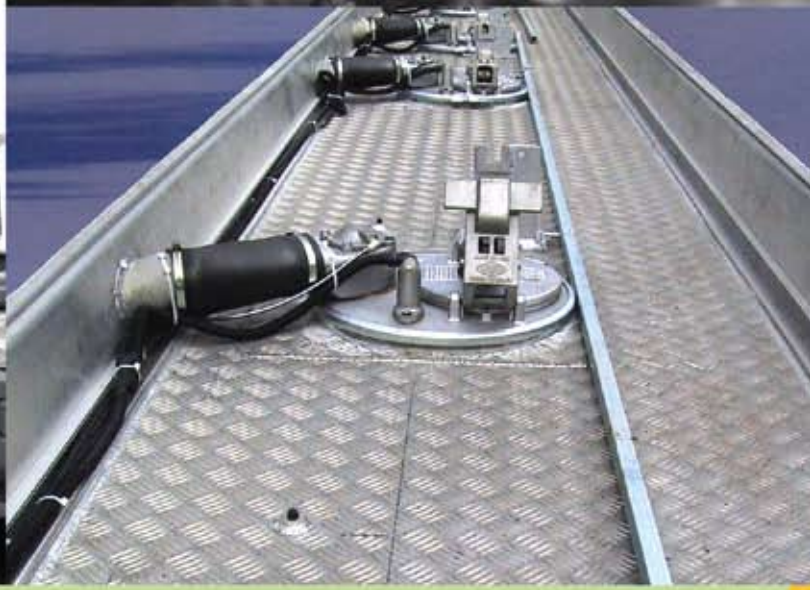
LIQUIP

# ROAD TANKER EQUIPMENT



ISSUE 5

## WELCOME TO ISSUE 5 OF LIQUIP'S TERMINAL EQUIPMENT CATALOGUE

This catalogue is by no means the full range of Liquip Terminal Equipment, it is intended as a guide to the range we have available.

Created using Indicium Content Management System, our catalogues are now seamlessly linked to information on Liquip's website, www.liquip.com

## HOW TO USE OUR CATALOGUE SYSTEM

- Read the various catalogues for an overview of the product range
- Email webmaster@liquip.com to request a login password
- Login and download the very latest data sheets, product manuals, installation and maintenance manuals as well as other technical information from the website
- Subscribe to our newsletter for the latest industry information

## CALL OUR CUSTOMER SERVICE TEAM

Please call +61 2 9725 9000 or email sales@liquip-nsw.com.au and ask for our Customer Service Bulletin which introduces our people and helps to understand who to call at Liquip for sales and technical advice.

Ask for our Terminal Survey sheet. Liquip's tool used to establish your requirements.

Experience the Liquip Advantage

# CONTENTS

# VEHICLE SETUP

## MANHOLES

VOH200 SERIES

VOH410 SERIES

VOH500 SERIES

VOH750 SERIES

PAGE 6–14

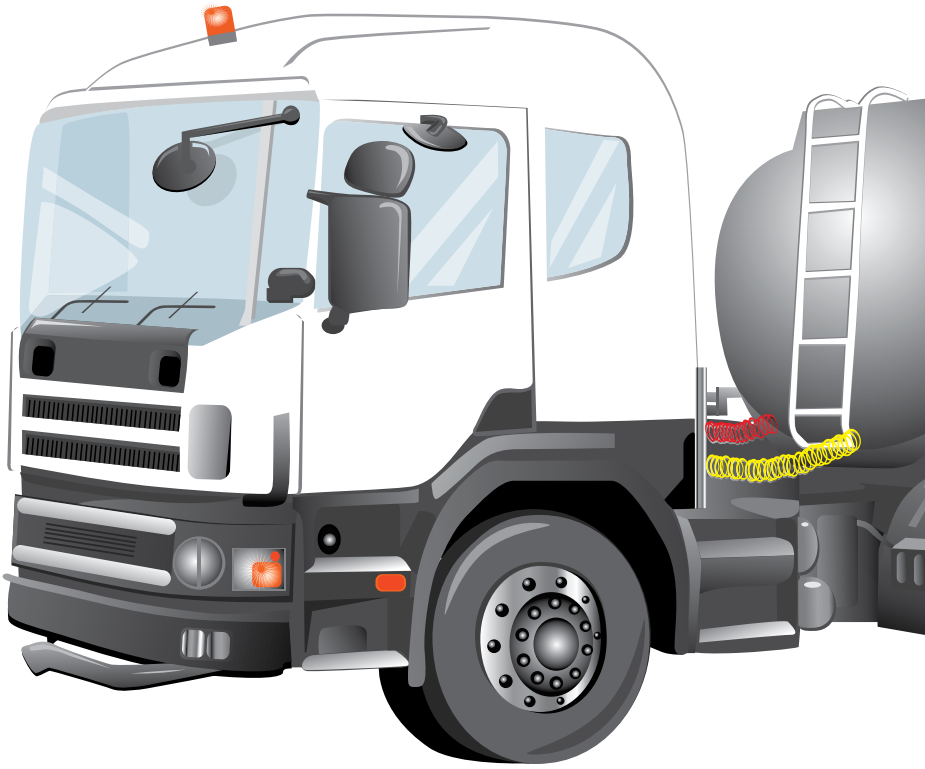
## FOOT VALVES

SLV5-ARO

SLV100

SLC200

SLV5CO



PAGE 26–29

## OUTLET VALVES

API490

API CAPS

PAGE 34–36

## OUTLET ADAPTORS

API MC SERIES

APIRC

PAGE 37–40

LBV SERIES VALVES



LIQUIP INTERNATIONAL
AN IDEX COMPANY

DIP FITTINGS

FILL FITTINGS

PAGE 16–18

VAPOUR VENTS

AVVF075V

AVV075V

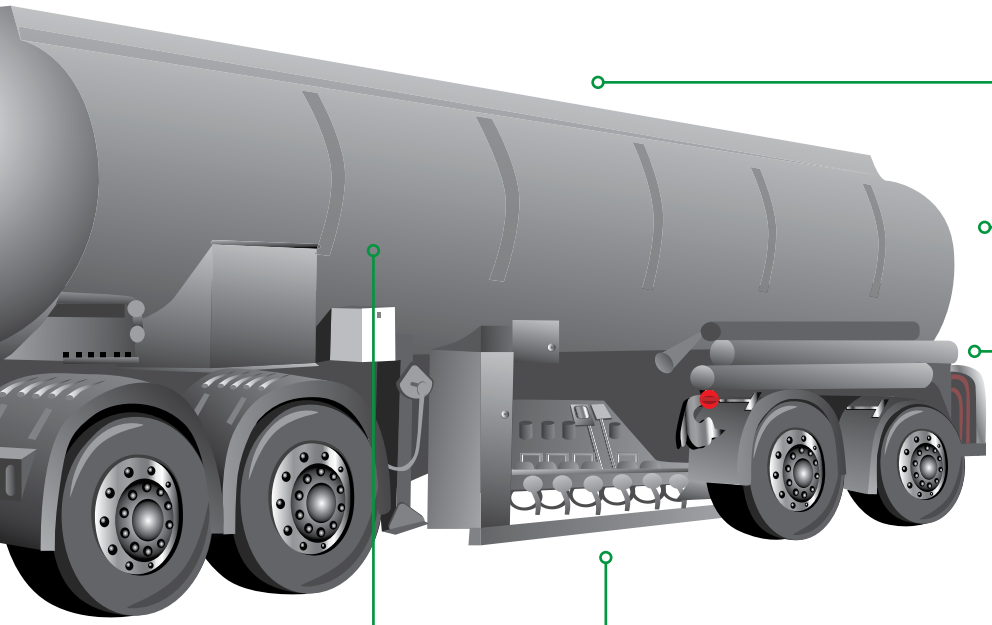
VENTS

PVV204

EH230

PAGE 21–25

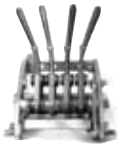
PAGE 13, 20



PAGE 31–32

VALVE OPERATORS

LCO



ACL405R

CL401

VAPOUR RECOVERY

PAGE 24, 25, 38

VCF075W

VCM3U

VCM450

VCF500

GC300

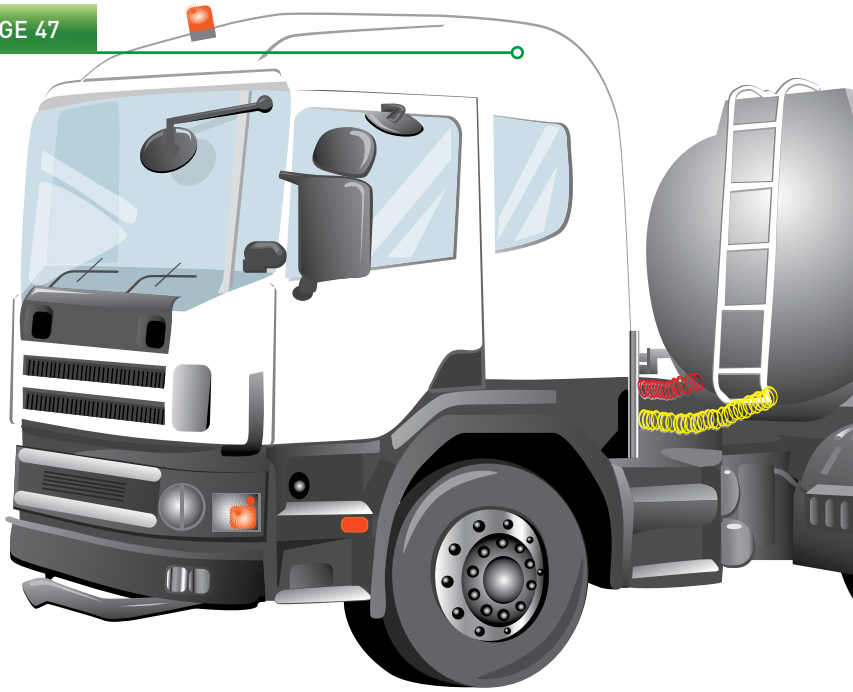
# VEHICLE SETUP

## DIPTRONIC

DIP100 DIP200 API461

PAGE 57–61

PAGE 47



## ENGINE SHUTDOWN SYSTEMS

RS305

MES5

## ON-BOARD MONITORING

PPM3XX SERIES

PAGE 53–54

MPP102

## OVERFILL PROTECTION

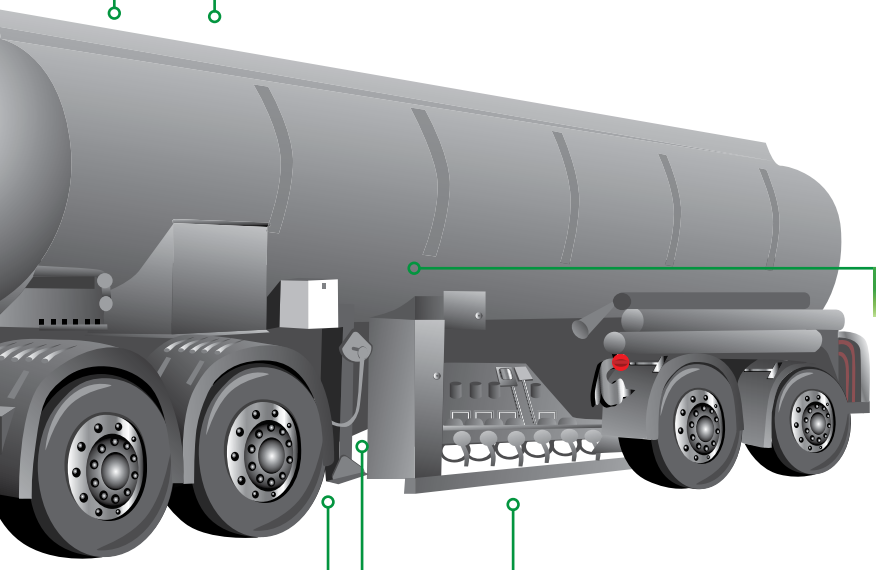
OPTIC PROBES
LDP SERIES

AGP102

PROBE HOLDERS
PJB300 SERIES

VOH 200-5

PAGE 49–50



## ELECTRONIC REGISTERS

EJB101

ERP101

EMH600

EMH500H

PAGE 55–56

## BELLY SENSOR

FOB100

PAGE 48, 60

## TEMPERATURE SENSOR

BTS100

DWS100

## OVERFILL PROTECTION

PAGE 51–52

TRUCK PLUGS
TP SERIES

ITP SERIES

Liquip design and manufacture a range of round manhole covers to suit individual customer preferences with the choice of up to four attachment points for the addition of over fill probes, vapour vents, dip & fill tubes and Diptronic® tank gauging. Sizes range from 400 mm – 500 mm (16" – 20").

Most are constructed of a cast Aluminium man-hole cover and bridge and handle with provision for pad locking the handle for security. The VOH800 Range is a steel plated style manhole cover.

Additional security can be achieved with a non opening bridge & handle design.

**REGULATIONS**

Liquip manholes and vents are designed to comply with worldwide standards including: Australia, UK, Europe, France & USA

**DROP-TEST**

Several models of Liquip man hole covers are Drop Test Approved to Australian, UK and US standards.

Drop tested manhole covers offer additional security in the event of a tanker rollover and help to prevent environmental damage and commercial loss through loss of product in a roll over situation.

**MANHOLE BOLTING**

Several methods of positioning manhole covers are available.

Clamp Band: A single clamp fits around the circumference of the manhole cover and manhole 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.

Bolt Pattern: The manhole cover is attached to the manhole coaming using a 24 bolt pattern,

Wing Nut: Used on Swing back and pressure hatches.

**EMERGENCY VENT**

All VOH series man hole covers incorporate a 225 mm (9") emergency vent and a pressure vacuum vent,

The emergency vent is a safety device which is designed to open, relieve surge pressure and then close in the event of a tanker roll over, this action prevents rupturing of the tanker shell. It can also be utilized to top load the tanker and is fitted with a two stage handle release to prevent hatch blow back when opening under pressure

All VOH series manhole covers are also equipped with a pressure/vacuum vent which is used for thermal relief of each compartment and incorporates shut off in the event of a roll over.

Please note that this is not suitable for bottom loading with the man hole cover in the closed position, a separate vapour vent should be fitted for this operation.

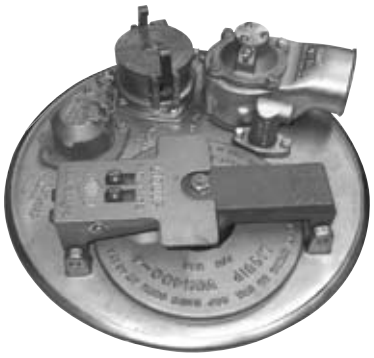
**ACCESSORIES**

UG101 Ullage Gauge

Accessory blank plates

Man-hole cover sightglass

Weather hatches



## VOH200 SERIES

400mm (16“) MANHOLE COVER

Cast aluminium construction, this manhole cover features two equipment mounting positions for Over Fill and Vapour Recovery. Any mounting position not used can be securely blanked off until required.

Ideal for either Top or Bottom loading.

MOUNTING

Clamp-Band mounted to corresponding coaming

VOH200U-15M Mild Steel Coaming

VOH200U-30 Aluminium Coaming

VENTS

A standard 1” pressure vacuum vent and 225 mm (9”) two stage emergency vent are included as standard on this series.

Please note: The pressure vacuum vent is for thermal expansion only and not for bottom loading vapour venting or vapour recovery.

A 225mm emergency pressure vent (also called fire engulfment vent) is also included on all models enabling bulk pressure release in event of a fire or rollover.

### OPTIONS

Gravity Latch

Lockable Bridge & Handle

### ACCESSORIES

UG101 Ullage gauge

AVV3.0-10 Blank Plate

VOH700TH-14 Overfill probe position blank plate

VOH700-22 Manhole cover sight glass

VOH200-5 Overfill probe Holders

VOH400-10 Lock Key

### DROP TEST

VOH200 Series Drop Test Approved

VOH210 Not Drop Test Approved

## VOH410 SERIES

455mm (18”) diameter MANHOLE COVER

Cast Aluminium construction with four equipment mounting positions the VOH410 series is the premier manhole cover in the Liquip range. This manhole cover is 455mm (18”) in diameter andis ideal for either top or bottom loading.

MOUNTING

Clamp-Band mounted to corresponding coaming

VOH300-15P Aluminium Coaming

VOH300-17 Mild Steel Coaming - Not Drop Test Approved

VENTS

All Liquip manhole covers come standard with 1” thermal pressure and vacuum vent complying with recognised industry codes. They are Australian drop test approved and incorporate a rollover ball to completely shut off the vent in event of a tanker rollover.

Please note: The pressure vacuum vent is for thermal expansion only and not for bottom loading vapour venting or vapour recovery.

A 225mm emergency pressure vent (also called fire engulfment vent) is also included on all models enabling bulk pressure release in event of a fire or rollover.

INSPECTION HATCH

The 225mm emergency vent doubles as an easy to open inspection hatch for top loading or visual inspection of tank contents. A two stage opening mechanism enables internal pressure to be released before completely opening the hatch cover.

### OPTIONS

Gravity Latch

Lockable Bridge & Handle

### ACCESSORIES

UG101 Ullage Gauge

AVV3.0-10 Vapour Recovery Blank Plate

VOH700TH-13 Dip & Fill Blank Plate

VOH200-14 Overfill Probe Blank Plate

VOH700-22 Sight Glass

VOH400-10 Lock Key

### DROP TEST

Passes the Australian and CEN Drop Tests

## VOH500 SERIES

500mm (20") MANHOLE COVER

Cast Aluminium construction. It features three mounting positions for vapour recovery, overfill protection, dipstick or Diptronic accessories.

Any mounting position not utilized can be securely blanked off until required.

MOUNTING

24 bolt pattern to corresponding coaming

VOH500-14A Aluminium Coaming

VOH500-17M Mild Steel Coaming

VENTS

A standard 1" pressure vacuum vent and 9" (225mm) emergency vent are standard on this model.

Please note: The pressure vacuum vent is for thermal expansion only and not designed for bottom loading, vapour venting or vapour recovery.

A 225mm emergency pressure vent (also called fire engulfment vent) is also included on all models enabling bulk pressure release in event of a fire or rollover.

The VOH500 Series can be used for either top or bottom loading with provision for a vapour vent and overfill probe, or top loading through the emergency vent. All major components are cast aluminium, keeping weight to a minimum while providing security.

### OPTIONS

Gravity Latch

Lockable Handle

### ACCESSORIES

7237Z Blank Plate for accessory mounting positions.

PJB301 Overfill Probe Holder

VOH400-10 Lock Key

### DROP TEST

Passes the Australian and CEN Drop Tests

## VOH750 SERIES

455mm (18") MANHOLE COVER

Cast Aluminium construction. Features three equipment mounting positions for Overfill Probe, Vapour Recovery, Dip Tube or Diptronic applications.

Any mounting position not used can be securely blanked off until required.

Ideal for either top or bottom loading.

MOUNTING

24 Bolt Pattern for mounting to corresponding coaming

VOH700-26 Aluminium Coaming

VOH700-26M Mild Steel Coaming

VENTS

All Liquip manhole covers come standard with 1" thermal pressure and vacuum vent complying with recognised industry codes. They incorporate a rollover ball to completely shut off the vent in event of a tanker rollover.

Please note: The pressure vacuum vent is for thermal expansion only and not for bottom loading vapour venting or vapour recovery.

INSPECTION HATCH

The 225mm emergency vent (fire engulfment vent) doubles as an easy to open inspection hatch for top loading or visual inspection of tank contents. A two stage opening mechanism enables internal pressure to be released before completely opening the hatch cover.

### OPTIONS

Gravity Latch

Lockable Bridge & Handle

### ACCESSORIES

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

### DROP TEST

Passes the Australian and CEN Drop Tests

## VOH800 SERIES

500mm (20") MANHOLE COVER

Plated steel construction. Features maximum three mounting positions for vapour recovery, overfill protection and dip and fill accessories.

Made to order with mounting positions as required.

MOUNTING

Mount with clampband, coaming and clampband supplied

VENTS

A standard pressure vacuum vent is fitted to the 10" (250mm) emergency vent. This vent (fire engulfment vent) allows bulk pressure release in event of a fire or rollover.

Designed for top or bottom loading this manhole cover is NOT drop test approved.

### ACCESSORIES

PJB300 Overfill Probe Holder

## SWING HATCH SH303

The SH303 swing hatch is a 441mm swing easy access style manhole cover. It features an integral emergency vent and provision for a pressure vacuum vent.

It comes complete with weld in coaming available in Aluminium, Mild Steel or Stainless Steel.

Various seal materials available to suit a wide range of applications.

It fully passes the Australian Drop Test and additionally complies with UK and US regulations.

This model is also available in a clean skin configuration, (SH302) with no pressure vacuum vent for dangerous goods application (see below.

**ACCESSORIES**

PVV204 Pressure Vacuum Vent

## SWING HATCH SH302

The SH302 cleanskin hatch cover comes complete with weld in coaming in Mild Steel, Aluminium or Stainless Steel.

The SH302 has no provision for pressure or vacuum relief.

Various seal materials available to suit a wide range of applications.

Optional full stainless steel construction (no vents)

## EMERGENCY HATCH

Emergency Hatch EH230 Series

This 225 mm (9”) unit is available in aluminium only.

The weld-in 150mm coaming is available in Aluminium, Mild Steel or Stainless Steel.

For safety the hatch has a two stage opening and also acts as an emergency vent. It also incorporates a standard Liquip pressure vacuum vent for thermal relief of the tanker (optional).

It is supplied as a complete unit ready for fitting to a tanker or storage tank.

### OPTIONS

A wide variety of seals are available depending on the product being stored or transported

## PRESSURE HATCH

Pressure Hatch PH18 (18”) and PH20 (20”) Series

Pressure vessel hatches in a range of sizes and specifications for use with road, rail or storage tanks. Cover is manufactured from cast aluminum.

The standard range of hatches, the PH 18” (460mm) and PH 20” (510 mm) allow secure access to pressure vessels for filling, cleaning and inspection.

They are supplied as a complete unit with coaming in mild steel or aluminium ready for fitting to a tank.

They comply with Australian pressure vessel standards and AS 1210.

Cam handles are adjustable without opening the hatch or depressurisation of the vessel.

### OPTIONS

Steel or Aluminium Weld rings

Liquip manufactured blank plates can be fitted to any unused mounting positions on the manhole covers. They are fastened from the underside of the manhole cover providing security and weather proofing. Gaskets and fasteners are supplied with each blank plate.

## BLANK PLATE FOR OVER-FILL PROBE POINT

VOH 700TH-14 (BLIND TAPPED) for added security - VOH200 & VOH750 only.

VOH 200-14 (THROUGH HOLE) - VOH410 only

Blank plates supplied complete with gasket and fasteners.


## BLANK PLATE FOR DIP AND FILL POINT

VOH 700TH-13 (BLIND TAPPED) for added security - VOH200 & VOH750 only

VOH-16 (THROUGH HOLE) - VOH410 only

Fits VOH200. VOH400 & VOH700 series manhole covers.

7237Z fits VOH500 series manhole covers

Blank plates supplied complete with gasket and fasteners.

## BLANK PLATE FOR VAPOUR POINT

AVV3.0-10 (BLIND TAPPED) for security fits VOH200, VOH410 & VOH750 series manhole Covers.

7237Z fits the VOH500 series Manhole Covers.

Blank plates supplied complete with gasket and fasteners.


## ULLAGE GAUGE UG101

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 allowing easy verification of product level within each compartment.

## MANHOLE COVER SIGHTGLASS VOH700-22

The manhole cover sight-glass (VOH700-22) is a manhole mounted sight glass designed to enable visual checking of the ullage gauge and liquid level inside each compartment without opening the manhole. It has a cast aluminium body and toughened glass window with a protective cover to prevent damage and dirt build up.

## HWC 304 HATCH WEATHER COVERS

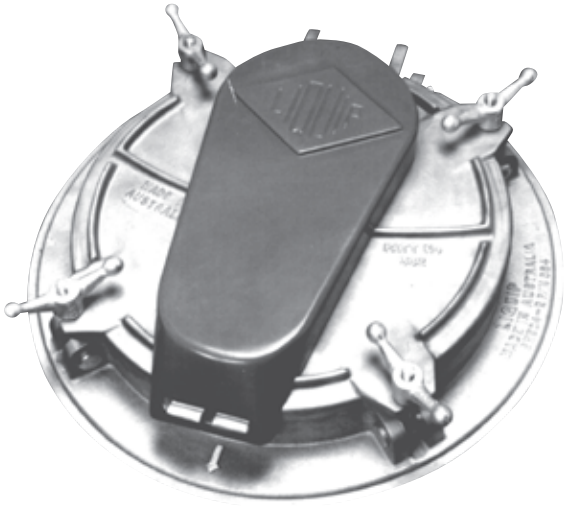
Fits SH303 swing back hatches. Provides extra protection against ingress of dust and water through vents. Simple spring clip allows for removal for maintenance, plus clip has built-in movement providing ample venting through the emergency vent should overfill occur.

OPTION AND RELATED EQUIPMENT

To fit Liquip swing-back hatches only. Stock colour green.

**TECHNICAL DATA**

Fibreglass cover. Stainless steel spring clip. Lifts at equivalent of 1 kPa pressure. Wt. 0.43 kg.



## HATCH WEATHER COVER

The Liquip hatch cover mounts onto the manhole.

The quick release rubber clamp allows quick opening and closing of the cover.

The clamp is made of petrol-resistant neoprene.

The weather cover is an additional safeguard against the entry of water into the tank, commonly used when carrying Jet A1 or Avgas.

Fibreglass green cover.

Overall size: 495mm for round hatches

HWC301 for VOH400 Manholes

HWC700 for VOH700 Manholes

## ADAPTOR & CAP

DBC80 Dip Cap

DBA80 Bayonet Adaptor

Available in 50mm and 80mm versions. The pressure relieving Dip Cap enables pressure to be released before opening the cap preventing possible operator injury.

DIP ADAPTOR is bayonet type fastening with flange mount.

DTM 80 Venting Mandrel locates between the Dip Adaptor and the dip tube. The dip tube attaches to the lower mounting point, the mandrel features 3 large gauzed holes which allows venting from the dip tube into the compartment ullage space preventing a product geyser when the dip cap is opened.

DIP CAP incorporates pressure relief, actuated when the cap is pressed down to twist-to-release.

## DIP ADAPTORS

DTA80 & DTA65

Standard mil spec camlock tops, with through hole square flanges and 74.5mm diameter lower flange to suit standard 80mm dip tube.

The DTA series bolts directly to the Liquip manhole cover or to separate weld in flanges.

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

DTA80 – 80mm Camlock NA80-2AW Camlock Dust Cap

DTA65 – 65mm Camlock NA65-2A Camlock Dust Cap

Suits VOH200, VOH400 & VOH700 series Manhole Covers.

DTA80F

Same as the DTA80 but suitable for the VOH500 series manhole covers.

**VARIATIONS**

DTA80-3 – Same as the DTA80 except it utilizes an integral weld flange for use on low profile tankers.

## FILL ADAPTORS

FTA80 & FTA65

Standard mil spec camlock tops, with through hole square flanges and 74.5mm diameter lower flange to suit standard 80mm fill tube.

The FTA series bolts directly to the Liquip manhole cover or to separate weld flange.

The fill tube is either welded or pop rivetted to the round section on the base of the Adaptor.

FTA80 – 80mm camlock NA80-2AW Camlock Dust Cap

FTA65 – 65mm camlock NA65-2A Camlock Dust Cap

Suits VOH200, VOH410 & VOH750 series Manhole Covers.

FTA80F

Same as the FTA80 but suitable for the VOH500 series manhole covers.

**VARIATIONS**

FTA80-3 – Same as the DTA80 except it utilizes an integral weld flange for use on low profile tankers.

## DIP & FILL TUBES

DIP TUBES

Dip Tubes are manufactured from aluminium extrusion or in optional stainless steel with a 600 micron (30 mesh) gauze extending the full length of the tube, available in either 1800mm or 2200 mm lengths, these are trimmed to exact length by the customer prior to installation

Also available are end bungs to meet European standards.

DTS3-6 Dip Tube 80mm X 1800mm

DTS3- 2200 Dip Tube 80 mm X 2200mm

FILL TUBES

Manufactured from aluminium with solid sides to prevent splashing while filling is taking place.

FTB3-6 Fill Tube 80mm x 1800mm

FTB3-2200 Fill Tube 80mm x 2200mm

Dip Tube DTS

Dip Adaptor

Fill Tube FTB

## DIP-STICK INTERLOCK DSI50

For use where operational procedures require that the emergency valve is open prior to a dip reading being taken.

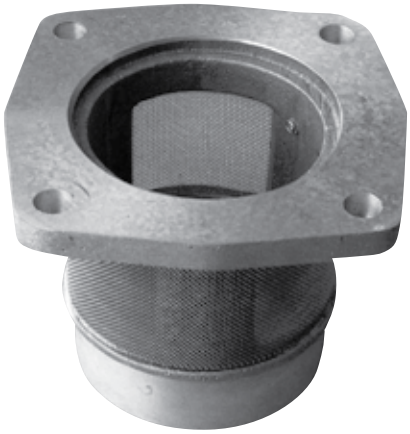
The DSI50 pneumatic Interlock prevents the dip stick from being inserted until a sequence valve, located on the emergency valve, pneumatically operates the locking mechanism on the DSI50.

It has a secondary function of not allowing access to any compartment through the dip stick access point unless the emergency valves have been activated.

## DTM80

The venting mandrel firs into the dip hole and its flange is sandwiched underneath the dip adaptor on to the manhole cover. Dip tube is attached to the boss on the mandrel by welding or pop-rivetting.

The mandrel incorporates three large port holes for venting from the normal ullage space. This feature eliminates any possibility of a liquid geyser from the dip hole due to internal pressure.



## DIP/FILL REMOTE MOUNT PAD

Dip & Fill remote mounting pads can be used on tankers where manhole covers do not have integral dip & fill points. They can be welded direct to the tanker walkway to enable the use of dip & fill points.

Available in 4 configurations

DP3.0-1A - Single flange for either dip or fill in Aluminium

DP3L - Double flange for both dip and fill points in Aluminium

DP3S - Double flange for both dip & fill points in Stainless Steel

DP3M-1 - Single Flange for either dip or fill in Mild Steel

## DIP TUBE GUIDE DTG SERIES

Dip Tube guides are used to support the bottom of the dip stick tube preventing the tube from moving or swaying while the tanker is in motion.

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

DTG3-R - Aluminium with integral striker pad and elastomer bearing

DTG3-R-AT - Aluminium with integral striker pad and Teflon bearing

DTG3-M - Mild Steel, no striker pad and plain bore

DTG3-S - Stainless Steel, no striker pad and plain bore


## TUBE STEADY - TS SERIES

Used when a dip and fill tube are both used.

The TS3X3 steady braces the fill tube off the dip tube, which has been securely fixed in position using one of the dip tube guides.

Aluminium construction

Suitable for use with VOH400 Series manholes and DP weld pads only.

## ANTI-RATTLE DIP STICK DSS 21, DSR 21

DSR 21

Is a simple polyurethane ring which locates on the top of the dip stick and prevents it rattling within the dip tube while the tanker is in motion. This reduces wear on the dipstick and the graduations engraved into it.

DSS 21

Is a ring pull which attaches to the top of the dip stick enabling easy retrieval of the stick when checking compartment contents. It is also compressed by the dip cap while in transit preventing the dip stick from bouncing within the compartment.

## PLAIN VENTS PV2 & VV2 SERIES

Medium capacity vents 50mm nominal bore used primarily for static tanks.

Spring operated pressure or vacuum vents with gauzed vapour ports. Reduces contamination of product in storage tank and vapour loss from volatile liquids. Easy to clean and maintain.

Mounted on to tank by weld flange, or in some circumstances, can be bolted directly through tank top.

Pressure vent opens at 15kPa, capacity 430m3/hr free air at 35kPa. Allows loading rate of 1500 l/m at 21kPa tank pressure.

Vacuum vent open 3kPa allows discharge rate of 2000 l/m at 10kPa vacuum.

### PRESSURE VENTS

PV2-ST Stainless Steel with Teflon Seals.

PV2-SV Stainless Steel with Viton Seals

PV2-AV Aluminium with Viton Seals

PV2-AB Aluminium with Buna Seals

### VACUUM VENTS

VV2-ST Stainless Steel with Teflon Seals

VV2-SV Stainless Steel with Viton seals

VV2-AB Aluminium with Buna Seals

## PV 401

A simple and reliable emergency pressure relief vent.

Flange welds directly onto tank top. Materials as listed below, opening pressure can be specified to suit your requirements. Standard setting vent opens 30kPa. Capacity 3250m3/hr free air at 45kPa.

Conforms to AS2809

### FLANGE & COVER MATERIALS

A = Aluminium cover

S = Stainless steel cover

A = Aluminium flange

M = Mild steel flange

S = Stainless steel flange

### SEAL MATERIALS

B = Buna seal

V = Viton seal

T = Teflon seal

## PVV104 & PVV104U

The PVV104 is designed primarily for thermal relief, not as a high capacity vent for loading and unloading. The vent incorporates rollover protection such that it locks shut at any angle greater than 60° from the vertical. The vent is normally mounted directly to the manhole on the underside of the emergency vent.

- Bonded buna to metal seats
- Aluminium body and poppets
- Stainless steel springs
- Capacity 98m3/hr free air at 35kPa

PVV104U settings comply with international codes

- Pressure opens 10kPa
- Vacuum opens 2kPa

PVV104 settings comply with AS2809

- Pressure opens 15kPa
- Vacuum opens 2kPa

## PVV204, PVV204U

The PVV204 series vents are designed for use on tankers which load or discharge with fill caps closed. They provide more capacity than the PVV104, which deals with thermal effects on the tank. Rollover protection is designed in and it locks shut at any angle greater than 60° from the vertical.

Mounting may be on a Liquip manhole cover or on a separate weld flange.

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.

- Aluminium body and poppets
- Stainless steel housing, shafts, springs
- Nitrile seals
- Capacity 240m3/hr free air at 35kPa
- Max recommended liquid loading rate 1000 l/min depending on tank shell capability

PVV204 (settings comply with AS2809)

- Pressure Setting 15kPa
- Vacuum Setting 3kPa
- Free air bleed hole in body

PVV204U (settings comply with international codes)

- Pressure Setting 10kPa
- Vacuum Setting 2kPa
- No bleed hole

NOTE: For chemicals use PVV204-AT Aluminium, stainless steel and teflon. For stainless steel tanks use PVV204-ST316 all stainless steel and teflon.

## AVV3SST CHEMICAL VAPOUR VENT

### APPLICATIONS

Liquip's air operated chemical vapour vent has been completely redesigned in 316 wrought stainless steel, with Teflon encapsulated o-rings for superior chemical compatibility and resistance.

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

Sequencing operation ensures the main valve poppet is open before the next valve is opened. The end signal is then used to provide a permissive signal before loading/unloading can commence.

### FEATURES

- Downward opening poppet to prevent leaks from product surge.
- Piston operation for sequential operation
- Air cylinder serviceable without removing the valve from tank
- Mount via Stainless Steel weld flanges to the walkway
- 90mm nominal diameter outlet for a minimum full 80mm flow throughout
- Adjustment free
- Low maintenance
- Bolted from outside to blind tank flange

### SPECIFICATIONS

Wetted materials - Grade 316 Stainless Steel, Teflon encapsulated seals

Operating air cylinder pressure - 70-900 kPa (normal 500 kPa)

Vacuum opening pressure - minus 7 kPa vacuum

Air consumption - 1.0L free air per stroke

Weight - 3.7 Kg

Flange mount - 8 holes equally spaced, 11mm on a 130mm PCD. 154mm OD.

### ASSOCIATED EQUIPMENT

AVV3-12 Polyurethane louvre kit with spark arresting gauze

VH3.5 90mm nitrile hose (check suitability for chemical products)

AVV3SS-11 Optional spark arresting gauze

AVV3SS-10 Stainless Steel weld in mount flange to mount on tank top

## AVV075V WITH SEQUENCING VALVE BUILT-IN

The AVV075V 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.

### TECHNICAL DATA

- Operating air pressure 120 kPa to 900kPa. (Normal 500kPa)
- Consumption per stroke 1 litre free air.

### MOUNTING

- Directly on to manhole covers VOH200, VOH750 and VOH410: or by weld flanges in aluminium or steel.

### MATERIAL

- Aluminium body.
- Acetal Piston with viton seal is standard.

### SECURITY

- Bolted from inside tank. Gauze in body prevents access through outlet spout in certain models (optional)

### NOTE:

For complete stainless steel tanks use AVV3SST all stainless steel and teflon fabricated vapour vent.

### VARIATIONS

AVV075VW Through holes. Coaming mount

AVV075K  Chemical Version with Kalrez o rings

AVV075VG Ethanol Version with Viton GFLT seals

## AVVF075V FLANGED VAPOUR ADAPTOR

The AVVF075V is a flange mounted sequential Vapour Recovery Vent with 90 mm nominal diameter outlet, specifically designed to meet CEN standards. The AVV075V is designed to mount only to the VOH500 series manhole covers or via separate weld in flanges.

The poppet opens inward to prevent loss due to product surge in transit.

### TECHNICAL DATA

- Operating air pressure 120kPa to 900kPa (Normal 500kPa)
- Consumptions per stroke 1 litre free air

## MOUNTING FLANGES FOR AVV SERIES VAPOUR VENTS

- AVV3L-7 Walkway mount. Aluminium with through holes
- AVV3L-8 Walkway mount. Mild steel with through holes
- AVV3.0-9 Walkway mount. Stainless steel with tapped through holes
- AVV3U-7 DIN80 Flange Walkway mount. Aluminium with blind tapped holes.
- AVV3L-9 Coaming mount. Aluminium with drilled and tapped holes
- AVV3L-10 Coaming mount. Mild steel with drilled and tapped holes
- AVV3L-11 Mild Steel with through holes

## ACCESSORIES - WELD STUBS

Available in Mild Steel or Aluminium these weld stubs make connecting the vapour vents to the rollover coaming a fast and neat exercise.

VRB3.5-1 Aluminium

VRB3.5-2 Mild Steel

VRB3.5 Aluminium, 45 degree angle

VH 3.5 Hose 1m Long – Used to connect the Vapour Vent outlet to the coaming weld stub.

## ACCESSORIES - AVV3-12 LOUVRE KIT

Polyurethane Louvre Kit provides weather and spark protection for the Vapour Vent.

Normally used on the Vapour Dump Vent but can be used for normal vapour vent application if there is no vapour recovery operation.

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

MATERIALS OF CONSTRUCTION

BODY: Polyurethane

GAUZE: Stainless steel

## VCF500 VAPOUR COUPLING

The latest release Liquip vapour coupling incorporates the unique Liquip hinged poppet design to provide lower pressure drops than standard poppets at high flow rates.

The spring loaded hinged poppet retains vapours until coupled to the male vapour adaptor. Conforming to CEN regulations for pressure drop, flow area, and vapour retention, the VCF500 will operate at flow rates up to 10,000 litres per minute at 20 degrees celsius (4 compartments loading each at 2500lpm).

A sightglass in the body shows vapour condensation if present, and enables visual checking of function.

### FEATURES

- High flow rates and low pressure drop
- Unique hinged poppet design
- Aluminium, stainless steel and Viton construction, with brass cams
- Weight 4.3kg
- Poppet is automatically opened when connected to male adaptor
- Flange mount is universal 100mm (4”) TTMA with threaded M10 mount holes
- Universal 4” (100mm) camlock connection

## VAPOUR ADAPTOR WITH SIGHT GLASS VCM450

The VCM450 vapour adaptor has been introduced to enhance the Liquip range of equipment used in bottom loading and vapour recovery. The introduction of high flow rate into multiple compartments via bottom loading means the pressure drop across the adaptor must be kept to an absolute minimum. With many vehicles having 4 compartments loaded at once, this adaptor is designed to work with flow rates of up to 600m3/hour (10 000 litres per minute) at 20°C.

**FEATURES**

- High flow rate/low pressure drop
- Low weight aluminium construction
- Pneumatic interlock (optional extra)
- Sight glass for visual check of product in the vapour line
- Universal connection – 100mm camlock
- Universal mounting – 100mm (4") TTMA flange
- Drain plug
- Viton lip seal

Note: VCM3 series is for Australia and New Zealand

## VCM3

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

Aluminium body with 100mm (4") TTMA flange mounting.

Seals are viton and the shaft runs in a delrin bush.

A standard camlock will not fit onto this adaptor, only an approved vapour coupler.

Note: Australia and New Zealand use only VCM3

## SLV5-ARO EMERGENCY VALVE WITH SEQUENTIAL ACTUATOR

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

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. This translates into faster flow rates and a reduction in static electricity, resulting in a faster and safer operation.

The valve features a huge 125mm diameter poppet area and 100mm discharge area giving minimal pressure drop across the system.

This valve can also be operated from the tank top with the addition of lifting wire and cable operator, or can be cable operated from the tank bottom with the addition of a cable operator. (see SLV5CO and SLV5MZ)

**FEATURES.**

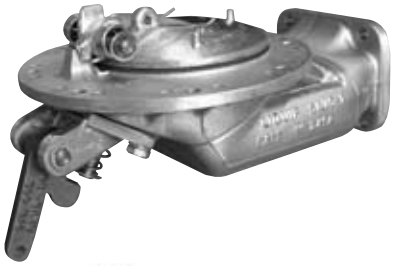
1. Easily removed for routine maintenance.
2. Low maintenance.
3. Specially bonded lip seal design for superior sealing and extended life.

## SLV5CO - CABLE OPERATED

The SLV5CO incorporates all of the features of the pneumatic version but is cable operated from the tank top or bottom as opposed to pneumatic operation.

Additional equipment required includes top cable operator, either pneumatic or manual and lift wire kit.

See section on cable operators.



## SLV5 MZ - TOP OPERATION ONLY

The SLV5MZ incorporates all of the features of the pneumatic version but is cable operated from the tank top as opposed to pneumatic operation.

Additional equipment required includes top cable operator, either pneumatic or manual and lift wire kit.

See section on cable operators.

## WELD-IN TANK FLANGE

Flanges are welded into the tank floor to fix the SLV5 series emergency valves in place.

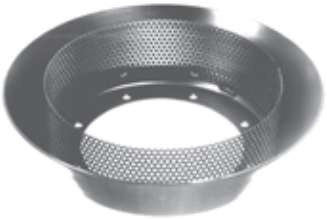
- SLV5-13 Aluminium Tank Flange
- SLV5-34 Mild Steel Tank Flange

## MOUNTING FLANGES/SUMPS

Aluminium and mild steel sumps which are welded into the compartment floor to ensure complete delivery of product. The SLV5 series emergency valves then bolt to the base of the sump providing an efficient delivery system.

SLV5-38MZ Mild Steel C/W Bolt-On Pad & Strainer

SLV5-45 Strainer Z/P



## SLV5-45 STRAINER

Optional strainer that protects the emergency valve from solid contaminants which may cause jamming of the valve or damage to the valve's sealing surfaces.

## SLV5 OUTLET ADAPTORS

For simple connection of the delivery pipe (wet leg) to the emergency valve.

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.

- SLV5-110 Suits 100mm tube
- SLV5-114 Suits 4"" pipe

## SLV5-47 MILD STEEL OUTLET ADAPTOR

For simple connection of the delivery pipe (wet leg) to the emergency valve.

Steel delivery (wet leg) pipe is welded to the tapered outlet side of the adaptor, the flanged side is then securely bolted to the outlet of the emergency valve providing a clean efficient delivery / loading system.

## SLV5-43M MILD STEEL 80MM OUTLET ADAPTOR

Mild steel outlet flange adaptors that allow connection of the delivery pipe (wet leg) to the outlet of the emergency valves.

- SLV5-43M Mild Steel 80mm Outlet Adaptor

## SLV100 EMERGENCY VALVE & ACCESSORIES

The SLV100 pneumatic and sequential emergency valve incorporates the latest technical advancements to ensure fast and safe loading and discharge of road tankers.

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 valve features a huge 125mm dia poppet area and 100mm discharge area giving minimal pressure drop across the system.

The 125mm dia poppet has a concave design which operates as a deflector reducing splash, surge and static electricity build up during loading and similarly during discharge the unique design results in nil vortexing of the product. This translates into faster flow rates and a reduction in static electricity resulting in a faster and safer operation.

This valve can also be operated from the tank top with the addition of lifting wire and cable operator, or can be cable operated from the tank bottom with the addition of a cable operator (see SLV101COZ and SLV102COZ.)

### FEATURES

1. Easily removed for routine maintenance.
2. Low maintenance.
3. Specially bonded lip seal design for superior sealing and extended life.

SLV100 is a modified version of the SLV5 series with a tank flange complying to CEN specifications.

### ASSOCIATED EQUIPMENT

SLV100-5Z Aluminium tank weld-in mount flange c/w stud kit

SLV100-7Z Mild Steel tank weld-in mount flange c/w stud kit

EFV100-9 Aluminium pipe adaptor flange 100mm

EFV100-10 Mild Steel pipe adaptor flange 100mm

SLV100-3 Zinc plated steel mesh strainer

### MODELS

- SLV101Z Air-operated, with strainer
- SLV102Z Air-operated, without Strainer
- SLV101COZ Cable Operated with strainer
- SLV102COZ Cable operated without strainer

## SLC200 SUPER LOW CHEMICAL VALVE

The NEW SLC200 Super Low Chemical Valve is another example of Liquip's continuous innovation. Teflon seals are replaced with Teflon encapsulated 'O' rings and a unique spherical seat which provides a vast improvement in sealing efficiency at no additional cost.

The valve is opened by a pneumatic air ram mounted to the bottom of the elbow. It features a split construction which allows simple removal from the outlet elbow assembly and easy 'O' ring replacement

### FEATURES

- For road tanker use
- Mounted in the bottom of the tank as an internal / emergency valve
- Provides a chemical version of the SLV5 such that standard tanker shells can be converted from petroleum specification to chemical specification with a minimum of change

### ACCESSORIES

| | |
|---|---|
| SLV5-13ATZ | Tank Flange Kit Teflon / aluminium |
| SLV5-34Z | Tank Flange Kit Mild Steel |
| SLV5-13SZ | Tank Flange Stainless Steel |
| SLV5-110 | Aluminium Outlet adaptor to 100mm Tube |
| SLV5-114 | Aluminium Outlet Adaptor to 4" Pipe |
| SLV5-47 | Mild Steel Outlet Adaptor |

### TECHNICAL DATA

- Aluminium elbow body, seat & poppet
- Stainless steel main spindle
- Teflon encapsulated main seal
- Nominal Ø100mm flow area
- Weight: 5.45kg including tank flange

## OLE100SS FOOT VALVE

A one piece full stainless steel footvalve is now available.

The OLE100SS valve is sold complete with the following:

- Elbow
- Internal Valve
- Tank Flange Studs & Gaskets
- Strainer

Note: This valve is available as top cable operated only

## ITV CHEMICAL SERIES

The ITV series of valves are the standard choice for manually operated tankers. They can also be converted to bottom loading at a later date and their split construction provides excellent flexibility and easy maintenance. The valve is separated from the elbow and with the joint being sealed by an O ring. It enables the valve to be serviced either inside or outside the tank. These valves comply with the UK, USA and Australian regulations.

### PART NUMBER

ITV2-B BUNA 50mm Mild Steel and Buna, top operated only

ITV2-B VITON 50mm Mild Steel and Viton, top operated only

ITV4-B - 100mm Mild Steel and Viton, top operated only

ITV4-E - 100mm Mild Steel and Viton, bottom operated squat elbow - suits SE4-1 Squat Elbow only

ITV4-B-AT - 100mm Aluminium and Teflon, top operated only

ITV4-B-ST316 - 100mm Stainless Steel and Teflon, top operated only

### OPERATION

Top operation via cable, manual or pneumatic lifter.

Bottom operation via cable, manual or pneumatic lifter.

Mounts to SE & OLE Series Outlet Elbows.

The ITV series of valves mate with a series of outlet elbows. The elbows incorporate shear grooves to ensure valve retention in the case of an accident. Standard material of construction is aluminium.

### OPTIONS: CONFIGURATION AND SIZING

### PART NUMBER

SE 4 - 100mm, Squat Elbow, Manual Top Operated

SE 4-1 - 100mm, Squat Elbow, Manual Bottom Operated

SE 4-1-AO - 100mm, Squat Elbow, Air Ram Fitted

Shown as OLE4-1 with ITV4-0 and weld-in tank flange

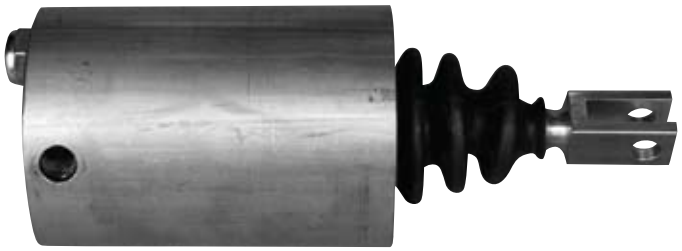
## AR2.5 AIR RAM

Direct mounts to the outlet elbow to allow pneumatic operation of the ITV series emergency valves and SE series outlets.

Manufactured in brass and stainless steel with a weather proof rubber boot enclosing the shaft.

### TECHNICAL DATA

- Air pressure to 900 kPa (9 bar)
- Thrust 1750N (400 lbs)
- Stroke 30mm
- Air fitting 1/4" bsp. thread



## CL401R / CL402R MANUAL OPERATED CAMLIFTERS

Camlift top operators for 100mm internal valve.

Mounts on top of the tank with an internal cable connecting the spindle to the internal valve poppet.

Cam operated, as the handle is rotated through 90 degrees the emergency (internal) valve fully opens.

Features simple external adjustment of the cable, heavy duty construction with large diameter stainless steel shaft, dual O-rings and aluminium body.

- Aluminium body and handle
- Matching weld socket
- Viton O-rings

### OPTIONS

- CL401RAT Aluminium with teflon trim 1/2" BSP thread mount Stainless Steel spring & retainer
- CL401R Aluminium with teflon trim 1/2" BSP thread mount Mild Steel spring & retainer.
- CL401RST316 Aluminium handle only, rest of the operator is 316 Stainless Steel with teflon trim (also avail with Stainless Steel 314 / 316 trim)
- CL402R Aluminium & Mild Steel with teflon trim Flange mounted. (CL402RZ includes mounting kit)
- CL402RVG Aluminium & Mild Steel Fuel + Ethanol trim Flange mounted.

RELATED EQUIPMENT

Matching weld socket - 1/2" (38mm) BSP thread

- CL401-11 Aluminium
- 0554 Mild Steel
- CL401-11S Stainless Steel
- LW410 Lift Wire Kit Stainless Steel. Length - 2.1 meters

MATCHING WELD FLANGES

- CL402-1 Aluminium
- CL402-2 Mild Steel

## ACL405R AIR OPERATED

The ACL405R pneumatic top operator mounts on the tank top and allows remote pneumatic operation of the cable operator and emergency valve. The cable operator can also be operated manually from the tank top if required.

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

The unit can be bolted directly onto the tank walkway or located using weld flanges.

ACL405R

- Aluminium body and handle, stainless steel spindle, Delrin bush, Viton o-ring.

ACL405RAT (CHEMICAL)

- Aluminium body and handle, stainless steel spindle, spring and retainer teflon bush and o-ring.

MATCHING WELD FLANGES

- ACL405-11A Aluminium
- ACL405-11M Mild Steel
- ACL405-11S Stainless Steel

RELATED EQUIPMENT

LW410 Lift Wire Kit Stainless Steel. Length - 2.1 meters

## LCO COMPARTMENT OPERATOR

LCO COMPARTMENT OPERATOR

Cable operators are used to open and close the range of manually operated emergency valves manufactured by Liquip International.

It connects via cable (available separately) to the cable operator on the emergency valves.

The LCO includes provision for fitting an emergency stop lever and also features a fusible link which in the event of a fire will automatically close all of the emergency valves should the temperature exceed 85° Celsius.

Aluminium modular construction for any number of compartments.

**PART NUMBERS**

LCO-1 single handle
LCO-2 two handle
LCO-3 three handle
LCO-4 four handle
LCO-5 five handle
LCO-6 six handle
LCO-7 seven handle

## BTO100 TOP OPERATOR

The Liquip Bitumen emergency valve consists of two components, the BTO Top Operator and the BMV400 Bottom Mitre valve with a control rod (BMV400-4) connecting them.

BTO100 Top Operator

A screw type brass hand wheel operated from the top of the tanker. The centre spindle indicates if the valve is in the open or closed position. Approximately 7 complete turns of the handle moves the bottom valve from fully open to the fully closed position.

The hand wheel features Brass handle, Stainless Steel Shaft, Viton Seals, Aluminium Body and Delrin Bush.

## BMV400 BOTTOM MITRE VALVE

A screw-down type valve 100mm bore, hand wheel operated from the tank top. Rising spindle indicates if valve is open or closed.

Used for difficult products, such as bitumen where a spring would be ineffective. Also allows driver to close off flow against pressure in bottom loading system.

### OPERATION

Hand wheel situated at the top of the tank is manually turned which opens the poppet situated inside the tank. Drive is via steel connecting rod. The mechanism is within the valve.

### TECHNICAL INFORMATION

Provides equivalent of full 100mm diameter bore area.

Metal to metal seat.

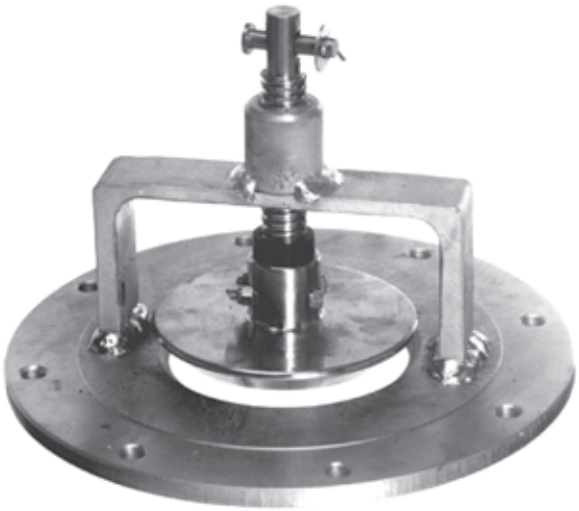
Approximately 7 turns of the wheel from full open to full closed.

### WEIGHT

8.5 kg

### MATERIAL

Steel body, shaft and poppet, zinc plated. Seat is metal to metal.



## BOTTOM LOADING ADAPTOR API403

A proven performer for 20 years, the API403 Bottom Loading Adaptor is suitable for chemicals which are compatible with Aluminium and Teflon.

### SAFETY

Nose cone is heat treated for hardness and not anodised as the latter process can prevent establishing electrical continuity.

### FULL FLOW

Internal construction provides full-bore flow area throughout.

### LONG LIFE

Three bushes, two on the camshaft and one on the poppet shaft, ensure reliability. All are replaceable when service is required.

### INTERNATIONAL STANDARDS

Machined to API Standard RP1004 for interchangeability with other manufacturers equipment.

### 'SILENT' HANDLE

The handles on some adaptors swing around when the bottom loading coupler is attached and can cause injury. A clever mechanism in the API403 ensures the handle does not move.

### OPTIONS

- Handle lock
- Removable handle

### MATERIALS

- Aluminium body
- Stainless steel shafts
- Teflon seals

## API ADAPTOR VALVES

The Liquip API 400 Series valves are based on proven design and service which has kept these valves in use with oil companies the world over.

The API valves are machined in accordance with API RP1004 for total interchangeability with all loading valves.

Internal construction provides full flow area throughout.

Aluminium components are heat -treated for strength and hardness, not anodised as this can prevent electrical continuity and cause premature wear.

## API490

The API490 is a bottom loading and discharge adaptor conforming to API RP1004.

Models include sight glass &/or drain boss. It also has 2 sets of mounts to match industry - standard air interlock valve, Liquip Model AIV 3. Two piece body with replaceable nosecone.

### TECHNICAL DATA

- 100mm bore all through for minimum pressure drop
- 52mm poppet travel
- Electrical continuity guaranteed by use of non-anodised nose cone
- Flange is gramophone finish for improved sealing

### WEIGHT

4.8kg

### MOUNTING

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

### MATERIAL

- Aluminium body and poppet
- Stainless Steel shafts
- Viton o-rings.

## API455 VALVE

Like other Liquip API valves, the API455 API adaptor conforms to API RP 1004. Where it differs from the rest of the 490 series adaptors, is that it is the simplest of all the API adaptors, having no sightglass, no operating handle and no drain port.

It is light and compact, and ideal for applications where space is limited. It can be used as a loading valve only, or can be used for unloading with the aid of an unloading or loading coupler

### TECHNICAL DATA

- 100mm bore all through for minimum pressure drop
- 52mm poppet travel
- Electrical continuity guaranteed by use of non-anodised nose cone. Instead nose cone is heat-treated for hardness and long life
- Flange is gramophone finish for improved sealing
- Max. working pressure 700kPa (100PSI)
- Max. recommended internal pressure when connecting female coupling 400kPa (approx 60 PSI)

### WEIGHT

2.4kg

### MOUNTING

Flange is 100mm TTMA standard. Mount horizontal with flat at bottom to have full product drainage

### MATERIAL

- Aluminium body, spider and poppet
- Stainless steel shaft, spring and circlip
- Viton O-rings

## API OUTLET ADAPTORS

API TO CAMLOCK ADAPTOR

For gravity discharge from an API adaptor where it is preferred to use existing hose fitted with standard camlocks.

API-MC80 API to 80mm male camlock at 15 degree downward angle.

API-MC100 API to 100mm male camlock at 15 degree downward angle.

## API-T4E / API-T3E HOSETAIL

For gravity discharge from API adaptor having an openable poppet

Hose fits straight onto integral static safe hose tail. API-T3E suits 80mm ID hose. API-T4E suits 100mm ID hose.


## AIV3 3/2 WAY AIR VALVE

Used to identify that a hose has been connected to the adaptor for either loading or discharge.

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

Mount to API490 series adaptors (except API455), VCM450 and GC300 guard bar.


## APIPC DUST CAP

Nylon dust cap to suit all API adaptors.

Unique ribbed inner surface provides the seal against the adaptor face.

Half the weight and half the price of aluminium equivalents.

## API-DC & API-DCLA DUST CAP

Caps for any API adaptor built to the RP1004 standard.

Uses same closure principle as a camlock and has same cam arms.

Aluminium body, metal arms and pins.

Buna seal is standard, but Viton available on request

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

## APINZ, APIRC

The API dry break discharge coupler is for gravity discharge for use with API adaptors on tank trucks and rail tank cars. The APINZ is a 90° outlet with 80mm FBSP thread. The APIRC is straight through with 102mm FBSP thread.

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

The handle has an over centre operation and also has locks in an open or closed position.

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.

Although designed for use in gravity drops, the coupler will operate at up to 350 kPa to couple and will hold pressure up to 1000 kPa.

### SPECIFICATIONS

- Aluminium body with hard anodised bearing surfaces
- Viton seals
- 350 kPa max coupling pressure

## PI1200 PRODUCT INDICATOR

Mounts at outlet valve to display name of product contained within. 12 positions are available for 12 different products to be displayed.

PI1200 supplied complete with label displaying the following

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

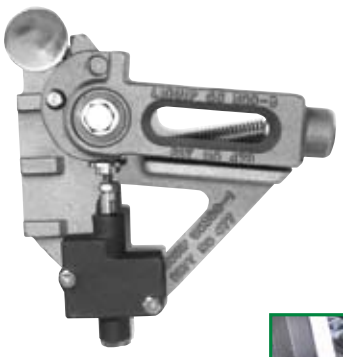
Also available as PI1202 without labels


## INTERLOCK BAR GC300

The interlock bar is positioned over the bottom loading adaptors, overfill system connection and vapour recovery adaptor.

The bar must be lifted for hose connections to be made, and an integral air valve then applies the vehicle brakes and can, for example, also open the vapour recovery vents.

The system is in component form so the vehicle manufacturer can adapt to suit the vehicle design number of compartments.



## LBV300 AND LBV450 BUTTERFLY VALVES

Full flow hand operated or position locked butterfly valves.

The LBV300 and LBV450 valves suit 80mm (3") and 100mm (4") TTMA flanges respectively.

### MATERIALS OF CONSTRUCTION

Body - Cast aluminium

Butterfly disc - Cast aluminium

Handle - Cast aluminium with zinc plated steel locking lever

Spindle - Stainless steel

Seal - Viton B70 (LBV450) or GFLT (LBV450VG)

### MOUNTING

LBV450 mount directly to Liquip 100mm TTMA flange with chamfered entry to ensure disc clearance in open position.

### WEIGHT

LBV450 - 1.8kg

### TECHNICAL DATA

Working pressure 1500kPa (210 PSI) in open position

Working pressure 700kPa (101 PSI) in closed position

Maximum temperature 100°C

Minimum temperature -10°C

LBV450 Available Variations

- LBV450 100mm Viton B70 Bonded Seal
- LBV450L 100mm Viton B70 Bonded Seal with locking tab (no operating handle)
- LBV450VG 100mm Viton GFLT Bonded Seal
- LBV450VGL 100mm Viton GFLT Bonded Seal with locking tab (no operating handle)

## DM104 DISCHARGE MANIFOLD

Manifold valve, pneumatically operated to provide bottom loading discharge with bolt-up modular assembly.

Primary purpose is to provide a system allowing the use of a permanently attached hose for discharge of “split drops” by pump or gravity. Eliminates the need to change over jumper hoses, prevents spills and drips, and also saves considerable driver time.

Being pneumatically operated, deliveries are easier and quicker through centralised control.

Manifold valves bolt directly to each other (one for each compartment) to form the manifold.

The upper gallery forms a 100mm diameter pipe connecting a bolted on API adaptor to the tanker pipework, allowing completely normal bottom loading.

A second, lower gallery runs at right-angles and when bolted together these form an 80mm diameter pipe. Discharge from this lower gallery can be from an end fitting e.g., 80mm camlock adaptor on 100mm TTMA flange (part number MC3-V4A) : or from any of the bottom outlets on each valve e.g., 80mm camlock on 75mm TTMA flange (part number MC3-V3A)

To enable the manifold to drain, a special blank flange BF4-5, 100mm TTMA, has a 3/4” BSP port to allow fitting of a vacuum breaker VB100U. This can be direct mounted via a safety isolating ball valve for pump systems, and if a gravity discharge is required through the lower section, final clearing is achieved by simply depressing the VB100 cap to manually open it. Alternatively, elevate the vacuum breaker to ensure operation.

The upper gallery is drained through to the lower gallery by pneumatic operation of the poppet in the manifold valve.

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

### SPECIFICATIONS

- Tanker air pressure 600 kPa to 800 kPa to operate. Poppet lifts at 120 kPa back pressure against spring only.
- Passed European CEN draft 296 test for endurance to 25,000 cycles and subsequent leak test.
- 8 kg each without end flanges but including bottom blank flange.
- 100mm (4”) TTMA to tank
- 100mm (4”) TTMA to API adaptor
- 100mm (4”) TTMA side to side
- 75mm (3”) TTMA bottom outlet
- Body and cover aluminium AP601
- Stainless steel spindle
- Bonded viton seal
- Spring steel, zinc plated

### ASSOCIATED EQUIPMENT

- BF4-5 blind flange with 3/4” BSP mount
- VB100 Vacuum breaker
- MC4-V4 5° camlock adaptor to flange
- MC3-V4 5° camlock adaptor to flange
- MC3-V3A camlock adaptor flange

## BF 4-7 BLANK FLANGE

100mm (4”) TTMA Blanking flange

## BF 4-5 END PLATE PORTED FOR VACUUM BREAKER

100mm (4”) TTMA Blanking flange with vacuum breaker port

## VB100 & VB100U VACUUM BREAKERS

BSP thread mount. Vitona seals.

VB100 opens at 1-2kPa vacuum

VB100U opens at 35kPa vacuum

## MAC200 SERIES MANIFOLD AIR CONTROL

### AVAILABLE FOR 2 - 6 COMPARTMENT SYSTEMS

The MAC200 range is incredibly simple, and includes many new functions including:

- Manifold Control
- Air Control
- Emergency Stop integrated with truck system
- Footvalve Control
- Shuttle Valves for footvalves built into box
- Vapour Vent Pressure Indicator
- Over-fill pressure switch with gold contacts
- Colour Coded Pneumatics
- Pneumatic Diagram Included
- Aluminium Enclosure
- Support by pneumatic experts
- Brake & Gate inputs supported

### BENEFITS

- Stop Manifold Shandies
- Simplified Installation - one box only, not two
- Installation Time Saving up to 6 hours
- Weight & Space Saving
- 200 mm height suits chassis rail height
- Huge Reduction in Testing & Commissioning Time

### MODELS AVAILABLE

MAC202 - 2 Comp, 2 Pumps, 450mm Box
MAC203 - 3 Comp, 2 Pumps, 450mm Box
MAC204 - 4 Comp, 2 Pumps, 600mm Box
MAC205 - 5 Comp 2 Pumps, 600mm Box
MAC206 - 6 Comp, 2 Pumps, 600mm Box
MAC212 - 2 Comp, 1 Pump, 450mm Box
MAC213 - 3 Comp, 1 Pump, 450mm Box
MAC214 - 4 Comp, 1 Pump, 450mm Box

MAC200

MAC202

MAC204

## RTC100 ROAD TANKER CONTROL

The RTC100 is incredibly simple to install and operate, and includes many new functions.

Benefits of using a control box on a road tanker

- One integrated system
- Supplied fully assembled and tested
- Faster and cheaper than mounting individual components
- Easier to troubleshoot and maintain


### FEATURES

- Reduced system installation time – costs less to fit
- The enclosure is designed to fit the chassis rail height 200mm
- Clear durable self-explanatory labels on the lid and connection panel – less driver training required
- Air Service Equipment supplied mounted to the enclosure
- Strong aluminum box with a hinged lid for easy maintenance
- Vapour recovery / over-fill pressure switch with gold contacts and prewired Din plug and lead – saves space and installation time
- Vapour vent indication via an informative gauge not just an indicator
- All Emergency Stop valves drop off Terminal signal – less driver training required
- Possible to configure individual spec. brake interlock circuits
- Colour coded with smart bulkhead labels – installation and troubleshooting time saver
- Latest design to interface with all current equipment, presented in a modern aesthetically pleasing and stylish enclosure which has a simple and easy to operate layout

## BF SERIES FLANGES

A complete range of weld flanges for pipe and tube. Chamfered bore to clear the disc, if fitted beside butterfly valve.

**PART NO. DESCRIPTION**

BF3 Aluminium 80mm tube x 75mm (3") TTMA

BF3-1 Mild Steel 80mm pipe x 75mm (3") TTMA

BF3-1S Stainless Steel 80 mm Pipe x 75mm (3") TTMA

BF4 Aluminium 100mm Tube x 100mm (4") TTMA flange

BF4-1 Mild Steel 100mm Tube x 100mm (4") TTMA flange

BF4-1S Stainless Steel 100mm Tube x 100mm (4") TTMA flange

## SIGHTGLASS FLANGES

Sightglass flanges bolt behind an outlet adaptor to show if product is present and its colour to confirm product identification.

The standard drilling is TTMA, so the unit will fit behind an API adaptor as well as a Liquip butterfly valve. Max pressure 1000kPa. Max temp 70°.

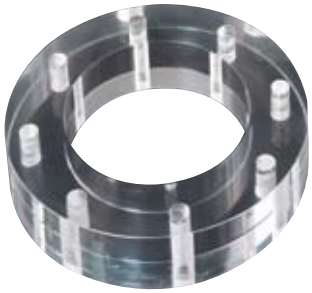
Available as:

BF3-SG 3" 75 mm TTMA x 25mm thick

BF4-SG-25 4" 100mm TTMA x 25mm thick

BF4-SG-40 4" 100mm TTMA x 40mm thick

API-SG-150 ANSI flange pattern 40mm thick



## OUTLET ADAPTORS

Outlet adaptors provide nose cones that bolt directly to the butterfly valve. These make camlock connections and allow simple and easy connection to discharge hoses.

They angle downwards for product drainage.

**PART NUMBER**

MC3-V3A - 76 mm NATO camlock to 76mm (3") valve 5° angle

MC3-V4A - 76 mm NATO camlock to 102mm (4") valve 10° angle

MC4-V4A - 102 mm NATO camlock to 102mm (4") valve 5° angle

## PIPE BENDS

Make complicated pipe-work simple. Just cut the pipe bend to the required angle and butt-weld to the adjoining pipe ends. Minimises friction losses on corners, reduces working time, eliminates unsightly welds or heating and bending. Use on product lines, exhausts, air intakes and ventilation.

**PART BEND & BEND PIPE SIZE**

| No. | O/Dia | I/Dia | O/Dia |
|---|---|---|---|
| PB1.5-A | 197 | 118 | 38mm (1.5") |
| PB2.0A | 250 | 148 | 51mm (2.0") |
| PB2.5-A | 309 | 178 | 63mm (2.5") |
| PB3.0-A | 315 | 152 | 76mm (3.0") |
| PB3.5A | 308 | 123 | 89mm (3.5") |
| PB4.0-A | 321 | 120 | 102mm (4.0") |
| PB4.5-A | 345 | 117 | 114mm (4.5") |

## SR100 & SR200 STATIC REEL

Electrostatic charges can be generated by a variety of circumstances including product flow and vehicle or aircraft movement. Ignition of flammable vapours is possible by discharge of static at a gap, e.g. as a hose or nozzle is connected or parted.

The Liquip static reels provide a ready means of bonding two components with maximum assurance of continuity.

Primary continuity is by a carbon brush bearing on the stainless steel shaft.

Secondary paths are through the solid aluminium body to the shaft and also by spring-loaded stainless steel washers to the end face.

Dust seals protect the assembly internals and graphite grease ensures easy rotation without electrical resistance, and long life.

### TECHNICAL DATA

Aluminium body, carbon brush, balance stainless steel, shaft screwed 12mm (1/2 BSW) for direct mounting.

Standard wire 4mm dia. tinned copper. Other types readily available.

## ILS400 100MM STRAINER

The ILS400 is a lightweight in-line strainer typically used on-board the prime mover or in the mobile pumping system. Made from cast aluminium, the ILS400 is light and has low pressure drop characteristics. 100mm (4") TTMA flanged for easy installation. Access for cleaning is simple through the quick-release lid. Available with a variety of filter mesh sizes and materials.

## LTE SERIES TITEFILL ELBOWS

Liquip have a range of Tight Fill Elbows to provide a spill free delivery during discharge of road tankers. The LTE series elbows connect between the underground tank and the discharge hose and incorporate a reflective high visibility strip, a sightglass to view product flow and a nameplate recess.

Sealing on the bottom connection is via lip seal on the side of the LTA adaptor as this surface is rarely worn. Simply push on to connect. Connection at the top inlet is via standard camlock. Release via quick release clips.

Also available as a vapour recovery elbow in the same style with integral poppet. Dustcap to suit is VTA-DC.

LTE4x4 4" male camlock to 4" tight fill connection

LTE3x4 3" male camlock to 4" tight fill connection

LTE3x3 3" male camlock to 3" tight fill connection

VTE-3 4"male vapor camlock with poppet to 3" tight fill connection

### WEIGHT

3.9kg

### MATERIALS

Aluminium body with viton seal. Stainless Steel levers and acrylic sightglass.

## LTA TITEFILL ADAPTORS

LTA brass adaptors provide the tank side connection for the LTE series elbows. Screwed into place on the storage tank inlet, the LTA adaptors come in a variety of size combinations. 3" and 4" dustcaps also available.

LTA3x2 3" connection x 2" MBSP threaded mount

LTA3x3 3" connection x 3" MBSP threaded mount

LTA3x4 3" connection x 4" MBSP threaded mount

LTA4x2 4" connection x 2" MBSP threaded mount

LTA4x3 4" connection x 3" MBSP threaded mount

LTA4x4 4" connection x 4" MBSP threaded mount

LTA3-DC 3" dustcap

LTA4-DC 4" dustcap

## LS200 STRAINER

Fitted upstream of the positive displacement pump to prevent objects being sucked into the pump, the LS series is a simple and effective strainer. Cleaning involves opening the camlock cap and lifting the basket out.

Max vacuum 80 kPa. Max pressure 700 kPa. Steel plated body. Basket standard 30 mesh - others to order.

Mounting is via BSP threads (male at inlet, female at outlet).

## 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.

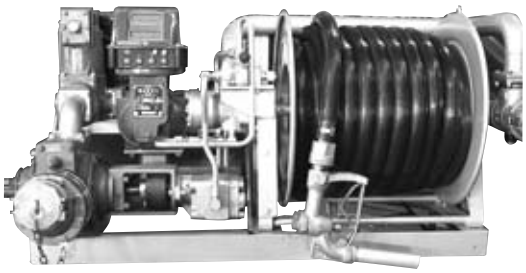
Units typically include: Inlet strainer and sight glass, hydraulically driven high flow vane pump, high flow/low flow switch, positive displacement meter with electronic register, air elminator and strainer, non return valve, hosereel, hose, swivel and nozzle assembly.

### OPTIONS

hydraulic, electric or hand rewind hosereel, electronic or mechanical register, preset registers, bulk unmetered bypass.

### TECHNICAL DATA

Meets Weights and Measures regulations; fully NSC approved; flow rate of up to 340 lpm through the nozzle; flow rate of up to 500 lpm unmetered bypass, typical weight 250 kg; typical size 650mm x 650mm x 1150 long.



## 40MM REFUELLING NOZZLE AVN042

The Liquip AVN042 Pressure Balanced nozzle is typically used as a specialty aviation refuelling nozzle for overwing fuelling applications, but can be used as an all-purpose dispensing nozzle. This robust, modern and lightweight manual shut-off nozzle is suited for high pressure and flow rates up to 450lpm. Cast aluminium construction, the AVN042 incorporates a "shut-off' delay device, dampening the sudden shut-off effect on the valve, to reduce shock pressures.

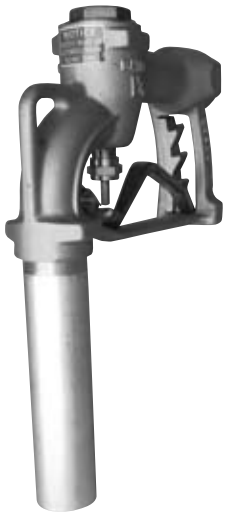
The AVN042 is ideal for any high-flow fluid dispensing application where dangerous hydraulic shock needs to be controlled. Standard 40mm BSP threaded inlet. Also available as optional extras in colour coding and inlet swivel.

SPOUTS - AVIATION AND INDUSTRIAL

- Alternative spouts available in 25mm, 32mm and 38mm
- To avoid incorrect filling, a JET-A1 selective spout and dust cap are available. The Elaflex oval spout is clearly marked on both sides with the inscription JET-A1
- Also available are accessories: EKG1200 bonding clip; dust cap and chain; splash-guard and quick release screw-in stainless steel 100 mesh strainer, swivels

## TRUCK NOZZLES

Liquip also stock a range of 1 1/4" and 1 1/2" Bayco lightweight aluminium truck nozzles in manual and automatic shut-off variations.



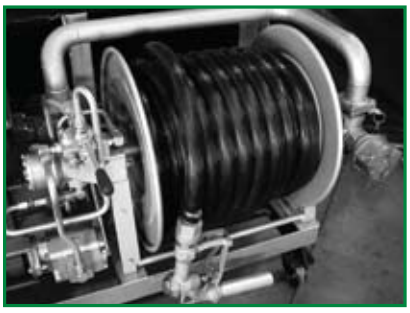
## HOSEREELS

The basic Liquip drum type hosereel adapts to a variety of drive mechanisms, hose lengths and products.

A new generation of hosereel for high pressure use, available in hand, hydraulic or electric rewind and a variety of sizes, all robustly constructed.

**FEATURES**

- Stiffened steel cheek plates
- Sturdy thick wall manifold with steel inner drum
- Steel base frame and self aligning bearings
- Flow area 38 mm throughout
- Sealing is by lip seal
- Ball bearing rotation
- End thrust is via heavy duty circlips and thrust washers.
- All components easily replaced
- Manifold rubbing surfaces are nickel-plated for long life.
- Available in Galvanised finish upon request.



## SJ032 & SJ1.5L HOSE-END SWIVELS

The SJ032 is an aluminium swivel incorporating a 32mm hosetail and integral checkvalve to retain residual hose internal pressure (mandatory under NSC Regulations).

The SJ1.5L incorporates the same features as the SJ032, but comes with a 38mm threaded mount instead of hosetail, and is for use with 38mm nozzles

## ILS2.5 STRAINER

Sightglass strainer enables quick and convenient inspection of the basket for particles and objects, and shows the colour of the liquid for identification. Also allows confirmation of empty before hose disconnection.

Assembly incorporates 80mm suction camlock. Basket is zinc plated steel, 1500 micron. Flow area through mesh is equivalent to 70mm diameter

## SAMPLING VALVE ITV1-AO

The ITV1-AO is a 25mm air operated piston valve, typically used as a sampling valve in aviation. Materials of construction are nickel plated steel body with stainless steel and viton trim. Mounts via 25mm BSP male thread. As with all internal valves, the body incorporates a shear groove below the valve seat to prevent product loss in event of accident

## ROLL-OVER SENSOR

The Roll-Over Sensor minimises the risk of electrically ignited fires occurring in tanker accidents involving roll-over. In the event of a tanker tilting more than 45° from the horizontal, power from the truck battery to all electrical equipment is cut to remove possible source of product ignition that may cause fire or explosion.

The sensor is also used to operate a Liquip engine strangler to ensure the truck motor stops.

### ORDERING INFORMATION

Roll-Over Sensor RS305

Suitable for use with a variety of battery isolation switches. Ask for our data sheet or speak to customer service.

## ENGINE STRANGLER

On it's own, the Mechanical Engine Strangler is an emergency engine shutdown device. It 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 Mechanical Engine Strangler can also be actuated by the Roll-Over Sensor via a solenoid valve. This provides a complete system of engine protection and electrical isolation for maximum vehicle safety.

### ORDERING INFORMATION

- MES3 (75mm (3") dia.)
- MES5 (125mm (5") dia.)
- MES5MS (Mining Specification)

## HLS102 HAZARDOUS SIGNAGE LIBRARY SYSTEM

Liquip's HLS102 comes with lightweight aluminium frame and metal signage for weight reduction and long life. Sign inserts are easily replaced, changed or folded over to display alternate signage in compliance with hazardous transport signage regulations.

### FIBRE OPTIC OVERFILL PROBES FOT100

The FOT100 is a simple and lightweight fibre optic overfill protection sensor. It comes with 8 meters of fibre optic cable which can be easily lengthened using a fibre optic joiner. Standard construction of the sensor is aluminium body with glass sensing tip. Probe dimensions are the same as electronic optical sensors. The FOT100 operates in conjunction with the MPP102 and PPM3XX series monitors.

### LPG PROBE HOUSING ASSEMBLY FOL100

The FOL100 is a world first in providing fibre optic level detection for LPG road tankers. Built to be installed in a 50mm (2") NPT socket at the top of the LPG road tanker, the housing incorporates a special sealing mechanism for the high pressure application, and a shear groove to prevent loss of gas should the sensor housing be struck, in a tanker rollover for example.

Complete with 8 meters of fibre optic cable, the FOT100 has wetted materials of glass, zinc plated steel and viton. It has no electrical components. The FOL100 operates in conjunction with MPP102 and PPM3XX monitors.

### RETAINED PRODUCT SENSORS FOB100

The FOB100 is a fibre optic Retained Product Sensor sometimes referred to as a "belly sensor". Installed in the tank bottom, it works in conjunction with the MPP102 (1 only), PPM310 and PPM320 (up to 8 sensors per monitor), to detect the presence of retained fuel inside a compartment and prevent contamination and subsequent overfill as a result. A shear groove prevents loss of product if the sensor is hit during an accident.

## LDP102 AND LDP105

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

Unlike other optic sensors, the Liquip Optic-On sensor has its own special LED in the rear of the sensor, and a visible optic light in the sensor tip to indicate whether it is dry and operational.

Troubleshooting sensors couldn't be easier...simply look for the sensor with the lights in the tip or rear of the sensor not working.

### SPECIFICATION

- Glass prism. Three stage viton sealing. Solid state electronics in potting compound. Anodised aluminium retainer & body.
- Extension bars of aluminium to suit various length applications.
- Trigger point + 0.5 mm repeatability. The prism is Light-shielded by the retainer.
- Probe can be removed from tank top without having access to interior to remove a hood.

### VARIANTS

- LDP102 - 2 wire
- LDP105 - 5 wire
- Also available in 14" long single piece body

### MATERIALS

Aluminium probe body, retainer & extension, glass prism and epoxy, Viton O-rings.

### CERTIFICATION

- IECEx TSA 05.0058X
- Ex ia IIA T4 IP66 T ambient = -40 to +65 degrees C
- Ui = 30V, Ii = 500mA, Ci = 105pF, Li = 0mH

## AGP 202/205 OVERFILL SENSORS

Liquip's AGP202/205 Overfill Protection Probe provides all the features associated with optic overfill protection probe technology. Combined with this, the probe has some significant advantages in the areas of specialist applications.

Applications like corrosive chemicals, high temperature and low temperature require specialised materials of construction. As such, the one piece glass probe developed by Liquip, solves the problems associated with these environments. The unique construction of this probe means there is no possible attack either chemically or atmospherically (temperature range from -40°C to +100°C).

The probes, like all Liquip probes, are designed to be totally interchangeable with other approved systems.

### FEATURES

- Glass body
- Solid state electronics in the compound
- Unique light reflection system ensures accuracy
- Probe dimensions universal to existing flanges
- Self checking circuitry for fail-safe operation

## LIQUIP PJB HOUSING

The Liquip PJB housing is designed to be mounted through a 50mm (2") hole and sealed with a gasket and locknut or screwed directly into a 50mm (2") BSP thread. Access to the height adjustment for the probe or the wiring is through the top of the housing. The probe can be adjusted by loosening the internal capscrews and sliding the probe up or down to the correct sensing height.

The body has provision for two M20 cable entries, eliminating the need to mount a tee with cover in the conduit line.This allows for better connections, easier fault finding and quicker installation.

### SPECIFICATIONS

- Will accommodate probe dia. 22.3mm to 25.5mm with min. probe length 70mm.
- Maximum length of probe inside housing is 87mm.
- Maximum plate thickness for mount is 7mm
- Overall height is 101mm, overall dia. is 107mm.
- Weight 1.1 kg
- Mounting via 50mm (2") BSP male thread or into 62mm dia. hole.

### MATERIALS

Aluminium lid, body & compression bush, Nitrile seals, Zinc plated screws & washers.

## VOH200-5 PROBE HOLDER

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

Chemical version order as VOH200-5AT.

## TRUCK PLUG

Truck plug is used for overfill protection with added ground assurance.

Industry standard 10 pin overfill protection plug is interchangeable with others of the same type, however 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.

TP series provides standard 10 pin connection for tanker system with room for an electronic dummy probe should this be required in a 2-wire system.

Where TP series differs is in the way it ensures good grounding of the tanker to the gantry and ensures dissipation of static electricity and so eliminates sparks. Hence the name “Ground Boss”.

It has long been a recommended practice to break the number 10 common earth return and “force” it through the tanker frame by terminating and bolting the wire through the tank at a distance apart to ensure grounding of the tank. However the difficulty in doing this cheaply and neatly has meant that only a few tankers use the technique.

”Ground Boss” achieves this at no additional cost by using the mounting bolts inside the plug. Internal insulating bushes ensure the only electrical path is via the external fastener, i.e. those bolted to the tanker: and the number 10 common earth wire is run from pin 10 to one bolt head and from under the other bolt head via conduit to the probes. 9 and 10 are simply looped together if required. Therefore the only way the tanker can load is by having its tank in good contact with the rack monitor earth.


### FEATURES

- 3 and 4 bayonet options to industry standard
- 10 pin as standard
- Conduit ports 1/2” NPT thread
- Mounting by 2 stainless steel bolts 8mm dia. via Delrin insulating bushes
- TP103 - 3 pin bayonet fastening
- TP104 - 4 pin bayonet fastening
- Weight-1.3kg.
- Aluminium nose-cone, hard anodised
- Stainless steel pins and terminator

## DUMMY PROBES DP250N

Used on 2 wire systems when tankers have less than the full number of compartments in order to satisfy the gantry monitor.

A dummy probe can be used for up to 5 compartments and mounts inside the truck plug housing.

## TRUCK PLUG WITH ELECTRICAL PRESSURE SWITCH

A pneumatic pressure switch has been built into a standard truck socket.

The simple and compact design automatically accepts a pneumatic signal from other equipment.

Latest generation tankers use this switch to automatically link into the pneumatic logic and ensure the correct pressure keeps the system operating.

Signal may be used to prevent loading until all connections are made.

ITP113 3 slot

ITP114 4 slot

### TRUCK PLUG WITH AIR INTERLOCK

A pneumatic interlock has been built into a standard truck socket by adding an air valve and plunger.

The simple and compact design automatically provides a pneumatic signal when the plug is connected before loading.

Latest generation tankers use this interlock to automatically inflate air suspension and raise bottom loading valves to correct height for filling.

Also used as an integral part of the pneumatic logic. Signal may be used to initiate other functions as required.

ITP103 3 slot

ITP104 4 slot

### TRUCK PLUG WITH COMBINATION AIR INTERLOCK AND PRESSURE SWITCH

This combination truck plug is used to double as both an air interlock as well as a pressure switch in the pneumatic logic.

If for reasons of space, the truck plug does not fall within the loading envelope, then it is essential to have interlocks to control brake and loading functions.

The loading functions come complete with pneumatic interlock pressure switch and dummy probe, all factory wired.

ITP 104U - 4 slot

Also available soon is the DTP100 Truck Plug with digital output for use with Diptronic systems.

### TRUCK PLUG DUST CAP

Plastic cap used in conjunction with all series of truck plugs.

Part Number

5069

Liquip's on board monitors provide fail safe automatic liquid detection and provide intrinsically safe outputs for overfill protection, automatic re-ordering, retained product notification (to prevent contamination) etc. They also provide an improved level of sensor diagnostics through an easy to read display.

**APPLICATIONS**

- Retained Product Monitoring for road tankers
- Self-loading and overfill protection in remote locations
- Aviation Refueller/Defueller loading
- LPG Tanker loading
- Storage Tank overfill protection

## MINI MONITOR™ MPP102

Developed for sites or vehicles with one or two tanks or compartments only but with a necessity for overfill protection and/or automatic reorder.

Extremely small, light and more economical to purchase than current 8 channel monitors.

Versatility was the key word during development. The Mini Monitor works with either:

(a) A single 2 wire electronic overfill sensor

(b) A single fibre-optic sensor

(c) One of each simultaneously

(d) Via a truck plug connected to a standard gantry monitor

(e) Directly to a pump, control valve, alarm etc

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. This signal is used in the tank control system to either stop liquid flow or sound an alarm. LED indicators show the condition of the system at all times. Mini Monitor is designed to IEC, EN and Cenelec Safety Standards.

Weight 1.35kg

Voltage range 11v to 30v dc

Temperature range approx -25 to +55°C

**MATERIALS**

Cast aluminium housing Poly-carbonate cover.

## PPM3XX MONITORS

Provides Retained Product notification to prevent contamination of fuels by disallowing loading until bottom sensors are dry. PPM3XX monitors also provide the interface between the terminal monitors and the overfill sensors and provide useful sensor diagnostics.

Like the MPP102, the PPM3XX Series monitors use fibre optic technology, provide intrinsically safe outputs to the terminal monitors through the truck plug, and also provide a power switch output.

The range of PPM3XX monitors includes 4 variations on an 8 channel monitoring system.

PPM310 8 channel monitor with fibre optic Light Guard retained product sensors, with standard electronic optical overfill protection sensors.

PPM320 8 channel monitor with fibre optic Light Guard retained product sensors AND fibre optic Light Guard overfill protection sensors.

PPM330 8 channel monitor with electronic overfill sensors only.

PPM340 8 channel specialist operation monitor for Diptronic¬Æ Load Integrity Protection System (LIPS) pipeline product monitoring.

### SENSORS

Electronic optical and fibre optic sensors. Five wire and two wire optical sensors may be used for overfill protection and fibre optic can be used for overfill or retain sensing.

Over-ride electronic “Key”

PPM310 and PPM320 have an over-ride function for the bottom sensors if necessary. This will enable loading to commence even with wet bottom sensors. However, the overfill protection sensors cannot be over-ridden under any circumstances as they are a mandatory safety feature.

### WEIGHT

6.5 kg

### VOLTAGE RANGE

11-30V dc

### TEMPERATURE RANGE

approx -40 to +80°C

### MATERIALS

Cast aluminium housing

Poly-carbonate display window

Nitrile seal

## EMH500 ELECTRONIC REGISTER WITH PRE-SET CONTROL

The EMH500 includes a pre-set batch control and up to 50 other programmable functions, making it ideal for small quantity deliveries.

The EMH500 is always used in conjunction with the EJB101 (or EJB200 for EMH500IS) which provides filtered power supply and houses input and output facilities. Power supply from EJB101 is 9 VDC, polarity protected.

### OTHER FEATURES

- Programmable 2 stage solenoid outputs providing slow start and stop of batched delivery
- Dual displays for “Batch” and “Delivery”


### SIZE

150 x 200 x 200mm

WEIGHT

1.8kg

### APPROVALS

NSC Australia

UK Weights and Measures

USA Weights and Measures

Canada Weights and Measures

### MODEL NUMBERS

EMH500H Standard version with heated display

EMH500IS Intrinsically Safe certified version

Optional sun visor EMH500-25Z

### MOUNTING

Mounts to all popular meters with separately supplied adaptor flanges.

## EMH600 ELECTRONIC REGISTER

The EMH600 has the features of the EMH500 minus the preset control functions

The EMH600 is ready for service upon mounting and connecting 12 or 24 VDC power.

### SIZE

131 x 200 x 200mm

### WEIGHT

1.6kg


### APPROVALS

NSC Australia

USA Weights and Measures

Canada Weights and Measures pending

### MODEL NUMBERS

EMH600 Standard version

EMH600H version with heated display

Optional sun visor EMH600-25Z

### MOUNTING

Mounts to all popular meters with separately supplied adaptor flanges.

## ERP101 ELECTRONIC REMOTE PULSE TRANSMITTER

A remote mounted pulse transmitter for use with electronic registers where the register is located other than with the meter or the register has no in-built drive to fix the pulse-generating pick up to.

The pulse transmitter has three opto sensors, each sensor producing 25 Pulses per revolution; the combination of three sensors produces 150 Pulses per revolution. This allows the detection of flow direction, faulty opto sensor(s) and/or loss of power.

## EJB101 / EJB200 POWER JUNCTION BOX

The housing is cast aluminium with weather-proof seal. Six connection ports are provided.

One for the power supply (11v to 30v), one output to supply power and communication to the Register, and the remaining ports are for the auxiliary devices such as communication ports temperature probe, remote pulser and solenoids. These ports may require approved glands and conduit to comply with local regulations.

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

**MODELS**

EJB101Electronic Junction Box

EJB200 Electronic Junction Box intrinsically Safe

## DIPTRONIC® MEASURING SYSTEM INTRODUCTION

Diptronic® is a high tech measuring system using radar. With Weights and Measures Approval in several countries, Diptronic® is a commercially viable, technically superior alternative to mechanical dipsticks and other metering systems.

Diptronic offers the following user benefits:

- Convenient automatic eye-level display of compartment volume continuously updated in real time keeps operators and delivery site attendants off the tank top to pro-actively provide a safer operating environment for drivers and delivery point attachments.
- Removes need for ladders, hand-rails and other safety devices on the tanker.
- Instantly updated volume display at ground level helps reduce delivery time.
- Protects the integrity of the load with level measurement 240,000 times per second, and an optional level tracking program as part of Diptronic" LIPS (Load Integrity Protection System).
- Lighter than other metering systems
- Reduces tanker weight
- Dedicated compartments and fuel lines are a thing of the past with Diptronic®. Not product specific - accurately measures any type or grade of fuel in the compartment without re-calibration to give maximum flexibility in fleet utilisation
- Maintenance-free with no moving parts, reducing the whole of life cost
- Reduces vapour emissions by enabling delivery without opening the tank to check levels preventing possibility of release of VOC's to atmosphere
- Automates inventory control of fuel throughout delivery
- Diptronic® leaves no room for human error or misinterpretation of level readings. Diptronic® is permanently fixed in the compartment so you cannot measure using a non-dedicated stick.
- Enables temperature compensated deliveries
- Enables split deliveries to maximise fleet utilisation and efficiency
- Diptronic® overcomes "frustrated delivery" problems where the entire contents cannot fit into the receiving tank
- Diptronic® requires no special pipework, and keeps pipework simple and free of joins.
- Diptronic® is lighter than gravity meters and similar in weight to turbine meters.
- Unlike conventional meters, with Diptronic® you don't have to empty the tank to know what was in it!

Diptronic® is a revolution in inventory control and custody transfer in the liquid transport industry. It is the only system offering such a level of flexibility and user benefits at a commercially viable price.

ASSOCIATED SYSTEMS

Diptronic MK1 – Simple Measurement System
Diptronic LIPS MK2 – Load Integrity Protection System
Diptronic COPS – Cross Over Protection System
Diptronic OverDrive – Full Telematics Load Control System

## DIPTRONIC® MK1

Diptronic® modernises the way liquids are measured. Long gone are the days of operators climbing on top of tanks to measure hazardous substances that evaporate before the stick is measured.

Diptronic® leaves behind the days of disputes between suppliers and customers as to who got what.

DIPTRONIC® MK1 - MEASUREMENT ONLY

Measurement and eye-level display of all compartment contents in litres (or mm if preferred) with optional temperature compensation.

### TECHNICAL DETAILS

- RADAR transmitters and HART Communicators
- Approved for custody transfer of fuels including split drop deliveries in several countries
- Electrically approved for installation and operation in hazardous products

### SPECIFICATIONS

- Length and range of the sensor determined by the height of the component: 0.6 - 2.5m
- Accuracy: +/- 0.2mm or better over whole range.
- Repeatability: 0.05% or better over the range
- Maximum height of the housing above the walkway: 147mm
- Operating temperature: Standard temp. version -20C - +70C
- Storage temperature: -40C - +110C
- Operating humidity: up to 95%
- Operating voltage: 12V - 30V
- Type of liquid to be detected - all petroleum products (dielectric constant approx. 1.7 - 2.1)
- Approvals - DIP200 Ex e m ib [ia] IIA T4 IP66

### DIP100 EX IA IIA T4 IP66

- Temperature compensated option
- CPU operates up to 9 sensors
- Weight DIP200 - 7.8 kg, DIP100 - 4.8 kg
- Materials of construction - aluminium housing, poly-carbonate window. Wetted materials are Grade 316 Stainless Steel and Teflon

## DIPTRONIC® LIPS MK2

Diptronic® LIPS is Liquip's Load Integrity Protection System

Diptronic® LIPS is an add-on Diptronic® system which gives additional guarantees of load security by monitoring sensors in the API adaptors, ensuring complete discharge through system logic, and "sealing" the loaded volume at the terminal upon disconnection of the gantry plug.

Additional hardware on top of the simple measurement system includes DWS100 digital wetleg sensors, API adaptors, a pressure switch in the ticket printer line and a digital truck plug interface (DTP100).

WHY LIPS?

Oil companies and transport fleets seeking to gain an edge over their competitors can use Diptronic® LIPS' security features as a powerful marketing tool, demonstrating to their customers a high level of load security beyond simple measurement

It removes the "grey" area surrounding the pipeline contents, and ensures complete discharge of the pipelines.

Air system interlocks ensure that the footvalve is always open when printing tickets, guaranteeing that any pilferage of the pipeline contents shows as a change in the cpt volume

The additional display monitor (PPM340) gives added visual indication of operational status of overfill sensors and API adaptors to confirm that the lines are full

Anyone transporting liquids wanting measurement and security is a potential customer

### FEATURES

- RETAINED PRODUCT MONITORING. Prevents contamination and overfill situations. Sensors in the API outlet valve detect liquid and will not allow reloading until they are dry (see DWS100 below).
- SEALED PARCEL DELIVERY. Detects draining of pipelines, changes in volume of tank contents. Also detects power loss. All events are logged and printed out on ticket. If level changes by more than 10mm (non-temperature compensated) or 3mm (with temperature compensation), the system will alert that the fuel level has "broken" and this will be printed on the ticket
- HISTORY. Special software package will include history of most recent 2,000 events can be recalled at any time
- SUMMARY. Allows a quick check of any alerts.
- FOOTVALVE OPERATIONAL CHECK. Each time a ticket is printed, the footvalves must all open (part of guaranteed total discharge). This is an important operational check to ensure they are in working condition
- PROGRAMMABLE LEVEL CONTROLS. In conjunction with a Liquip PLC, Diptronic® can have up to 3 programmable levels at which an output is activated via the PLC. Commonly used for load control in aviation refuellers

## DWS100 SERIES DIGITAL WETLEG SENSOR

The digital wetleg sensor is designed to detect the presence of liquid, typically at the bottom of the tank or in the pipelines (Wetleg) of a road tanker. The sensor has a cylindrical aluminium enclosure in which the electronics are mounted and completely encapsulated with potting compound with the exception of the optical sensing elements. The elements are located at the tip of the sensor and are sealed inside an optical glass prism.


## DTP100 SERIES DIGITAL TRUCK PLUG

Designed to complement the DWS100, a digital input from the truck plug communicates directly with the Diptronic CPU.

## DIPTRONIC OVERDRIVE™

Diptronic OverDrive™ is acknowledged as a 'world first' in combining telematics and fuel load management. It is an exciting solution that offers significant operational and financial benefits for petroleum transportation companies.

This product represents a significant innovation for the bulk fuel transport industry and this technology initiative between LIQUIP and TOMR illustrates the commitment of both companies to develop premium solutions that deliver real bottom line value and operational benefits for their customers.

Diptronic OverDrive™, combines TOMR's flagship product TopGear™ with LIQUIP's Diptronic guided wave radar system. The solution comprises hardware components and software modules that monitor the on-board status of tanker loads as well as vehicle management functions. TOMR's in-vehicle unit (IVU) acts as mobile data gateway and a centralised communications hub for the system. Data collected from both the truck ECM (Engine Control Module), the Diptronic CPU (Central Processor Unit) and other sources are uploaded to TOMR's Data Center where vehicle and load information is processed and reported back to client users via the Internet.

The system monitors operational activity of a tanker fleet and electronically records load transactions. Client users can also view 'live' data and respond to alarms or key events, as they occur. The system has been designed to track and monitor tanker configurations that include both rigid trucks and prime movers with multi-trailer configurations.

### BENEFITS

Diptronic OverDrive™

The combined features of LIQUIP's Diptronic system and TopGear™ provide a premium solution for bulk fuel vehicles. This solution helps dispatchers and fleet managers monitor the on-board status of tanker loads as well as a comprehensive suite of vehicle operating activities. Without any manual intervention critical data is quickly and efficiently gathered about each vehicle and its loaded condition. An important safety feature is that the status of the vehicle and its precise load can be instantly monitored.

The key features of Diptronic OverDrive™ are:

- Current Status of Vehicle and Load
- Detailed Vehicle Trip Reports
- Automated Load Transaction Recording
- Active Geo-fencing (Approved Vs Un-Approved Zones)
- Emergency Vehicle Tracking

Topgear™

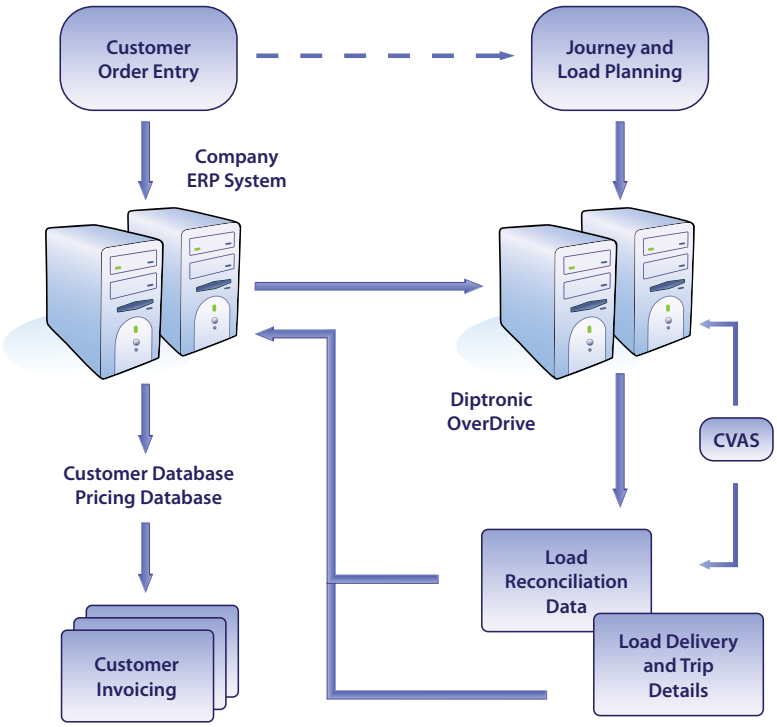
The TopGear™ suite of online monitoring and reporting modules is the closest you can get to having someone in the cab with your driver, providing 'real time' information on the following, plus more:

- Vehicle performance
- Driver performance
- Vehicle location
- Fatigue management
- Driver time sheets
- Alerts for violations
- Fuel usage
- Harsh braking
- Customer visit reports
- Accident replay

Diptronic OverDrive™ has been designed to enable dispatchers and fleet managers to monitor the onboard status of tanker loads, and also provide a comprehensive suite of vehicle management functions. Most significantly, critical data about each vehicle and its load is continuously collected and analysed without human invention. This provides a highly secure and accurate load management system which is automatically being updated with current data in virtual realtime.

The key features of Diptronic OverDrive™ are:

- Provides Current Status of Vehicle and Load
- Detailed Vehicle Trip Reports
- Detailed Reporting of Load Activities
- Active Geo-fencing (Approved Vs Un-Approved Zones)
- Vehicle Tracking
- Electronic Proof of Load
- Electronic Proof of Delivery
- Load Security
- Improved Driver Safety
- Accident Replay Analysis
- Real-time Load Measurement
- Time-On-Site Reporting
- Enables Accurate Partial Compartment Deliveries
- Requires No Manual Data Input
- Customer Management Reporting
- Easy Access to all Load and Vehicle Data



Liquip have developed a range of loading and tanker equipment specifically to suit the special needs of rail car loading.

From long range boom loading arms, modified couplers, overfill protection and discharge equipment, the complete range is equipment is available to facilitate rapid and safe transfer.

## PM4RC

When filling rail cars via dry break systems, it is imperative to have effective overfill protection.

The PM4RC uniquely provides the housing for both the overfill probe and the plug receiver connection. The unit is SG iron (cadmium plated) and comes complete with a cap to provide protection from water intrusion.

## API 400M

Many rail authorities discourage the use of aluminium fittings in rail cars, and require outlets to have security fittings to discourage pilferage.

The API400-M is manufactured in heat-treated SG iron for strength equal to steel. It does not have an operating handle, being intended for loading and discharge only with the use of special couplers. Body is one-piece for maximum strength and integrity.

Shaft, spring, cap and seal are interchangeable with truck valve API403.

Poppet, shaft & seal easily maintained as whole assembly withdraws through rear of body.

### OPTIONS AND RELATED EQUIPMENT

- Cap is API-DC or API-DCLA
- Loading coupler API513 or API710
- Seal Viton

### TECHNICAL DATA

Body and poppet in SG iron

Shaft stainless steel

Flange to ANSI150

## API-SG-150

A special 40mm thick sight glass that, when bolted between the outlet pipework and the API, will show if product is in the line and also the colour to identify the grade.

ANSI 150 bolt pattern

## 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 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.
- 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. (ie skip welding, backstep etc.).

## NOTE:

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
- 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
- Where hatch accessories exist fit using setscrews and tighten to 10-12Nm
- 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.

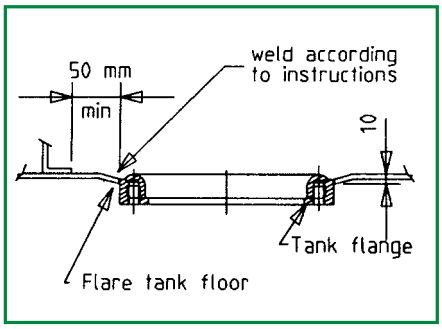
| | VOH400U | SH303/SH302 | EH9/EHV9 | VOH700 | VOH200 |
|---|---|---|---|---|---|
| CUT HOLE DIA | 473 to 475mm | 420 to 422mm | 241 to 243mm | 461 to 463mm | 414mm (minimum) |
| WELD-RING MAT | | | | | |
| ALUMINIUM | 6063T5 | AP601 | 5005H32 | As tank | 5005H32 |
| WELD-RING MAT | | | | | |
| MILD STEEL | AS1204 | AS1204 | AS1204 | As tank | AS1204 |
| FLATNESS | 0.5mm | 1.0mm | 0.5mm | 1.0mm | 0.5mm |
| ROUNDNESS | 2mm | 2mm | 2mm | 2mm | 2mm |
| FASTENERS Nm | 27-34Nm | Not Applicable | Not Applicable | 20-25Nm | 27-34Nm |

Note: This information 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 hole diameter (refer to table) in the determined position, slightly smaller diameter than the flange because of trimming later if needed. Flare tank shell circumference outwards for improved drainage and so the tank flange can fit inside cutout.

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 the tank flange inside the hole and ensure the flange face is flush with the flared tank shell and lined up with the location marks. Place 4 tack welds approximately 25 to 40mm equally spaced to secure the flange.

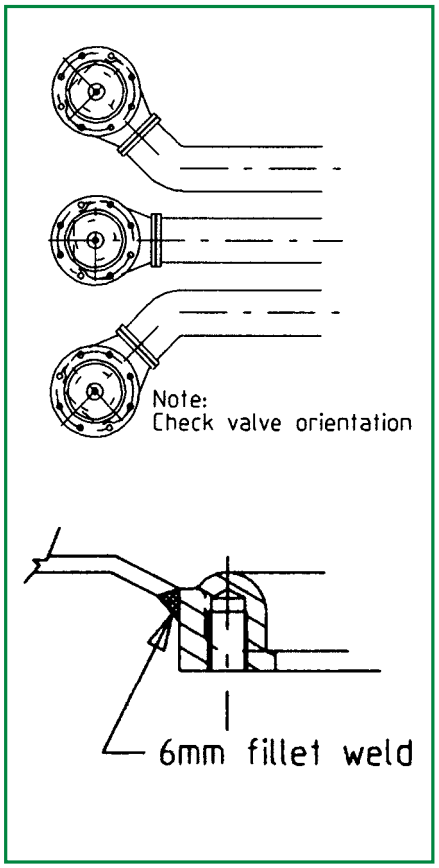
## NOTE: REMOVE ALL STUDS BEFORE WELDING.

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

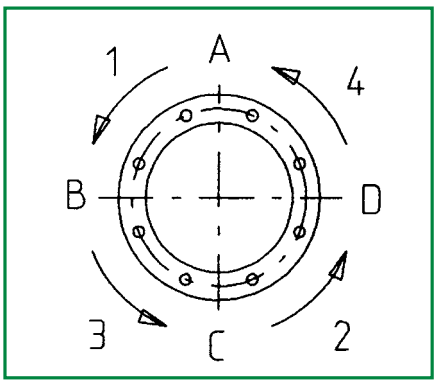
1. WELD No. 1 A TO B
2. WELD No. 2 C TO D
3. WELD No. 3 B TO C
4. WELD No. 4 D TO A

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

## MINIMUM WELDING STANDARD: STRUCTURAL PURPOSE.




When cool remove all swarf, spatter and filings from the tank to avoid damage to valve. Clean all sealing faces.

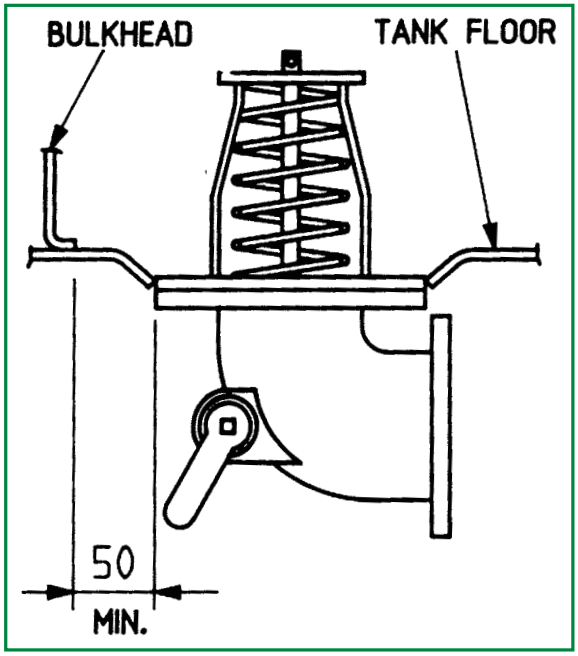


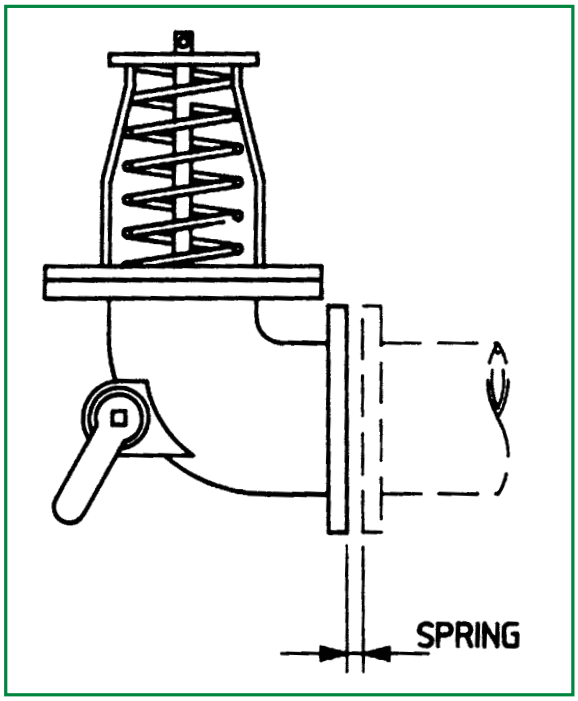

Note: This information is a guide only. Ask Liquip for installation manual.

**OUTLET PIPE**

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.




INDICATIVE

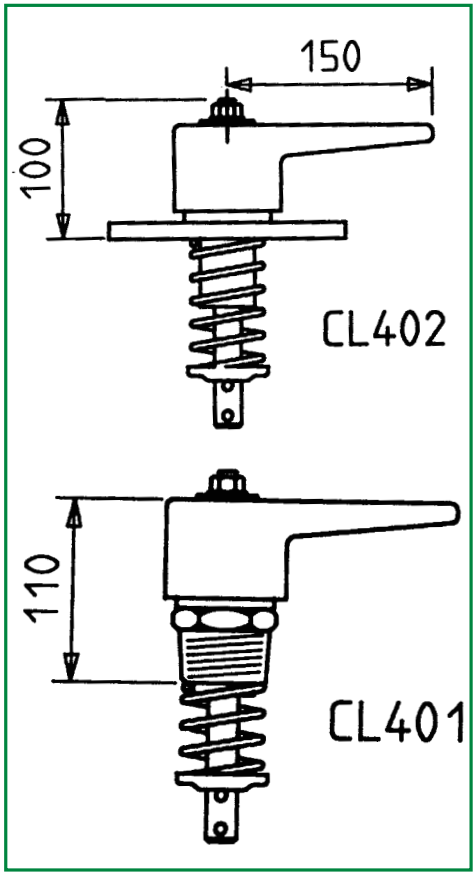
Note: This information is a guide only. Ask Liquip for installation manual.

### TOP OPERATOR (CAMLIFT)

Choice of camlift depends on your application. The ACL405R camlift being air operated sits higher than the standard screwed or flanged camlifts (CL401R and CL402R). Check height of your rollover coaming.

Before cutting hole ensure there is enough clearance from rollover coaming for handle to turn. Camlifts can be bolted direct to the walkway or via a flange or socket.

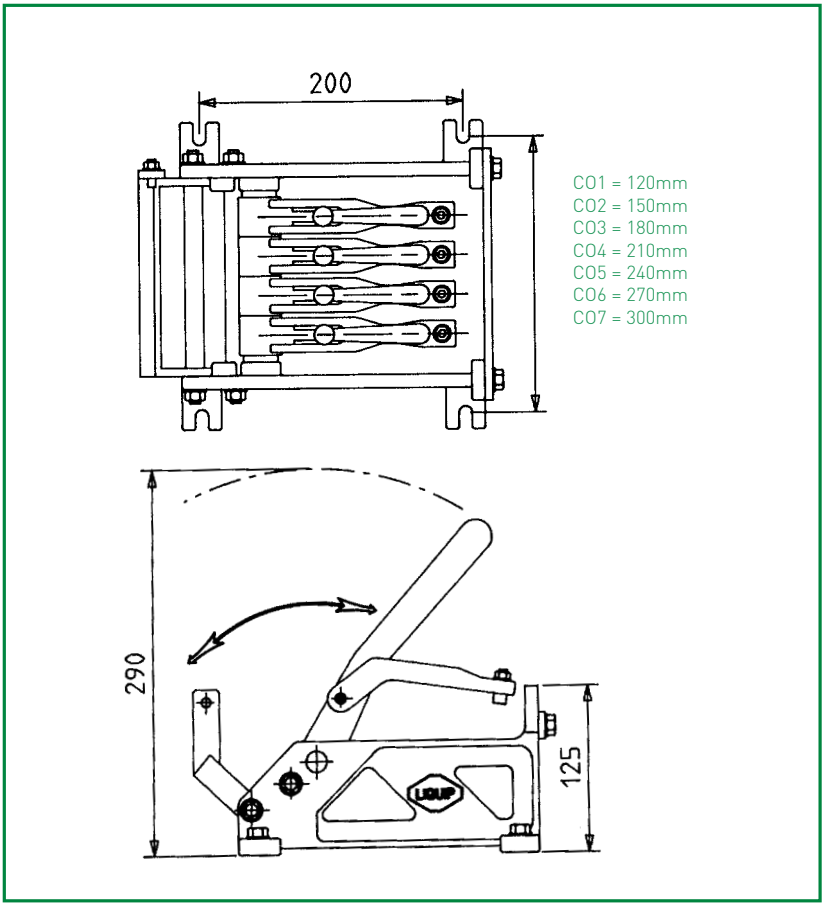
Where air lines are needed it is easier to screw in air line fitting before bolting down camlift.




### FITTING CAMLIFT WITH WELD FLANGE/SOCKET

- Cut hole in walkway directly above internal valve (maximum offset 50mm). If not directly over internal valve, continuous use can result in excessive and undue wear of components.
- Clean all weld surfaces and sit flange or BSP socket in walkway. Note: writing on flange should be facing downwards into tank for correct sealing.
- Place 4 short tack welds around outside circumference of flange before fully welding.
- Allow to cool and install camlift complete with gasket and fix in position with bolts supplied. Tighten nuts to 10-12Nm.
- Fit lifting wire kit with sufficient length of wire and cut off excess wire. Ensure there is 3mm of slack in the cable so the camlift can rise 3mm without opening the internal valve.

NOTE: Standard kit LW400, caters for any tank up to 2 metres in height.




### COMPARTMENT OPERATOR

Mounting holes are shown in the diagram. The Liquip operator is set up for use with plain wires and pulleys although Morse type inner/ outer cable can be used if preferred.

Use 2mm or 3mm diameter braided stainless steel wire and crimp into the integral fasteners. Ensure slack is left in the cable: 2mm to 3mm movement.

Note: This information 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 API403 VALVES

Note the holes in the API403 flange are offset at 12˚. 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.

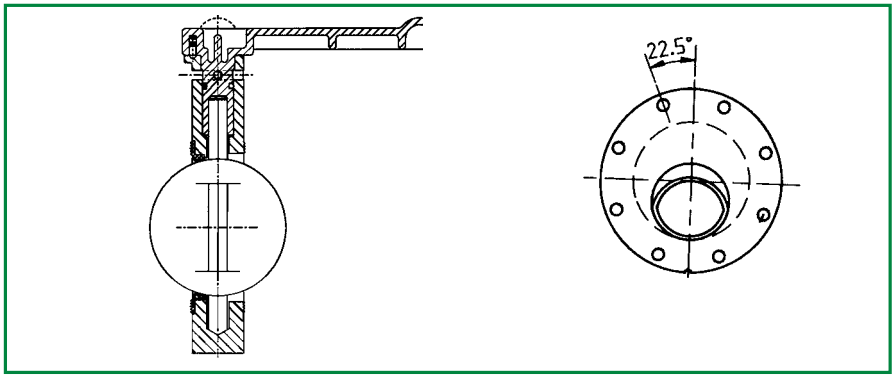
Before fixing valve in position with nuts supplied, it's best recommended to have the API valve with a 10˚ to 15˚ incline to the horizontal. This will have to be considered when welding outlet flange to pipeline.

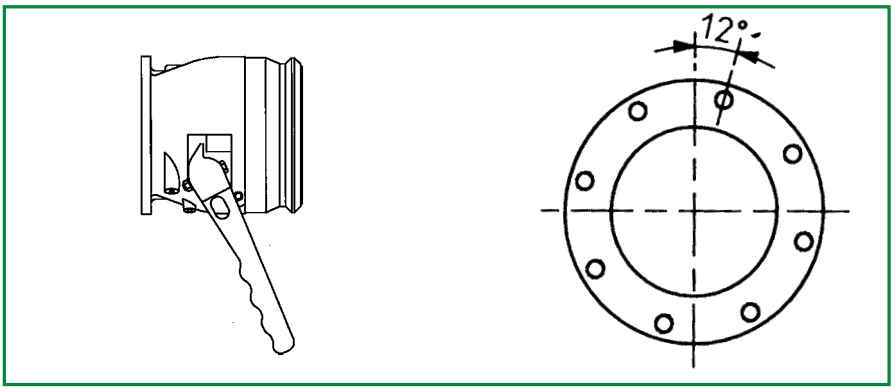
Nuts to be tightened to10-12Nm.

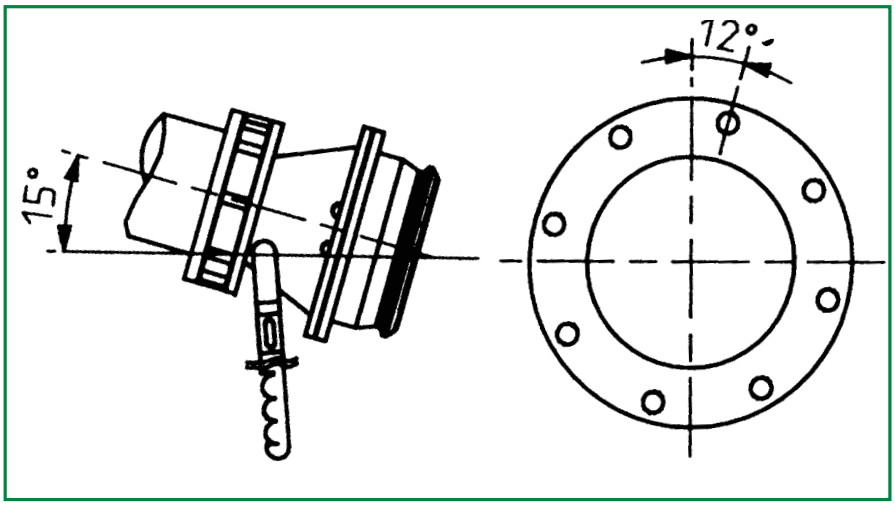
## MOUNTING LBV BUTTERFLY VALVES

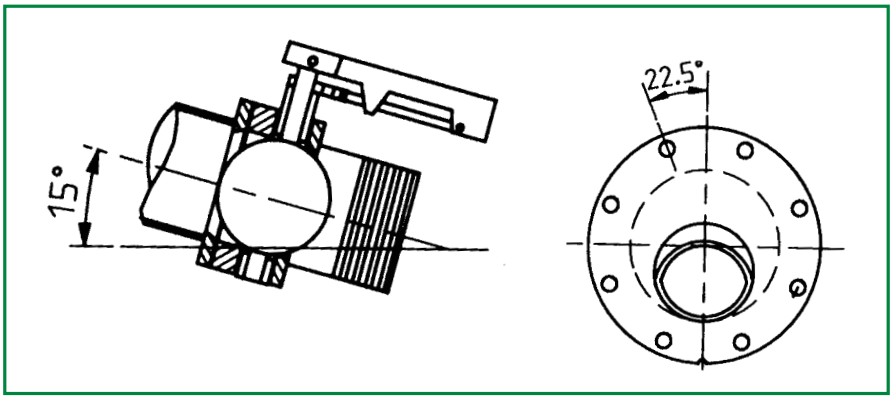
When a butterfly valve is to be used, a flange with an internal chamfer must be used to allow enough clearance for the opening of the butterfly.

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




Note: This information is a guide only. Ask Liquip for installation manual.

**GENERAL GUIDELINES FOR 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: This information is a guide only. Ask Liquip for installation manual.

# NOTES

## WELCOME TO ISSUE 5 OF LIQUIP'S TERMINAL EQUIPMENT CATALOGUE

This catalogue is by no means the full range of Liquip Terminal Equipment, it is intended as a guide to the range we have available.

Created using Indicium Content Management System, our catalogues are now seamlessly linked to information on Liquip's website, www.liquip.com

## HOW TO USE OUR CATALOGUE SYSTEM

- Read the various catalogues for an overview of the product range
- Email webmaster@liquip.com to request a login password
- Login and download the very latest data sheets, product manuals, installation and maintenance manuals as well as other technical information from the website
- Subscribe to our newsletter for the latest industry information

## CALL OUR CUSTOMER SERVICE TEAM

Please call +61 2 9725 9000 or email sales@liquip-nsw.com.au and ask for our Customer Service Bulletin which introduces our people and helps to understand who to call at Liquip for sales and technical advice.

Ask for our Terminal Survey sheet. Liquip's tool used to establish your requirements.

Experience the Liquip Advantage

LIQUIP

www.liquipvictoria.com.au

# EXPERIENCE, INNOVATION, EXCELLENCE
# THAT'S THE LIQUIP ADVANTAGE

Liquip International is a world leader in hydrocarbon bottom loading and vapour recovery for Road Tankers. Experience the Liquip Advantage using the Liquip one stop shop for everything you need:

**Loading and discharge fittings**
- Drop tested manlid covers
- Certified Pressure vacuum vents
- Vapour recovery vents
- Dipstick fittings and accessories
- Bottom valves
- API loading and discharge valves
- Complete range of adaptors
- Manifold system components

**Metering and pumping**
- Distributor and stockist of Liquid Control meters
- Hi Flow pumping systems

**Monitoring and measuring**
- Diptronic radar measurement systems
- Diptronic Overdrive telematics system
- Retained product monitoring system
- Pneumatic and Electronic Control systems

**Safety systems**
- Advanced overfill detection
- Rollover shutdown switches
- Engine stranglers

Liquip offer in depth product selection and engineering support with every product.

That's the Liquip Advantage!


For more information please visit our website or contact your Liquip Distributor

**Liquip International Pty Ltd**

Distributed by:

Liquip Victoria
48 Vella Drive, Sunshine West, Victoria 3020
Phone: (03) 9311 7822
Fax: 03 9311 8784
e-Mail: sales@liquipvictoria.com.au

ISO 9001
LIC QEC22149
SAI Global

Part No. LCAT-TAN