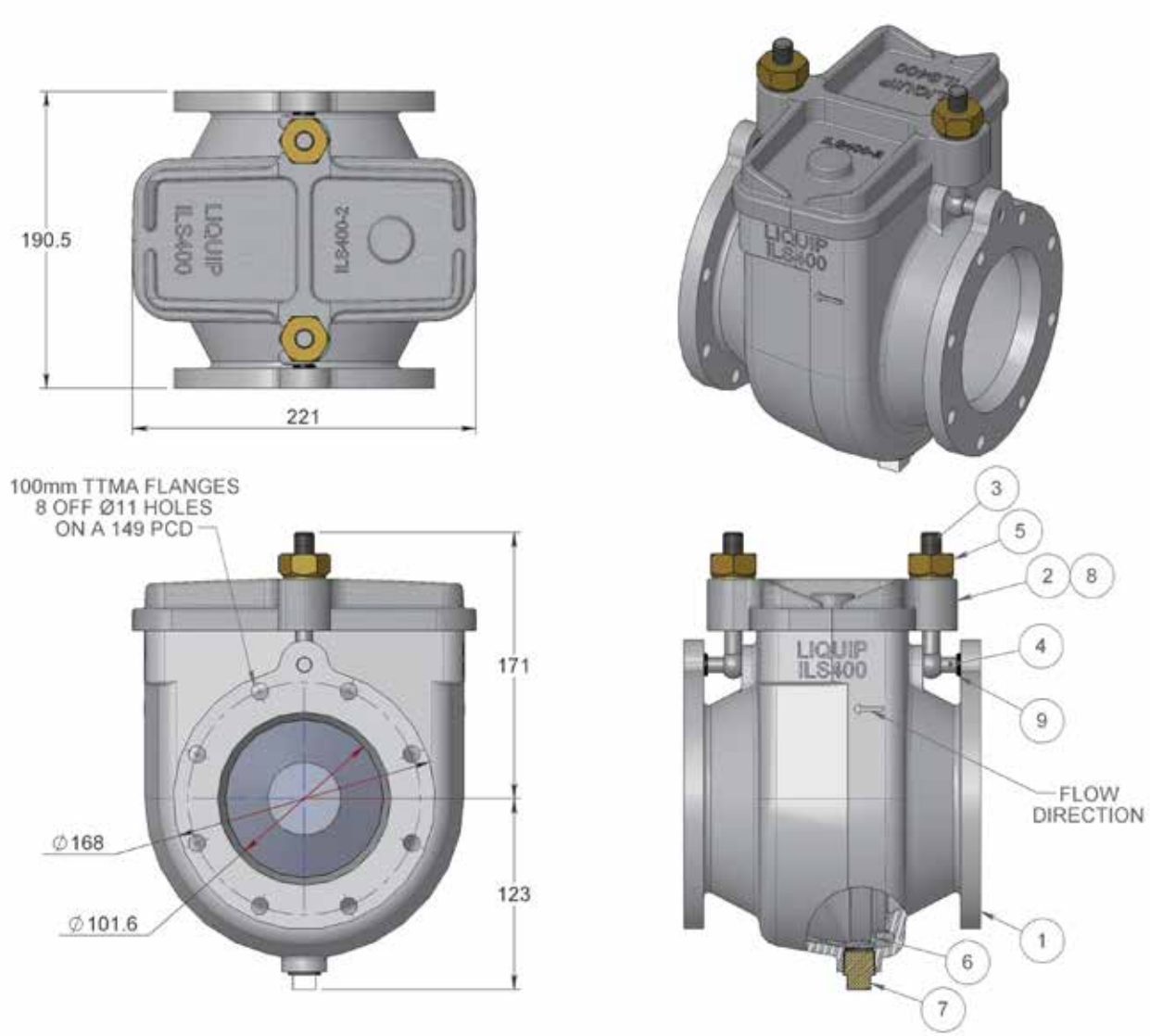
Ordering Information

- **ILS400:** Aluminium In-Line Strainer 4" TTMA flange both end with quick release lid for easy cleaning.
- **ILS400TPA:** Aluminium In-Line Strainer 4" TTMA flange both end with quick release lid for easy cleaning with 1/4" NPT boss.
- **ILS2V20Z:** 3” sightglass strainer kit c/w ILS2V20-1 adaptor flange, strainer basket and fasteners.
- **ILS2.5Z:** 4” sightglass strainer kit c/w BF4-V25-A adaptor flange, MC3-V4A camlock, strainer basket and fasteners.

Associated Equipment

- **ILS400-3:** Aluminium strainer basket, zinc plated finish, no mesh.
- **ILS400-3-80P:**Aluminium strainer basket, stainless steel finish, 80 mesh.
- **ILS400-3-200P:**Aluminium strainer basket, stainless steel finish, 200 mesh.
- **ILS400-3-350P:**Aluminium strainer basket, stainless steel finish, 250 mesh.
- **ILS400-3-40S:**Aluminium strainer basket, stainless steel finish, 40 mesh typically ARMY spec).
- **LBV450VG:** Aluminium 4" Butterfly Valve.
- **BF4-SG-40:** 4" TTMA sightglass (40 mm thick).
- **BF4-SG-25:** 4" TTMA sightglass (25 mm thick).

ILS400 INLINE STRAINER ASSEMBLY



ITEM	PART No	DESCRIPTION	ILS400	ILS401MIL	MATERIAL
1	ILS400-1	IN-LINE STRAINER BODY	1	1	ALUMINIUM
2	ILS400-2	IN-LINE STRAINER LID	1	-	ALUMINIUM
	ILS400-2T	IN-LINE STRAINER LID	-	1	ALUMINIUM
3	ILS400-4	EYE BOLT	2	2	MILD STEEL
4	ILS400-5	PIN HINGE	2	2	Z/P M/S
5	ILS400-6	BRASS HEX NUT	2	-	BRASS
	SH301-4	TEE HANDLE FOR SWING HATCHES	-	2	SG IRON
6	ILS400-3	STRAINER 1mm THICK 2mm HOLES	1	-	ALUM/STEEL
	ILS400-3S	STRAINER 0.9 THICK 2.06mm HOLES	-	1	ALUM/ST/ST
7	0614	PLUG 1/2" BSP	1	1	Z/P STEEL
8	2344	LID SEAL	1	1	NITRILE
9	0194	O-RING	2	2	NITRILE



32mm Aluminium Swivel

The SJ032 is an aluminium swivel incorporating a 32mm hosetail and integral check valve to retain residual hose internal pressure (mandatory under NSC Regulations).

Features & Benefits

- Ball bearings allow for trouble free rotation, thus eliminating thrust & hose kinking.
- Swivel body is manufactured from lightweight aluminium, anodised for long life.
- Swivel incorporates a check valve, to retain residual pressure in the hose. (Mandatory under NSC regulations).
- Can be mounted via hose tail or threaded end.

Technical Information

Pressure

Poppet opens at 55 kPa.

Mounting

- 1 ¼" tapered male BSP thread.
- 1 ¼" hose tail.

NOTE: Ensure sufficient flow area between poppet and bore of female body when assembled.

Materials

- Anodised aluminium body.
- Aluminium poppet.
- Steel ball bearings.
- Viton™sealing O-ring.

Weight

0.38 kg.

Ordering Information

- **SJ032:** Swivel 32mm (1 ¼") with hold back valve and ball bearings.

Associated Equipment

- **SJ1.5L:** Swivel 1½" straight swivel c/w hold back valve.

SJ032 SWIVEL JOINT



ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	SJ032-1	BODY OUTER HOSE TAIL	1	ALUMINIUM
2	SJ032-2	BODY INNER 1-¼" MBSPT	1	ALUMINIUM
3	1031	BALL BEARING	22	ST STEEL
4	7535	O-RING	1	VITON A
5	0142	O-RING	1	NITRILE
6	0117	O-RING	1	VITON A
7	SJ1.25-3	POPPET	1	ALUMINIUM
8	SJ1.25-4	SPINDLE	1	STEEL
9	0099	WASHER FLAT	1	ZP STEEL
10	0153	NUT NYLOC	1	Z/P STEEL
11	6113	SPRING	1	SPRING STEEL
12	3246	PLUG TAPERED	1	BRASS



38mm Aluminium Threaded Swivel

The SJ1.5L is an aluminium swivel incorporating a 38mm threaded mount and integral check valve to retain residual hose internal pressure (mandatory under NSC Regulations).

Features & Benefits

- Ball bearings allow for trouble free rotation, thus eliminating thrust & hose kinking.
- Swivel body is manufactured from lightweight aluminium, anodised for long life.
- Swivel incorporates a check valve, to retain residual pressure in the hose. (Mandatory under NSC regulations).
- Can be mounted via hose tail or threaded end.

Technical Information

Pressure

Poppet opens at 65kPa.

Mounting

- 1½" tapered male BSP thread (outlet).
- 1 ½" parallel female BSP thread (inlet).

Materials

- Anodised aluminium body.
- Acetal poppet.
- Steel ball bearings.
- Viton™sealing O-ring.
- Stainless Steel fasteners.

Weight

0.55 kg.

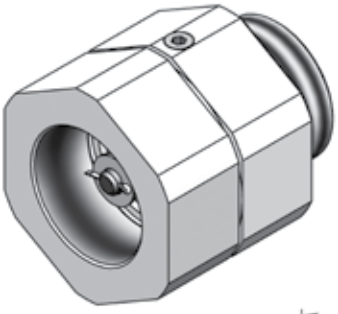
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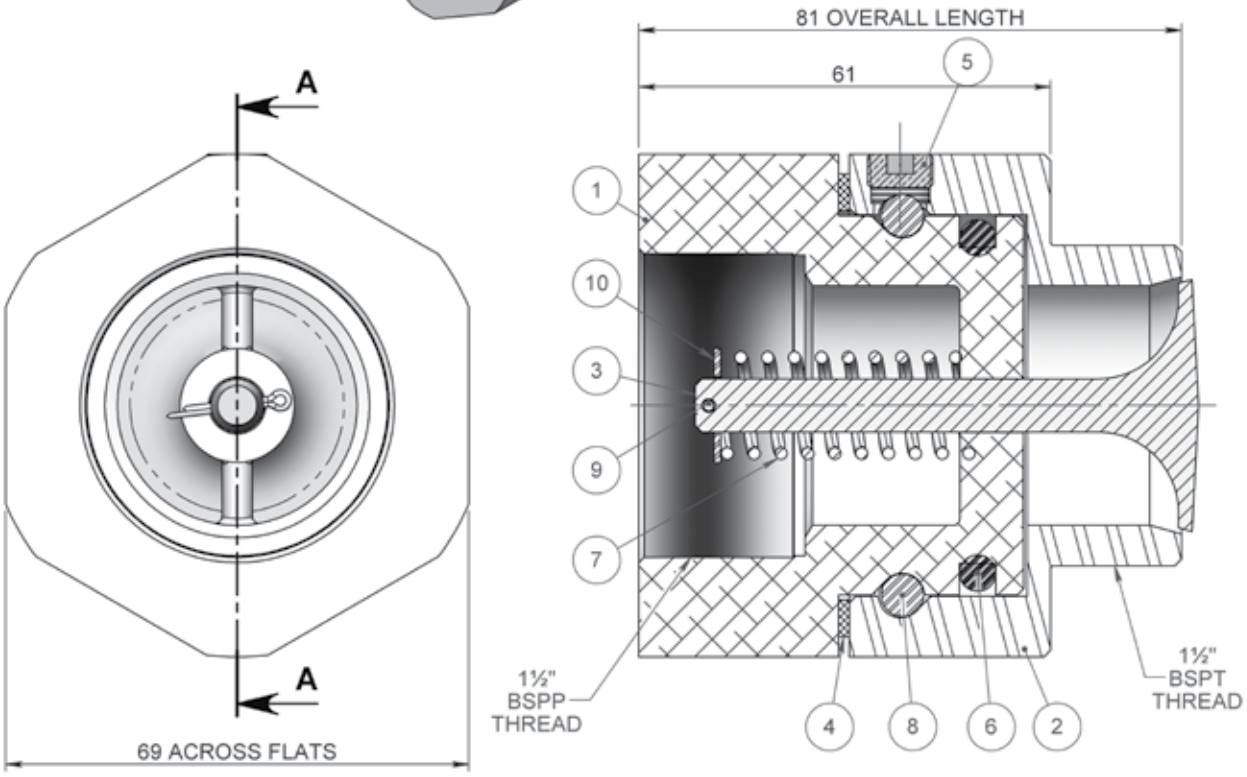
- **SJ1.5L:** Swivel 1½" straight swivel c/w hold back valve.

Associated Equipment

- **SJ032:** Swivel 32mm (1 ¼") with hold back valve and ball bearings.

SJ1.5L SWIVEL JOINT





ITEM	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
11	7815	GREASE MOLYKOTE (AVIATION)	1	GREASE
10	6620	WASHER FLAT	1	ST STEEL
9	0756	SPLIT PIN	1	ST STEEL
8	1031	BALL BEARING	28	ST STEEL
7	4404	COMPRESSION SPRING	1	ST STEEL
6	4506	O RING	1	VITON
5	3246	PLUG	1	BRASS
4	6084	SEAL RING SOLID	1	TEFLON
3	SJ1.5L-3	POPPET	1	ACETAL
2	SJ1.5L-2	SWIVEL BODY MALE	1	ALUMINIUM
1	SJ1.5L-1	SWIVEL BODY FEMALE	1	ALUMINIUM



i-Meter Fuel Tracking System

The i-Meter GPS truck tracking system allows you to monitor fuel deliveries online and in real time.

The i-Meter system is a plug and play devices that connects to your Liquip electronic register or combined register and Diptronic level gauge CPU and instantly records and reports all tanker flow and product level activities on a 24/7 cloud based system.

The i-Meter will report each delivery detail to HQ within 30 seconds of completion, giving you complete transparency and accuracy of all stock movements in real-time.

Features & Benefits

- No contracts or software installation thanks to a 24/7 cloud based dashboard.
- Real time GPS tracking of the Stock and the Vehicle using GPS coordinate on Google Maps.
- A range of built in reports available.
- Ability to set Geo fences to know when a truck enters or leaves a set area/location.
- Easy to install and can be set up in a couple of hours.
- Reports tanker route and delivery activity, product type, flow quantity, time and date in a secure web based dashboard in HQ.
- Low up front & monthly costs.
- Delivery information is displayed in E-ticket format. This information, helps to eliminate fraud as any stock discrepancies can be easily identified.
- i-Meter uses mobile data. If the device goes into a bad cellular signal area, the i-Meter will capture the satellite GPS co-ordinates & time stamp them. Once the device comes back online, it will send up all the stored GPS co-ordinates so you can always see where the vehicle has been.



DFV Register



24/7 Cloud based dashboard



i-Meter Tracker



Truck Mounted Dispenser Systems

Liquip manufacture a range of pre-tested permanent and de-mountable dispensing systems for dispensing of hazardous fluids. These self contained dispensing units minimise build time and change over time through their unique modular construction and "plug and play" approach.

Units typically include: Inlet strainer and sightglass, hydraulically driven high flow vane pump, high and low flow switch, positive displacement meter with electronic register, air eliminator and strainer, non return valve, hosereel, hose, swivel and nozzle assembly.

Technical Information

- Meets Weights & Measures regulations (Aus).
- Fully NSC approved.
- Flow rates of up to 340 LPM through the nozzle.
- Flow rate of up to 500 LPM (unmetered bypass).
- Typical weight: 250kg.
- Typical size: 650mm x 650mm x 1150 long.

Options

- Hydraulic, electric or hand rewind hosereel.
- Electronic or mechanical register.
- Preset registers or bulk unmetered by-pass.

Ordering Information

Please contact your local Liquip representative for specifications and custom requests.



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OPW®

A DOVER® COMPANY



LIQUIP'S SMART FUELLING VEHICLE IDENTIFICATION

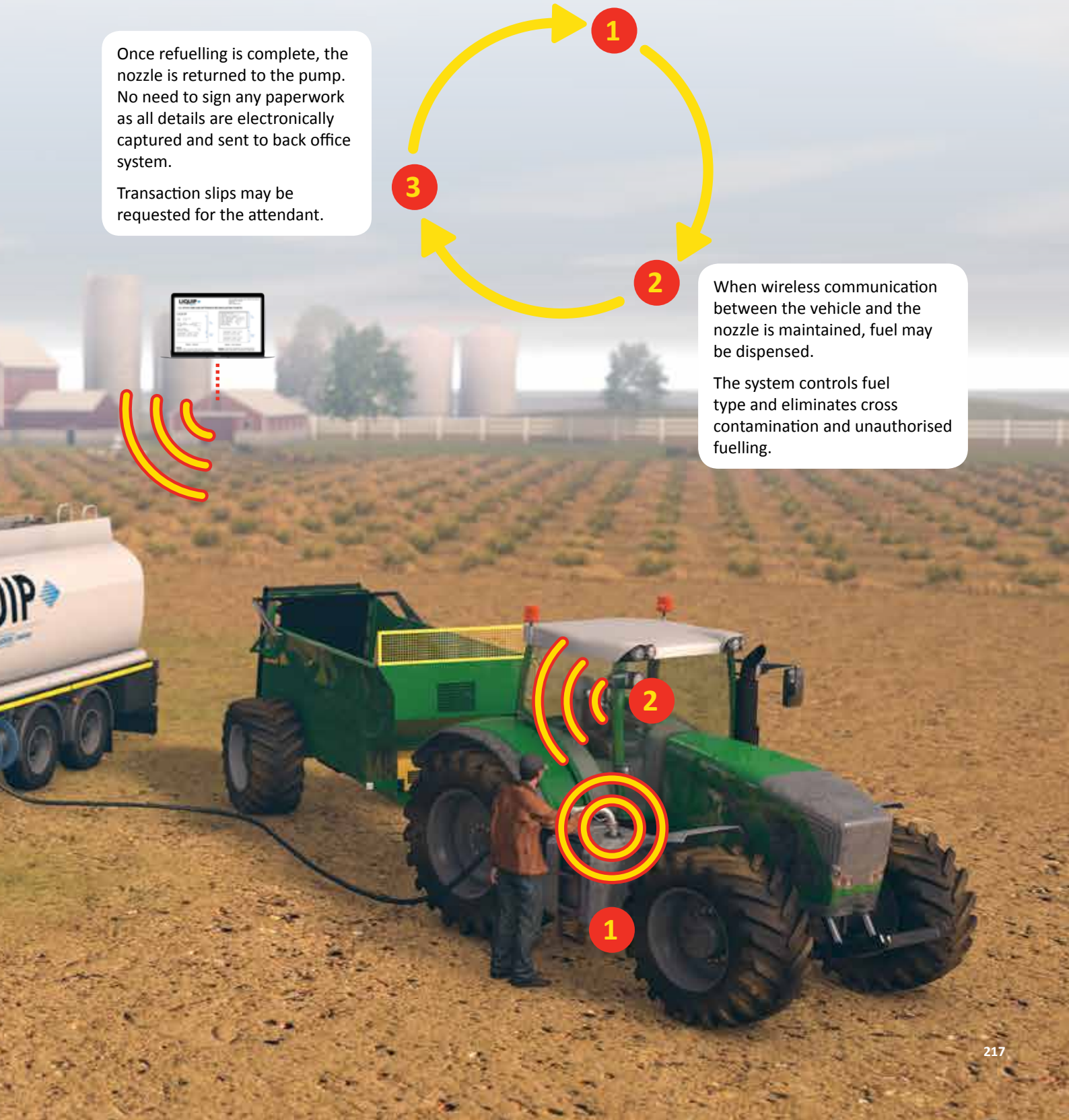
Liquip's automatic vehicle identification (AVI) solutions are designed to help reduce fraud and overcome many of the limitations inherent in traditional data input technology.



Nozzle is inserted in the fuel tank. Vehicle Tag details are checked by the Fuel POS or DiaLOG device.

Once refuelling is complete, the nozzle is returned to the pump. No need to sign any paperwork as all details are electronically captured and sent to back office system.

Transaction slips may be requested for the attendant.



When wireless communication between the vehicle and the nozzle is maintained, fuel may be dispensed.

The system controls fuel type and eliminates cross contamination and unauthorised fuelling.

BULK FLUID HANDLING SOLUTIONS



Tank Truck Equipment 1 → 2 Unload and Loading Arms

↓

Automatic Tank Gauging 4 ← 3 Storage Tank Solutions

↓

Overfill Protection 5 → 6 Vehicle Refuelling



LIQUIP

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Loading Arms

- Bottom Loading Arms
- Top Loading Arms
- Vapour Recovery Arms
- Other Applications



Balance Mechanisms

- LBM800 Loading Balance Mechanisms
- Velvet Touch MK3



Swivels

- VNS-A4 Straight Swivels
- VNC-A4VG Coupler Swivels
- VNI-A4VG Intermediate Swivels
- Single Plane Flange Swivels
- Weld on Swivels



Isolating Valves

- CVS120 Holdback Valves
- LBV Series Butterfly Valves



Loading Equipment

- APIDP100 API Drain Plugs
- ILS400 Strainers
- Sightglasses



Parking Adaptors

- PA800 API Parking Adaptors
- SPS100 Top Loading Arm Parking Adaptors
- VCFPA Vapour Coupler Parking Adaptors



Loading Couplers

- LYNX API Couplers
- VCF500 Vapour Couplers
- VCF075W Vapour Couplers
- APIRC Drybreak Couplers



Terminal / Depot Overview

Overfill Protection Monitors

- RM140 Series Multi Channel Overfill Monitors
- PD500 Series Single Channel Overfill Monitors



Monitor Accessories

- GP100 Series Gantry Plug Assemblies
- JB100 Junction Boxes
- TPA4 Gantry Plug Parking Adaptors
- HTA Series Portable Testers



Electronic Registers

- DFV Series Electronic Registers



Spools and Hoses

- Pipe Spools
- Coupler Spools
- Drop Hoses
- Drop Hose Covers

Other Accessories

- VB100 Vacuum Breakers
- SD100 T-Deflectors
- DB100 Drip Buckets
- Proximity Sensor Holders

Overfill Protection Accessories

- SMS102 Top Load Overfill Sensor Assemblies
- Overfill Protection Sensors



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Loading Arms



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Loading Arms

For over 45 years Liquip has manufactured loading arms for a wide range of liquid transfer applications.

Our loading arms are built to meet your unique applications and specifications. Nearly any application currently using a hose is a potential custom loading arm application.

With an already extensive range, we are able to respond quickly to specific and specialised requests.

Using our specialised gas strut design that Liquip is renowned for, we can tailor design an arm to suit your operational requirements.

Please contact Liquip if you have any questions or enquiries regarding your application.

Applications using Liquip loading arms include:

- *Standard Bottom loading.*
- *Standard Top loading.*
- *Liquid sugar syrup loading of rail cars.*
- *Waste water unloading of rail cars.*
- *Rail car locomotive refuelling.*
- *Mine service vehicle loading.*
- *Aviation refuellller loading.*
- *Fuel barge loading and unloading.*
- *Marine loading.*
- *LPG Loading.*

Technical Information

Thermal Relief

Over pressuring of the loading arm can be caused by thermal expansion of the product contained in the loading arm pipe work, i.e. the temperature of the static product within the loading arm is higher than the ambient temperature. This is caused as a result of the sun heating the pipes and product; as the temperature rises so to does the pressure within the loading arm. This increase in pressure, if severe enough can cause seals and gaskets to rupture and can damaged couplers. Therefore, the recommended working pressure of most loading arms is 517 kPa (75 PSI) as per API RP 1004.

Note: Liquip arms are designed for pressures higher that this.

Fuel Velocity

Loading rates differ between installations. It is always advantageous to maximise loading flow rates in order to minimise loading time. While maximising fuel rates Liquip ensures that the fuel velocity at any flow rate, does not exceed the maximum safe flow rate typically 2,500 LPM (660 GPM) for 4" pipe.

Excessive velocity increases the generation of dangerous static electricity and should be considered. It may be wiser to increase the size of the loading arm to achieve the same flow rate, thereby minimising static generation.

Chemical Compatibility

Liquip loading arms are available in a range of materials and with seals to suit various chemicals and liquids.

Liquip reference industry standard chemical compatibility charts when deciding compatibility of materials and physically test product compatibility with seal and gasket material.

If in doubt, consult Liquip and if available provide your recommendations and material safety datasheet for specific products.

General Information

To ensure each loading arm that leaves our factory operates to its maximum potential, Liquip requests that the dimensional details and designs of each installation be checked by our design department. Design survey sheets are available from Liquip and Liquip distributors.

The following is the information needed to recommend an arm to suit your requirements:

- Top loading or Bottom loading Top - long reach or pantograph Bottom - overhead or low profile.
- Left hand or right hand mechanism.
- Product to be conveyed.
- Temperature of the product to be conveyed.
- Flow rate required.
- Preferred diameter.
- Material of construction.
- Operating pressure.
- Operating temperature.
- Maximum temperature.
- Mounting connection.
- Coupler or other connection.



Ordering Information

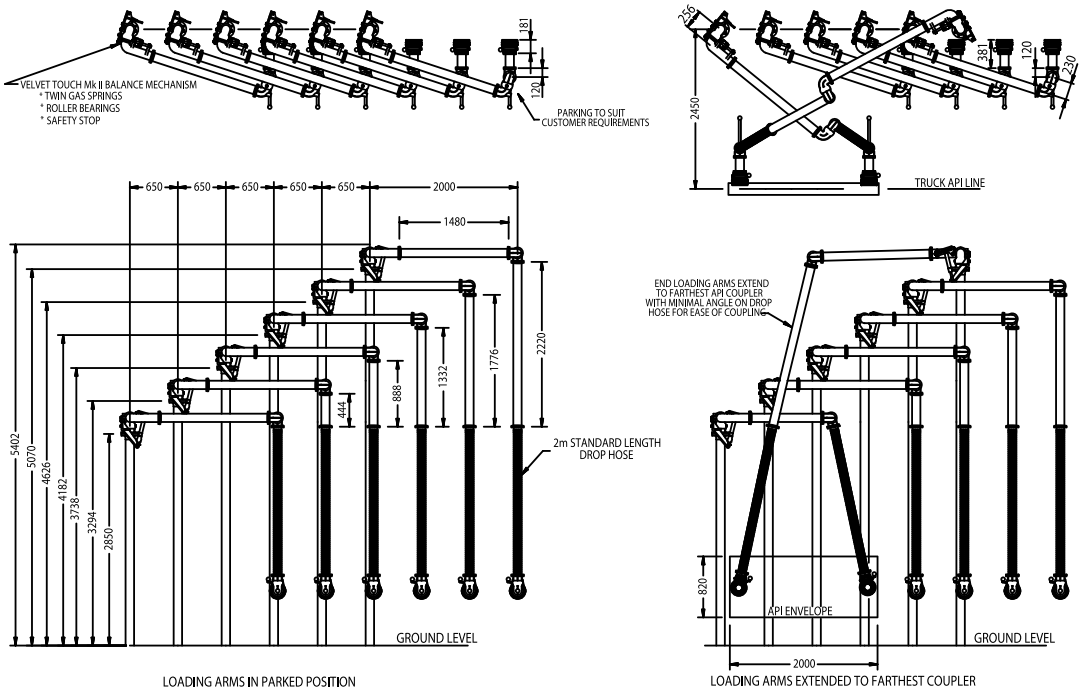
To ensure each loading arm that leaves our factory operates to its maximum potential, Liquip requests that the dimensional details and designs of each installation be checked by our design department. If your requirements are beyond the scope of this catalogue, contact us. Design survey sheets are available from Liquip and Liquip distributors.

The following is the information needed to recommend an arm to suit your requirements:

1. Top loading or bottom loading
   Top - long reach or pantograph
   Bottom- overhead or low profile
2. Top feed or bottom feed (liquid is supplied from above or below)
3. Left hand or right hand mechanism
4. Product to be conveyed
5. Temperature of the product to be conveyed
6. Flow rate required
7. Preferred diameter
8. Material of construction
9. Operating pressure
10. Operating temperature
11. Maximum temperature
12. Mounting connection
13. Coupler or other connection

To help maximise the productivity of your loading arms and thus provide the best value for money, it is important that Liquip be consulted early in the planning stage of the bulk liquid terminal or loading rack. The loading arm is the last component of an expensive supply chain so it is important not to compromise this important asset.

The next two pages contain The Bottom Loading Bay Design Survey Sheet and Top Loading Bay Design Survey Sheet. Which can be completed to order your loading arm. If your application requires an alternate method of loading, please contact Liquip for further details.



Bottom Loading Bay Design Survey Sheet

Project: _____ Date: _____

Location (city, state, zip): _____

Company: _____ Terminal: _____

Bay: _____ Surveyed By: _____

Arms Orientation: ☐ Right Hand ☐ Left Hand Product Loaded: _____

Flow Rate: _____ Pressure: _____

COMMENTS:

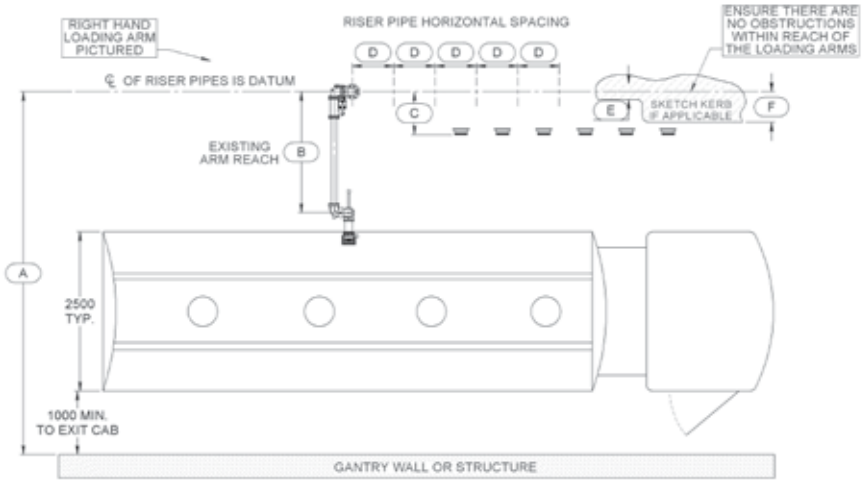
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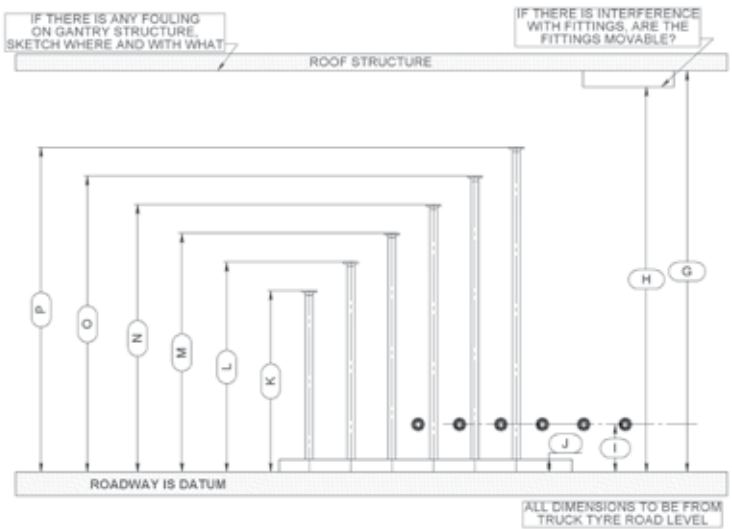
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DIMENSIONS:

A _____

B _____

C _____

D _____

E _____

F _____

G _____

H _____

I _____

J _____

K _____

L _____

M _____

N _____

O _____

P _____

Top Loading Bay Design Survey Sheet

Project: _____ Date: _____

Location (city, state, zip): _____

Company: _____ Terminal: _____

Bay: _____ Surveyed By: _____

Number of Arms: _____ Pipe Size: _____

Arms Orientation: ☐ Right Hand ☐ Left Hand Product Loaded: _____

Flow Rate: _____ Pressure: _____

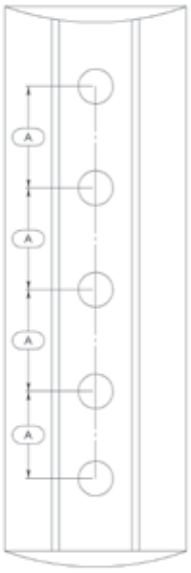
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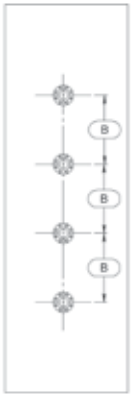
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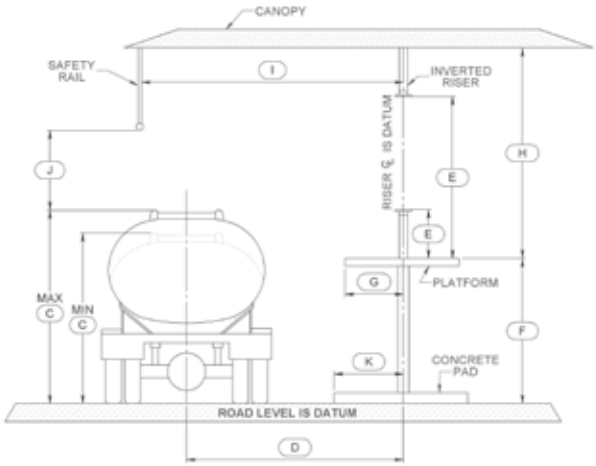
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DIMENSIONS:

A - Fill Centres _____

B - Riser Centres _____

C - Truck Height (max) _____ (min) _____

D - Truck Centre to Riser Centre _____

E - Riser Height _____ Inverted _____

F - Platform Height _____

G - Riser to Platform Edge _____

H - Platform to Canopy _____

I - Riser to Safety Rail _____

J - Safety Rail to Truck (highest) _____

K - Riser to Edge of Concrete _____

Riser Flange Size and Spec _____

Loading Valve? ☐ Yes ☐ No Inboard / Outboard

Vapour Recovery Required? ☐ Yes ☐ No

All arms to reach all fill points? ☐ Yes ☐ No

Both sides of platform? ☐ Yes ☐ No

Loading spear parking required? ☐ Yes ☐ No

Overfill protection required? ☐ Yes ☐ No

Outlet: ☐ Diffuser ☐ 45° Mitre ☐ Other



Overhead Arms

A new benchmark has been set for all bottom load arms through Liquip's "bulletproof" overhead loading arms which provide effortless loading combined with safety, long service life and minimal maintenance.

Liquip's 4" overhead bottom loading arms are capable of loading at flow rates of up to 2,500 litres per minute and are designed to enable complete cross-over within the API envelope of up to 6 arms in a single bay.

In regions where regulations permit, it is common to load using 3 or 4 arms at a time.

Liquip's overhead bottom loading arms are fitted with a 2 metre standard length drop hose and varying loading arm heights are accommodated with aluminium or steel drop spools.

Standard length drop hoses enable easier changeover and reduced spare parts inventory for the operating company.

Liquip can also supply loading arm couplers that provide the connection between the tanker and loading arm that are compliant with API RP 1004.

Features & Benefits

- Easy to install loading arms on site.
- Quick loading at flow rates of up to 2,500 LPM.
- Allows for cross over of multiple arms and simultaneous loading of compartments.
- Easily manoeuvour load arm within the API envelope.
- Superior safety through the use of Liquip's unique balance assembly swivel design.
- Simple and safe to adjust & replace.
- Can be supplied to suit a range of products including various chemicals and aviation fuell.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Counter balance type
Single or Dual gas struts.

Range of motion
Horizontal 360°, Vertical +15° to-15°.

Mounting connections
4" Class 150 ANSI RF flange.

Temperature limits
-28°C to +90°C (-18°F to +200°F) - GFLT seals.

Working Pressure
1,000 kPa.

Test Pressure
1,500 kPa.

Maximum coupling pressure
517 kPa working.

Primary seal materials
Viton™ B70 or GFLT.

Dust seal material
Buna Nitrile or HAN.

Gasket material
Klingerite or Viton™ A.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

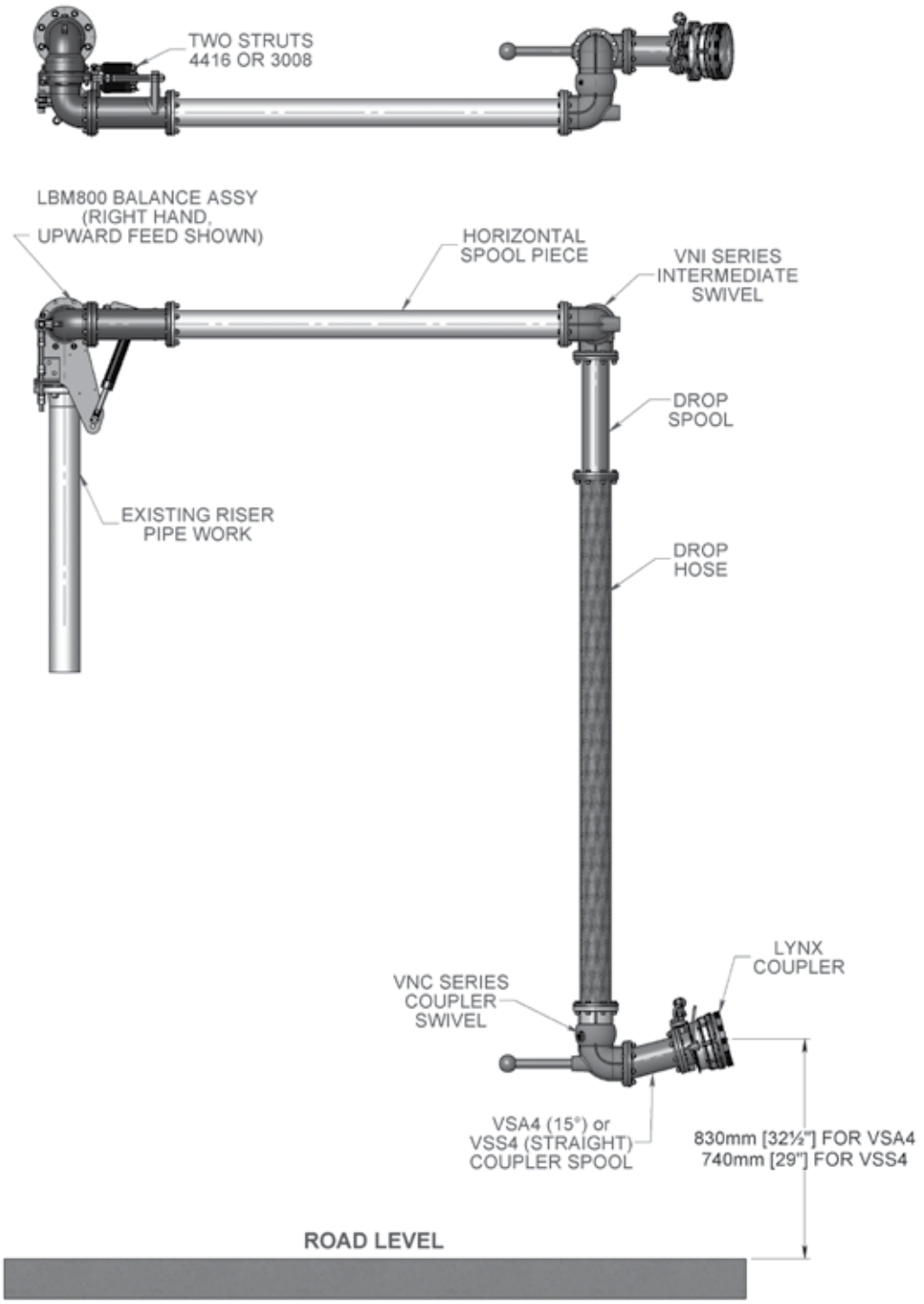


Associated Equipment

Overhead loading components

- Balance Assembly
- Gas Struts e.g 4416 or 3008
- Straight Swivels
- Intermediate Swivels
- Coupler Swivels
- API couplers - LYNX Series
- Drop hoses & covers
- Butterfly Valves
- Sightglasses
- Spools
- Riser Pipes

TYPICAL OVERHEAD BOTTOM LOADING SETUP





A-Frame Load Arms

A-Frame loading arms by Liquip provide superb flexibility and long reach bottom loading combined with an easy to use and comfortable design.

A-Frame loading arms park near the vertical for convenient storage and allow the arms to be used on either side of the loading island.

Features & Benefits

- Preferred where space limitations exist in the loading rack.
- Compact design allows A-frame arms to be mounted next to one another and can achieve arm cross-over for simultaneous compartment loading.
- A-frame arms can easily service both sides of the loading arm bay.
- Allows for easy handling of the loading arm and can easily fit the standard API envelope.
- Easy to adjust design for elevation/tilting during loading or unloading.
- Custom designs are available to suit individual loading applications and configurations.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Product Compatibility

Typical products handled by Low Profile arms include: Diesel, Jet Fuell. Petrol and various chemicals etc.

Sealing

A range of sealing options are available including: Viton™, Teflon™ and FFKM.

Materials

A-frame arms are available in aluminium, mild steel and stainless steel.

Pipe Size

4" (other sizes available on request).

Standard range of motion

Standard range of motion to suit the API envelope.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the Liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

A-Frame loading components

- Primary arm with base swivel.
- Balance assembly.
- Gas struts.
- Intermediate swivel.
- Drop spool/Drop hose.
- Double plane, coupler swivel assembly.
- Coupler spool.
- API dry break couplers.
- Butterfly valves.
- Sightglasses.



Low Profile Loading and Unloading Arms

Low profile loading arms can be used for gravity or pumped discharge of road and rail tankers, as well as for bottom loading.

Low profile arms can load at flow rates of up to 2,500 litres per minute and are popular for large single compartment tanker loading and unloading such as railcars and aviation bridging tankers.

Liquip can supply loading arm couplers that provide the connection between the tanker and loading arm that are compliant with API RP 1004.

Features & Benefits

- Easy to operate/manoeuver.
- Reduce trip hazardous by eliminating the need for hose on the ground.
- Ideal for where there are space limitations overhead.
- Can be used in sites without a gantry structure in place.
- Available in a self draining design.
- Quick loading at flow rates of up to 2,500 LPM.
- Compact storage.
- Provides flexible long range movement.
- Suitable for gravity or pumped discharge of road and rail tankers, as well as for bottom loading.
- Available in a range of materials to suit various fluid transfer applications.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Lengths

Low Profile arms can be built in lengths of up to 5 metres.

Product Compatibility

Typical products handled by Low Profile arms include: Diesel, Jet Fuell. Petrol and various chemicals etc.

Sealing

A range of sealing options are available including: Viton™, Teflon™ and FFKM.

Materials

Low Profile arms are available in aluminium, mild steel and stainless steel.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

Low Profile loading components

- Primary Arm with base swivel.
- Balance Assembly.
- Gas Struts.
- Secondary Arm.
- Double plane, coupler swivel assembly.
- Multiple Couplers Options.
- Butterfly Valves.
- Sightglasses.





Long Reach Arms

Top loading provides an efficient and cost effective way to load and unload in many situations and is still a prominent method of loading throughout many different countries.

Liquip's long reach top loading arms can load both sides of the gantry and can reach all compartments on a typical road tanker without the need to move the tanker.

***Note:** a special high load base swivel may be required for longer 'wet' arms.*

Features & Benefits

- Unique design allows for loading both sides of the gantry.
- Long reach top loading arms allow for full cross-over capability and a horizontal reach of up to 5,500mm.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Configuration

Up to 4 arms per bay (5 or 6 arm bays are possible, but consult Liquip for details).

Flow Rates

Typical flow rates are up to 1,500 LPM.

Horizontal reach

Up to 5,500mm.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

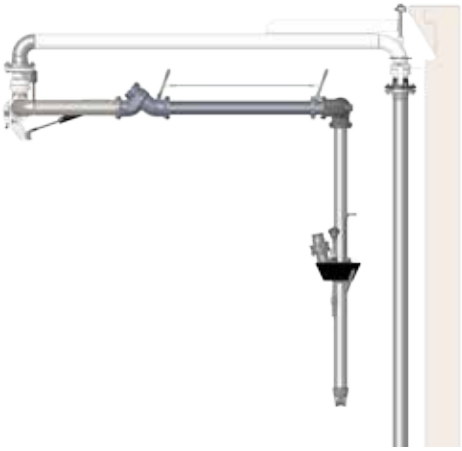
Associated Equipment

Long Reach loading components

- Primary arm with base swivel.
- Balance Assembly.
- Gas Struts.
- Secondary arm.
- Intermediate Swivels.
- Drop spear.

Options

- Remote handle.
- Position indicating brackets.
- Rotation limiter.
- Diffuser.
- Vapour cone.
- Spear mounted overfill protection sensor.
- Up/down stops.
- Butterfly Valves.
- Sightglasses.
- Spools.
- Riser Pipes.





Pantograph Loading Arms

Pantograph top loading arms are a very commonly used style of top load arm all around the world.

Liquip specialise in offering balanced pantograph arms for superior strength and stability. Pantograph arms are a simple and affordable design for medium duty applications.

Features & Benefits

- Long reach arms for ease of loading.
- Unique design allows for high flow rates to be achieved.
- Easily access a single sided loading bay.
- Vacuum breakers are available to assist drainage of the loading arm.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Configuration

Up to 4 arms per bay (5 or 6 arm bays are possible, but consult Liquip for details).

Flow Rates

Typical flow rates are up to 1,500 LPM.

Horizontal reach

Up to 2,600mm (longer horizontal reach is possible but dependent on design). Contact Liquip for assistance.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the Liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

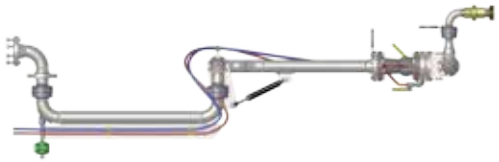
Pantograph loading components

- Balance Assembly.
- Gas Struts.
- Loading Valve.
- Intermediate Swivels.
- Remote handle.
- Spools.
- Drop spear.

Options

- Position indicating brackets.
- Rotation limiter.
- Diffuser.
- Spear mounted overfill protection sensor.
- Up/down stops.
- Butterfly Valves.
- Sightglasses.
- Riser Pipes.





LPG Loading Arms

Liquip offers a custom designed low profile loading arm for LPG (Liquefied petroleum gas).

The highly advanced 3" Liquip LPG loading arm is designed to provide efficient loading with an emphasis on occupational healthy and safety.

Features & Benefits

- High pressure swivels enable loading up to 120m3/hr.
- LPG arms fold away for safe compact storage.
- Electronic interlocks ensure the arm is disconnected and stowed.
- Replaces the need for heavy and hard to handle liquid loading hoses.
- Remote draining valve to empty final pipe section of liquid before disconnection.
- Parallelogram linkage to hold outboard pipe section horizontal at all times.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Materials

- All pipework & flanges are ASTM Standard for high-pressure use.
- Swivel bearing surfaces are nitrided for hardness & seals are Teflon™.
- Gaskets spiral wound metal.

Mounting

- Inlet flange 80mm diameter ANSI 300 raised face flange.
- Optional free-standing mounting pillar available, rated to moment of 500kg.m.
- Optional parking stand with proximity sensor also available.

Typical weight

Approx 150kg.

Drive away protection

Double acting stainless steel emergency release dry-break coupling to protect against accidental drive-away of tanker with arm still attached.

Process Data

- Designed for LPG from 0.5 to 0.6 s.g., 0.11cP viscosity, 2,000 litres/minute.
- Design pressure 2,400 kPa, test pressure 3,600 kPa.
- Design temperature +60°C to –30°C.
- Normal working conditions 1,200 kPa max pressure and 0°C to 40°C temperature range.

Ordering Information

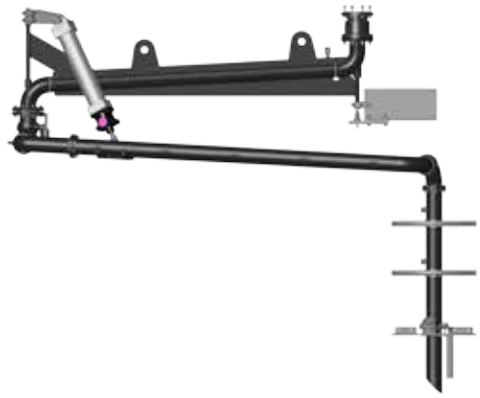
Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

Low Profile loading components

- Primary arm with base swivel.
- Balance assembly.
- Gas struts
- Secondary arm.
- Double plane, coupler swivel assembly.
- Multiple couplers options.
- Butterfly valves.



Bitumen Arms

Liquip manufactures loading arms for a wide range of liquid transfer applications. Bitumen top loading arms are amongst the most common loading arms that Liquip designs and builds.

Bitumen loading arms can be designed to meet your applications whilst providing increased efficiency and superior operator safety.

Features & Benefits

- Removes the need to have hoses full of product on the terminal floor.
- High temperature bearing grease and paint ensures longevity of each load arm.
- Arms are designed so that heat tracing of the arm can be easily installed on site.
- Allows for fast, safe and efficient bitumen loading.
- Constructed with a heavy duty base swivel to support heavy loads.

Technical Information

Materials

All steel construction for temperature compatibility.

Seals

- Viton™ seals supplied as standard.

Temperature Range

Wide range of temperatures available. Contact Liquip for further details.

Ordering Information

Loading arm survey forms are available for users to fill out. Survey forms detail all technical requirements for your loading arm needs. These forms can be downloaded once you login to the liquip website.

Alternatively, you can contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

Bitumen loading components

- Primary arm with base swivel and thrust bearing support.
- Balance assembly with pneumatic actuator.
- Secondary spool.
- Intermediate swivel.
- Drop spear drop hose.

Options

Vapour plates.



Vapour Recovery Arms

The Liquip Vapour Recovery Arm provides a safe and efficient method of vapour collection during loading.

Vapour recovery arms are fitted with a low pressure drop vapour coupler which allows for vapour recovery during multiple compartment loading.

With the variations in transports that exist today, it's important to partner with a company that has the experience, the technologies and the breadth of product to meet any application. Liquip has you covered for all our vapour recovery needs.

Features & Benefits

- A safe, fast and cleaner method for vapour recovery.
- Removes the potential safety risk of vapour hoses on loading bay floors.
- Eliminates the need for costly hoses replacements.
- Vapour loading arms are available in all bottom loading configurations.
- Uses Liquip's unique gas strut "Velvet Touch" technology.

Technical Information

Counter balance type
Single or Dual gas struts.

Range of motion
Horizontal 360°, Vertical +15° to-15°.

Mounting connections
4" Class 150 ANSI RF flange.

Pressure Ratings
- **Working Pressure:** 1,000 kPa,(not including coupler).
- **Test Pressure:** 1,500 kPa (not including coupler).
- **Maximum coupling pressure:** 500 kPa working.

Temperature limits
-30°C to + 60°C.

Primary seal materials
Viton™ B70 or GFLT.

Dust seal material
Buna Nitrile or HAN.

Gasket material
Klingersil or Viton™ A.

Ordering Information

Contact Liquip to receive a loading arm survey form and discuss any specific requirements you may have.

Associated Equipment

Vapour recovery loading components

- Balance assembly.
- Gas struts.
- Straight swivels.
- Intermediate swivels.
- Coupler swivels.
- Vapour couplers.
- Drop hoses & covers.
- Butterfly valves.
- Sightglasses.
- Spools.
- Riser pipes.
- Parking adaptor e.g. VCFPA.





Custom Loading Arms

Liquip manufactures custom loading arms for a wide range of liquid transfer applications. Nearly any application currently using a hose is a potential custom loading arm application.

Our custom loading arms are built to meet your unique applications and specifications.

With an already extensive range, we are able to respond quickly to specific and specialised requests.

Using our specialised gas strut design that Liquip is renowned for, we can tailor design an arm to suit your operational requirements.

Please contact Liquip if you have any questions or enquiries regarding your application.

Aside from standard loading arm applications, some of the applications using Liquip loading arms include:

- *Liquid sugar syrup loading of rail cars.*
- *Waste water unloading of rail cars.*
- *Rail car locomotive refuelling.*
- *Mine service vehicle loading.*
- *Aviation refuellller loading.*
- *Fuel barge loading and unloading.*
- *Marine loading.*

Ordering Information

To ensure each loading arm that leaves our factory operates to its maximum potential, Liquip requests that the dimensional details and designs of each installation be checked by our design department. Design survey sheets are available from Liquip and Liquip distributors.

The following is the information needed to recommend an arm to suit your requirements:

- Top loading or Bottom loading Top - long reach or pantograph Bottom- overhead or low profile.
- Left hand or right hand mechanism.
- Product to be conveyed.
- Temperature of the product to be conveyed.
- Flow rate required.
- Preferred diameter.
- Material of construction.
- Operating pressure.
- Operating temperature.
- Maximum temperature.
- Mounting connection.
- Coupler or other connection.



To help maximise the productivity of your loading arms and thus provide the best value for money, it is important that Liquip be consulted early in the planning stage of the bulk liquid terminal or loading rack. The loading arm is the last component of an expensive supply chain so it is important not to compromise this important asset.



LBM800 SERIES Balance Mechanism

A new benchmark has been set for all bottom loading arms with the introduction of the LBM800. This state of the art design is essential when you require safety and long service life with minimal maintenance.

The 'bulletproof' LBM800 provides effortless bottom loading in petrochemical distribution depots through the use of the unique design known as the 'Velvet Touch'.

The ability of 360° rotation in the horizontal plane allows the LBM800 to easily move from a parked to loading position, to service vehicles on either side of the loading bay. While the vertical plane swivel allows users to position the coupler at different heights within the API envelope.

Suitable for:

TOP LOAD | BOTTOM LOAD | BITUMEN | VAPOUR RECOVERY

Features & Benefits

- Superior safety through Liquip's unique gas strut "Velvet Touch" design.
- Exceptional durability and minimal servicing requirements thanks to the best in class base swivel assembly and overall design.
- Any unit can be easily configured for left hand, right hand, upward and downward configurations on site.
- Slimline drop leg bracket provides easy installation and compact overall size.
- Enhanced strength and ease of adjustment through a heavy duty adjustment mechanism.
- Downtime during installation is reduced by an all-flanged design.
- Outlet spool provides an industry standard 100mm (4") TTMA connection for simple installation and allows for future applications.
- Adjustable up/down stop that can be set with minimal effort.
- Viton™ GFLT product seals fitted as standard. Other seals available on request.
- Velvet touch provides smooth operation over the entire stroke of the loading arm.

Technical Information

Working Pressure
1,000 kPa (145 PSI).

Test Pressure
1,500 kPa (217 PSI).

Material
Investment cast 4130 steel construction.

Seals
LBM800: Fitted with Viton™ GFLT product seals & HAN dust seal. (Other special seals available on request).

LBM800C: Fitted with FFKM product seals & HAN dust seal.

LBM800AVI: Fitted with Viton™ GFLT product seals & HAN dust seal with grease suitable for use with aviation fuell.

Mounting
- Base flange is 4" ANSI 150 raised face flange.
- Outlet flange is 100mm (4") TTMA pattern.

Weight
60.4kg.

Operating Temperature
-40°C to +90°C (-40°F to +200°F).

Min Moment
90 kg.m (650 ft.lb).

Max Moment
250 kg.m (1,800 ft.lb).

Up / Down Angluar Movement
-15° to +15° (From horizontal).

Typical Horizontal Spacing
650mm (24").

Typical Vertical Spacing
450mm (18").

Typical Radius of arm
1300mm to 2000mm (50" to 80").

Typical No. of arms per bay:
6.

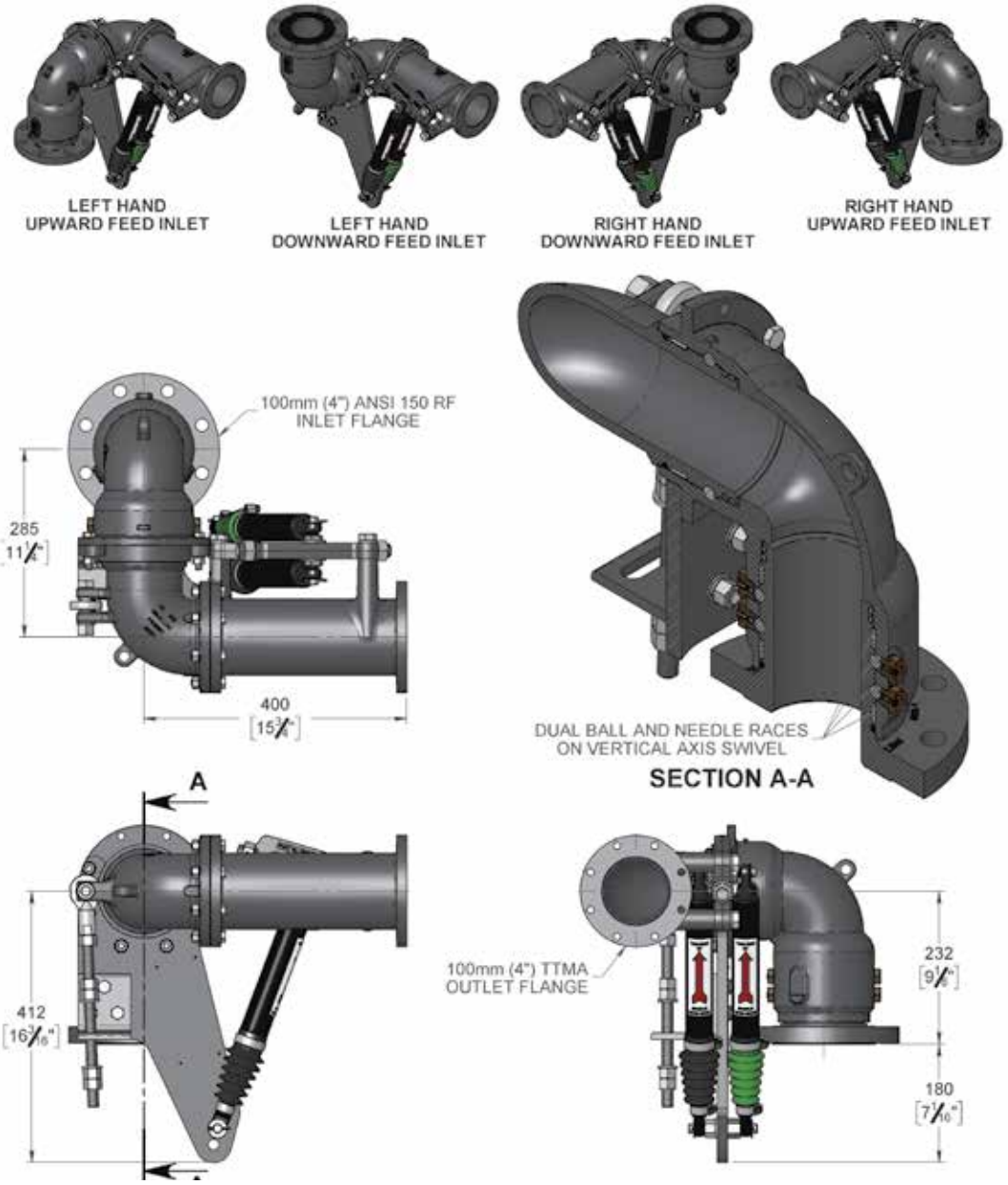
Ordering Information

- **LBM800:** Standard Balance Mechanism.
- **LBM800C:** Chemical Balance Mechanism.
- **LBM800AVI:** Aviation Balance Mechanism.
- **LBM800-LR:** LBM800 Long Reach (Top Load Balance Assembly).
- **LBM800-1Z:** LBM800 with 2 x 2800N Struts.
- **LBM800-2Z:** LBM800 with 2 x 5200N Struts.
- **LBM800-3Z:** LBM800 with 2800N & 5200N Strut.

Associated Equipment

- **4416:** Standard Bottom loading arm gas strut 2,800N, 500mm (black boot).
- **3008:** Standard Bottom loading arm gas strut 5,200N, 500mm (green boot).
- **VNI-A4VG:** 4" Intermediate Swivel, Viton™ GFLT for Loading Arms.
- **VNC-A4VG:** 4" Coupler Swivel, Viton™ GFLT for Loading Arms.
- **LYNX Series Coupler.**

LBM800 - LIQUIP BALANCE MECHANISM





VBB SERIES Balance Assembly

Liquip offers a unique balance assembly to be used with long reach and low profile arms. These can also be used for gravity or pumped discharge of road and rail tankers, as well as for bottom loading.

Liquip's VBB series is used with MK3 loading arms. The 'Velvet Touch' MK 3 loading arm is a breakthrough in balance systems for bottom loading. This particular loading arm has been purpose designed to suit that market where a practical application outweighs style and looks.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- Utilises Liquip's famous "Velvet Touch" design.
- Arms can reach both sides of a loading gantry.
- Available in 75mm (3") or 100mm (4").
- Available in a range of materials to suit various fluid transfer applications.
- Uses a single gas-strut to counter-balance the weight of the arm, which means the up and down movement of the arms requires minimal effort.
- Steel swivels run on needle roller bearings with much lower friction than the traditional double row ball bearings.
- A pressure relieving nipple allows old grease and particles to be expelled and provides visible evidence of greasing being thorough and prevents over pressuring.

Technical Information

Maximum Pressure
1,000 kPa.

Maximum Viscosity
150cSt viscosity (when loading valve is used).

Typical Reach
1,750mm.

Operating Temperature
-30°C to 200°C (depending on seals used).

Mounting
100mm standard size but also available in 75mm NB.

Materials
Mild Steel and Stainless Steel 316 grade is available.

Seals
Product seals are available in Viton™ or PTFE.

Ordering Information

- **VBB075MMV:** MK3 balance assembly, mild steel c/w Viton™ seals.
- **VBB075MMLV:** Left hand MK3 balance assembly, mild steel c/w Viton™ seals.
- **VBB100MMILVG:** Left hand, inverted MK3 balance assembly, mild steel c/w Viton™ seals.
- **VBB100MMIT:** Inverted MK3 balance assembly, mild steel c/w Teflon™ seals.
- **VBT100MMIVG:** MK3 balance assembly, steel c/w Viton™ GFLT seals.
- **VBB100MMLVG:** Left hand MK3 balance assembly, mild steel c/w Viton™ GFLT seals.
- **VBB100MMIT:** Inverted MK3 balance assembly, mild steel c/w Teflon™ seals.
- **VBB100MMIVG:** Inverted MK3 balance assembly, mild steel c/w Viton™ GFLT seals.
- **VBB100MMLT:** Left hand MK3 balance assembly, mild steel c/w Teflon™ seals.
- **VBB100MMLVG:** Left hand MK3 balance assembly, mild steel c/w Viton™ GFLT seals.
- **VBB100MMT:** Mk3 balance assembly, mild steel c/w Teflon™ seals.
- **VBB100MMVG:** MK3 balance assembly, mild steel c/w Viton™ GFLT seals.
- **VBB100SSIT:** Mk3 balance assembly, Stainless steel c/w Teflon™ seals.
- **VBB100SSIV:** Inverted MK3 balance assembly, Stainless steel c/w Viton™ seals.
- **VBB100SST:** MK3 balance assembly, Stainless steel c/w Teflon™ seals.

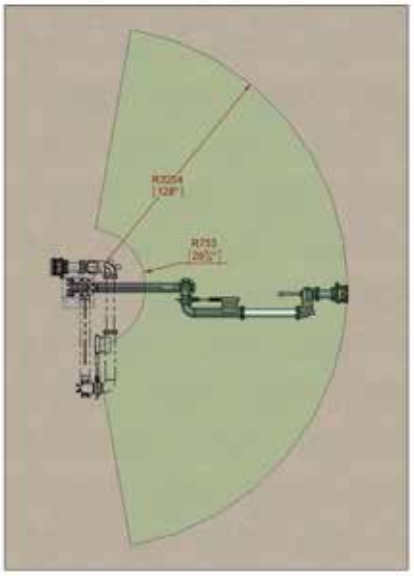
Contact Liquip for Z-kits which include struts.

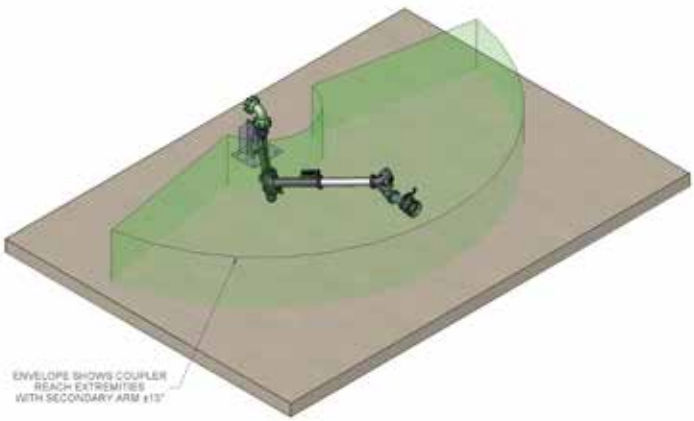


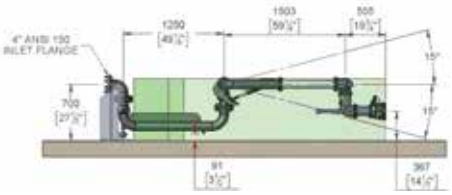
Low profile loading arm The benchmark for innovation

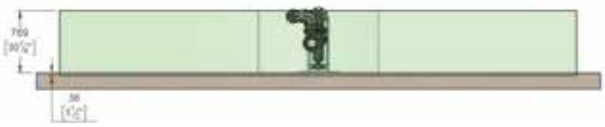
Another popular bottom loading design is the low profile loading and/or unloading arm. The low profile arm can be used for gravity or pumped discharge of road and rail tankers, as well as for bottom loading. Also commonly used where there are space limitations overhead. This makes the low profile unloader popular for large single compartment tanker loading and unloading, such as railcars, aviation bridging tankers and loading.

Unloading Arm Typical Envelope









Key Features

- The low profile arm is also available in a self draining design to ensure complete tank drainage.
- Available in a range of materials to suit various fluid transfer applications.
- Liquip use the latest in available design and manufacturing techniques to ensure that our arm designs work to their full potential, giving our customers the best possible solution for their investment, and consistent product quality.



Intermediate Swivels

Liquip offers a market leading 180° single-plane swivel for use on Liquip loading arms.

The VNI series is fitted between the primary (horizontal) spool and the secondary (vertical) spool. It allows the loading coupler to swing in & out relative to the tanker API adaptor.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- All aluminium construction.
- Ball and needle rolling elements for optimum axial and radial load bearing with minimum friction.
- Grease nipple on one side with relief valve mounted opposite for efficient removal of old grease and debris.
- Dual O-rings for product seal and dust seal respectively.

Technical Information

Working pressure
1,000 kPa (145 PSI).

Test pressure
1,500 kPa (218 PSI).

Operating temperature
-40° to +90°C (-40° to +200°F) for Viton™ GFLT grade.

Mounting
Both ends are 100mm (4") TTMA.

Seals
Viton™ GFLT grade O-rings. (Teflon™ or other special seals available on request).

Weight
5.6 kg (12.3lb).

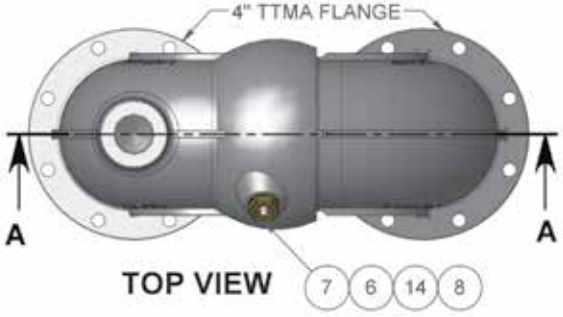
Ordering Information

- **VNI-A4VG:** 4" intermediate swivel with Viton™ GFLT seal.
- **VNI-A4AVI:** 4" intermediate swivel with Viton™ GFLT seal and Aviation grease.
- **VNI-A4T:** 4" intermediate swivel with Teflon™ seal.

Associated Equipment

- **LBM800:** Standard Balance Mechanism.
- **LBM800C:** Chemical Balance Mechanism.
- **LBM800AVI:** Aviation Balance Mechanism.
- **LBM800-LR:** LBM800 Long Reach (Top Load Balance Assembly).
- **LBM800-1Z:** LBM800 with 2 x 2800N Struts.
- **LBM800-2Z:** LBM800 with 2 x 5200N Struts.
- **LBM800-3Z:** LBM800 with 2800N & 5200N Strut.
- **VNC-A4VG:** 4" coupler swivel with Viton™ GFLT seal.
- **VNC-A4T:** 4" coupler swivel with Teflon™ seal.
- **VNC-A4AVI:** 4" coupler swivel with Viton™ GFLT seal & Aviation grease.
- **VNC-A4DVG:** 4" coupler swivel with Viton™ GFLT seal & D-handle.

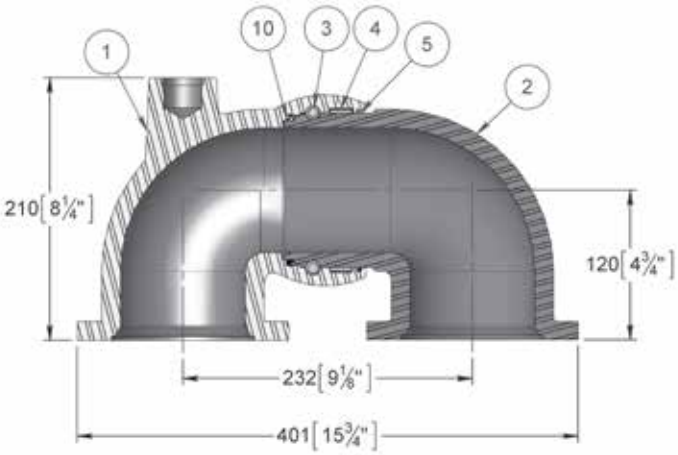
VNI-A4VG INTERMEDIATE SWIVEL





VNI-A4AVI SHOWN

AVIATION SPECIFIC SWIVELS (WITH AVI SUFFIX) USE GREASE SPECIFICALLY FOR AVIATION APPLICATIONS AND HAVE THE GREASE NIPPLE REPLACED WITH A ST STEEL GRUBSCREW TO AVOID STANDARD GREASE BEING INJECTED DURING REGULAR MAINTENANCE



SECTION A-A



END VIEW

ITEM	PART No.	DESCRIPTION	VNI-A4VG	VNI-A4AVI	VNI-A4T	VNI-A4E	VNI-A4C	MATERIAL
1	LAN400-6	ELBOW FEMALE TO 100mm TTMA	1	1	1	1	1	ALUMINIUM
2	LAN400-7	ELBOW MALE TO 100mm TTMA	1	1	1	1	1	ALUMINIUM
3	2334	BALL BEARING	32	32	32	32	32	STEEL
4	4531	NEEDLE ROLLER	100	100	100	100	100	STEEL
5	6080	O-RING	1	1	1	1	1	VITON B70
6	0885	WASHER FIBRE	1	1	1	1	1	FIBRE
7	LAN400-9	PLUG	1	1	1	1	1	BRASS
8	1525	NIPPLE GREASE RELIEF	1	1	1	1	1	Z/P STEEL
9	0126VG	O-RING	1	-	-	-	-	VITON GFLT
	0126	O-RING	-	1	-	-	-	VITON B70
	4641	TEFLON V SEAL	-	-	1	-	-	TEFLON
	0126EPDM	O-RING	-	-	-	1	-	EPDM
	0126K	O-RING	-	-	-	-	1	FFKM
10	0481	NIPPLE GREASE STRAIGHT	1	-	1	1	1	Z/P STEEL
11	6696	GRUBSCREW CUP POINT	-	1	-	-	-	ST STEEL
12	7172	GREASE MOLYKOTE	1	-	1	-	-	GREASE
	7815	GREASE MOLYKOTE (AVIATION)	-	1	-	-	-	GREASE
	7128	GREASE ROCOL (SILICONE)	-	-	-	1	1	GREASE



Coupler Swivels

Liquip offers 90° swivels with a handle that is manoeuverable for use on the coupler end of bottom-loading arm.

The VNC series allows the loading API coupler to rotate 360° in the horizontal plane so that the APIs on both the truck and terminal end align correctly for a secure connection.

Suitable for:

BOTTOM LOAD

VAPOUR RECOVERY

Features & Benefits

- All aluminium construction.
- Ball and needle rolling elements for optimum axial and radial load bearing with minimum friction.
- Grease nipple on one side with relief valve mounted opposite for efficient removal of old grease and debris.
- Dual O-rings for product seal and dust seal respectively.

Technical Information

Handle

Handle can be ball-type or D-handle.

Working pressure

1,000 kPa (145 PSI).

Test pressure

1,500 kPa (218 PSI).

Operating temperature

-40° to +90°C (-40° to +200°F) for Viton™ GFLT grade.

Mounting

Both ends are 100mm (4”) TTMA.

Seals

Viton™ GFLT grade O-rings (Teflon™ or other special seals available on request).

Weight

6.0 kg (13lb).

Ordering Information

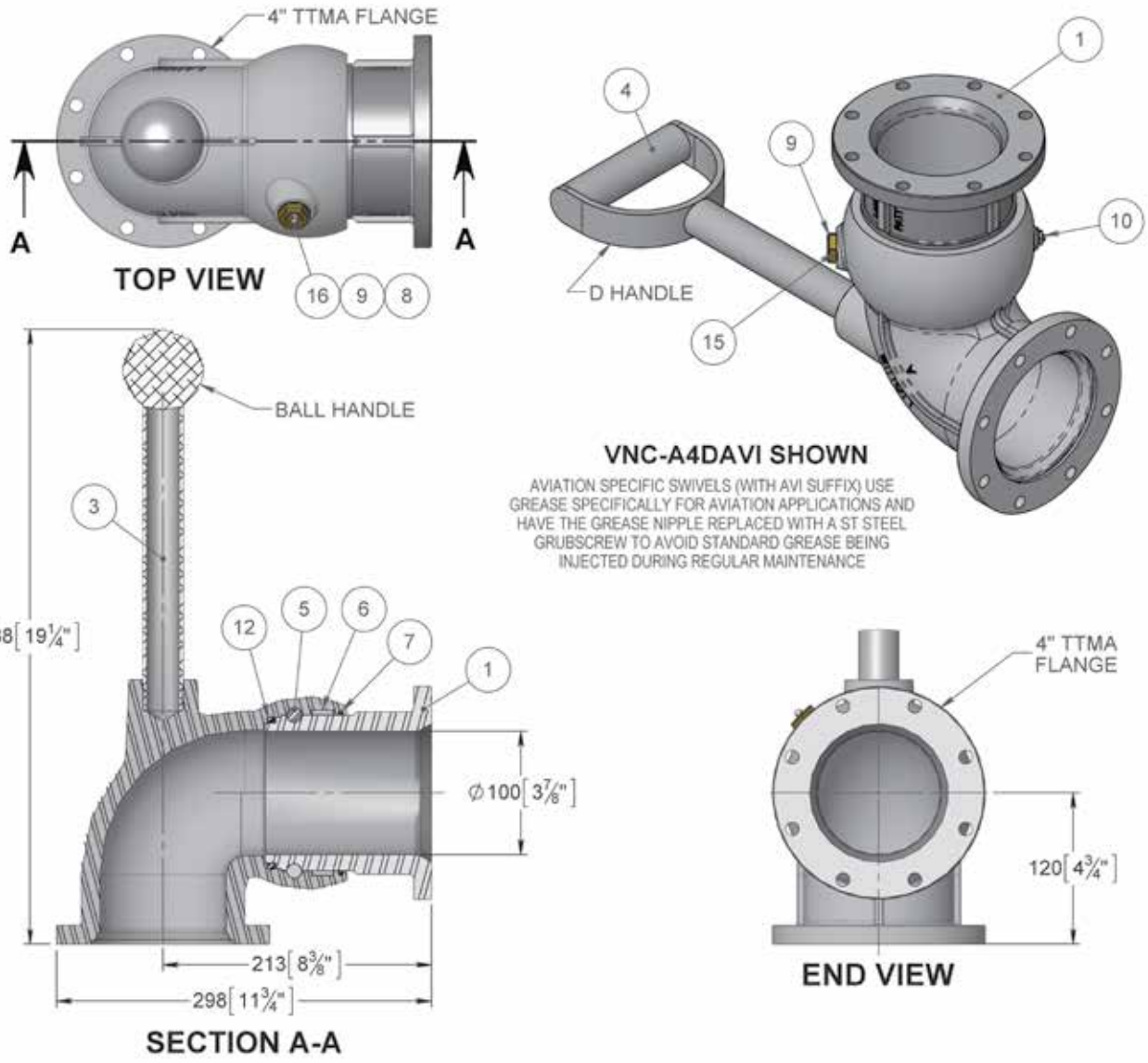
- **VNC-A4VG:** 4” coupler swivel with Viton™ GFLT seal.
- **VNC-A4T:** 4” coupler swivel with Teflon™ seal.
- **VNC-A4AVI:** 4” coupler swivel with Viton™ GFLT seal & Aviation grease.
- **VNC-A4DVG:** 4” coupler swivel with Viton™ GFLT seal & D-handle.

Associated Equipment

- **VSS-4:** Straight spool piece 200mm (8”) long.
- **VSA-4:** 15° angled spool piece 200mm (8”) long.
- **VSA4-SHORT:** 4” aviation selective loading arm coupler spool (15° angle) - 122mm length.
- **LBV450VG:** Butterfly Valve to suit 4” TTMA flange.

All Liquip API bottom loading couplers.

VNC-A4VG COUPLER SWIVEL



ITEM	PART No.	DESCRIPTION	VNC-A4VG	VNC-A4DVG	VNC-A4AVI	VNC-A4DAVI	VNC-A4T	VNC-A4E	MATERIAL
1	LAN400-8	STRAIGHT MALE SWIVEL 100NB	1	1	1	1	1	1	ALUMINIUM
2	LAN400-6	ELBOW FEMALE TO 100mm TTMA	-	-	-	1	-	-	ALUMINIUM
3	LA400-14	BALL HANDLE ASSEMBLY	1	-	1	-	1	1	ALUMINIUM
4	LA400-13	HANDLE D-STYLE	-	1	-	1	-	-	ALUMINIUM
5	2334	BALL BEARING	32	32	32	32	32	32	STEEL
6	4531	NEEDLE ROLLER	100	100	100	100	100	100	STEEL
7	6080	O-RING	1	1	1	1	1	1	VITON B70
8	0885	WASHER FIBRE	1	1	1	1	1	1	FIBRE
9	LAN400-9	PLUG	1	1	1	1	1	1	BRASS
10	1525	NIPPLE GREASE RELIEF	1	1	1	1	1	1	Z/P STEEL
11	0126VG	O-RING	1	1	-	-	-	-	VITON GFLT
	0126	O-RING	-	-	1	1	-	-	VITON B70
	4641	TEFLON V SEAL	-	-	-	-	1	-	TEFLON
	0126EPDM	O-RING	-	-	-	-	-	1	EPDM
12	6696	GRUBSCREW CUP POINT	-	-	1	1	-	-	ST STEEL
13	0481	NIPPLE GREASE STRAIGHT	1	1	-	-	1	1	Z/P STEEL
14	7172	GREASE MOLYKOTE	1	1	-	-	-	-	GREASE
	7815	GREASE MOLYKOTE (AVIATION)	-	-	1	1	-	-	GREASE
	7128	GREASE ROCOL (SILICONE)	-	-	-	-	1	1	GREASE



Gas Struts

Liquip's gas struts are world renowned for their proven design, quality and smooth movement. They allow for the best loading arm support and effortless loading.

Our uniquely designed gas struts have been incorporated into virtually all of Liquip's specialist loading arms including: low profile gravity unloading arms, overhead arms, A-frame arms, Pantograph arms and other types of loading arms.

***Note:** Gas struts are used on all Liquip arms except Bitumen arms. Bitumen arms use air rams due to temperature requirements*

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY | LPG LOAD

Features & Benefits

- Loading arms can be fitted with single or dual gas struts to suit any loading application.
- Gas struts exert almost constant force throughout the stroke range. This means that up and down movement of the arm requires minimal effort.
- Gas struts are maintenance free.
- Reduced weight and advanced balance mechanism technology make Liquip loading arms the most manoeuverable loading arms available.
- Highly engineered to ensure struts will not lose any force throughout their entire service life.

Ordering Information

- **4416:** Standard Bottom loading arm gas strut 2,800N, 500mm (black boot).
- **3008:** Standard Bottom loading arm gas strut 5,200N, 500mm (green boot).
- **4450:** Pantograph loading arm gas strut 3,200N, 800mm (black boot).
- **5449:** A-frame Bottom loading arm gas strut 5,200N, 800mm (black boot).

Associated Equipment

- **LBM800:** Standard Balance Mechanism.
- **LBM800AVI:** Aviation Balance Mechanism.
- **LBM800-1Z:** LBM800 with 2 x 2800N Struts.
- **LBM800-2Z:** LBM800 with 2 x 5200N Struts.
- **LBM800-3Z:** LBM800 with 2800N & 5200N Strut.



Riser Pipes

Riser pipes lift the height of each arm as required to ensure that each arm is at the correct operational height and that it will fit in the bay without risk of colliding into other balance assemblies.

Liquip can supply custom riser pipes for use in any loading arm applications.

Ordering Information

Contact Liquip for any loading arm requirements so that Liquip can manufacture riser pipes to suit your applications.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY | BITUMEN



Up/Down Stops

Liquip offers up & down stops for loading arms to ensure the arm is able to move freely within the allowed vertical axis.

Up & Down stops ensure the arm can easily be maneuvered within the loading envelope while ensuring excess strain is not placed on the loading arm.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Ordering Information

- **UDS075R:** 75mm up/down stop for MK3 balance assembly - Right Hand.
- **UDS075L:** 75mm up/down stop for MK3 balance assembly - Left Hand.
- **UDS100R:** 100mm up/down stop for MK3 balance assembly - Right Hand.
- **UDS100L:** 100mm up/down stop for MK3 balance assembly - Left Hand.
- **LBM800-UDL:** Up/down stop to suit LBM800 balance assembly.



Single Plane Flange Swivels - VNS Series

The VNS-A4 is a 100mm (4") straight single-plane cast aluminium swivel with 4" TTMA flanged ends.

The VNS swivels are often used on loading arms instead of the coupler spool to enable rotation of the API coupler.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- Swivels allows for 360° rotation. It may be used on any application where another plane of rotation is required.
- Ball and needle rolling elements are incorporated into the design for optimum axial and radial load bearing with minimum friction.
- 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.

Technical Information

Materials

- Cast aluminium body.
- Viton™ seals.

Working Pressure

1,000 kPa (145 PSI).

Test Pressure

1,500 kPa (218 PSI).

Mounting

4" TTMA.

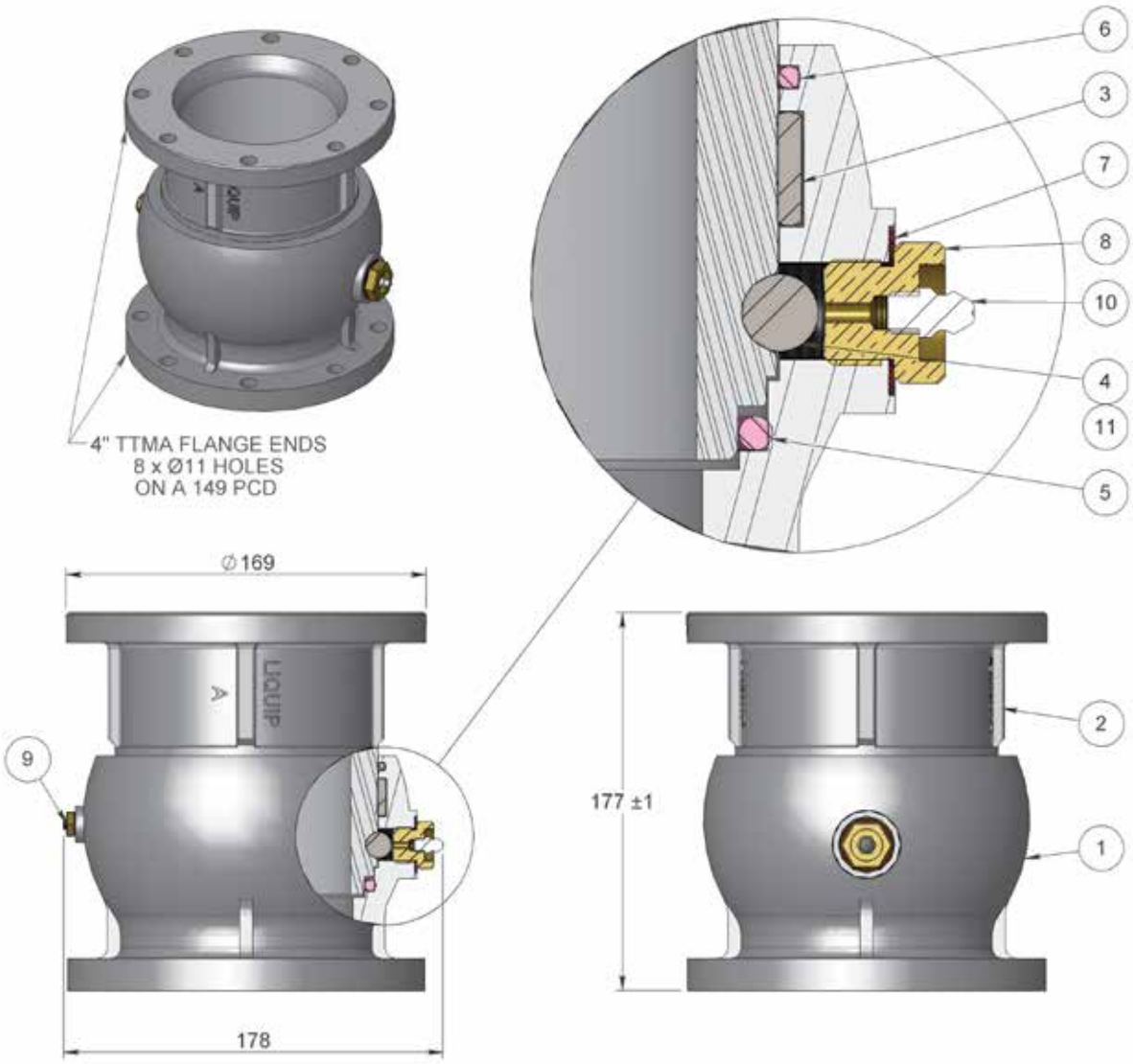
Weight

4.02kg.

Ordering Information

- **VNS-A4:** 4" Straight Single-plane Swivel with 4" TTMA flanged ends - Aluminium.
- **VNS-A4AVI:** Aviation spec 4" Straight Single-plane Swivel with 4" TTMA flanged ends - Aluminium.

VNS-A4 STRAIGHT SWIVEL 4” TTMA



ITEM	PART No.	DESCRIPTION	VNS-A4	VNS-A4AVI	MATERIAL
1	LAN400-4	SWIVEL STRAIGHT FEMALE	1	1	ALUMINIUM
2	LAN400-8	STRAIGHT MALE SWIVEL 100NB	1	1	ALUMINIUM
3	4531	NEEDLE ROLLER	100	100	STEEL
4	2334	BALL BEARING	32	32	STEEL
5	0126	O-RING	1	1	VITON B70
6	6080	O-RING	1	1	VITON B70
7	0885	WASHER FIBRE	1	1	FIBRE
8	LAN400-9	PLUG	1	1	BRASS
9	1525	GREASE RELIEF NIPPLE	1	1	BRASS
10	0481	NIPPLE GREASE STRAIGHT	1	-	Z/P STEEL
	6696	GRUBSCREW CUP POINT	-	1	ST STEEL
11	7172	GREASE MOLYKOTE	1	-	GREASE
	7815	GREASE MOLYKOTE (AVIATION)	-	1	GREASE
12	7367	LABEL - WRITE ON	-	1	PVC



Single Plane Flanged Swivels - Stainless Steel

Liquip offers a range of straight swivel joints for the fabrication of loading arms and pipe work requiring up to 360° rotation.

Liquip swivels offer exceptional performance and reduced downtime and maintenance.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- Cost-effective way of achieving a rotating joint, for loading arms or machinery.
- Heavy-duty stainless steel construction.
- Incorporates the well-known high load, low wear Liquip principle of ball with needle bearing combination.
- Purpose designed primary face seal and multiple seals for added safety.
- 4" TTMA flange to suit industry loading arms.

Technical Information

Materials
Bodies - Stainless steel 316L.

Test Pressure
1500 kPa.

Seals
Viton™ or Teflon™.

Mounting
4" TTMA.

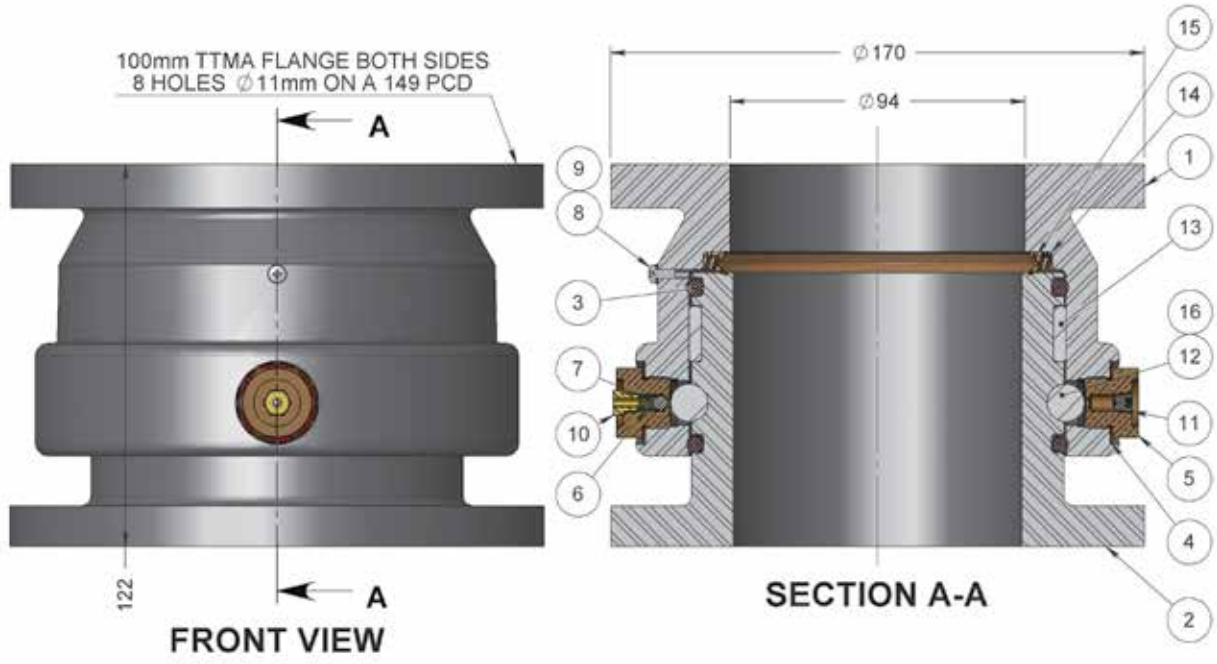
Working Pressure
900 kPa.

Weight
9 kg.

Ordering Information

- **SJF101L -** Stainless Steel Flanged Swivel Joint - 100mm TTMA Flanges, Viton™ Main Seal.
- **SJF101T -** Stainless Steel Flanged Swivel Joint - 100mm TTMA Flanges, Teflon™ Main Seal.

SJF101x 4” TTMA FLANGED SWIVEL



ITEM NO.	PART NUMBER	DESCRIPTION	SJF101L	SJF101T	MATERIAL
1	SJF101L-1	SWIVEL FEMALE 100mm	1	1	ST STEEL
2	SJF101L-2	SWIVEL MALE 100mm	1	1	ST STEEL
3	0126	O-RING	2	2	VITON B70
4	0885	WASHER FIBRE	2	2	FIBRE
5	SJW100-3	BALL RETAINER PLUG	2	2	BRASS
6	4480	SPRING COMPRESSION	1	1	ST STEEL
7	7822	BALL BEARING 3/16"	1	1	ST STEEL
8	4926	SCREW METRIC	1	1	STEEL
9	5263	WASHER FIBRE MET	1	1	FIBRE
10	6688	SCREW RETAINING	1	1	BRASS
11	6696	GRUBSCREW CUP POINT	1	1	ST STEEL
12	2334	BALL BEARING	30	30	STEEL
13	4531	NEEDLE ROLLER	90	90	STEEL
14	7576	WEAR RING TO SUIT 7575 SEAL	1	-	TEFLON
15	7575	LIP SEAL	1	-	VITON B70
	7574	SEAL SPRING LOADED	-	1	TEFLON
16	7815	GREASE MOLYKOTE (AVIATION)	1	1	GREASE





Weld On Swivels - SJW Series

The SJW range of weld on swivels are used for the 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.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY | BITUMEN

Features & Benefits

- 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™ 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 leaks are 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.

Technical Information

Operating temperature
-20°C to +220°C.

Test Pressure
1,650 kPa.

Sizes
3” or 4”.

Mounting
Weld on.

Materials
Stainless Steel or Mild Steel.

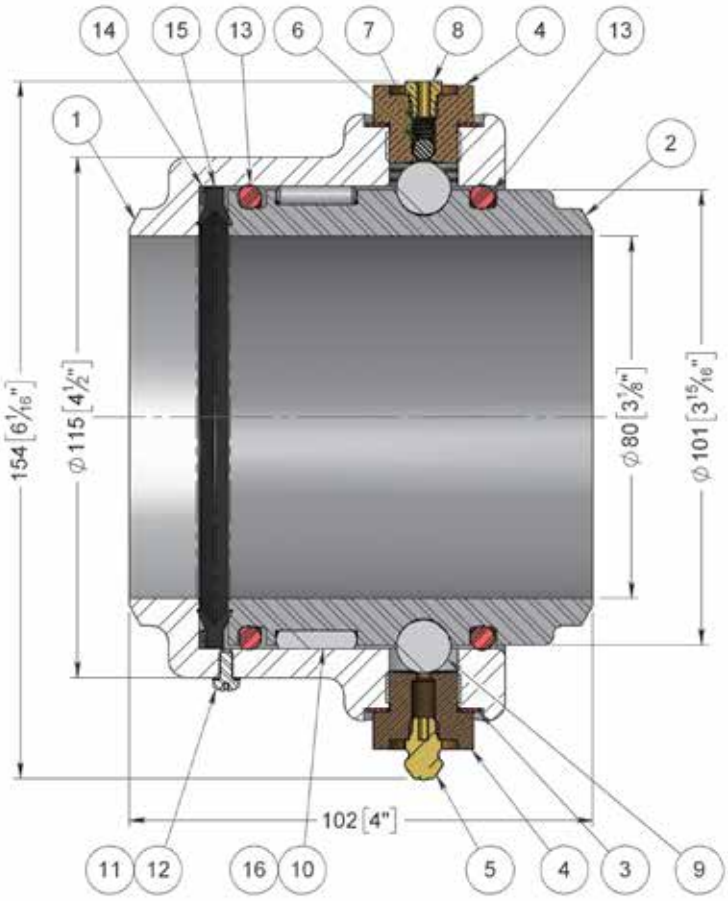
Weight
4.3kg.

Working pressure
1,100 kPa.

Ordering Information

- **SJW075MMVZ -** SJW Weld-On 3” Swivel Mild Steel, Viton™ Main Seal.
- **SJW100MMVZ -** SJW Weld-On 4” Swivel Mild Steel, Viton™ Main Seal.
- **SJW075SSVZ -** SJW Weld-On 3” Swivel Stainless Steel, Viton™ Main Seal.

SJW075 WELDABLE SWIVEL Ø 75





ITEM	PART No	DESCRIPTION	QTY	MATERIAL
1	SJW075M-4	SWIVEL FEMALE 75mm	1	STEEL
2	SJW075M-1	SWIVEL MALE	1	STEEL
3	0885	WASHER - 5/8"- FIBRE	2	
4	SJW100-3	BALL RETAINER PLUG	2	BRASS
5	0481	GREASE NIPPLE	1	BRASS
6	4580	BALL BEARING	1	STEEL
7	4480	SPRING COMPRESSION	1	ST STEEL
8	6688	SCREW RETAINING	1	BRASS
9	2334	BALL BEARING	26	STEEL
10	4531	NEEDLE ROLLER	77	STEEL
11	5263	WASHER FIBRE MET	1	FIBRE
12	4926	SCREW METRIC	1	STEEL
13	0065	O-RING	2	VITON A
14	4606	WEAR RING	1	TEFLON
15	4605	LIP SEAL	1	VITON B70
16	7172	GREASE MOLYKOTE	1	GREASE

Horizontal Rotation Limiters (Top Loading)

Suitable for:

TOP LOAD



The VBS113 is a 4" rotation limiter, which prevents 360° rotation of loading arms.

Features & Benefits

- Limits the rotation of the loading arm to suit each individual loading bay/gantry.
- Prevents accidental clashing of the loading arm with any obstructions that may be present in the vicinity of the loading arm.
- Prevents damage to any accessories or cabling present on the loading arm that may be caused by over rotation of the loading arm.

Ordering Information

- **VBS113:** 4" Rotation Limiter to suit Liquip loading arms.

Coupler Rotation Limiters

Suitable for:

BOTTOM LOAD



Liquip's swivel rotation limiters are used on Aviation loading arms to prevent the coupler from rotating 360° and ensures the selective slots will be in the correct position to easily engage the coupler and adapter.

Features & Benefits

- Lightweight aluminium construction.
- Limits the rotation of the coupler to 360° to the left or right of the centreline.

Ordering Information

- **SLR100:** Swivel rotation limiter, typically used for aviation loading arms.

Associated Equipment

- **VNC-A4AVI:** 4" coupler swivel with Viton™ GFLT seal & Aviation grease.
- **VNS-A4:** 4" Straight Single-plane Swivel with 4" TTMA flanged ends - Aluminium.
- **VNS-A4AVI:** Aviation spec 4" Straight Single-plane Swivel with 4" TTMA flanged ends - Aluminium.
- **VSA4-SHORT:** 4" aviation selective loading arm coupler spool (15° angle) - 122mm length.

Rotation Limiters (Bitumen)

Suitable for:

BITUMEN



The LAB100-10 is a rotation limiters for use on Bitumen loading arms and prevents 360° rotation of loading arms.

Ordering Information

- **LAB100-10:** Rotation Limiter to suit Bitumen loading arms.

Associated Equipment

- **LAB100:** Balance assembly for Liquip Bitumen loading arms.

All Liquip Bitumen load arms.

Features & Benefits

- Limits the rotation of the loading arm to suit each individual loading bay/gantry.
- Prevents accidental clashing of the loading arm with any obstructions that may be present in the vicinity of the loading arm.
- Prevents damage to any accessories or cabling present on the loading arm that may be caused by over rotation of the loading arm.



Spear Mount Overfill Sensor Assemblies

The SMS102 is a drop spear mounted overfill probe holder which is fixed to the top loading arm and is used while loading vehicles when overfill protection is required but not present on the vehicle.

If the overfill probe is triggered, it will send a signal to the rack monitor advising of an overfill incident. This in turn will stop the loading process, preventing an overfill from occurring.

Suitable for:

TOP LOAD

Features & Benefits

- Aluminium construction for a lightweight and durable design.
- Suitable for 100mm OD drop spears.
- Overfill equipment is permanently attached to the loading arm so it can be used on multiple vehicles.

Ordering Information

- **SMS102:** Spear Mount Sensor Assembly (probe not included).



Position Indicators

The VBS100-32 is a position indicator for use on long reach top loading arms.

The VBS100-32 indicates whether the arm is being used on the left or right side of the loading bay. A signal via proximity switch (sold separately) is sent to the TAS system and can be used for different purposes.

Suitable for:

TOP LOAD

Ordering Information

- **VBS100-32:** Position Indicator - Zinc Plated.

Associated Equipment

- **5544:** Proximity switch sensor.



Vacuum Breaker

Vacuum breakers fit into top loading valves or the suction side of pumping systems. They ensure the piping systems are able to be drained quickly and completely.

The VB100 Series is 1/2" vacuum breaker that is fitted with Viton™ A seals and operates at 1-2 kPa.

Suitable for:

TOP LOAD

Technical Information

Pressure

VB100 and VB100SS open at 1-2 kPa (gravity).
Orifice equal to 6mm dia. hole.

Operation

Spring loaded poppet opens at a set pressure to allow air into the high section of the system and removing any vacuum that may 'hang-up' a liquid column.

Mounting

Into 12mm BSP female socket. Ensure the poppet head is level with the inner end of the socket thread inside the pipe when fitted, in order to maximise flow area.

Materials

- Brass body, polyurethane cap, stainless steel spring.
- Poppet is acetal in VB100, stainless steel in VB100SS.
- Seal is Viton™ A standard (coloured red).
- VB100SS has a stainless steel body.

Weight

0.14 kg.

Ordering Information

- **VB100:** 1/2" BSP and NPT Vacuum Breaker Brass (1-2 kPa).
- **VB100SS:** 1/2" BSP and NPT Vacuum Breaker S/S (1-2 kPa).



Check Valve Spools

Liquip's check valve spools are designed to hold back the product in the loading arm so that the pipework will not drain when the API coupler is opened.

Since the arm can no longer be drained by just opening the coupler, 2 drain bosses have been incorporated into the check valve spool.

1. *On the API side of the poppet - allows product to be drained from the outlet side of the CVS120, for removal and servicing of the API coupler.*
2. *On the loading arm side of the poppet - allows sampling or complete draining of the loading arm for servicing and repair of up stream components like the outboard swivel and hose.*

Suitable for:

BOTTOM LOAD

VAPOUR RECOVERY

Features & Benefits

- Can be used to avoid product contamination.
- Prevents pilfering by not allowing drainage of the drop hose section.
- Product flow through the loading arm opens the poppet inside the check valve spool.
- Can be fitted with a sightglass to show presence of product.
- 2 drain bosses have been incorporated into the valve.

Technical Information

Materials

- Aluminium body, poppet and spider.
- Stainless steel spring & high-tensile steel shaft.
- Viton™ product seal.
- Brass drain plugs and over pressure valve.

Opening pressure in flow direction

45 kPa (6.5 PSI).

Over pressure in non-flow direction

30 kPa (4.5 PSI) (emergency relief in reverse direction to allow for thermal expansion).

Weight

4.5 kg (9.9 lb).

Ordering Information

- **CVS120:** 4" TTMA Check Valve Spool for load arms.
- **CVS120Z:** 4" TTMA Check Valve Spool kit for load arms c/w gasket and mounting fasteners.
- **CVS120SGZ:** 4" TTMA Check Valve Spool kit for Load arms c/w with gasket, mounting fasteners and flanged sightglass.

Associated Equipment

- **VSA4:** 4" Loading arm coupler spool (15° angle) - 200mm long.
- **VSS4:** 4" Loading arm coupler spool (straight spool) - 200mm long.
- **VSA4-SHORT:** 4" Aviation selective loading arm coupler spool (15° angle) - 122mm long.
- **BF4-SG-40:** 4" TTMA Acrylic sightglass 40mm thickness.
- **BF4-SG-25:** 4" TTMA Acrylic sightglass 25mm thickness.



Coupler Spools

Liquip offers a range of 4" TTMA coupler spools that are designed to be used on loading arms to connect the API coupler to the coupler swivel.

Our coupler spools are provided in 2 lengths and can be supplied in straight or angled profiles to suit standard loading arm, aviation selective or other loading arm applications.

Suitable for:

BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- Aluminium construction for lightweight and longevity.
- 4" TTMA flanged connections.
- Provides distance between the loading arm and API coupler to ensure the coupler does not come in contact with other obstacles.

Ordering Information

- **VSA4:** 4" aluminium loading arm coupler spool (15° angle) - 200mm long.
- **VSS4:** 4" aluminium loading arm coupler spool (straight) - 200mm long.
- **VSA4-SHORT:** 4" aviation selective loading arm coupler spool (15° angle) - 122mm length.

Associated Equipment

- **LYNX850:** Short Handle, Viton™ B.
- **LYNX850VG:** Short Handle, Viton™ GFLT.
- **LYNX850C:** Short Handle, FFKM.
- **LYNX852:** Long Handle, Viton™ B.
- **LYNX852VG:** Long Handle, Viton™ GFLT.
- **LYNX852C:** Long Handle, FFKM.
- **LYNX852G:** Long Handle, Viton™ B- AVGAS Selective.
- **LYNX852J:** Long Handle, Viton™ B- Jet Selective.
- **LYNX860:** Short Handle Drip Catcher, Viton™ B70.
- **LYNX860VG:** Short Handle Drip Catcher, Viton™ GFLT.
- **LYNX862:** Long Handle Drip Catcher, Viton™ B70.
- **LYNX862VG:** Long Handle Drip Catcher, Viton™ GFLT.
- **VNC-A4VG:** 4" coupler swivel with Viton™ GFLT seal.
- **VNC-A4T:** 4" coupler swivel with Teflon™ seal.
- **VNC-A4AVI:** 4" coupler swivel with Viton™ GFLT seal & Aviation grease.
- **VNC-A4DVG:** 4" coupler swivel with Viton™ GFLT seal & D-handle.



Flanged Spools

Liquip offers a range of flanged spools which are used on loading arms between swivel joints, riser pipes, drop hoses and couplers.

Liquip spools can be manufactured out of aluminium or steel and can incorporate any flanges, including TTMA or ANSI flanges to suit any loading arm application.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY | LPG LOAD | BITUMEN

Features & Benefits

- Spools are custom made out of steel or aluminium pipe.
- Range of fittings available including TTMA and ANSI 150# Flanges.
- Spools can be made to any length to suit loading arm applications.

Ordering Information

Contact Liquip for any loading arm requirements so that Liquip can manufacture spools to suit your applications.



Drop Spear Parking Sensors

Liquip offers drop spear parking sensors for loading arms, which provide an electrical signal to associated equipment to confirm the loading arm is safely stowed away and also to drain any residual product from the drop spear.

Suitable for:

TOP LOAD

Features & Benefits

- Ensures the loading arm is safely stowed away.
- Drains residual product from the drop spear.
- Promotes best practice OH&S procedures.
- Keeps gantry and loading bay organised and tidy.
- Can be fitted with a proximity switch to detect when the arm is stowed.

Technical Information

Materials

All aluminium except for zinc plated steel fasteners.

Mounting

Mounts onto gantry framework using 12mm (1/2”) bolts and should be mounted where drop spear can come to rest inside container and remain unobtrusive.

Weight

2.16kg.

Ordering Information

- **SPS100:** Spear Parking Sensor Assembly.



Spear Diffusers

The SD100 is a 4” spear diffuser which can be fitted to a top loading drop tube to prevent product splashing and lift of the arm. The SD100 reduces the risk of static build up during loading by deflecting product flow to the sides of the tank (horizontally), instead of directly to the bottom of the tank (vertically).

Suitable for:

TOP LOAD

Features & Benefits

- Redirects the upward pressure in order to keep the arm from attempting to lift out of tank during loading.
- Reduces splashing that occurs during loading.
- Limits potential static build up and/or product foaming.

Ordering Information

- **SD100:** 100mm loading arm spear diffuser.



LBV350VG shown

3” Flanged Butterfly Valves

Liquip’s range of 3” butterfly valves provide and control full flow through pipelines fitted with 75mm (3”) TTMA flanges.

With a lightweight and durable design Liquip’s butterfly valves are the butterfly valve of choice.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- 4 stage opening/closing valve.
- 75mm (3") product flow.
- Industry Standard 3" TTMA Flange Mounting.
- Bonded Viton™ seal for increased durability.
- Lightweight aluminium body.
- Can be fitted with an Air Actuator or locking tab as required.

Technical Information

Working pressure

- 1,500 kPa (210 PSI) in open position.
- 700 kPa (101 PSI) in closed position.

Operating temperature

–10°C to 100°C.

Mounting

Mounts directly to Liquip 75mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Serivce

Periodically (approx every 6 months), inspect butterfly seat.

Materials

- Body - Cast aluminium.
- Butterfly disc - Cast aluminium.
- Handle - Cast aluminium with zinc plated steel locking lever.
- Spindle - Stainless Steel.
- Seal - Bonded Viton™ A.

Weight

- 1.6kg - LBV300.
- 1.16kg - LBV3-LA.

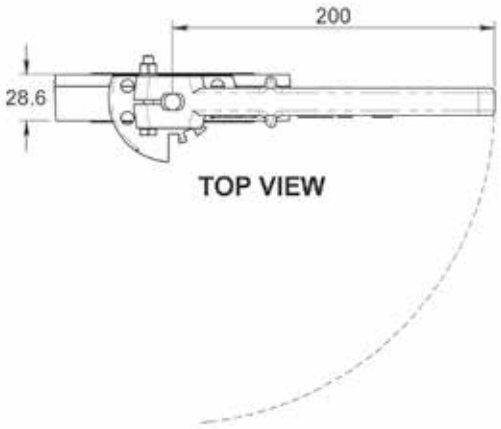
Ordering Information

- **LBV300:** 3” Butterfly valve c/w bonded Viton™ A seal.
- **LBV300Z:** LBV300 c/w 2 x 3” TTMA NBR gaskets.
- **LBV300VZ:** LBV300 c/w 2 x 3” TTMA Viton™ gaskets.
- **LBV350VG:** 3” Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV3-LA:** 3” Machined butterfly valve.
- **LBV3-AAZ:** 3” Butterfly Valve & Air Actuator.
- **LBV3-AASRZ:** 3” Butterfly Valve & Spring Return Actuator.

Associated Equipment

- **BF3:** 75mm TTMA aluminium flange (also available in mild & stainless steels).
- **0656:** 75mm TTMA NBR cork gasket.
- **4287:** 75mm TTMA Klingerite gasket.
- **0656V:** 75mm TTMA Viton™ gasket.
- **LBV4-7:** Locking tab.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.

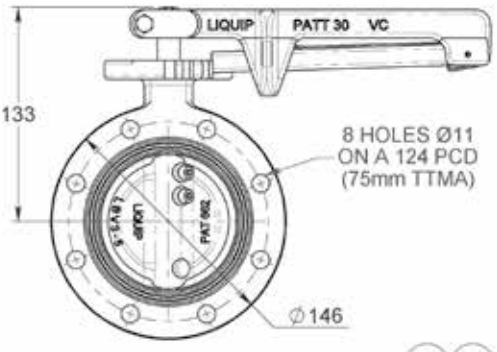
LBV350VG BUTTERFLY VALVE 75mm TTMA



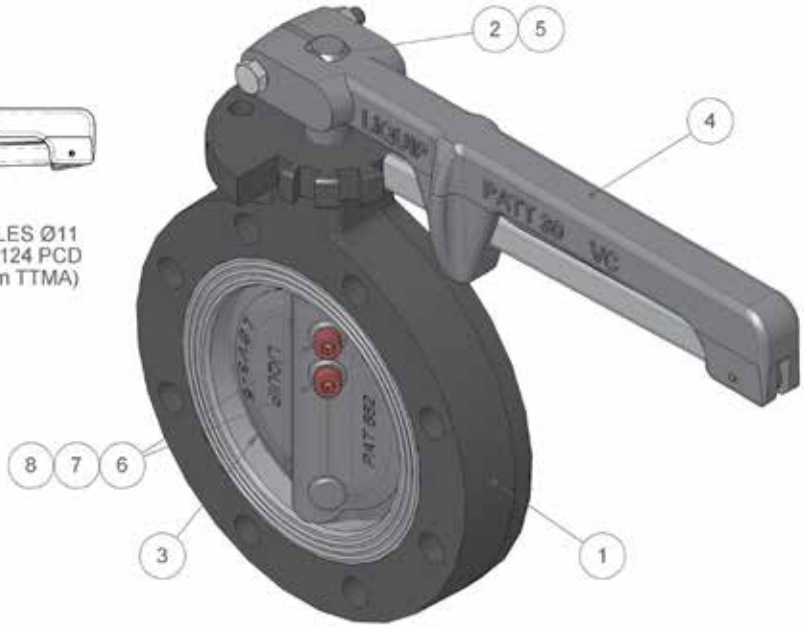
TOP VIEW



OPEN POSITION



FRONT VIEW



ISOMETRIC VIEW

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL
1	LBV350-1	BODY WITH BONDED SEAL	1	ALUMINIUM
2	LBV3-6	SPINDLE	1	ST STEEL
3	LBV3-5	BUTTERFLY 3" DISC	1	ALUMINIUM
4	LBV3-1	HANDLE ASSY	1	ALUMINIUM
5	0225	O-RING	2	NITRILE
6	709	CAPSCREW METRIC	2	Z/P STEEL
7	0156	NUT NYLOC	2	Z/P STEEL
8	3368	PIPE SEALANT	1	SEALANT



4" Lockable Flanged Butterfly Valves

Liquip's lockable 4" butterfly valves provide and control full flow through pipelines fitted with 100mm (4") TTMA flanges.

The Lockable feature ensures users don't inadvertently lock or open the butterfly valve.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- 100mm (4") product flow with locking tab.
- Bonded Viton™ GFLT seal for increased durability.
- Industry Standard 4" TTMA Flange Mounting.
- Lightweight aluminium body.
- Can be fitted with an Air Actuator or locking tab as required.

Technical Information

Working pressure

- 1500 kPa (210 PSI) in open position.
- 750 kPa (123.25 PSI) in closed position

Operating temperature

–40°C to 100°C.

Mounting

Mounts directly to Liquip 100mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Service

Periodically (approx every 6 months), inspect butterfly seat.

Weight

1.8kg - LBV450VGL.

Ordering Information

- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™ GFLT seal and aluminium locking tab.

Associated Equipment

- **LBV4-LA**: 4" Machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.
- **LBV4-7:** Locking tab.
- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steels).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.



LBV450VG shown

4" Flanged Butterfly Valves

Liquip's range of 4" butterfly valves provide and control full flow through pipelines fitted with 100mm (4") TTMA flanges.

With a lightweight and durable design butterfly valves are the butterfly valve of choice.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- 4 stage opening/closing valve.
- 100mm (4") product flow.
- Industry Standard 4" TTMA Flange Mounting.
- Bonded Viton™ GFLT seal for increased durability.
- Lightweight aluminium body.
- Can be fitted with an air actuator or locking tab as required.

Technical Information

Working pressure

- 1,500 kPa (210 PSI) in open position.
- 750 kPa (123.25 PSI) in closed position.

Operating temperature

–40°C to 100°C.

Mounting

Mounts directly to Liquip 100mm TTMA standard flange with chamfered entry to ensure disc clearance in open position.

Adjustment/Service

Periodically (approx every 6 months), inspect butterfly seat.

Materials

- Body - Cast aluminium.
- Butterfly disc - Cast aluminium.
- Handle - Cast aluminium with zinc plated steel locking lever.
- Spindle - Stainless Steel.
- Seal - Bonded Viton™ GFLT.

Weight

- 1.8kg - LBV540VG.
- 1.45kg - LBV4-LA.

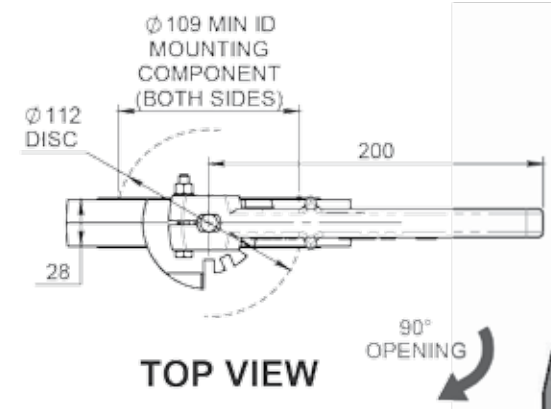
Ordering Information

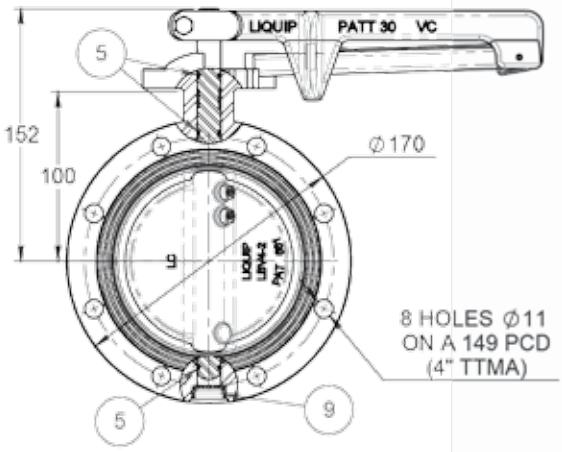
- **LBV450VG:** 4" Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV450VGZ:** LBV450VG c/w 2 x 4" TTMA Viton™ gaskets.
- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™ GFLT seal and aluminium locking tab.
- **LBV4-LA:** 4" Machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.

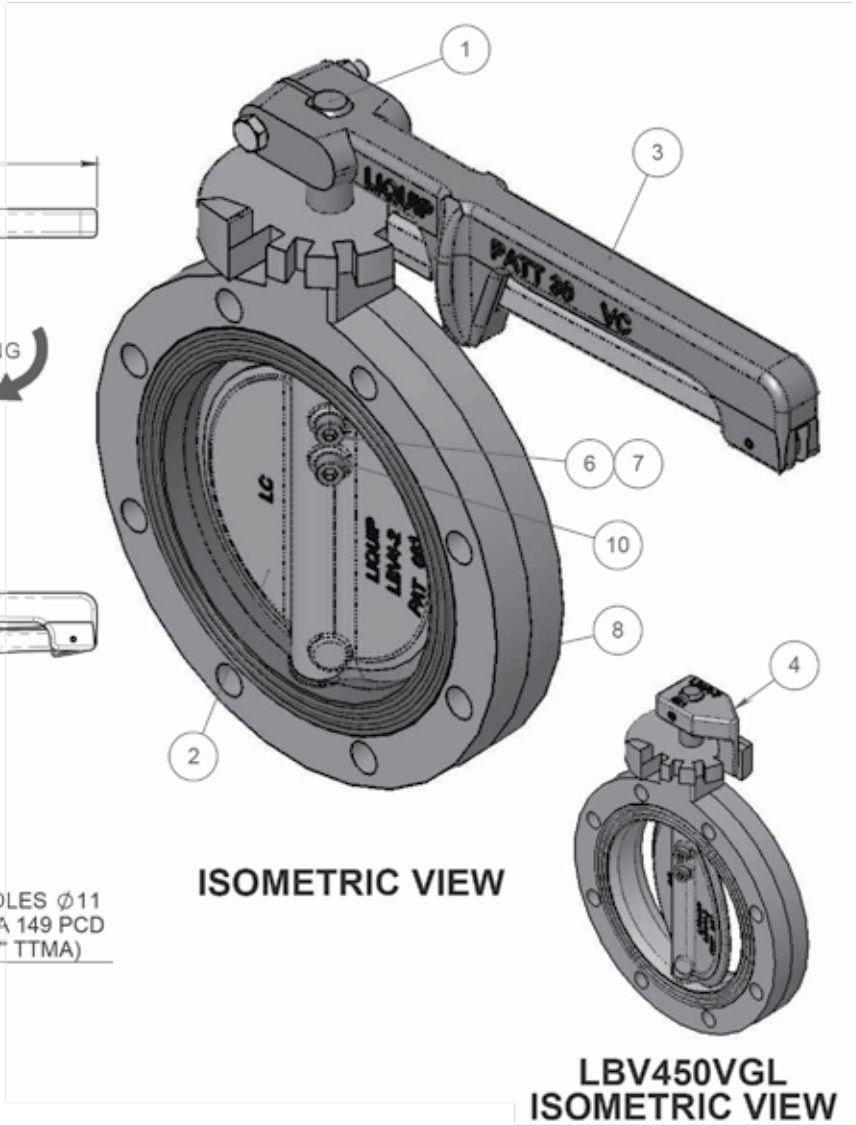
Associated Equipment

- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steels).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.
- **LBV4-7:** locking tab.
- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.

LBV450VG 100mm BUTTERFLY VALVE







LBV450VGL
ISOMETRIC VIEW

ITEM NO.	PART NUMBER	DESCRIPTION	LBV450VG	LBV450VGL	MATERIAL
1	LBV450-3	SPINDLE	1	1	ST STEEL
2	LBV4-2	DISC FOR LBV4	1	1	ALUMINIUM
3	LBV3-1	HANDLE ASSY	1	-	ALUMINIUM
4	LBV4-7	LOCK FOR LBV'S	-	1	ALUMINIUM
5	0225	O-RING	3	3	NITRILE
6	709	CAPSCREW METRIC	2	2	Z/P STEEL
7	0156	NUT NYLOC	2	2	Z/P STEEL
8	LBV450-2	BODY WITH BONDED SEAL VITON GFLT	1	1	ALUMINIUM
9	7608	WELCH PLUG	1	1	BRASS
10	3368	JOINTING COMPOUND	1	1	SEALANT



Air Actuators

The LBV3-LA (3") and LBV4-LA (4") butterfly valves are machined to be fitted with either a double acting or spring return pneumatic actuator.

The LBV3-LA, LBV4-LA and pneumatic actuators can be purchased separately or as part of a 'Z-Kit', which includes a 3" or 4" machined butterfly valve and either a double acting or spring return air actuator, plus mount kit. These Z-kits are supplied unassembled.

These actuated butterfly valves can be operated in conjunction with a manifold (DM104) or a product transfer pipe.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- Double acting or spring return air actuators available.
- High performance in a compact design.
- High torque value.

Technical Information

Air Actuator (LBV-AA)

Dimensions

172.6mm x 105.2mm x 82.7mm.

Supply Pressure Air

250 kPa - 800 kPa.

Temperature

-10°C to 80°C.

Minimum pressure to actuate

2.5 bar to open and close (providing 14Nm of torque).

Weight

1.99kg.

Spring Return Actuator (LBV-AASR)

Dimensions

242.0mm x 136.9mm x 109.2mm.

Supply Pressure

450 kPa- 800 kPa.

Temperature

-10°C to 80°C.

Minimum pressure to actuate

4.5 bar.

Weight

4.4kg.

Ordering Information

- **LBV-AA:** Air Actuator.
- **LBV-AASR:** Spring Return Air Actuator.
- **LBV3-LA:** 3" Machined butterfly valve.
- **LBV3-AAZ:** 3" Butterfly Valve & Air Actuator.
- **LBV3-AASRZ:** 3" Butterfly Valve & Spring Return Actuator.
- **LBV4-LA:** 4" Machined butterfly valve.
- **LBV4-AAZ:** 4" Butterfly Valve & Air Actuator.
- **LBV4-AASRZ:** 4" Butterfly Valve & Spring Return Actuator.

Associated Equipment

- **BF3:** 75mm TTMA aluminium flange (also available in mild & stainless steels).
- **0656:** 75mm TTMA NBR cork gasket.
- **4287:** 75mm TTMA Klingerite gasket.
- **0656V:** 75mm TTMA Viton™ gasket.
- **BF4:** 100mm TTMA aluminium flange (also available in mild & stainless steel).
- **0657V:** 100mm TTMA Viton™ gasket.
- **4248:** 100mm TTMA Klingerite gasket.



LYNX Series Bottom Loading Coupler

The LYNX series brings together the best features of all API couplers to provide a superior and effortless bottom loading experience.

The LYNX is optimised to bring your liquid terminals and tank trucks the very best in dry-break API technology. From its ultra-durable stainless-steel collar to its ability to protect your loading-arm connection even when facing surge pressures up to 3,400 kPa, you can count on LYNX for years of service and to help minimize fluid loss.

Fast Disassembly, Less Downtime

If you have 30 seconds and a screwdriver, you can disassemble LYNX. Thanks to a U-pin design, loading-arm operators can perform coupler maintenance without special tools and do it quickly.

Suitable for:

BOTTOM LOAD

Features & Benefits

Safety and Reliability

- Minimal product leakage during disconnect increases site safety.
- Low risk of leakage because of a proven seal design.
- Four, “true interlocking” stainless steel latches ensure superior latch alignment and maximum safety.
- Lightweight without reducing safety and reliability.
- High-quality components including a stainless-steel collar and hard anodized aluminium body for increased service durability and life.

Performance and Convenience

- Fast and easy disassembly of entire coupler through U-pin design.
- U-pin is secured when the TTMA flange is fastened to prevent the pin from falling out in service.
- Fast in-field replacement of main seals, on or off the arm.
- Two operating handle sizes to suit customer preference.
- Less drippage at disconnect compared to other couples.
- Collar designed to ensure minimal distortion of critical latching face.
- Easy to operate handle with a noticeable positive lock.

Comfort and Style

- Ergonomic operating handle and carry loop results in less physical strain on users.

Ordering Information

- **LYNX850:** Short Handle, Viton™ B.
- **LYNX850VG:** Short Handle, Viton™ GFLT.
- **LYNX850C:** Short Handle, FFKM.
- **LYNX852:** Long Handle, Viton™ B.
- **LYNX852VG:** Long Handle, Viton™ GFLT.
- **LYNX852C:** Long Handle, FFKM.
- **LYNX852G:** Long Handle, Viton™ B - AVGAS Selective.
- **LYNX852J:** Long Handle, Viton™ B - Jet Selective.
- **LYNX862:** Long Handle Drip Catcher, Viton™ B70.
- **LYNX862VG:** Long Handle Drip Catcher, Viton™ GFLT.

Associated Equipment

- **LBM800:** Liquip Loading Arm Balance Assembly.
- **LBV450VG:** 4” Butterfly Valve, Viton™ GFLT seals.
- **BF4-SG-25:** 4” TTMA Sightglass flange, 25mm thick.
- **BF4-SG-40:** 4” TTMA Sightglass flange, 40mm thick.
- **0657V:** 4” TTMA Viton™ Gasket.
- **4248:** 4” TTMA Klinger Gasket

Technical Information

Handle Length

Short (150mm) or Long (200mm).

Pressures

- **Max Working Pressure:** 80 psi (5.5 bar) (550 kPa).
- **Product Test Pressure:** 119 psi (8.2 bar) (820 kPa).
- **Design Pressure:** 363 psi (25 bar) (2,500 kPa).
- **Max Surge Pressure:** 493 psi (34 bar) (3,400 kPa).

Mounting

By industry standard 100mm (4") TTMA Flange.

Design Standard

API RP 1004 8th EDITION 2003 - Bottom Loading and Vapour Recovery.

Dismantling

Removal of one U-pin enables the shaft assembly and main poppet to be withdrawn.

Weight

8.6kg (LYNX85x Couplers).

10.81kg (LYNX86x Couplers).

Seals and Operating Temperatures

Seal Item No.	Seal Material	Seal Operating Temperature
API800-1	Viton™ B	-15°C to 90°C (0°F to 200°F)
API800-1VG	Viton™ GFLT (recommended for ethanol blends)	-28°C to 90°C (-20°F to 200°F)
API800-1C	FFKM (Kalrez)	-5°C to 80°C (-23°F to 176°F)
API800-1NBR	NBR (Nitrile/Buna)	-40°C to 100°C (-40°F to 212°F)
API800-1F	Fluorosilicone - low temps.	-45°C to 177°C (-49°F to 350°F)
API800-1ULT	Tecnoflon - ultra low temps.	-40°C to +90°C (-40°F to + 200°F).

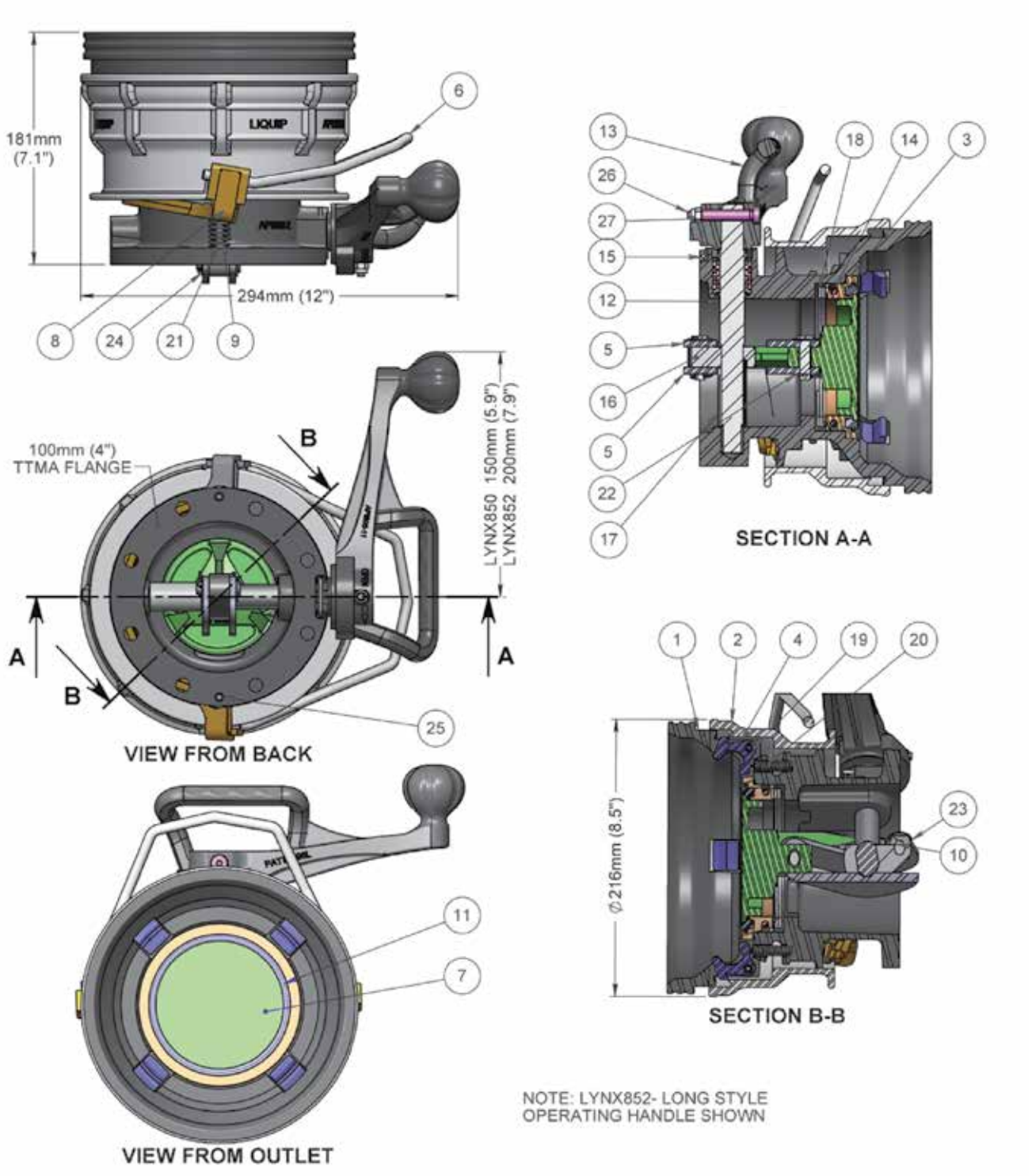
Scan this code with a QR Reader App on your smartphone to find out more about LYNX Series Products.

LYNX by Liquip

Not Just Better In Every Way. The Best In Every Way.



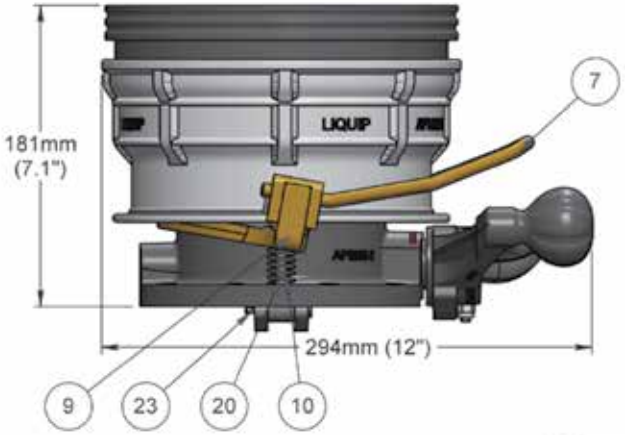
LYNX SERIES COUPLERS

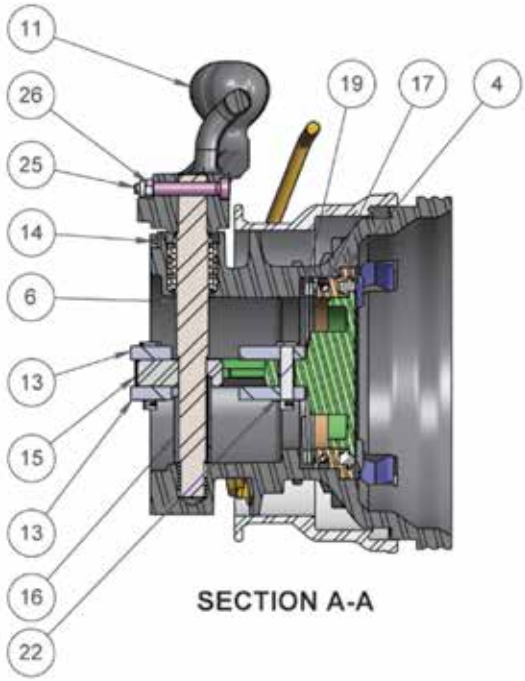


LYNX SERIES COUPLERS

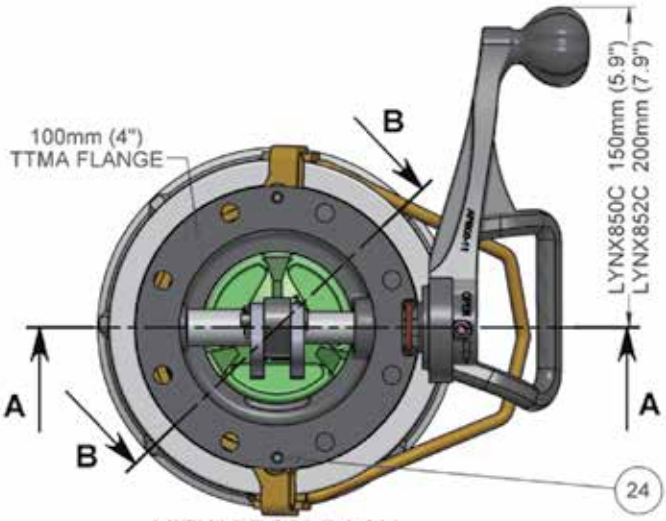
ITEM NO.	PART NUMBER	DESCRIPTION	LYNX850	LYNX852	LYNX850VG	LYNX852VG	MATERIAL
1	API800-2	BODY API800 SERIES COUPLER	1	1	1	1	ALUMINIUM
2	API800-3	OUTER BODY (COLLAR)	1	1	1	1	ST STEEL
3	API800-4	POPPET ADAPTOR RING	1	1	1	1	ALUMINIUM
4	API725-4	LATCH COLLAR INTERLOCK	4	4	4	4	ST STEEL
5	API800-6	CAMPLATE FOR API COUPLERS	2	2	2	2	STEEL PHOSPHATED
6	API555-6	HANDLE - OUTER BODY RING	1	1	1	1	ST STEEL
7	API800-9	POPPET 4"	1	1	1	1	ALUMINIUM
8	API555-10	LEVER OUTER BODY	1	1	1	1	ALUMINIUM
9	API800-13	PIN - SPRING RETURN	2	2	2	2	ST STEEL
10	API800-12	PIN CLEVIS	2	2	2	2	STEEL PHOSPHATED
11	API800-1	SEAL PRODUCT	1	1	-	-	VITON B
	API800-1VG	SEAL PRODUCT	-	-	1	1	VITON GFLT
12	API850-5A	SHAFT AND BUSH ASSY	1	1	-	-	STEEL, VITON A & ACETAL
	API850-5AVG	SHAFT AND BUSH ASSY	-	-	1	1	STEEL, VITON GFLT & ACETAL
13	API800-11	LONG STYLE HANDLE OPERATING	-	1	-	1	ALUMINIUM
	API800-15	SHORT STYLE HANDLE OPERATING	1	-	1	-	ALUMINIUM
14	0203	O-RING	1	1	-	-	VITON B70
	0203VG	O-RING	-	-	1	1	VITON GFLT
15	API800-23	PIN U	1	1	1	1	SPRING STEEL
16	API800-27	CAM ECCENTRIC WITH SLEEVE CUTOUTS	1	1	1	1	ST STEEL
17	API800-28	SPACER SLEEVE	1	1	1	1	STAINLESS STEEL
18	6182	SPRING SPIRAWAVE	1	1	1	1	SPRING STEEL
19	0927	SPRING (SELLOK) PIN	4	4	4	4	Z/P STEEL
20	6171	SPRING COMPRESSION	4	4	4	4	ST STEEL
21	4497	SPRING - RETURN	2	2	2	2	SPRING STEEL
22	5351	WASHER FLAT THIN	2	2	2	2	ST STEEL
23	0101	WASHER FLAT	2	2	2	2	Z/P STEEL
24	0762	SPLIT COTTER PIN	4	4	4	4	ST STEEL
25	3227	GRUBSCREW MET	2	2	2	2	BLK STEEL
26	55091	CAPSCREW SHOULDER METRIC	1	1	1	1	STEEL PHOSPHATED
27	4399	NUT NYLOC	1	1	1	1	Z/P STEEL

LYNX SERIES CHEMICAL COUPLERS

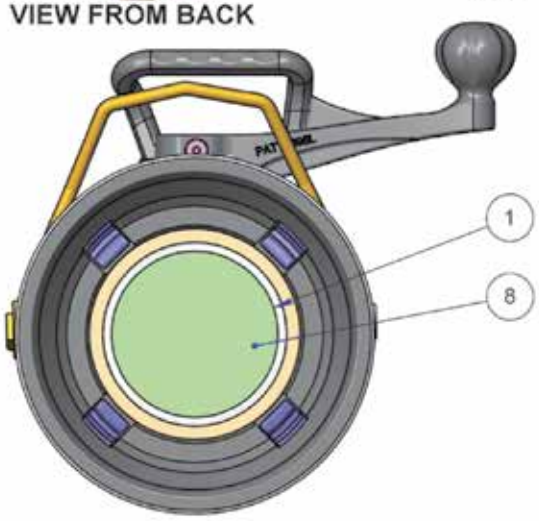




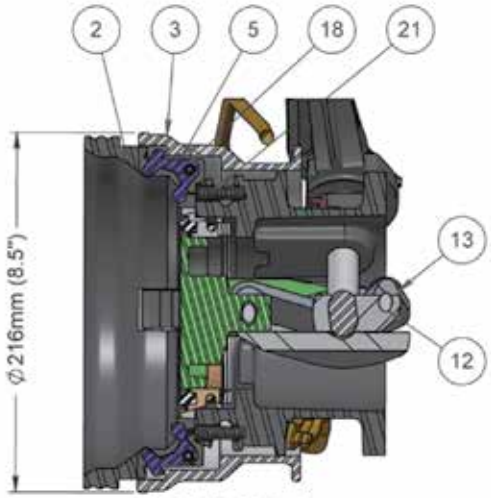
SECTION A-A



VIEW FROM BACK



VIEW FROM OUTLET



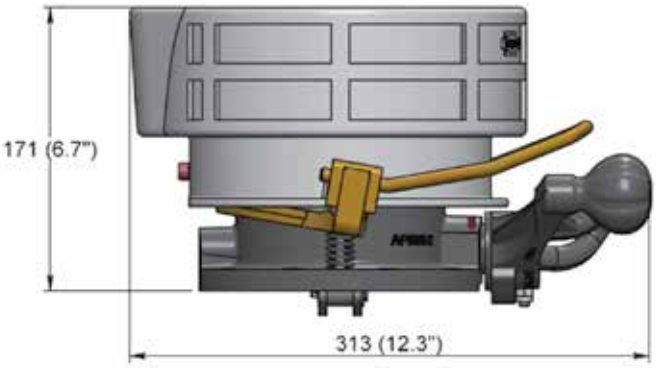
SECTION B-B

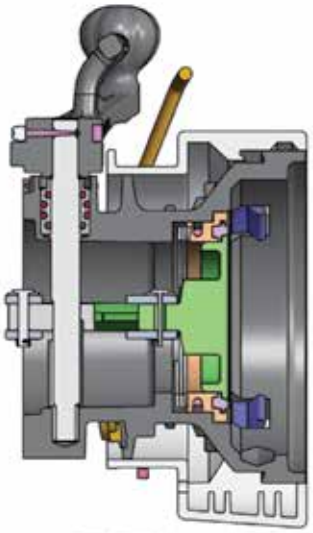
NOTE: LYNX852C - LONG STYLE
OPERATING HANDLE SHOWN

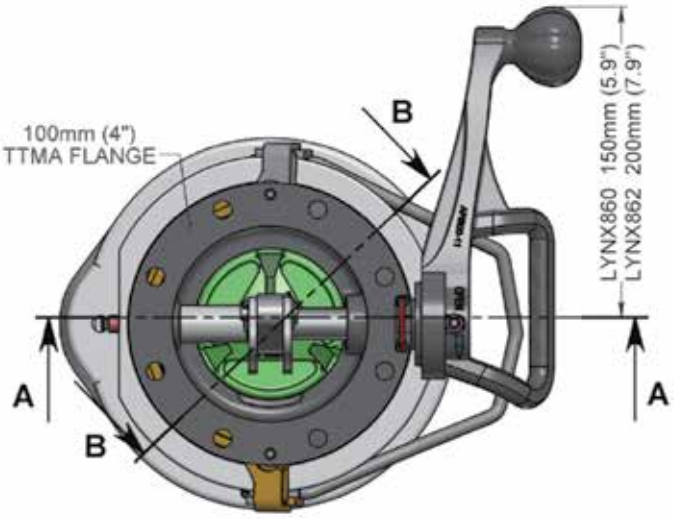
LYNX SERIES CHEMICAL COUPLERS

ITEM NO.	PART NUMBER	DESCRIPTION	LYNX850C	LYNX852C	MATERIAL
1	API800-1K	SEAL PRODUCT	1	1	FFKM
2	API800-2	BODY API800 SERIES COUPLER	1	1	ALUMINIUM
3	API800-3	OUTER BODY (COLLAR)	1	1	ST STEEL
4	API800-4	POPPET ADAPTOR RING	1	1	ALUMINIUM
5	API725-4	LATCH COLLAR INTERLOCK	4	4	ST STEEL
6	API850-5AC	SHAFT AND BUSH ASSY	1	1	SS, FFKM & PTFE
7	API555-6	HANDLE - OUTER BODY RING	1	1	ST STEEL
8	API800-9	POPPET 4"	1	1	ALUMINIUM
9	API555-10	LEVER OUTER BODY	1	1	ALUMINIUM
10	API800-13	PIN - SPRING RETURN	2	2	ST STEEL
11	API800-11	LONG STYLE HANDLE OPERATING	-	1	ALUMINIUM
	API800-15	SHORT STYLE HANDLE OPERATING	1	-	ALUMINIUM
12	API800-19	PIN CLEVIS (FOR API COUPLER-CHEMICAL)	2	2	ST STEEL
13	API800-20	CAMPLATE FOR API CHEMICAL COUPLERS	2	2	304
14	API800-23	PIN U	1	1	SPRING STEEL
15	API800-27	CAM ECCENTRIC WITH SLEEVE CUTOUTS	1	1	ST STEEL
16	API800-28	SPACER SLEEVE	1	1	ST STEEL
17	0203K	O-RING	1	1	FFKM
18	0927	SPRING (SELLOK) PIN	4	4	Z/P STEEL
19	6182	SPRING SPIRAWAVE	1	1	STSTEEL
20	4497	SPRING - RETURN	2	2	SPRING STEEL
21	6171	SPRING COMPRESSION	4	4	ST STEEL
22	5351	WASHER FLAT THIN	4	4	ST STEEL
23	0762	SPLIT COTTER PIN	4	4	ST STEEL
24	3227	GRUBSCREW MET	2	2	BLK STEEL
25	55091	CAPSCREW SHOULDER METRIC	1	1	STEEL PHOSPHATED
26	4399	NUT NYLOC	1	1	Z/P STEEL

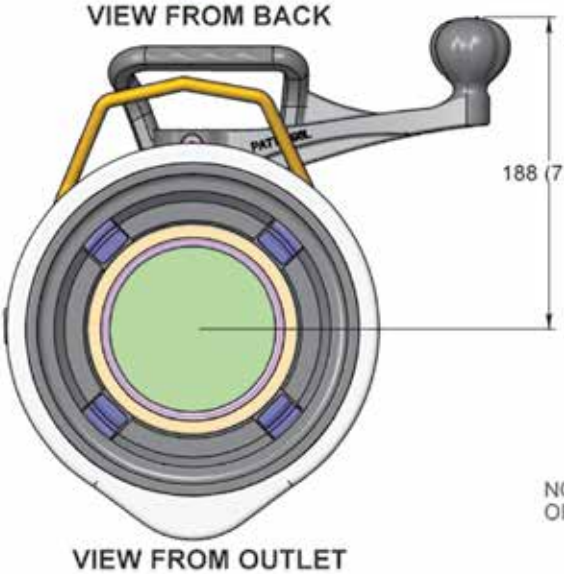
LYNX SERIES COUPLERS WITH DRIPCATCHER



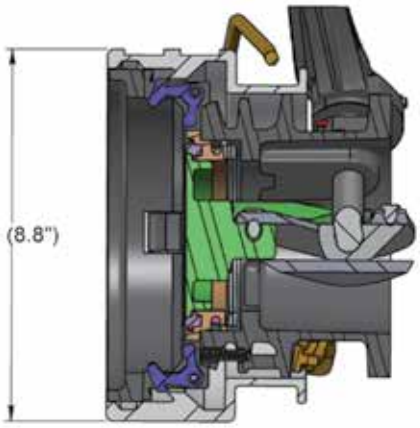

SECTION A-A



VIEW FROM BACK



VIEW FROM OUTLET



SECTION B-B

NOTE: LYNX862 - LONG STYLE
OPERATING HANDLE SHOWN

LYNX SERIES COUPLERS WITH DRIPCATCHER

ITEM	PART NUMBER	DESCRIPTION	LYNX860	LYNX862	LYNX860VG	LYNX862VG	MATERIAL
1	API800-1	SEAL PRODUCT	1	1	-	-	VITON B
	API800-1VG	SEAL PRODUCT	-	-	1	1	VITON GFLT
2	API820-2	BODY API800 SERIES COUPLER	1	1	1	1	ALUMINIUM
3	API725-3	COLLAR FOR API COUPLER	1	1	1	1	ST STEEL
4	API800-4	POPPET ADAPTOR RING	1	1	1	1	ALUMINIUM
5	API725-4	LATCH COLLAR INTERLOCK	4	4	4	4	ST STEEL
6	API800-6	CAMPLATE FOR API COUPLERS	2	2	2	2	STEEL PHOSPHATED
7	API555-6	HANDLE - OUTER BODY RING	1	1	1	1	ST STEEL
8	API800-9	POPPET 4"	1	1	1	1	ALUMINIUM
9	API555-10	LEVER OUTER BODY	1	1	1	1	ALUMINIUM
10	API800-12	PIN CLEVIS	2	2	2	2	STEEL PHOSPHATED
11	API800-13	PIN - SPRING RETURN	2	2	2	2	ST STEEL
12	API800-11	LONG STYLE HANDLE OPERATING	-	1	-	1	ALUMINIUM
	API800-15	SHORT STYLE HANDLE OPERATING	1	-	1	-	ALUMINIUM
13	API850-5A	SHAFT AND BUSH ASSY	1	1	-	-	STEEL, VITON A & ACETAL
	API850-5AVG	SHAFT AND BUSH ASSY	-	-	1	1	STEEL, VITON GFLT & ACETAL
14	0203	O-RING	1	1	-	-	VITON B70
	0203VG	O-RING	-	-	1	1	VITON GFLT
15	API800-23	PIN U	1	1	1	1	SPRING STEEL
16	API800-27	CAM ECCENTRIC WITH SLEEVE CUTOUTS	1	1	1	1	ST STEEL
17	API800-28	SPACER SLEEVE	1	1	1	1	ST STEEL
18	55091	CAPSCREW SHOULDER METRIC	1	1	1	1	STEEL PHOSPHATED
19	0927	SPRING (SELLOK) PIN	4	4	4	4	Z/P STEEL
20	4497	SPRING - RETURN	2	2	2	2	SPRING STEEL
21	6171	SPRING COMPRESSION	4	4	4	4	ST STEEL
22	6182	SPRING SPIRAWAVE	1	1	1	1	SPRING STEEL
23	5351	WASHER FLAT THIN	2	2	2	2	ST STEEL
24	0101	WASHER FLAT	2	2	2	2	Z/P STEEL
25	0762	SPLIT COTTER PIN	4	4	4	4	ST STEEL
26	3227	GRUBSCREW MET	2	2	2	2	BLK STEEL
27	6737	CAPSCREW METRIC	1	1	1	1	ST STEEL
28	4399	NUT NYLOC	1	1	1	1	Z/P STEEL



API Drain Plugs

Liquip offers a drain plug for API couplers that allows users to drain the loading arm if the arm is fitted with an API coupler that conforms to API RP 1004 for service and maintenance purposes.

Suitable for:

BOTTOM LOAD

Technical Information

Operation

Fit the plug into the API valve, this will disengage the mechanical override and allow the valve to be opened and the contents can be drained into a suitable container.

It is recommended to use the APIDP100 in conjunction with a Liquip butterfly valve.

Weight:

1.1kg.

Ordering Information

- **APIDP100:** API drain plug for loading arms.



API Latching Indicator

The API-LI has been designed to provide users with a quick and efficient method to measure the latching capability of Liquip manufactured API couplers, API700, API800 and LYNX Series.

The latching capability of the API coupler is measured instantly against pre-determined allowances and is visually represented allowing users to easily determine if the coupler is suitable for continued use or if it requires servicing.

Suitable for:

BOTTOM LOAD

Features & Benefits

- Indicates latching integrity of API coupler.
- Quick and easy to use.
- Visual indication of coupler latching capability.
- Can be used in situ.
- Stainless Steel 304 construction for durability.

Technical Information

Visual Identification

RED (only) visible:

Immediately remove coupler from service and conduct complete coupler maintenance.

GREEN (only) visible

Continue coupler use.

RED and **GREEN** visible:

Continue coupler use. Monitor and check again in 3-6 months.

Note: The API-LI is intended to be used in conjunction with standard coupler maintenance.
Liquip recommends users service couplers in line with Liquip's recommended coupler maintenance schedule.

Operation

When engaging the API-LI ensure you squeeze the stainless steel handle of the API coupler, as this will assist with the ease of engagement and increase the service life of the API-LI.

Ordering Information

- **API-LI:** API coupler latching indicator.

Associated Equipment

- **LYNX Series Dry-Break Coupler.**
- **API-NCFG:** Stainless steel API Nosecone wear gauge set.



API Parking Adaptors

The PA800 Series of parking adaptors for API couplers ensures bottom loading arms are correctly stowed and secured when not in use.

Parking adaptors can also be supplied to be used in conjunction with a proximity sensor (supplied separately). The proximity sensor once actuated can enable system interlocks.

Suitable for:

BOTTOM LOAD

Features & Benefits

- All parking adaptors have built in stops to ensure the coupler can not be opened whilst parked.
- Parking adaptors can be supplied with a proximity switch to enable system interlocks.

Technical Information

Adjustment

Periodically grease sliding proximity switch (where supplied) by using grease nipple visible from face of nosecone.

Mounting

- PA801 & PA811 bolt onto bracket supplied by customer.
- PAA80x & PAA81x are free standing (bolt to concrete or skid floor).

Weight

- PA801- 0.9kg.
- For other weights contact Liquip.

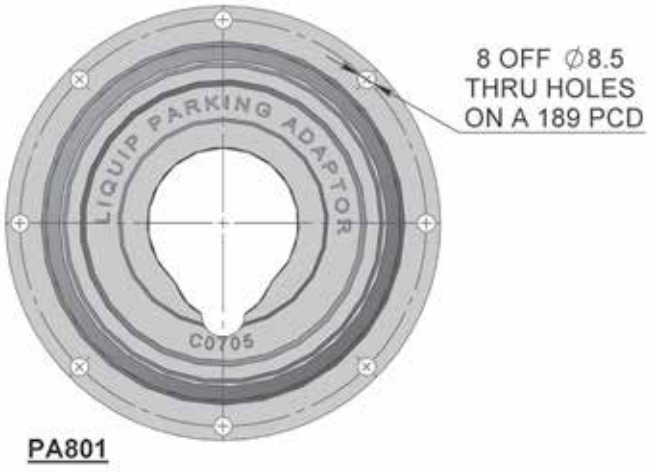
Ordering Information

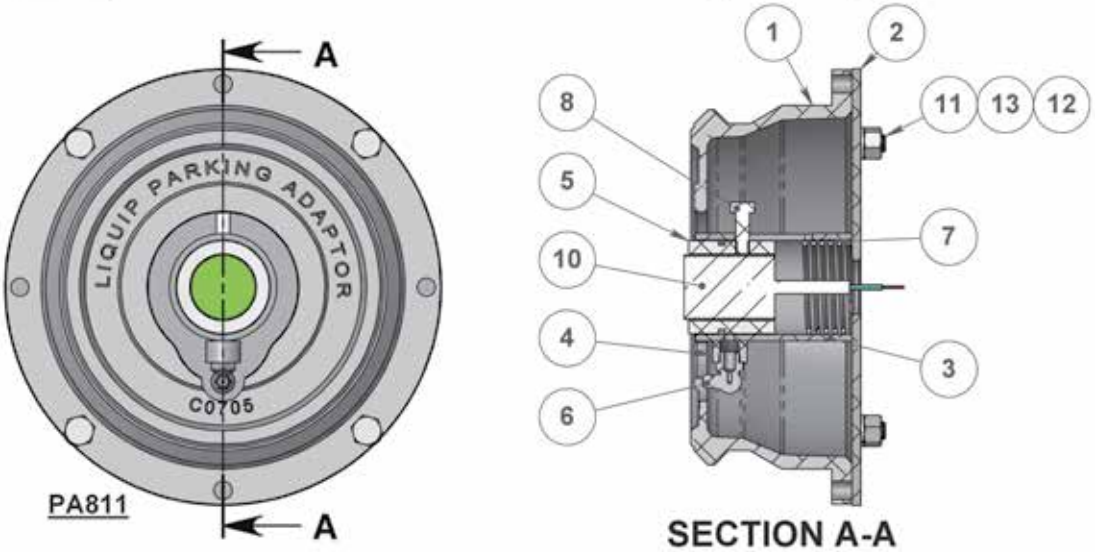
- **PA801:** API Parking Adaptor.
- **PA811:** API Parking Adaptor with Proximity Sensor Holder.
- **PAS801:** API Parking Adaptor c/w Stand, Straight.
- **PAS811:** API Parking Adaptor c/w Stand, Straight, with Proximity Sensor Holder.
- **PAA801:** API Parking Adaptor c/w Stand, Angled.
- **PAA811:** API Parking Adaptor c/w Stand, Angled, with Proximity Sensor Holder.

Associated Equipment

- **5544:** Proximity Switch Sensor.
- **LYNX Series Dry-Break Coupler.**

PARKING ADAPTOR





ITEM	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
13	6618	NUT METRIC	4	ST STEEL
12	5362	WASHER SPRING	4	ST STEEL
11	55057	SETSCREW METRIC	4	ST STEEL
10	5544	PROXIMITY SENSOR 30mm Ex ia (NOT INCLUDED)	-	ELECTRONIC
9	3395	GREASE SOLVENT RESIST	1	GREASE
8	4840	SETSCREW HEX HD IMP	1	NYLON
7	4439	SPRING COMPRESSION	1	ST STEEL
6	0478	GREASE NIPPLE	1	Z/P STEEL
5	APIPA-2	PROXIMITY HOLDER / SLIDER	1	ACETAL
4	APIPA-4	SOCKET 1/8" BSP	1	ALUMINIUM
3	APIPA-3	TUBE GUIDE	1	ALUMINIUM
2	APIPA-1	BACKING PLATE	1	ALUMINIUM
1	PA801	PARKING ADAPTOR	1	ALUMINIUM



API - Nosecone Wear Indicator

Liquip's API-NCFG is an industry first nosecone wear gauge which clearly shows the level of wear on any API nosecone that is manufactured to API RP1004 and EN 13083 standard.

Suitable for:

BOTTOM LOAD

Features & Benefits

- Made from grade 304 stainless steel for durability and longevity.
- Multiple measurements allow you to see where in the allowable tolerance the API nosecone is.

Technical Information

Operation (Text provided on unit)

#1 - API RP1004 & EN 13083 Maximum Nose Size

This gauge is at the upper tolerance of the standard. If this gauge does not fit over, loading couplers may not connect.

#2 - API RP1004 & EN 13083 Nominal Nose Size

This gauge is at the mid tolerance of the standard and indicates a nosecone in the ideal working condition.

#3 - API RP1004 & EN 13083 Minimum Nose Size

This gauge is at the lower tolerance of the standard. If this gauge fits over, the nosecone has worn outside the standard.

#4 - Half Worn - Recheck Regularly

This gauge indicates a nosecone with 0.4mm wear beyond the lower tolerance of the standard. It is possible for a coupler to disengage itself from a nosecone of this size.

#5 - Worn - Replacement Recommended.

This gauge indicates a nosecone with approx 0.8mm wear beyond the lower tolerance of the standard. It is not uncommon for a coupler to disengage itself from a nosecone of this size.

Ordering Information

- **API-NCFG:** Stainless steel API Nosecone wear gauge set.

Associated Equipment

- **API490 Series API adaptors.**
- **API-LI:** API coupler latching indicator.



Rail Car API Couplers

The APIRC is a drybreak coupler intended for gravity discharge only and will mate with any standard API bottom loading adaptors.

The APIRC is suitable for unloading rail cars or for use on jumper hoses to pumping systems up to a maximum working pressure of 350 kPa.

Suitable for:

BOTTOM LOAD

Features & Benefits

- Lightweight simple & inexpensive option to a standard API bottom loading coupler.
- Quick and easy disassembly process.
- Cam levers securely clamp the coupler onto API adaptor.
- Opening the operating handle will open both poppets on the API coupler and API adaptor.

Technical Information

Maximum coupling pressure

350 kPa.

Product retention

To 500 kPa.

Materials

- Body poppet and handle: Aluminium.
- Operating Shaft: Stainless Steel.
- Seals: Viton™ A.

Thread outlet

100mm BSP female.

Bore

100mm bore throughout.

Weight

4.3kg.

Ordering Information

- **APIRC:** 100mm Female API rail coupler.



Drop Hose Covers

Liquip offers a range of Velcro drop hose covers that can be mounted to drop hoses to allow easy identification of product in each loading arm.

Suitable for:

BOTTOM LOAD

VAPOUR RECOVERY

Features & Benefits

- Standard fit on Liquip 2m drop hoses.
- Coated PVC tarp fabric for durability.
- Covers are easily attached via Velcro fasteners.

Ordering Information

- **3576:** Diesel Drop Hose Cover (Olive background).
- **3577:** Unleaded Drop Hose Cover (Violet background).
- **4683:** Jet-A1 Drop Hose Cover (Black background).
- **4748:** PULP Drop Hose Cover (Yellow background).

Other products available upon request.

Associated Equipment

- **5639P:** 2 metre Stainless Steel drop hose with 4” TTMA flange.



Drop Hoses

Liquip offers 4" TTMA braided stainless steel drop hoses for use on bottom loading arms.

Liquip drop hoses are built to last and are provided in a standard length which when incorporated into the load arm design will allow the loading arm to move freely within the API loading envelope.

Suitable for:

BOTTOM LOAD

VAPOUR RECOVERY

Features & Benefits

- Drop hose is provided in a standard length for simplicity of ordering and construction.
- Braided stainless steel construction for strength, flexibility and durability.
- 4" TTMA flanges to allow easy connection and disconnection during installation, service and maintenance.
- Liquip's Stainless Steel drop hoses are manufactured and tested to ISO 10380 - Pipework - Corrugated metal hoses and hose assemblies and they meet AS2683 - Hose and hose assemblies for distribution of petroleum and petroleum products.
- Liquip test drop hoses to AS1180.13A. Which is a method of testing used to ensure resistance less than 1 mega ohm/metre for dissipation of static electricity.

Ordering Information

- **5639P:** 2 metre Stainless Steel drop hose with 4" TTMA flange.

Associated Equipment

- **3576:** Diesel Drop Hose Cover (Olive).
- **3577:** Unleaded Drop Hose Cover (Violet).
- **4683:** Jet-A1 Drop Hose Cover (Black).
- **4748:** PULP Drop Hose Cover (Yellow).



4" Sightglasses and Flanges

The BF4 series of sightglasses and flanges are made to suit 4" TTMA flanges/piping.

Flanges provide the ability to make a removable connection between two points.

Sightglass flanges bolt directly behind an outlet adaptor and provide the ability to view product in piping to ensure if a compartment/tanker has product present or if it has been drained.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- The standard drilling for sightglasses is TTMA, so the unit will fit behind an API adaptor as well as Liquip butterfly valve.
- Max pressure - 1,000 kPa
- Max temp - 70°C
- Specially designed to last in fuells for extended durations without cracking or crazing.

Ordering Information

Flanges

- **BF4:** Aluminium 100mm Tube to 4" TTMA Flange.
- **BF4-7:** Aluminium 4" TTMA Blank Flange.
- **BF4-1:** Mild Steel 100mm Tube to 4" TTMA Flange.
- **BF4-6:** Mild Steel 4" TTMA Blank Flange.
- **BF4-1S:** Stainless Steel 304,100mm Tube to 4" TTMA Flange.
- **BF4-1S-316:** Stainless Steel 316, tube to 4: TTMA Flange.

Sightglasses

- **BF4-SG-25:** 4" TTMA Sightglass flange (25mm thick).
- **BF4-SG-25Z:** BF4-SG-25 c/w 4" Neo Cork TTMA gasket.
- **BF4-SG-25VZ:** BF4-SG-25 c/w 4" Viton™ A TTMA gasket.
- **BF4-SG-40:** 4" TTMA Sightglass flange (40mm thick).
- **BF4-SG-40Z:** BF4-SG-40 c/w 4" Neo Cork TTMA gasket.
- **BF4-SG-40VZ:** BF4-SG-40 c/w 4" Viton™ A TTMA gasket.
- **API-SG-150:** ANSI flange pattern, 40mm thick.

Associated Equipment

- **LYNX Series Couplers**
- **LBV450VG:** 4" Butterfly valve c/w bonded Viton™ GFLT seal.
- **LBV450VGZ:** LBV450VG c/w 2 x 4" TTMA Viton™ gaskets.
- **LBV450VGL:** 4" Butterfly valve c/w bonded Viton™ GFLT seal and aluminium locking tab.
- **LBV4-LA:** 4" machined butterfly valve.



4" ANSI Sightglass Flanges

ANSI Sightglass flanges generally bolt below the Liquip balance mechanism in terminal systems and provide the ability to view product in the pipework to determine if a loading arm has product present or if it has been drained.

Suitable for:

TOP LOAD | BOTTOM LOAD | VAPOUR RECOVERY

Features & Benefits

- 4" 150# flange bolt pattern.
- 40mm thick.
- Flange is 228mm (9") O.D.
- Each sight glass is date stamped.
- Provides visual identification of product.

Ordering Information

- **API-SG-150:** ANSI flange pattern, 40mm thick.

Technical Information

Maximum working pressure

1,000 kPa.

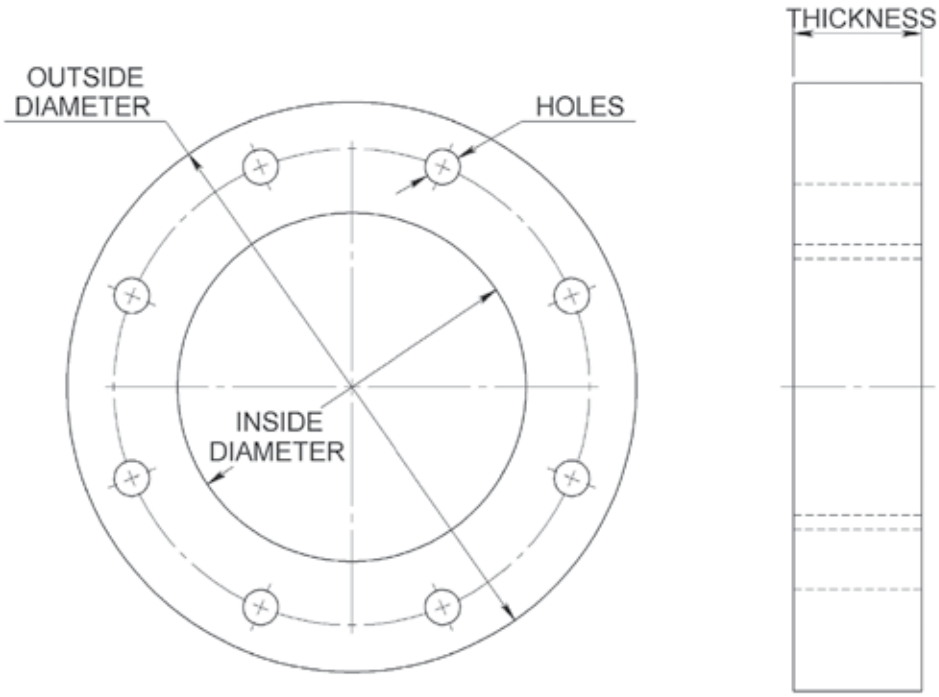
Maximum working temperature

70°C.

Weight

1.2kg.

SIGHTGLASS FOR FLANGES



Size	Part No	Outside Diameter	Inside Diameter	Thickness	Holes
4" ANSI125	API-SG-150	228	130	40	8 x Ø19 on 190 PCD
4" TTMA	BF4-SG-25	178	109	25	8 x Ø11 on 149.2 PCD
4" TTMA	BF4-SG-40	178	109	40	8 x Ø11 on 149.2 PCD
3" TTMA	BF3-SG	146	86	25	8 x Ø11 on 124 PCD

NOTES:
1. MATERIAL IS CAST ACRYLIC.
2. MOUNTING FLANGES TO BE FLAT TO WITHIN 1mm.
3. VITON (OR SIMILAR HARDNESS) GASKETS TO BE USED.
4. TIGHTEN MOUNTING BOLTS TO A TORQUE OF 20Nm.



Bitumen Air Rams

Liquip can supply air rams which are suitable for use with Liquip Bitumen top loading arms. Air (pneumatic) rams are used with Bitumen load arms to withstand extreme temperatures.

Contact Liquip for assistance with designing a bitumen loading arm to meet your specifications whilst providing increased efficiency and superior operator safety.

Suitable for:

BITUMEN

Technical Information

Contact Liquip for full details regarding technical information.

Ordering Information

- **58050:** Air (Pneumatic) Ram for use with Bitumen loading arms (500 Stroke).

Associated Equipment

- **LAB100:** Balance assembly for Liquip Bitumen loading arms.
- All Liquip Bitumen load arms.



Safety Breakaways

The NTS Series Safety Breakaway Coupling from Liquip/ OPW represents the best available technology to protect your equipment, your people and the environment. Whether you are loading tank trucks, railcars, barges or ships, with liquid or gas; the NTS is designed to separate in the event of an unintended pull-away.

Suitable for:

TOP LOAD | BOTTOM LOAD | LPG LOAD

Features & Benefits

- Non-return valves positively shut both ends preventing spills and protecting the loading station at the same time.
- Immediate separation occurs at individually determined straight or angular pulling force. This non-destructive separation allows easy reassembly, with no shear pins, tools or spare parts.
- The NTS can also be reassembled without tools or spare parts. You're back up and running in a matter of minutes.
- High value fluid and gas transfer is protected by two spring energized valves for maximum protection with a minimum of fluid loss.
- Break Force does not change with system pressure or angle of pull!

Specifications

Connections

- FNPT or Flange (150/300#)

Sizes

- 1", 2", 3", 4", 6" (Sizes up to 12" Available Upon Request)

Max. Pressure

- 360 PSI (Alu 232 PSI)

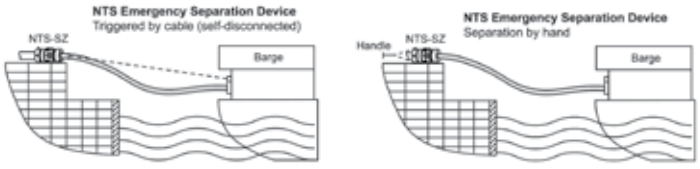
Materials

- 316 Stainless Steel (Anodized Aluminium in 4" size only)

Seals

- Fluorocarbon, EPDM, Chemraz®

*Other materials available upon request.



SZ Loading Arm Marine Installation Example

Note: The length of the SZ cable must be shorter than the maximum movement of the loading arm hose in order to trigger the separation.

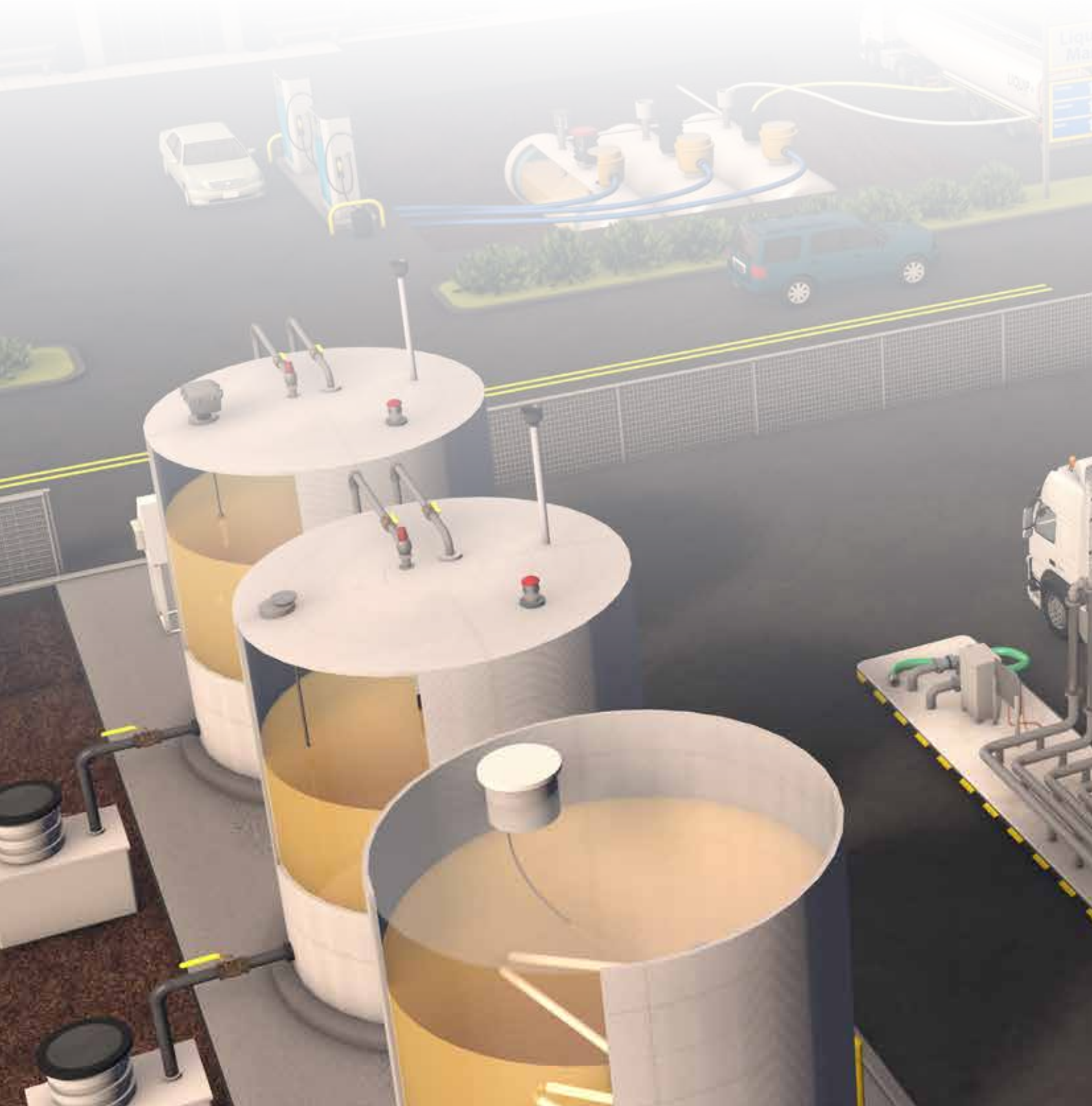
SZ Series Breakaway Coupling Installation Example

When the line system is subjected to an unprecedented load, the levers swing out by the cable. The slide ring is displaced and the segments are released. Then the two body halves separate and the two spring-loaded valves immediately shut both hose ends.



LIQUIP
PART OF OPW A DOVER COMPANY

Overfill Protection



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Gantry Plugs & Cables 292-295
Overfill System Testers..... 296
Overfill Accessories 297-299



Overfill Protection

Liquip overfill protection systems are safe, reliable and manufactured to world recognised codes and regulations.

With Factory Mutual, IECEX and ATEX approvals, Liquip' s terminal and depot based overfill protection equipment is compatible with industry recognised electronic optic and thermistor overfill probes on tanker fleets and compliant with other applicable codes such as EN 13922 and American Petroleum Institute Recommended Practice 1004 (APIRP1004).

The Liquip electronic overfill protection monitors, probes and accessories are available in a range of configurations and compatible and interchangeable with other industry standard brands.

Liquip manufacture 2 base models for different applications with variations such as voltages, earthing methods, probe type and numbers of probes easily accommodated in each model.

Key Concepts Common To Our Range Include:

- Reliable fail-safe operation
- Detection and shutdown response of less than 0.5 seconds
- Self checking circuitry
- System diagnostics
- Integral grounding functions on all monitors is provided at no extra cost (no need for separate grounding monitor)
- Automatic detection and switching between 2 wire and 5 wire modes
- Compatibility with 2 wire, 5 wire and thermistor probe types
- Maintenance free with solid state circuitry requiring no adjustment

Grounding

Have you really been grounded? Much has been claimed about the specific features and functions of various grounding systems. What is actually important is a basic understanding of the properties of static electricity and it's need to escape to ground by jumping to objects with a lower electrical potential.

Following a large static spark at a terminal equipped with a dedicated earthing monitor, Liquip surveyed available earth assurance systems and 'unearthed' shortcomings in their operation. Many of these criticisms were due to incorrect installation methods, though the equipment itself was sound. Liquip therefore added simple features to our tanker and terminal mounted equipment to improve the effectiveness of the grounding systems.

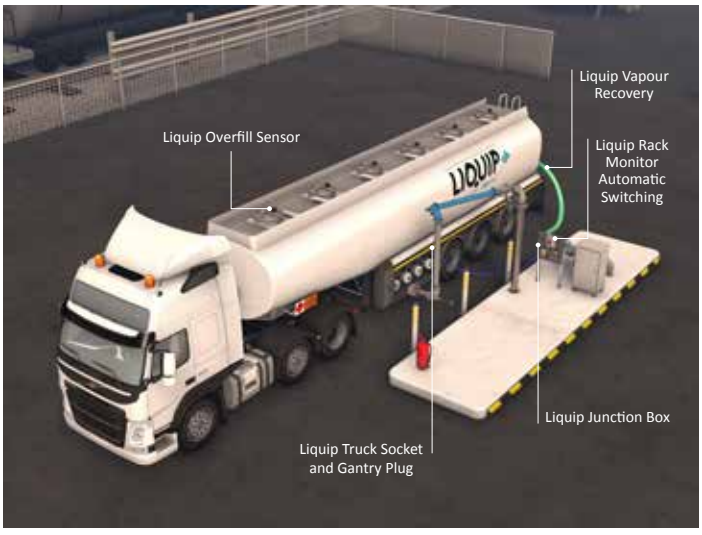
On the tanker, it is essential that the common earth wire be grounded through the tank structure. Many tankers only have the bumper bar or truck plug earthed, not the tanker.

Truck Plugs, Probes and Accessories

A comprehensive range of tanker mounted overfill equipment is available from Liquip. Please refer to our Tanker Equipment catalogue for more details.

Lightning and Other Electrical Surges

Recent upgrades to Liquip's range have made them even more resistant to fluctuating electrical power supplies and lightning strikes. However, please ensure adequate electrical protection for your installed electrical equipment.



Indicative Schematic





Single Channel Overfill Protection Monitor - ATEX Applications only

The PD501 monitor provides overfill protection combined with ground assurance.

The PD501 is a basic unit which offers the lowest capital cost with simple and cheap installation wiring. It is compatible with all common probes built to EN13922.

The PD501 is a multi-purpose monitor for use in ATEX applications only.

Features & Benefits

- Explosion proof housing.
- Incorporates a single channel for 2-wire probes for railcar filling or other 2 wire applications.
- Monitors up to 15 x 5-wire probes for overfill protection.
- Ground assurance.
- ATEX approvals.
- Cost effective overfill protection & ground assurance.

Technical Information

Safety Approvals

- ATEX Certificate: TRL03ATEX11007X.
- Marking: EEx d [ia] IIB T6
  CE 0518 EX II 2 [1] G.
- Parameters: Uo = 17V, Io = 179mA, Co = 1.8µF, Lo/Ro = 200µH/Ω.

Housing

Explosion proof housing for Zone 1, monitoring signals intrinsically safe Zone 0.

Power supply

240VAC or 110VAC (upon request).

Weight

8kg.

Ordering Information

Standard Configurations

- **PD501-240-FC:** 240V Single channel monitor - 5 wire and overfill monitor (ATEX only).
- **PD501-240-GC:** 240V Single channel monitor - Ground control (ATEX only).

For all other configurations, order as:

- **PD501-240:** 240V single channel monitor - (ATEX only).



RM140 - Overfill and Grounding Monitor

Overfill protection and grounding monitor for truck or rail loading in petro-chemical applications. Built to function with all probes designed to the API code: API RP 1004 and the EU Standard EN13922, the RM140 Series is the world's most flexible and adaptable monitor.

The RM140 provides state-of-the-art overfill protection and grounding monitoring that is compatible with all commonly used overfill protection and grounding systems.

Known around the world for its superior reliability and 'bullet proof' design. The RM140 series can detect the type of sensor in the transport, the state of liquid in the tank, an overfill situation, and/or verify the grounding condition.

Features & Benefits

- Grounding and/or Overfill Monitor in one competitive package.
- Automatic sensing of 2-wire/thermistor or 5-wire overfill systems.
- Supports up to (8) 2-wire/thermistor probes and up to (12) 5-wire probes.
- Self-test at start up/continuous self-monitoring, ensures safety throughout the loading process.
- Separate grounding and overfill control outputs.
- Ultra high visibility display provides flexibility for indoor/outdoor use.
- Full sensor diagnosis at a glance.
- Coded wireless by-pass key for secure and reliable operation.
- Built in 110 & 240 voltage selection.
- Built in 6 or 8 channel selection.
- Upgradeable software to allow for additional features.

Technical Information

Approvals

- IECEX, ATEX, FM.
- Built to comply with EN13922 and with API RP1004.
- Will function will all probes designed to EN13922.
- Up to Hardware SIL 1 capable.

Material

- Explosion proof aluminium housing base & cover.
- Laminated glass window.

Weight

16.5kg.

Operation

- In order to load the RM140 checks for grounding and overfill status of the gantry/vehicle.
- The RM140's ground verification ensures there is sufficient grounding in place to allow loading to occur.
- The RM140 checks the overfill status by sending a intrinsically safe signal to the probes in the vehicle asking them if they are dry or wet.
- When probes are 'dry', a signal is returned to the monitor. If the signal meets pre-determined characteristics the monitor goes to a "permissive" state which allows loading to occur. If the probe becomes 'wet', the relay is opened and the monitor goes to a "non permissive" state which prevents loading from occurring.

Electrical

Power	240V	110V
Min Input Voltage	185 Vac	85 Vac
Max Input Voltage	275 Vac	135 Vac
In-rush Current	2.2 A	2.3 A
Max Current	400mA	400mA
Normal Power Consumption	8.6W (No Probe) 20W (8 x2wire probes)	8.6W (No Probe) 20W (8 x2wire probes)
Mains Power Fuse Rating	250V, 400mA anti-surge 1500A Breaking Capacity	250V, 400mA anti-surge 1500A Breaking Capacity

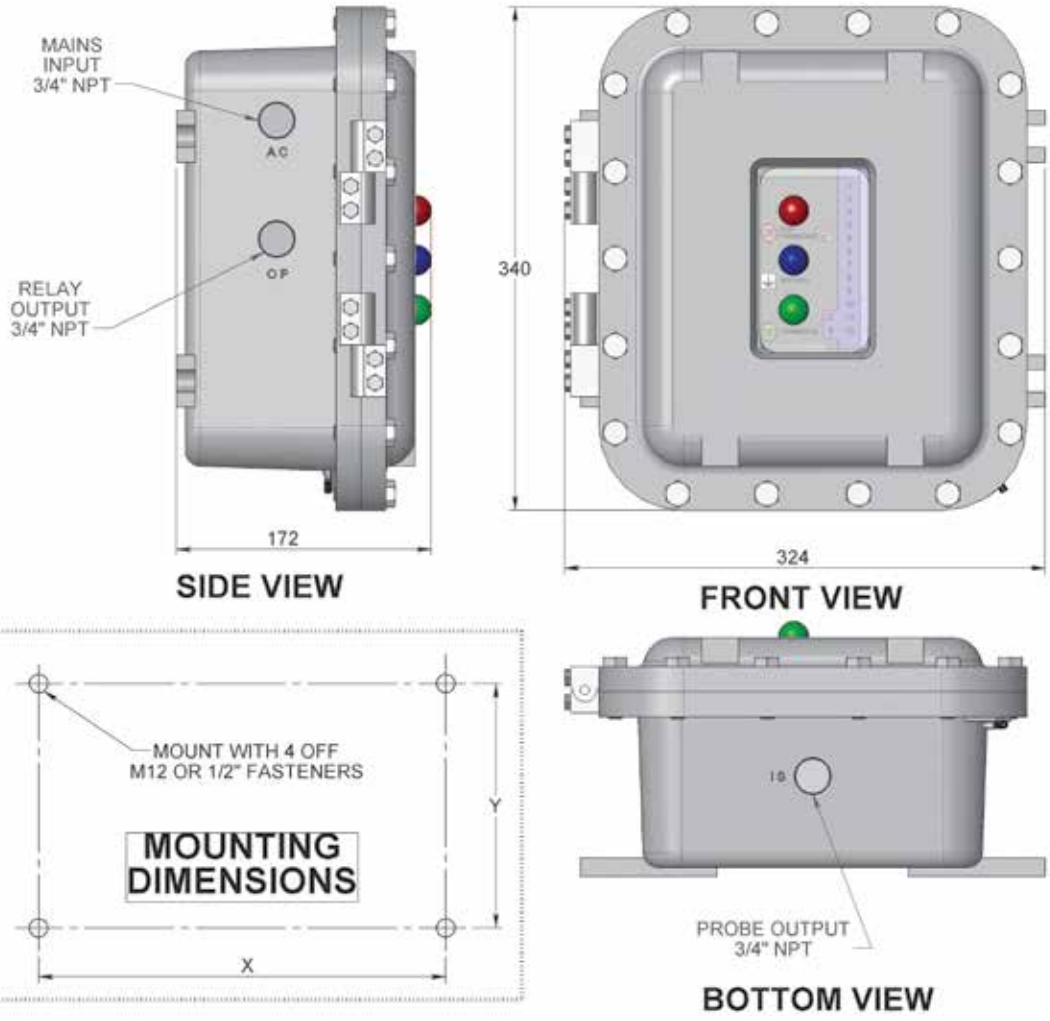
Ordering Information

- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets). For any specific configurations, contact Liquip.

Associated Equipment

- **6983:** Wireless FOB Bypass key for RM140.
- **6987:** Fuse 400mA, 250Vac anti-surge, 1500A Breaking Capacity.
- **5542:** Fuse 5A @ 250Vac anti-surge.
- **6985:** RM100 Safety Ground Harness.
- **RM100-3:** RM100 Aluminium Safety Barrier.
- **RM100-4:** RM100 Polycarbonate Terminal Cover.
- **RM100-5K:** RM100 PCB Assembly Complete Kit (RM100-5 + 6959 Display).
- **GP103:** 3 Bayonet Gantry Plug.
- **GP104:** 4 Bayonet Gantry Plug.
- **GP204U:** 4 Bayonet Gantry Plug screened cable, complies with EN13922.
- **JB100:** Junction Box with 2 threaded gland entries.
- **JB103:** Junction Box with 3 threaded gland entries.
- **EAC201:** Straight Earth Clamp.
- **EAC202:** Coil Earth Clamp.
- **HTA204:** Two-wire Optical Hand Tester.
- **HTA503:** Five-wire Optical Hand Tester.
- **LDP202:** Two-wire Level Detection Probe.
- **LDP205:** Five-wire Level Detection Probe.

RM100 SERIES RACK MONITOR



Model	X	Y	Z
RM140	285mm (11.2")	165mm (6.5")	170mm (6.7")
RM160	275mm (10.8")	165mm (6.5")	220mm (8.7")



Gantry Plug Parking Adaptors

Liquip offers gantry plug parking adaptors that provide a positive safe electronic interlock that can be used with the terminal automation system to ensure that the gantry plug has been disconnected from the loading vehicle before permission to leave the gantry is granted.

Features & Benefits

- Ensures the gantry plug has been disconnected from the loading vehicle before permission to leave the gantry is granted.
- When the gantry plug is connected, the proximity switch sends a signal to the terminal TAS for various user functions.
- Prevents damage to loading bay due to possible drive-aways.

Technical Information

Materials

- Aluminium nose-cone, hard anodised.
- Acetal mounting block.
- Aluminium body and cover plate.

Mounting

- 3 and 4 bayonet fixing to industry standard.
- Conduit ports 1/2" NPT (straight) thread, two options.
- Mounting by 2 stainless steel bolts 8mm dia.

Proximity Switch

Proximity switch size M30 x 1.5 thread specification to customer requirements.

Weight

1.3kg.

Ordering Information

- **TPA3:** 3 Pin parking adaptor.
- **TPA4:** 4 Pin parking adaptor.

Associated Equipment

- **5069:** Gantry plug dust cap.
- **TP103:** 3 Pin Truck Plug.
- **TP104:** 4 Pin Truck Plug.
- **GP103:** Gantry plug, 3-pin bayonet, Navy Blue, supplied with cable & gland.
- **GP104:** Gantry plug, 4-pin bayonet, Black, supplied with cable & gland.
- **GP114:** 4 Pin gantry plug with self coiling cable. (Quick Release).
- **GP214:** 4 Pin gantry plug with straight cable. (Quick Release).



Gantry Plugs & Cable - GP10X Series

Liquip gantry plugs are an industry standard 3 or 4 pin bayonet plug and they connect terminal/gantry systems to a tanker.

Gantry plugs are designed for use with common industry overfill protection monitors and vehicles including the Liquip RM140 'Overfill Monitor'.

Features & Benefits

- 3 pin or 4 pin configurations available to suit both 3 and 4 J-slot truck plugs.
- Caters for up to 8 compartments with 2-wire probes.
- Robust petroleum-resistant housing which can withstand harsh environments.
- Cable is ten-core self-coiling (8m reach) with petroleum-resistant outer sheath.
- High-visibility cable for ease of visibility and safety.
- Supplied with a M25 cable gland and junction box is supplied with an adaptor 3/4" NPT. This allows interchangeability for spare parts.

Technical Information

Cable parameters

- Capacitance C = 1.1 nF.
- Inductance L = 12 µH.
- Inductance/Resistance Ratio L/R = 35 µH/Ω.

Materials

All materials are non-static producing.

Weight

3.5kg.

Ordering Information

- **GP103:** Gantry plug, 3-pin bayonet, Navy Blue, supplied with cable & gland.
- **GP104:** Gantry plug, 4-pin bayonet, Black, supplied with cable & gland.

Note: For any other models contact Liquip.

Associated Equipment

- **5115:** Self-store coiled cable, blue.
- **RM140:** Overfill protection and grounding monitor.
- **Liquip TP Series of Truck Plug.**



Gantry Plugs & Cables (mil spec) - GPx14

The GPx14 is a 4 pin gantry plug which comes a mil spec plug to allow for quick connection/disconnection.

The GPx14 is designed for use with common industry overfill protection monitors and vehicles including the Liquip RM140 'Overfill Monitor'.

Features & Benefits

- Quick disconnect gantry plug for overfill monitors.
- Allows customers to exchange suspected faulty or damaged gantry plugs without needing an electrician.
- Cater for up to 8 compartments with 2-wire probes.
- Acts as a break-away junction if drivers fail to disconnect gantry plugs and just drives away.
- Cable is ten-core either self-coiling or 8m long uncoiled, both with petroleum-resistant outer.
- Each core is 32 strand tinned copper.
- Robust petroleum-resistant housing which can withstand harsh environments.
- High-visibility cable for ease of visibility and safety.

Technical Information

Cable specifications

- Resistance R = 0.0178 /m.
- Capacitance C = 45 pF/m.
- Inductance L = 0.325 FH/m.

Materials

- Aluminium Quick Release plug.
- Polyurethane socket body.
- Stainless steel pins and fittings.
- 10 core cable, outer polyurethane.

Weight

4kg (complete kit).

Ordering Information

- **GP114:** 4 Pin gantry plug with self coiling cable. (Quick Release).
- **GP214:** 4 Pin gantry plug with 8m straight cable. (Quick Release).

Note: For any other models contact Liquip.

Associated Equipment

Liquip TP series of truck plug.

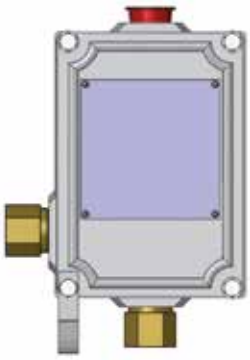
GANTRY PLUG & COMPONENTS





GP104-4
4 PIN PLUG

GP103-3
3 PIN PLUG



JB100 & JB103
JUNCTION BOX



5115
SELF-STORE 10-CORE CABLE



Overfill System Tester

Liquip offers portable overfill system testers that completely test both 2 and 5 wire tank truck and terminal/depot overfill systems.

Users can test truck systems, gantry systems and individual probes for quick and effective fault-diagnosis.

With a superior design and easy to use functionality the HTA series testers provide effective testing and diagnostics of overfill protection and grounding/earthing systems.

Features & Benefits

- Diagnoses all common probes and gantry monitors including thermistor, optical and capacitive.
- Test 2 wire or 5 wire systems.
- Test gantry systems, truck systems and individual probes.
- Clearly labeled diagnostic lights indicate if there is a fault and what the fault is.
- Easy to operate.
- Portable design, comes with carry handle and locking latch.

Technical Information

Operating Temperature

-20°C to +70°C.

Battery

12 Volt Lantern type.

Materials

- Aluminium briefcase.
- Gantry plug and truck plug are polyurethane and anodised aluminium respectively with self-store 10 core cable.

Weight

6.0kg.

Ordering Information

- **HTA204:** 2 wire overfill system truck and terminal tester.
- **HTA503:** 5 wire overfill truck and terminal system tester.

Associated Equipment

- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets).
- **LDP202:** 2 wire Aluminium Overfill Probe.
- **LDP205:** 5 wire Aluminium Overfill Probe.
- **GP103:** Gantry plug, 3-pin bayonet, Navy Blue, supplied with cable & gland.
- **GP104:** Gantry plug, 4-pin bayonet, Black, supplied with cable & gland.
- **GP114:** 4 Pin gantry plug with self coiling cable.(Quick Release).
- **GP214:** 4 Pin gantry plug with straight cable. (Quick Release).



Earth Assurance Clamps

Liquip offers earth assurance clamps to ensure the correct grounding of a truck's chassis prior to loading or unloading to eliminate static build up.

Features & Benefits

- 8m cable length supplied.
- Can be supplied with straight cable or self-storing (coiled) cable.

Technical Information

Operation

Before connecting any other equipment to truck, attach clamp to a suitable grounding point no more than 12.7 mm (1/2") thick.

Materials

- Clamp body - cast aluminium.
- Cable - polyurethane sheathed.
- Contacts - cone point grub screws - hardened steel.

Weight

1.3kg (clamp and cable).

Ordering Information

- **EAC201:** Earth Assurance clamp with 8m straight cable.
- **EAC202:** Earth Assurance clamp with 8m self-storing (coiled) cable.

Associated Equipment

- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets).



Junction Boxes

Electronic junction boxes provide an intrinsically safe and easy method of wiring to terminate and connect the gantry plug with the overfill rack monitor.

Features & Benefits

- Connection through industry standard 3 or 4 bayonet 10 pin plug for intrinsically safe signals only and/or earthing connection.
- Replace gantry plug components without the need to access the overfill monitor's explosion proof housing.
- Protects the monitor's housing from damage and potential hazard exposure should a drive-away occur.
- Provision for connection of the earth lead is provided.
- Easy maintenance.

Technical Information

Mounting

2 x Ø8.5 holes through base allow for mounting with M8 bolts.

Ordering Information

- **JB100:** Junction box comes with 2 x 3/4" NPS cable entries at top and bottom.
- **JB103:** Junction box comes with 3 x 3/4" NPS cable entries at top, bottom and left hand side.

Associated Equipment

- **GP103:** Gantry plug, 3-pin bayonet, Navy Blue, supplied with cable & gland.
- **GP104:** Gantry plug, 4-pin bayonet, Black, supplied with cable & gland.
- **GP114:** 4 Pin gantry plug with self coiling cable. (Quick Release).
- **GP214:** 4 Pin gantry plug with straight cable. (Quick Release).
- **EAC201:** Earth Assurance clamp with 8m straight cable.
- **EAC202:** Earth Assurance clamp with 8m self-storing (coiled) cable.
- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets).



RM140 Bypass FOB

Liquip provides Bypass FOBs that can be used on the RM140 by authorised personal to override the RM140 in an emergency situation.

Features & Benefits

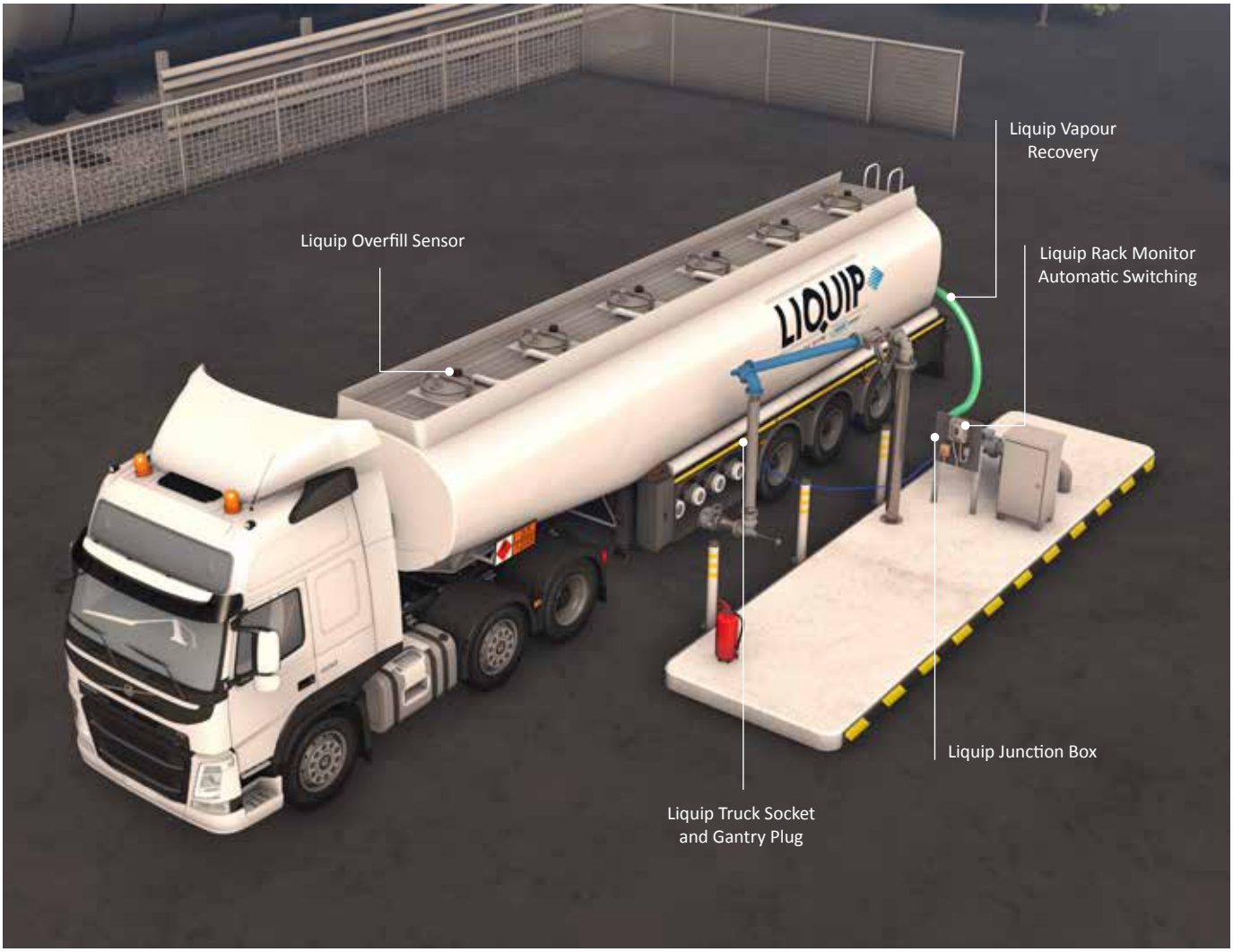
- Allows authorised personal to override the RM140 in an emergency situation.
- Wireless RFID signal with no batteries required.

Ordering Information

- **6983:** Wireless FOB Bypass key for RM140.

Associated Equipment

- **RM140D:** Overfill monitor (typical configuration for Australian market).
- **RM140E:** Overfill monitor (typical configuration for Global markets).


Liquip Vapour Recovery
Liquip Overfill Sensor
Liquip Rack Monitor Automatic Switching
LIQUIP
Liquip Junction Box
Liquip Truck Socket and Gantry Plug

LIQUIP
PART OF OPW A DOVER COMPANY

Vapour Recovery



Vapour Couplers 302-305
Vapour Adaptors 306-307





Vapour Coupler - VCF500

Liquip offers a 100mm (4”) with poppet and spigot that can be used for vapour transfer between the tank truck and loading/unloading tank.

The VCF500 is a spring loaded coupler that automatically opens when coupled to a compatible adaptor.

Features & Benefits

- Automatically seals when disconnected for increased operator safety.
- Patented “dunny lid” poppet to minimum pressure drop across the valve.
- Moulded lip seal for reliable sealing.
- Fitted with a sightglass to view any product left from condensation.
- Incorporates a carry handle for manoeuvrability.

Technical Information

Size

100mm (4”) bore all through for minimum pressure drop.

Materials

- Aluminium body and poppet.
- Brass Cam levers.
- Stainless Steel spring and shaft.
- Viton™ Seal.

Compatibility

- Performs to 97/23/EC Pressure Equipment Direction.
- Not compatible with AS5602:2009 compliant vapour adaptors.

Mounting

100mm (4”) TTMA blind flange with 8 off M10 x 20 deep tapped holes.

Weight

3kg.

Ordering Information

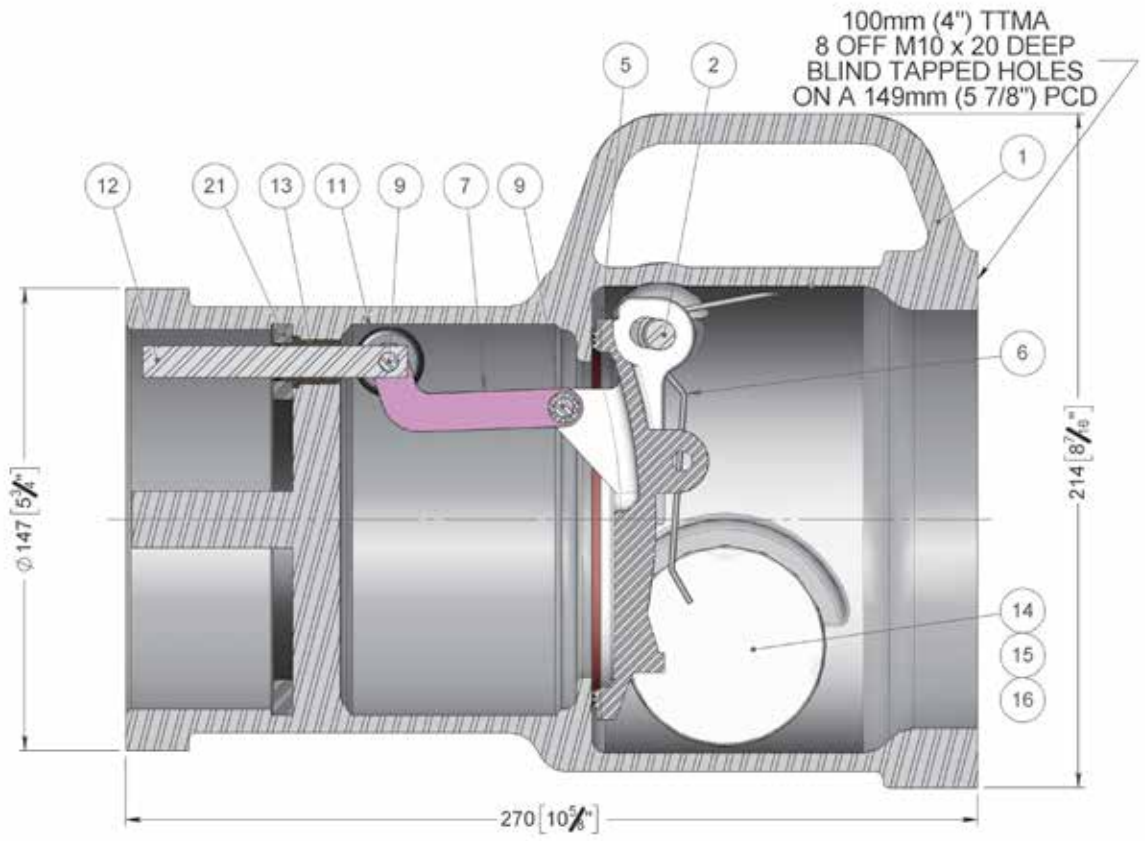
- **VCF500:** 4” Vapour Coupler with Dunny Lid. Spigot and blind flange.

Note: Not to AS:5602 and therefore not suitable for use in Australia.

Associated Equipment

- **VCF075W:** 100mm (4”) static safe hosetail & female Camlock with 75mm (3”) flow diameter.

VCF500 VAPOUR COUPLER





ITEM	PART No	DESCRIPTION	QTY.	MATERIAL
21	7516	SEAL CAMLOCK 4" WITH CUTOUT	1	HI-ACRYLONITRILE
20	978	KEY RING 1 1/2 Z/P	2	Z/P STEEL
19	0149	NUT NYLOC	2	Z/P STEEL
18	6554	CAPSCREW IMPERIAL	2	Z/P STEEL
17	CLC3.0-2	LEVER CAMLOCK	2	BRASS
16	4493	SPRING CLIP	1	ST STEEL
15	0179	O-RING	1	NITRILE
14	5731	SIGHTGLASS	1	ACRYLIC
13	VCF500-7	BUSH FOR PUSH ROD	1	BRASS
12	VCF500-5	PUSH ROD, PISTON	1	ST STEEL
11	7819	ROLLER	2	ACETAL
10	0756	SPLIT PIN	2	ST STEEL
9	SLV5-7	PIN	2	ST STEEL
8	7803	SPACER BUSH	1	ALUMINIUM
7	VCF500-3	LINKAGE FOR POPPET	2	ST STEEL
6	6151	SPRING TORSION FOR POPPET	1	ST STEEL
5	SLV100-2	POPPET MOLDED VITON SEAT	1	ALUMINIUM
4	PCU201-7	PLUG M16 CONDUIT	1	BRASS
3	0885	WASHER FIBRE	1	FIBRE
2	VCF500-2	SHAFT FOR POPPET	1	ST STEEL
1	VCF500-1	BODY	1	ALUMINIUM



Vapour Coupler - VCF075W

Liquip offers a 100mm female Camlock to 100mm male hosetail vapour coupler that can be used for vapour transfer between the tank truck and loading/unloading tank.

The VCF075W complies with AS5602:2009 and is a Ø75mm equivalent flow area and a spring loaded coupler that automatically opens when coupled with a compatible adaptor.

Technical Information

Open Area

4500mm² = (76 dia. hole).

Poppet

- 25mm travel.
- Poppet opens between 4 to 6 kPa vacuum for tank protection.

Materials

- Aluminium body and poppet.
- Brass cam levers.
- Stainless steel spring and central plunger.
- Nitrile poppet seal and Camlock seal.

Standards

Complies with AS5602:2009: Refined petroleum products - Vehicle bottom loading and vapour recovery. (selectivity counter-bore provided).

Mounting

- 100mm hose tail.
- 4” NATO standard Camlock.

Weight

2kg.

Ordering Information

- **VCF075W:** 100mm Female Camlock to 100mm Male Hosetail vapour coupling.

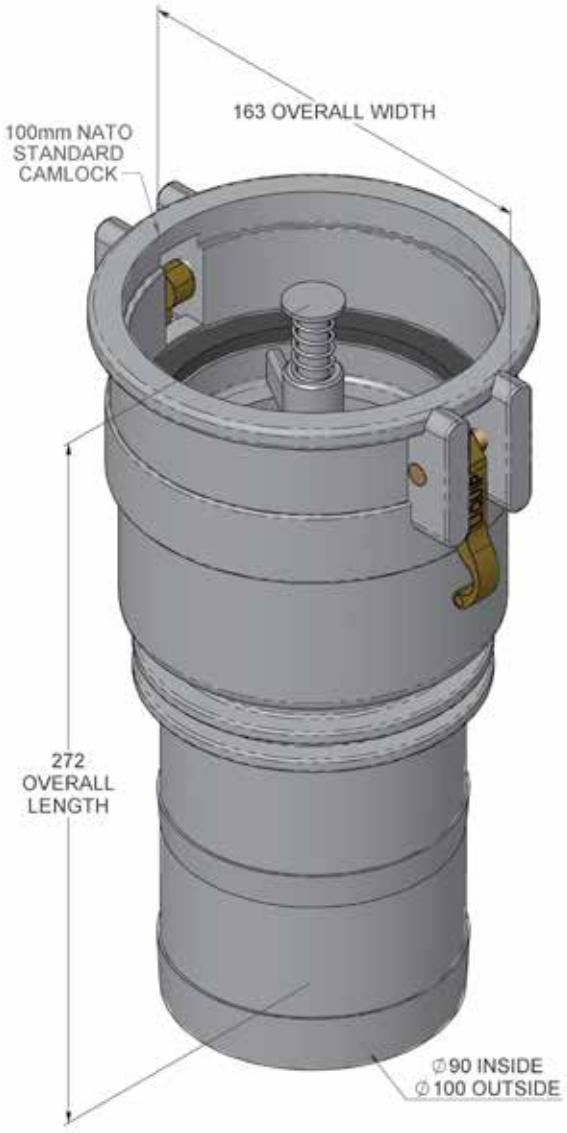
Associated Equipment

- **VCF500:** 100mm bore through, 4” TTMA flange mount & viewing sightglass.

Note: VCF500 not to AS:5602 and therefore not suitable for use in Australia.

VCF075W VAPOUR COUPLER FEMALE





SPARE PARTS

ITEM	PART No	DESCRIPTION	QTY	MATERIAL
2	0207	O-RING	1	NITRILE
1	0433	SEAL CAMLOCK BLACK 4 "	1	NITRILE



Vapour Adaptor - VCM3P

The VCM3P is a poppet sealed cam and groove connection for truck vapour return lines that comes with a proximity switch holder.

The VCM3P series has an aluminium body with a 100mm (4”) TTMA flange mounting. The seals are Viton™ and the shaft runs in a Delrin bush.

A standard Camlock will not fit into this adaptor, only an approved vapour coupler will fit.

Features & Benefits

- Automatic opening when vapour coupler is connected and automatically closing when coupler is disconnected.
- All aluminium construction with stainless steel springs and Viton™ poppet seal.
- High flow rates and low pressure drop.
- Universal mounting- 100mm (4”) TTMA flange.

Technical Information

Standards

- Complies with AS5602:2009: Refined petroleum products —Vehicle bottom loading and vapour recovery. (selectivity counter-bore provided).

Operation

When female coupler is connected, the poppet is pushed inwards to allow vapour flow. The outer diameter of the female coupler pushes the striker plate forward and is detected by the proximity switch to provide electrical signal that vapour recovery is connected.

Poppet Opening Pressure

Poppet opens under external pressure of 4-6 kPa for vacuum relief.

Pressure Drop

Pressure drop less than 4 kPa at 6,000 litres/min flow of free air across coupled connection.

Mounting

4” (100mm) TTMA flange (8 x Ø11 holes on 149mm PCD).

Nosecone

Nosecone is standard 4” NATO Camlock with interface selectivity ring to prevent wrong connection.

Ordering Information

- **VCM3P:** Vapour recovery adaptor with proximity switch holder. (prox switch sold separately).

Associated Equipment

- **5544:** Proximity switch (M30).
- **VCF075W:** 100mm Female Camlock to 100mm Male Hosetail vapour coupling.



Vapour Parking Adaptor - VCFPA

The VCFPA is a parking adaptor for vapour couplers.

The vapour coupler is coupled and an integral proximity sensor (supplied separately) is actuated to enable system interlocks.

The VCFPA ensures the coupler remains closed when parked.

Features & Benefits

- Ensures vapour recovery loading arms or hoses are correctly stowed and secured.
- Provision is provided for proximity sensor to detect when coupler is safely parked.
- Compatible with all known variants of vapour couplers.

Technical Information

Materials

- Nosecone - Zinc plated steel.
- Back plate - Zinc plated steel.
- Spring - Stainless steel.

Mounting

Bolts onto bracket supplied by customer using 4 mounting holes. Align parking adaptor so slot in the nose cone is at the top to suit couplers such as VCF500 that have an opening shaft at the top. May be made free standing (bolt to concrete or skid floor) by special order.

Weight

2kg.

Ordering Information

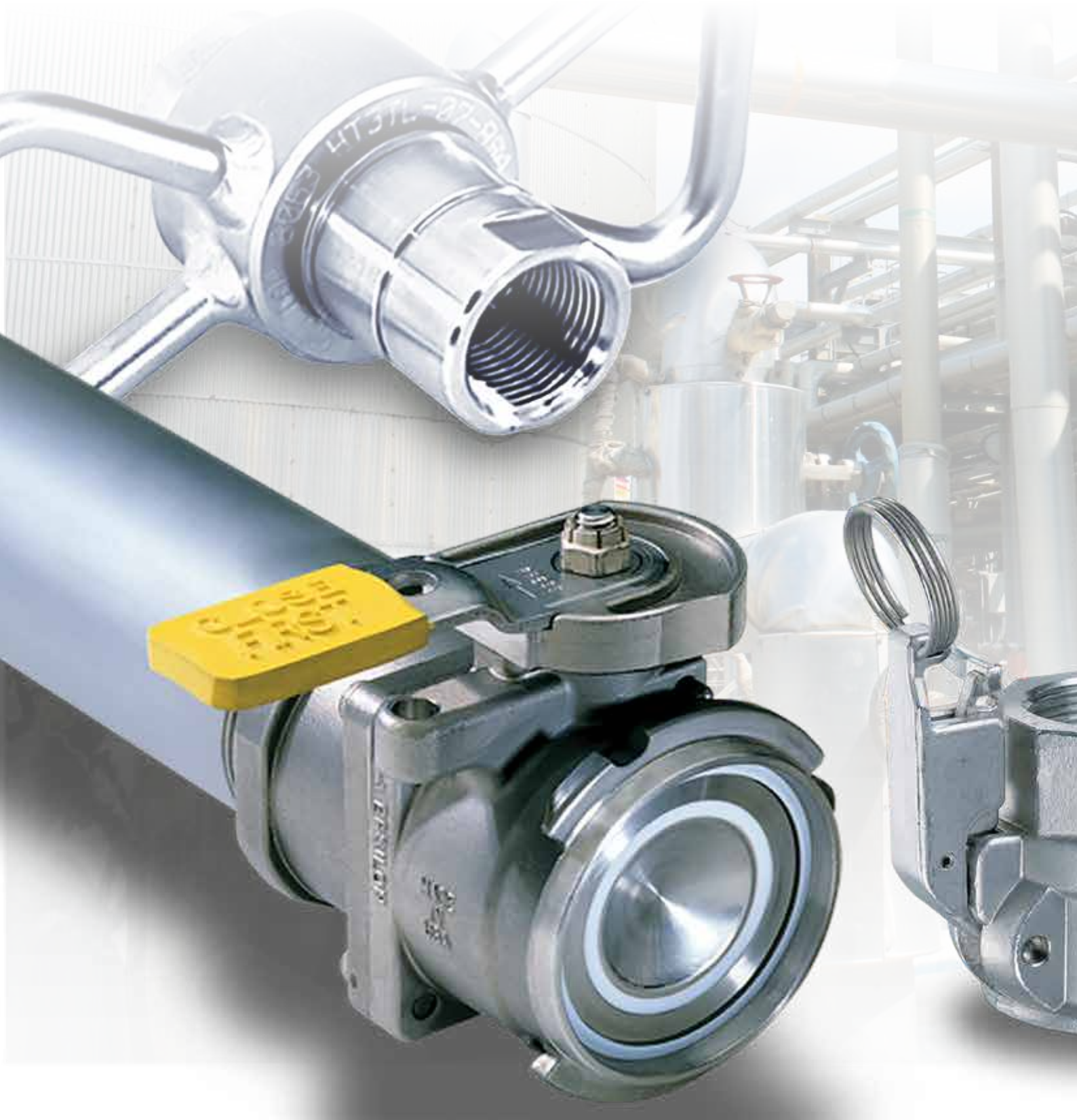
- **VCFPA:** Vapour parking adaptor comes with proximity switch mount (prox switch not included).

Associated Equipment

- **VCF075W:** 100mm Female Camlock to 100mm Male Hosetail vapour coupling.
- **VCF500**: 4” Vapour Coupler with Dunny Lid. Spigot and blind flange.

LIQUIP
PART OF OPW A DOVER COMPANY

Dry Disconnect Fittings



Kamvalok® 310-315
DryLok™ 316-317
Epsilon™ 318-319





1600AN Series Adaptor

The 1600AN Series Adaptor is specifically designed to mate with OPW Kamvalok® Couplings to help prevent liquid spillage during the connection/disconnection process. The adaptor contains a spring-loaded poppet to assure fast closing and a tight seal.

Features & Benefits

- **Single Piece Design** - Eliminates a possible leak path.
- **Spill Prevention** - Poppet-actuated design can only be opened with a Kamvalok® coupling; designed to provide a tight seal when closed.
- **Reliability of Operation** - The simple spring-loaded poppet design and heavy-duty construction provide for reliable, long-life operation.
- **Optimum Flow Rate** - Even flow and low pressure drop are achieved by a built-in deflector that reduces turbulence.

Technical Information

Available sizes

Available in 1½", 2" and 3" Sizes.

Housing Materials

Available in aluminium, and stainless steel construction (stainless steel corrosion resistance comparable to 316 Stainless Steel).

Seal Materials

Range of seals including: Buna-N, Fluorocarbon, PTFE, EPDM, Chemraz®.

Thread

Female Threads – Can be fitted to either a male pipe end or to a hose fitting.

Ordering Information

Please CONTACT LIQUIP for ordering information for all other configurations.

TYPE
16 - Adaptor

CONFIGURATION
1 - Aluminium Body, Stainless Steel Internals
7 - Stainless Steel Body, Stainless Steel Internals

SIZE
15 - 1-1/2" FNPT
20 - 2" FNPT
30 - 3" FNPT

STYLE
* Leave blank for FNPT
A - 150 lb. Flange
GL - Greaseless
KL- Keylok
T - 300 lb. Flange

1611AN - AL15 - GL

O-ring SEAL
1 - Buna-N
2 - Fluorocarbon (GFLT)
3 - PTFE / Silicone
4 - EPDM
6 - Chemraz®
7 - PTFE / Fluorocarbon

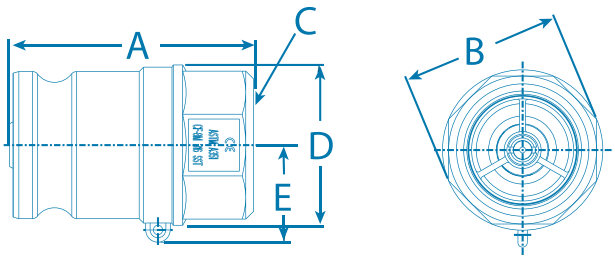
CONNECTION
AN - FNPT
ABN - FBSPT
ANF - 150 lb. Flange
ANFT - 300 lb. Flange

CONSTRUCTION MATERIAL
AL - Aluminium Body
SS - Stainless Steel Body

Dimensions

Size in Inches (Nominal)

	1 1/2"	2"	3"
A	4-3/4"	4-15/16"	6-17/32"
B	2-1/2"	3-1/4"	4-1/2"
C	1-1/2"	2"	3"
D	2-21/32"	3-1/4"	4-7/8"





1673ANF and 1673ANFT

1600ANF & 1600ANFT Series Railcar Adaptor

The 1600ANF and 1600ANFT Series Railcar Adaptors are designed specifically for applications using an ANSI flange.

The 1600ANF Dry Disconnect Adaptors keep hazardous chemicals and vapours in-line and out of the environment. Rugged, yet quick and easy to install, the 1600ANF Series is ideal for closed-loop loading conversions.

Features & Benefits

- Available in 1 ½", 2" & 3" Sizes.
- **Heavy-Duty Construction** - Available in aluminium, and stainless steel construction (stainless steel corrosion resistance comparable to 316 Stainless Steel).
- **Wide Range of Seals Available** - Buna-N, Viton™, PTFE, EPDM, Chemraz®.
- **Female Threads** - Can be fitted to either a male pipe end or to a hose fitting.
- **Spring-Loaded Poppet Design** - Assures fast closing and a tight seal.
- **Eliminates Threads** - One less leak point.
- **Spill Prevention** - The poppet-actuated design can only be opened with a Kamvalok® coupling; designed to provide a tight seal when closed.
- Easy Access Connection.
- Connects with D2000™ Actuating Coupler or Kamvalok® 1700 Series Dry Disconnect Couplings.
- **Easy Cleaning** - Can be quickly disassembled.
- Specifically designed for applications using ANSI flanges.

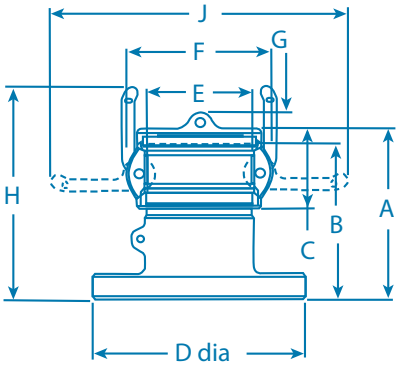
Ordering Information

Common Models

- **1672ANF-SS20:** 2" Kamvalok®Adaptor, SST, Viton™, 150 ANSI Flange.
- **1612ANF-AL30:** 3" Kamvalok®Adaptor, Aluminium, Viton™, 150 ANSI Flange.

Full Range

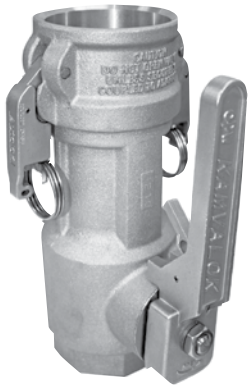
Please CONTACT LIQUIP for ordering information for all other configurations.



Dimensions

Size in Inches (1670ANF)	1 1/2"	2"	3"
A Overall Length	4-47/64"	4-29/32"	6-9/16"
B Length of Body	4-13/32"	4-31/64"	6-1/8"
C Length of Cap	2-5/64"	2-1/4"	2-5/16"
D Diameter of Flange	6"	6"	7-1/12"
E Diameter of Body	2-1/2"	3"	4-45/64"
F Width of Cap	3-9/16"	4-1/16"	5-33/64"
G Height of Chain Lug	1/2"	7/16"	1/2"
H Length with Arms	6-1/32"	6-1/32"	8-1/8"
Number of Bolt Holes	4	4	4
Diameter of Holes	3/4"	3/4"	3/4"
Diameter of Bolt Circle	4-3/4"	4-3/4"	6"
J Max Width of Arms	7-18"	8"	11-3/32"

Size in Inches (1670ANTF)	2"	3"
A Overall Length	5-5/32"	6-13/16"
B Length of Body	4-47/64"	6-6/8"
C Length of Cap	2-1/4"	2-5/16"
D Diameter of Flange	6-1/2"	8-1/4"
E Diameter of Body	2-63/64"	4-45/64"
F Width of Cap	4-1/16"	5-33/64"
G Height of Chain Lug	7/16"	1/2"
H Length with Arms	6-21/64"	8-3/8"
Number of Bolt Holes	8	8
Diameter of Holes	3/4"	7/8"
Diameter of Bolt Circle	5"	6-5/8"
J Max Width of Arms	8-9/32"	11-3/32"



1700DL Series Coupler

OPW Kamvalok® Dry Disconnect Couplings are considered the standard of the industry. Used at liquid transfer points where product loss could occur, Kamvaloks® provide a reliable solution to prevent spillage during connection or disconnection.

Kamvalok® Dry Disconnect Couplings are used by manufacturers of paint, lacquers, inks, adhesives, fatty acids, pharmaceuticals, liquid soaps, and many other liquid products.

Common Applications:

- *Handling petroleum products*
- *Solvents*
- *Ag-chemicals*
- *Vegetable oils*
- *Detergents*
- *Many acids and caustics.*

Features & Benefits

- **Spill Protection** - Helps to reduce the hazards involved in the connection/disconnection process of transferring hazardous materials.
- **Added protection** - Autolok™ locking arms with an automatic locking mechanism signalled by a positive click. Uncoupling requires only an easy tug on the lock release.
- **Dual protection** - Poppeted seal cylinder with snap-on nose seal provides automatic closure from both directions – the coupler and the adaptor – to prevent accidental spills. Nose seal can be easily replaced without need for new seal cylinder.
- **Provides Total Closed-Loop Loading Capabilities** by keeping hazardous liquids and vapours in-line and out of the environment.
- **Ease of Use** - The simple connection and disconnection design and lever actuated internal poppet configuration makes this the first choice for liquid transfer operations.
- **Lever Actuation** - The open/close lever action helps to ensure that liquid flow can only begin once the coupling and adaptor are securely coupled. The lever provides for smooth opening and closing even for high pressure applications.

Technical Information

Available sizes

Available in 1½", 2" and 3" Sizes.

Housing Materials

Aluminium body with SST internals or SS body with SS internals.

Seal Materials

Flurocarbon.

Thread

FNPT or BSPT.

Ordering Information

Common Models

- **1712DBL-AL15**: 1 ½" Kamvalok®Coupler, Aluminium, Viton™, BSPT thread.
- **1711DBL-AL20**: 2" Kamvalok®Coupler, Aluminium, Buna, BSPT thread.
- **1712DL-AL20**: 2" Kamvalok®Coupler, Aluminium, Viton™, FNPT thread.
- **1712DBL-AL20**: 2" Kamvalok®Coupler, Aluminium, Viton™, BSPT thread.
- **1711DBL-AL30:** 3" Kamvalok®Coupler, Aluminium, Buna, BSPT thread.
- **1771DL-SS20:** 2" Kamvalok®Coupler, SST, Buna, FNPT thread.

- **1772DL-**

TYPE
17 - Coupler

CONFIGURATION
1 - Aluminium Body, Duplex Stainless Steel Internals
7 - Stainless Steel Body, Duplex Stainless Steel Internals

SIZE
15 - 1-1/2" DN40
20 - 2" DN50
30 - 3" DN80

1711DL - AL15 - GL

STYLE
* - Leave blank for FNPT
A - 150 lb. Flange
GL - Greaseless
KL- Keylok
T - 300 Lb. Flange

O-ring SEAL
1 - Buna-N
2 - Fluorocarbon
3 - PTFE
4 - EPDM
6 - Chemraz®

DL - FNPT
DBL - FBSPT

CONSTRUCTION MATERIAL
AL - Aluminium Body (ASTM A356-T6 B-26)
SS - Stainless Steel Body (ASTM A351 CF3M 316L)



1700ESL & 1700ES Series Couplers

Transport Series Dry Disconnect Couplings are considered the standard of the industry for use on multi-compartment petroleum, solvent and chemical product delivery trucks with an on-board pumping unit. Offered with or without Autolock™ locking arms.

Common Applications:

- *Handling petroleum products*
- *Solvents*
- *Ag-chemicals*
- *Vegetable oils*
- *Detergents*
- *Many acids and caustics.*

Features & Benefits

- Available in 2".
- Aluminium material of construction.
- ESL Series is supplied with Autolok™ Locking Arms.
- ES Series is supplied without Locking Arms.
- Features Poppeted Seal Cylinder with Snap-on Nose Seal.
- Simple Cam and Groove Design with Lever Actuation.
- **360° Orientation** - coupler can be connected in any orientation onto the adaptor.
- **Spill Protection** - Helps to reduce the hazards involved in the connection/disconnection process of transferring hazardous materials.
- **Dual Protection** - OPW Kamvaloks® provide automatic closure from both directions- the coupler and the adaptor.
- **Ease of Use** - The simple connection and disconnection design and lever actuated internal poppet configuration makes this the first choice for liquid transfer operations.

Ordering Information

Please CONTACT LIQUIP for all ordering information.

ESL Series

TYPE
17 - Coupler

CONFIGURATION
1 - Aluminium Body, Stainless Steel Internals

SIZE
20 - 2" Female NPT

1711ESL - AL20

O-ring SEAL
1 - Buna-N
2 - Fluorocarbon
4 - EPDM

STYLE
Elbow Swivel

CONSTRUCTION MATERIAL
AL - Aluminium Body (ASTM A356-T6 B-26)

ES Series

TYPE
17 - Coupler

CONFIGURATION
1 - Aluminium Body, Stainless Steel Internals

SIZE
20 - 2" Female NPT

1711ES - 0200

O-ring SEAL
1 - Buna-N
2 - Fluorocarbon
4 - EPDM

STYLE
Elbow Swivel

Dry Disconnect Fittings

Kamvalok®



2173AVN Series

The 2173AVN Vapour Recovery Dry Disconnect Coupling provides easy access in recovering vapours for either top or bottom loading/unloading tank truck operations. The OPW 2173AVN installs onto the QRB valve on tank trailers and can provide a dry disconnect connection for emergency evacuation of hazardous liquids in the case of a roll-over.

Features & Benefits

- **Vapour Hose Connection** - 2" Kamvalok® Dry Disconnect or D2000™ Actuating Couplers.
- **No trailer modifications required** - Easy attachment to existing MC307, DOT407, MC312, and DOT412 trailers.
- 3" straight thread mounting with 2" Kamvalok® dry disconnect cam and groove connection makes the ideal 3" x 2" adaptor for QRB valves.
- **Can replace existing Clean** - Out Caps for Closed Loop System.
- **Closed-Loop Protection** - Helps protect people and the environment by providing a vapour and liquid tight seal during the connection/disconnection process specifically designed to contain VOC (Volatile Organic Compounds) products that have high vapour pressure that evapourates quickly. Contains fugitive emissions and transfers VOCs without vapour loss.
- **Roll-Over Safety** - Low profile design keeps the fitting below roll-over plane to minimize damage in the event of a roll-over. Meets IMO profile dimensions.
- **Easy Emergency Evacuation** - Provides a dry disconnect connection for emergency evacuation of hazardous liquids in case of roll-over.
- **Quick and Easy Cleaning** - Designed for easy disassembly for routine cleaning.

Ordering Information

Please CONTACT LIQUIP for all ordering information.





D2000™ Actuator Series

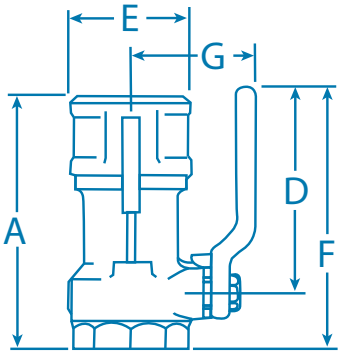
The D2000™ Actuator Series is designed for those applications that require automatic closure from only one flow direction. Ideal for vapour recovery and suction pump applications.

Features & Benefits

- Available in 2" size.
- Available in stainless steel or aluminium construction.
- Single poppet design.
- Easy to clean design.
- Cam and Groove Design provides for 360° coupling orientation and makes connection and disconnection smooth and easy.
- Compatible with Kamvalok® adaptors.
- **Ease of Use** - Handle-actuated, single poppet design provides for smooth, easy opening and closing operation.
- **Reliability and Durability** - Heavy duty aluminium or stainless steel construction (corrosion resistance comparable to 304 Stainless Steel).
- **Best Dry Disconnect Valve** - Easy to clean, easy to use, quality construction in a low-cost design.

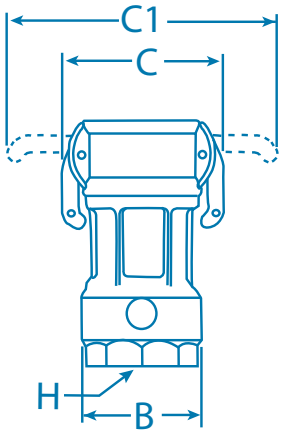
Ordering Information

Please CONTACT LIQUIP for all ordering information.



Dimensions

Size in Inches (Nominal)	2"
A Length of Body	7-9/32"
B Diameter of Body	3-33/64"
C Distance across Cam Arms- closed	4-5/16"
C1 Distance across Cam Arms- closed	8-9/16"
D Centreline of Stem to end of Handle	6-1/16"
E Diameter of Coupler End	3-1/8"
F Length, Pipe End to end of Handle	7-11/16"
G Centreline of Coupler to outside end of Handle	3-17/32"
H Pipe Thread (NPT)	2"





Drylok™

Drylok™ is designed to safely transfer hazardous corrosive, volatile liquids such as acids, solvents and petrochemicals.

An interlocking handle averts accidental spills by preventing uncoupling while the valve is open. And, the unit's flat face minimizes fluid loss, further reducing exposure to risk during operation.

Drylok™ is ideal for all kinds of hazardous fluids where product loss is a problem, such as high-pressure lines, high flow rates, slurries, and gases.

Features & Benefits

- **One of the driest disconnects in the industry** - Less than 1/2 ml of fluid loss from a 2" unit (less than 0.10 of a teaspoon).
- Super-Pak Adjustable packing with V-type material provides a continuous compression, emission-free seal on handle shaft (2"& 3" only).
- **Unprecedented safety** - Meets or exceeds today's stringent emission and worker safety requirements.
- Drylok™ cannot be uncoupled while the valve is open.
- **Optimum flow rate** - less obstruction in easy-flow interior optimizes the flow rate in high-pressure or high-viscosity applications.
- **Ease of use** - Simple handle action connects valve to coupler and opens and closes the flow.
- 360° orientation ensures proper seating and alignment.
- Simplicity of repair and maintenance.

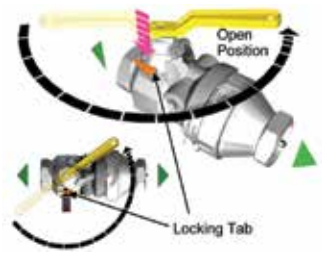
Operation



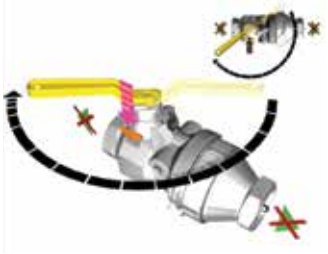
1. Push coupler onto adaptor by first engaging lower jaw of coupler under lip of adaptor and tilting the coupler upward to engage top jaw.



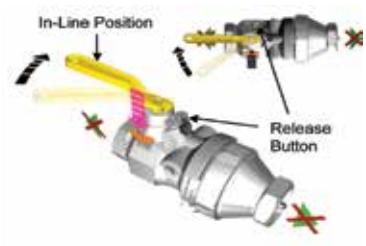
2. Turn handle counter-clockwise until lock engages. Coupler and adaptor are locked together but valve is closed.



3. Press button on coupler down and turn handle counter-clockwise until it locks. Valve is now open and product will flow.



4. To disconnect - press button on coupler and rotate handle clockwise until it locks. Valve is now closed.



5. Press button on coupler down and turn handle clockwise to the "In-Line" position. Press tab on opposite side of coupler to release the upper jaw and move coupler away.

Technical Information

Available sizes

• Available in 1½", 2" and 3" Sizes.

Materials

• Available in 316 Stainless Steel, Alloy 20, Hastelloy C.

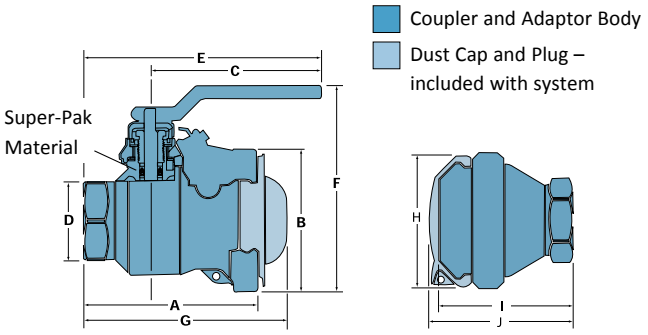
Seal Materials

• Standard O-rings (Flurocarbon).

End Connections

• NPT, BSP, ANSI Flanged, BW and SW end connections.

Dimensions



Super-Pak valve seal system on 2" and 3" models.*

*Super-Pak valve seal is a V-Type 75% PTFE and graphite blend, pressure energized packing. The packing nut can be tightened to stop leaks and emissions.

Type	Number	Size	Weight
Coupler	5770	1"	2-1/4 lbs./1.0kg
		2"	10-1/4 lbs./4.6kg
		3"	14-1/2 lbs./6.5kg
Adaptor	5670	1"	1-1/4 lbs./6kg
		2"	7-1/2 lbs./3.4kg
		3"	11-3/4 lbs./5.3kg

Size	A	B	C	D	E	F	G	H	I	J	Connected
1"	3-21/64"	2-15/32"	5-3/8"	1-7/8"	6-3/4"	4-37/64"	3-33/64"	2-5/32"	3-3/16"	3-3/4"	6-1/16"
	85.6mm	62.7mm	136.5mm	47.6mm	171.5mm	116.3mm	89.3mm	54.9mm	81mm	95.3mm	153.9mm
2"	6-3/16"	5"	6"	2-3/4"	8-3/8"	7-1/4"	7-7/32"	5"	4-15/16"	5-5/16"	10-1/6"
	173mm	127mm	152.4mm	69.9mm	212.7mm	184.2mm	183.4mm	127mm	125.4mm	134.9mm	255.5mm
3"	7-3/4"	6-3/16"	8-3/4"	4"	12"	8-31/32"	8-49/64"	5-1/2"	6-7/8"	7-17/64"	13-3/8"
	196.9mm	157.2mm	222.3mm	101.6mm	304.8mm	227.8mm	197.3mm	139.7mm	174.6mm	184.7mm	339.7mm

Size indicates NPT Pipe Thread

Ordering Information

O-ring SEAL
- B - Fluorocarbon-B
- C - Fluorocarbon-E
- E - EPDM
- F - PTFE Encapsulated Fluorocarbon
- N - Buna-N
- T - PTFE Encapsulated Silicone
- V - Fluorocarbon-A
- W - White Nitrile
- Y - Kalrez® (4079)
- Z - Kalrez® (6375)

CONSTRUCTION MATERIAL
- 7 - 316 Stainless Steel
- 8 - Alloy 20®

5670 - V720N

TYPE
- 56 - Adaptor
- 57 - Coupler

SIZE
- 10 - 1"
- 20 - 2"
- 30 - 3"

STYLE
- A - ANSI Flange 150 Lbs.
- B - Female BSPT
- C - Cutaway
- D - Din Flange
- N - Female NPT
- P - Sanitary Triclamp
- T - ANSI Flange 300 Lbs.
- W - Butt Weld
- X - Parking Adaptor



Epsilon® Low Spill Coupling System

EPSILON® is a low spill coupling, based on a double ball valve system integrating a sophisticated safety design. Beyond the common advantages of a ball valve design, EPSILON® provides for product flow through an unrestricted flowpath and double shut-off reliability in the coupling connection.

The EPSILON® Coupling System is designed to prevent chemical spills and reduce fugitive emissions of Volatile Organic Compounds (VOCs), particularly in the process facility and during transfer to and from tank trucks and tank cars.

During in-plant chemical transfers, the EPSILON® Chemical Containment System will provide your Plant with process flexibility, while improving operator safety, enhancing environmental compliance and reducing overall capital expenditures and operating costs.

EPSILON® Applications:

- *Bulk Storage*
- *Reactor Units*
- *Tank Car*
- *In-plant Processing*
- *Filtration Units*
- *Railcar*

Features & Benefits

- **Dry Disconnect Reliability** - Low spill face seal reduces amount of loss upon disconnect, specified to less than 0.40 ml spillage for the 2" coupling (2000 cycles test average 0.6 ml) and less than 0.10ml of a teaspoon (half an eyedropper).
- **Enhanced Environmental Compliance** - Positive shut-off of coupling halves eliminates line contamination and accidental release of potentially hazardous fluids into the environment during connection and disconnection.
- **Full Flow** - Straight-through flow path provides unrestricted flow in either direction, minimizing pressure drop. Unrestricted flow path provides less than 1 psi pressure drop at 560LPM.
- **Unparalleled Safety** - Multiple safety interlocks eliminate unintentional spills and catastrophic chemical releases that threaten worker safety and the environment.
- EPSILON® safety interlocks force the valves to open and close only with a deliberate action, preventing accidental opening of the valve.
- **Prevents Cross-Contamination** - Optional keyed couplings mechanically lock out and isolate transfer lines.

Technical Information

Next generation PTFE with best combination of temperature ranging from-22°F (-30°C) to 450°F (230°C), sealing, and sliding characteristics.

Available sizes

Available in ¾", 1", 1½", 2" and 3" Sizes.

Materials

Available in Stainless Steel and Hastelloy® C.

Seal Materials

FDA-compliant seal materials, TFM or PFA.

End Connections

Available with end connections complying to ANSI and DIN standards.

Pressure & Temperature Ratings

Constructed to handle pressure of 435 psi (30 Bar) temperatures from -30°C up to 230°C.

Ordering Information

Please CONTACT LIQUIP for all ordering information.

Options

Ultra Low Spill Face Seal

This seal reduces the amount of spillage at disconnect to .2 cc. This seal is not pressure assisted and should only be used for applications lower than 100 psi.

Cavity Filled

Designed to reduce the possibility of contamination by entrapment of process fluid in the void normally found behind the ball and the valve body. Ideal for applications where cross-contamination and cleanliness is a concern. Back side of the valve balls are bored for efficient cleaning.

Keyed Couplings

For extremely critical operations, EPSILON™ offers the unique keyed interface which locks out and isolates transfer lines, preventing cross-contamination.

Dual Ball Race (Optional)

Radial swivel seal

- Replaces dynamic face seal
- Lower leak rate
- Lower seal mortality rate caused by over-compressing seal to install bearings

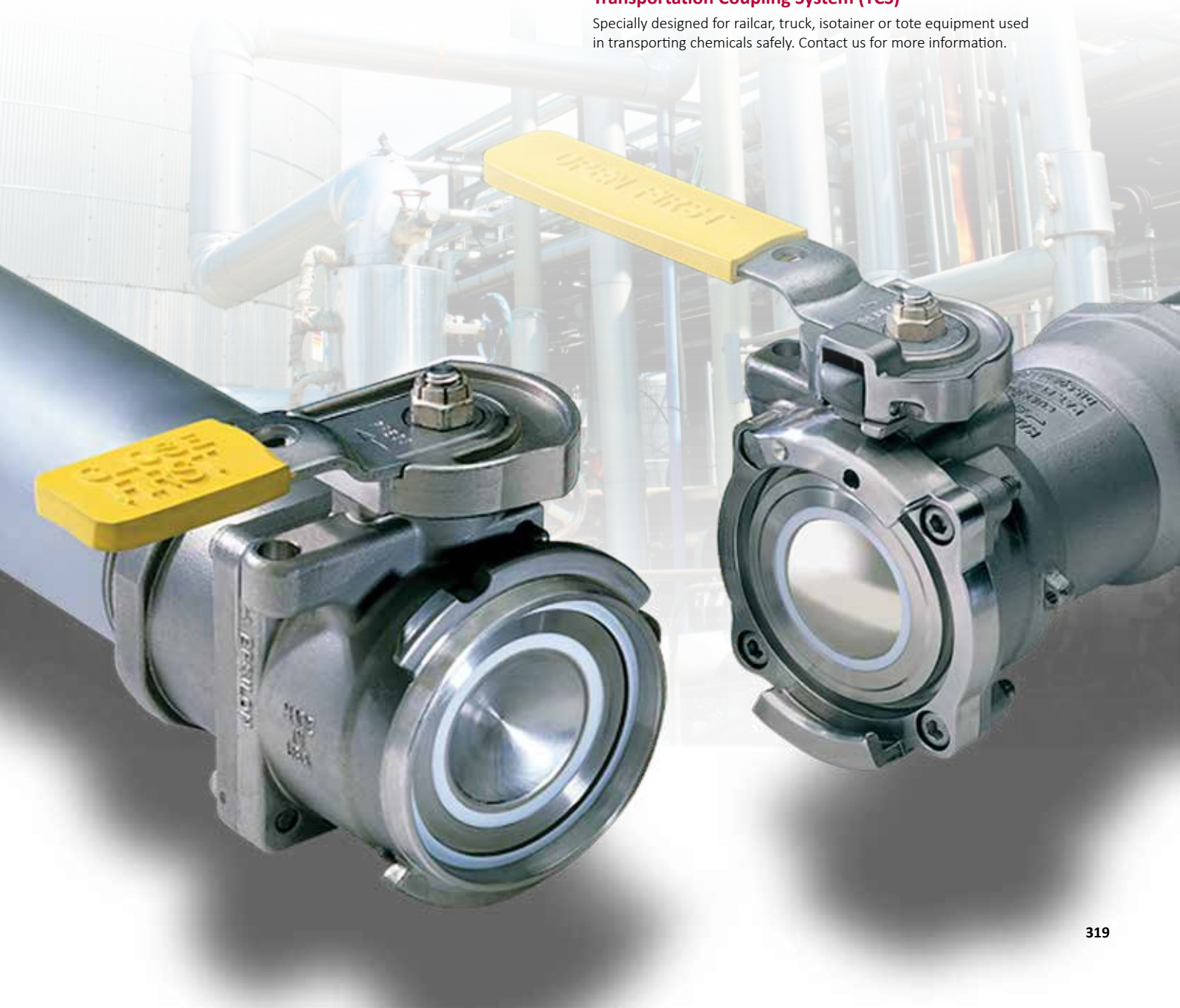
Dual ball races with hardened stainless bearings

- Replaces PTFE sleeve bearing that may become overloaded and allow greater axial misalignment causing the dynamic face seal to leak
- Provides additional support for applications with long hose drops or high load requirements

Spring energized dust seal

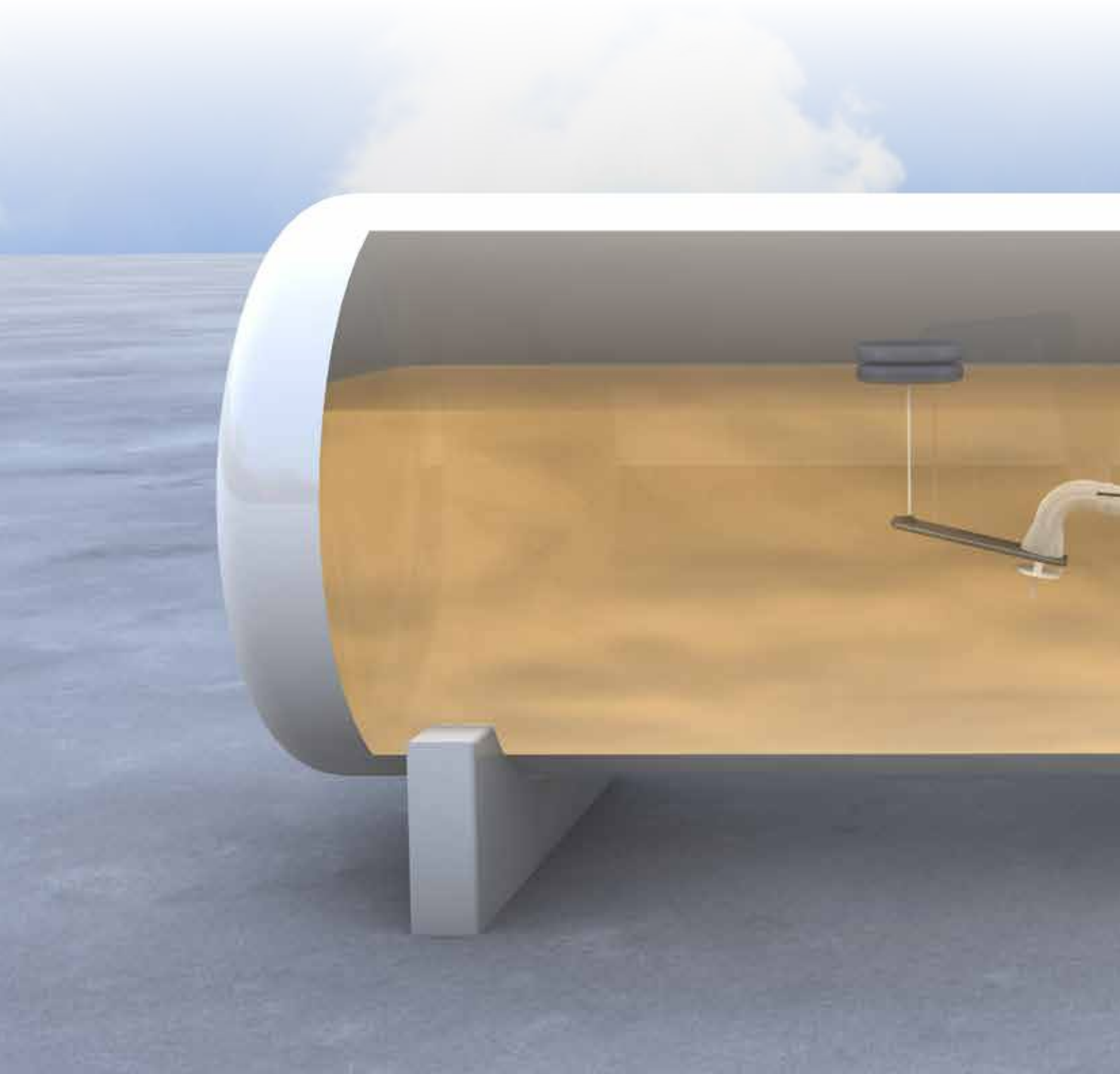
Transportation Coupling System (TCS)

Specially designed for railcar, truck, isotainer or tote equipment used in transporting chemicals safely. Contact us for more information.

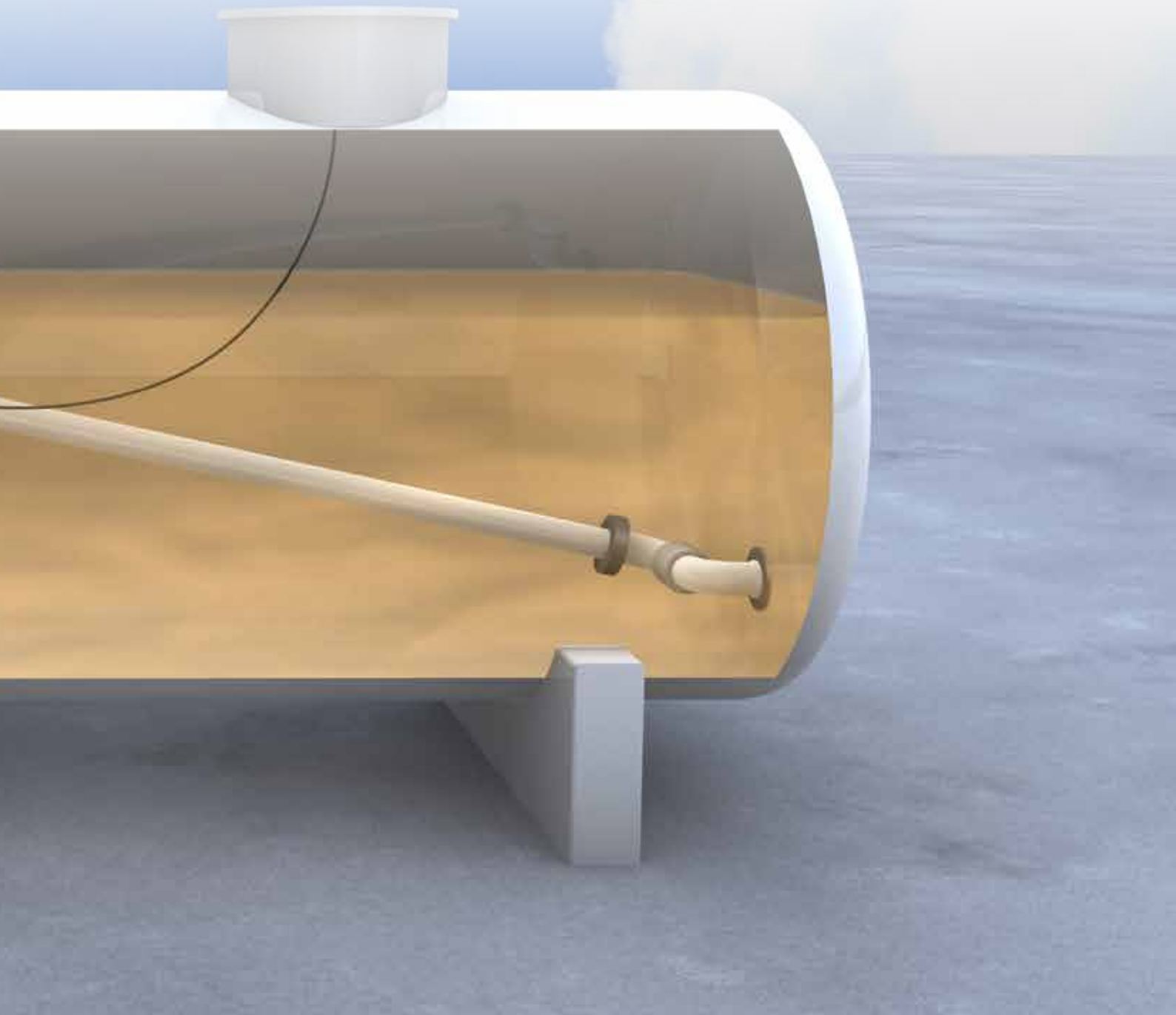


LIQUIP
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Floating Suctions



Floating Suctions 322-323



Floating Suction

Liquip/OPW offer floating suction assemblies for use in horizontal or vertical, above or below ground storage tanks where little or no contamination can be tolerated.

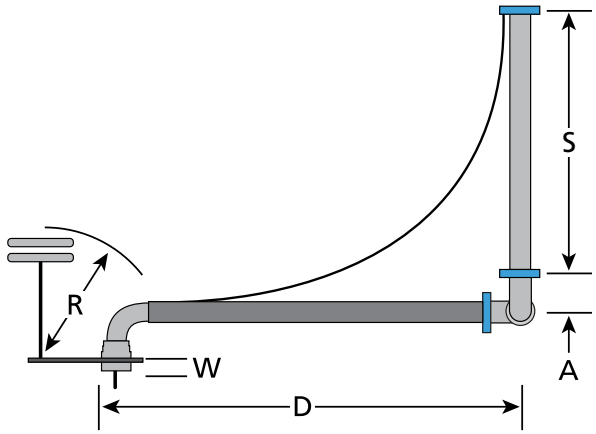
Since the fuel near the top of the tank is least likely to contain water or foreign particles, the floating suction assemblies are designed to float near the top of the liquid surface and draw contamination free liquid.

All of our loading suctions are designed for long and trouble free service life.

Features & Benefits

- Maintenance-free.
- Increases efficiency and decreases maintenance of filter separators.
- Permanently lubricated dual race swivel joints.
- Triple-sealed swivel joints specially designed for submerged service.
- Suction baffle and stop leg maintains a minimum intake level of 8” above tank bottom (or as specified).
- Aluminium 150 lb. flat-faced flanges are standard; steel and stainless steel available upon request.
- Range of models available to suit different budgets.

Dimensions



Size		A		D (763)		D (764)		R		W		S (763V)		S (764V)	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2”	51	5-1/2	140	69	1753	121-1/4	3080	28-1/2	714	6-1/2	165	60	1524	108	2743
3”	76	5	127	69	1753	121-1/4	3080	28-1/2	714	6-1/4	159	60	1524	108	2743
4”	102	6-1/16	154	69	1753	121-1/4	3080	28-1/2	714	6-1/2	165	60	1524	108	2743
6”	152	7-3/4	197	69	1753	120-1/8	3051	28-1/2	714	6-3/4	171	60	1524	108	2743

Ordering Information

Please CONTACT LIQUIP for all ordering information.

Standard Configurations

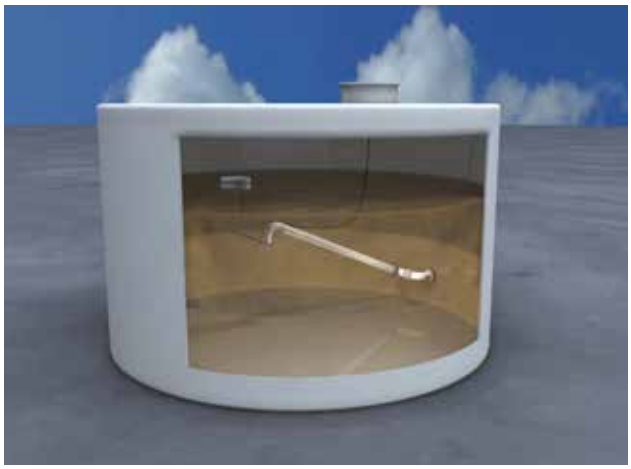
The following are standard Floating Suction Assemblies. Special configurations are available upon request.



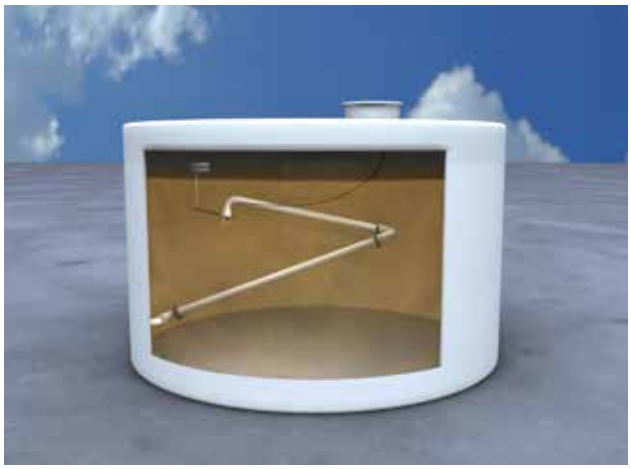
Model 763: for tanks under 8’ in diameter
Model 764: for tanks 8’–12’ in diameter



Model 763V: for tanks under 8’ in diameter
Model 764V: for tanks 8’–12’ in diameter



Model 765: Single-pipe, extended reach for cone roof tanks



Model 766: Scissor-style for large vertical tanks

LIQUIP
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Loading Skids

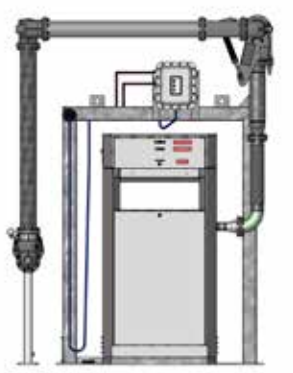


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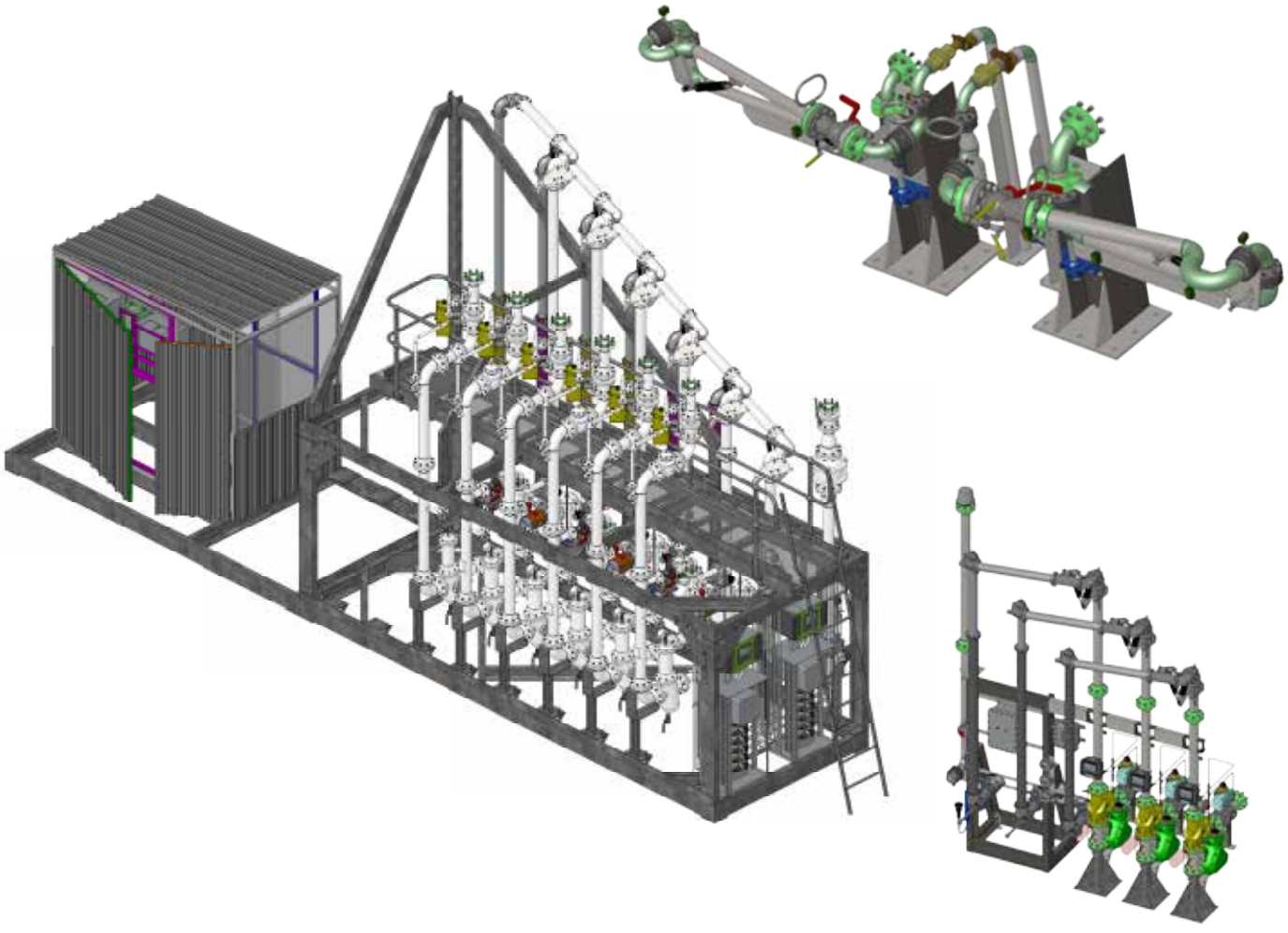
Complete Turnkey Truck Loading Skids

Liquip provide a complete turnkey truck loading stations (gantries), starting with assessment of customers requirements and consultation to provide the most productive & cost efficient solution.



With customer instruction we then go through the design process and produce a general arrangement drawing list all the major components for the customers approval. From this point we detail and begin construction following through to wet testing and operational confirmation. The final process after the station is positioned and connected at site we can calibrate and commission all aspects of the project.

Loading skids designs vary form the most simple single arm with mechanical registers and printers to the 6 arm skids which can include blending additive injection, fuel management system linked to a gantry operated control connected to the site terminal automation system.





Features & Benefits

- Expert assessment consultation
- Designs the most cost effective solution
- Delivers pre- and post-sale support
- Offers a complete line of loading skid components
- Single Source
- Plug & Play Solutions



Site Preparation Considerations/ Consultation GANTRY

- Driver side of tanker
- Truck drive in direction
- Frame work
- Full frame with Maintenance Walkway
- Platform style frame work
- Skid Foundations
- Spill tray
- Grating
- Concrete
- Fuel entry pipes
- Fuel Max Pressure
- Drive way sump & Slops return
- Modular Frame work with expansion allowed
- Container size frame work for shipping
- Number of loading arms or bays

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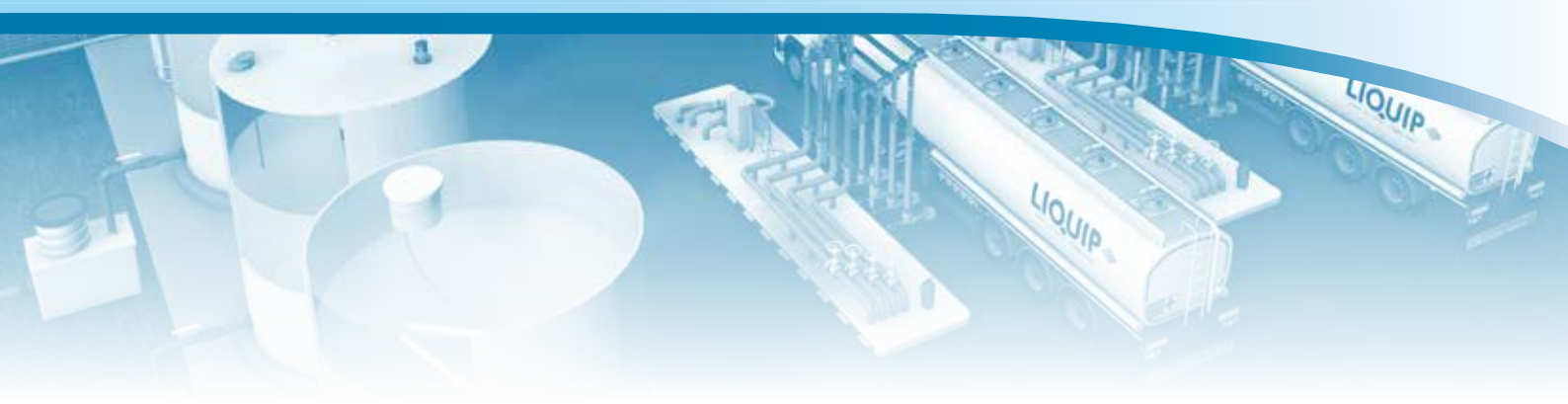
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LIQUIP STANDARD PRODUCT WARRANTY

Warranty Details:

In this Warranty, Goods mean products, systems, installations designed and manufactured by Liquip.

Liquip International warrants to the end purchaser ("the Customer") that for 12 months from the original date of purchase ("Warranty Period") the Goods will be free from defects in materials and/or workmanship when used in accordance with these Warranty Terms and Conditions.

Under the terms of this Warranty, and subject to approval of the claim by Liquip International, Liquip International may elect at its discretion to repair or replace the Goods during the Warranty Period. If a replacement part is supplied, warranty remains based on the original date of purchase.

Making a Warranty Claim:

To make a warranty claim under this Warranty, the Customer must:

1. Inform Liquip International as soon as the warranty claim arises by contacting Liquip International (details below) and obtain any relevant details including reference number, purchase order, serial number and tank ID where relevant;
2. Send to Liquip International original proof of purchase and reasonable evidence of the original date of purchase and your written description of the fault (including image samples and any other relevant material); and
3. Courier the Goods to Liquip International in its original packaging or packed in a manner that ensures goods are protected to the address below, and subject to the applicable consumer laws, pay for all packing, freight and insurance costs for transit of the Goods to Liquip International:

Investigation of Claims:

Liquip International will make its own evaluation of the fault stated by the Customer before any warranty claim is accepted.

If the warranty claim is accepted by Liquip International, Liquip International will, subject to the applicable consumer laws and at its cost:

- Repair or replace any faulty parts or rectify any faulty workmanship; and
- Return the Goods to you.

Liquip Smithfield:

13 Hume Rd, Smithfield, NSW 2164 Australia
T +61 2 9725 9000

Liquip Aviation Services / Fuelling Solutions:

7 Trevi Crescent, Tullamarine, VIC 3043 Australia
T +61 03 8336 2800

Exclusions to Warranty:

This warranty does not cover:

- Components that may need replacement or repair due to normal wear and tear or lack of maintenance upkeep;
- Damage caused by accident, misuse, negligence, abuse or fire;
- Overloading or transport damage
- Goods that are not returned in original packaging or not packed in a manner that is approved by Liquip International;
- Unauthorised alteration, modification or substitution of any parts of the Goods, installation or use of the Goods not in accordance with instructions supplied;
- Malfunction of Goods due to faulty installation or operation;
- Goods that have their serial number or model number label removed or defaced;
- Goods that have been used for a purpose other than for what was reasonably intended for the Goods;
- Freight/transport costs for delivery and return of the Goods unless otherwise agreed in writing by Liquip International.

Repair of any Goods that do fall within the terms and conditions under this Warranty will be charged to the Customer at Liquip International's service rates (current at that time) and the list price for parts (current at that time).

Limitation of Liability:

The following statement applies only if the supply of the Goods to the Customer is a "consumer sale" as defined in the Australian Consumer Law. In this statement, 'Our' means Liquip International, 'You' means the Customer and 'goods' means 'goods':

> Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Notwithstanding this, the liability of Liquip International is limited, to the extent permitted by law and at the option of Liquip International to:

- Replacing the Goods or the supply of equivalent Goods;
- The repair of the Goods;
- The payment of the cost of replacing the Goods or of acquiring equivalent Goods; or
- The payment of the cost of having the Goods repaired.

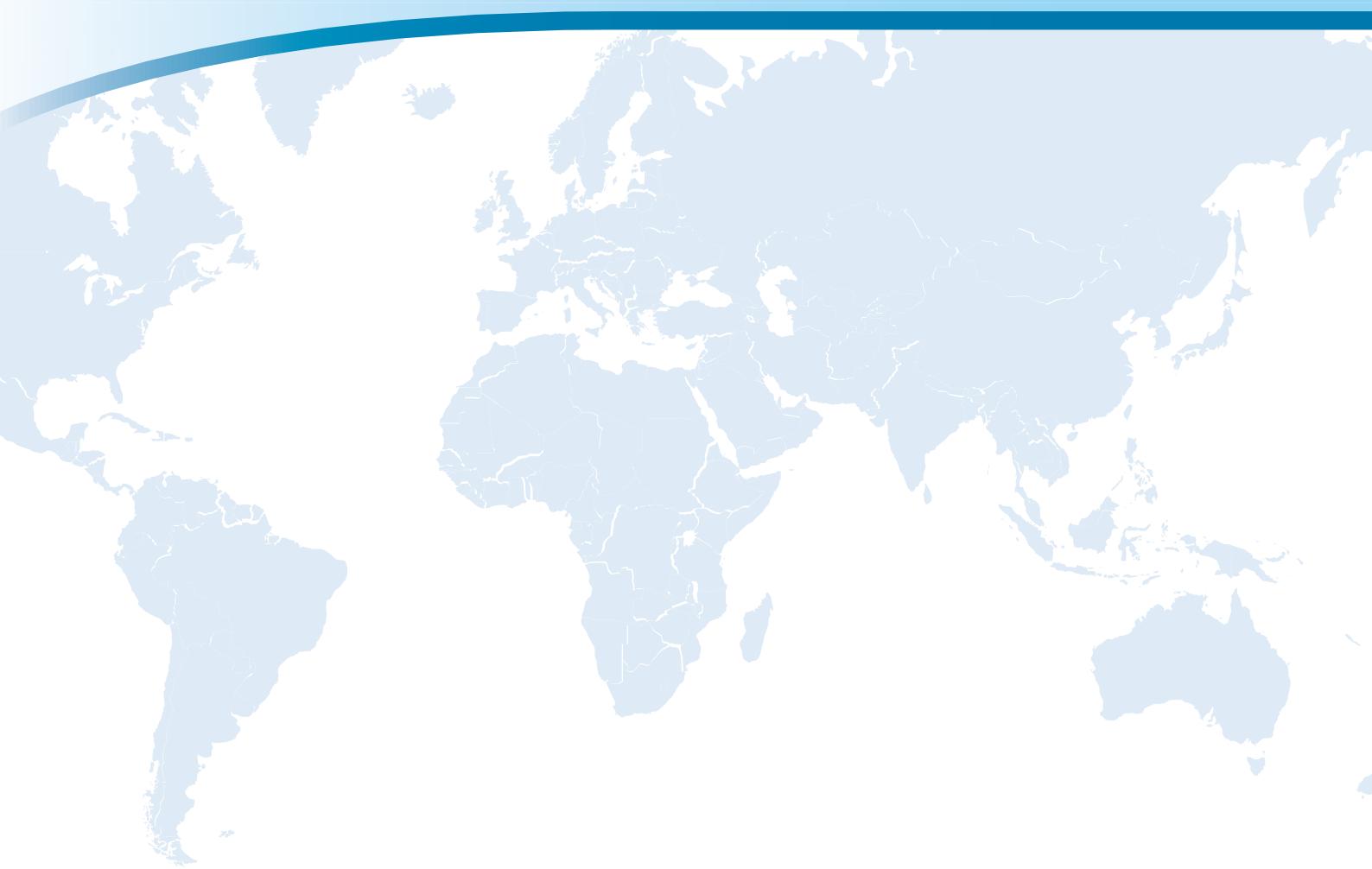
To the extent permitted by law, all other warranties whether implied or otherwise, not set out in this Warranty are excluded and Liquip International is not liable in contract, tort (including, without limitation, negligence or breach of statutory duty) or otherwise to compensate the Customer for:

- Any increased costs or expenses;
- Any loss of profit, revenue, business, contracts or anticipated savings;
- Any loss or expense resulting from a claim by a third party; or
- Any special, indirect or consequential loss or damage of any nature whatsoever.

The benefits given to the Customer in this Warranty are in addition to other rights and remedies under a law in relation to the Goods or services to which this Warranty applies.

This warranty is not applicable outside Australia.

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LIQUIP GLOBAL PRESENCE

For a list of all Liquip distributors

Please visit www.liquip.com/wheretobuy

Retail Fuelling
Components and products to protect the environment and the consumer at retail fuelling sites for conventional and alternative fuels.

Dispensing & Automation Solutions
Manufacturing a complete range of fuel dispensers, pumps and automation systems for the global retail fuelling market.

Electronic Systems
Innovative electronic tank gauges and fuel control systems to ensure customers know how much fuel they have and where it is going. Also, Automated Vehicle Wash Systems.

Chemical & Industrial
Safe and efficient loading and unloading of critical hazardous chemicals: loading arms, swivel joints, sight flow indicators, quick and dry disconnect couplers, and safety breakaways.

Transportation
Components and systems for use on Tank Trucks and Rail Tank Cars to ensure the safe handling, loading, transport and unloading of hazardous bulk products, including: petroleum, chemical and dry bulk cargo.

NOTE: All information subject to engineering and/or other changes.