LOADING ARMS

GENERAL INFORMATION

For over 35 years Liquip loading arms have been the benchmark for innovation to those who have used them. Their reduced weight and advanced balance mechanism technology make Liquip loading arms the most maneuverable loading arms available and the loading arms of choice for customers around the world.

"Smooth as velvet, slick as silk"

Velvet Touch arms can be customised to suit individual requirements, all with one thing in common...the "VELVET TOUCH". The name Velvet Touch is a reference to the ease of operation and is the culmination of extensive research into different balancing systems after 35 years in the petroleum equipment manufacturing industry. It utilises the properties of perhaps one of the best support mechanisms available today and one which is used and well proven in many different applications around the world, the gas strut.

With the gas strut of the Velvet Touch as the backbone of our loading arm range, we manufacture arms for top and bottom loading of petroleum products and chemical applications in a range of sizes and materials. Specialist arms include low profile gravity unloading arms, LPG loading arms, bitumen arms and vapour recovery arms. In line with Liquip's dedication to quality, Liquip loading arms and components are made to world standards in accordance with ISO9001 Quality Assurance System.

Liquip use the latest in available design and manufacturing techniques to ensure that our arm designs work to their full potential, giving our customers the best possible solution for their investment, and consistent product quality. Repeat sales with existing satisfied customers across 27 countries proves that our loading arms continue to provide significant benefits and value for money.

CHEMICAL COMPATIBILITY

Liquip loading arms are available in a range of materials and seals to suit various chemicals and liquids. Liquip reference industry standard chemical compatibility charts when deciding compatibility of materials and physically test product compatibility with seal and gasket material. If in doubt, consult Liquip and if available provide your recommendations and material safety data sheet for specific products.
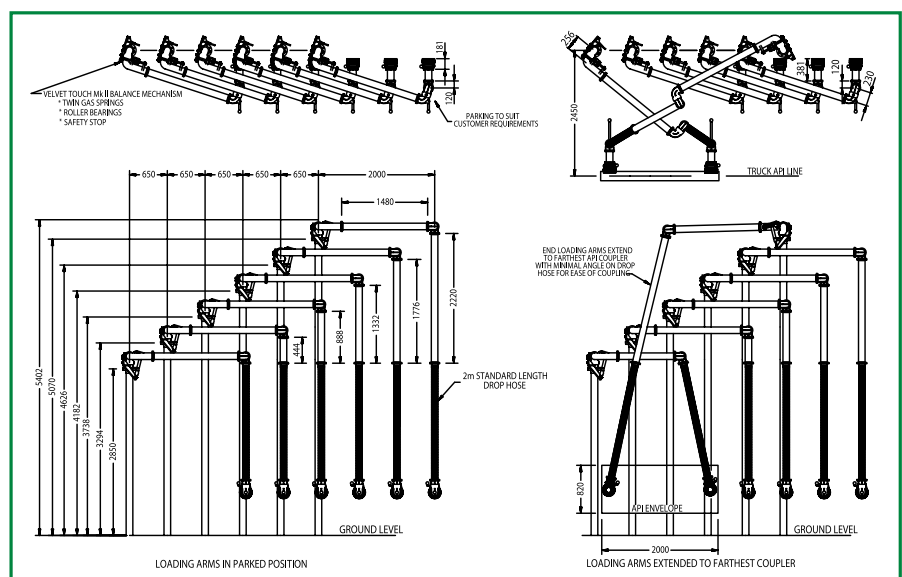
THERMAL RELIEF

Over pressuring of the loading arm can be caused by thermal expansion of the product contained in the loading arm pipe work, i.e. the temperature of the static product within the loading arm is higher than the ambient temperature. This is caused as a result of the sun heating the pipe and product; as the temperature rises so too does the pressure within the loading arm. This increase in pressure, if severe enough can cause seals and gaskets to rupture and can damage the API coupler. Recommended operating static pressure for loading arms is 1,000 kPa, refer to Liquip Tech Talk T011.

Liquip recommend that you consult your company policy on thermal pressure relief and put in place a system to prevent over-pressurisation through thermal pressure buildup.

FUEL VELOCITY

Loading rates differ between installations. It is always advantageous to maximise loading flow rates in order to minimise loading time. However ensure that the fuel velocity at any flow rate, does not exceed maximum safe rates. Excessive velocity increases the generation of dangerous static electricity and should be considered. It may be wiser to increase the size of the loading arm to achieve the same flow rate, thereby minimising static generation.

LOADING ARMS IN PARKED POSITION

LOADING ARMS EXTENDED TO FARTHEST COUPLER

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ORDERING INFORMATION

To ensure each loading arm that leaves our factory operates to its maximum potential, Liquip requests that the dimensional details and designs of each installation be checked by our design department. If your requirements are beyond the scope of this catalogue, contact us. Design survey sheets are available from Liquip and Liquip distributors.

The following is the information needed to recommend an arm to suit your requirements:

1. Top loading or bottom loading
   Top - long reach or pantograph
   Bottom - overhead or low profile
2. Top feed or bottom feed (liquid is supplied from above or below)
3. Left hand or right hand mechanism
4. Product to be conveyed
5. Temperature of the product to be conveyed
6. Flow rate required
7. Preferred diameter
8. Material of construction
9. Operating pressure
10. Operating temperature
11. Maximum temperature
12. Mounting connection
13. Coupler or other connection

To help maximise the productivity of your loading arms and thus provide the best value for money, it is important that Liquip be consulted early in the planning stage of the bulk liquid terminal or loading rack. The loading arm is the last component of an expensive supply chain so it is important not to compromise this important asset.

OVERHEAD

Liquip 4" bottom loading arms are capable of loading at flow rates up to 2500lpm and are designed to enable complete crossover within the API envelope of up to 6 arms in a single bay. In those regions where regulations permit, it is common to load using 3 or 4 arms at one time.

Liquip Velvet Touch bottom loading arms are fitted with a 2 metre standard length drop hose and varying heights are accommodated with aluminium or steel drop spools. Standard length drop hoses enable easier changeover and reduced spare parts inventory for the operating company. Couplers supplied are compliant with API RP1004.
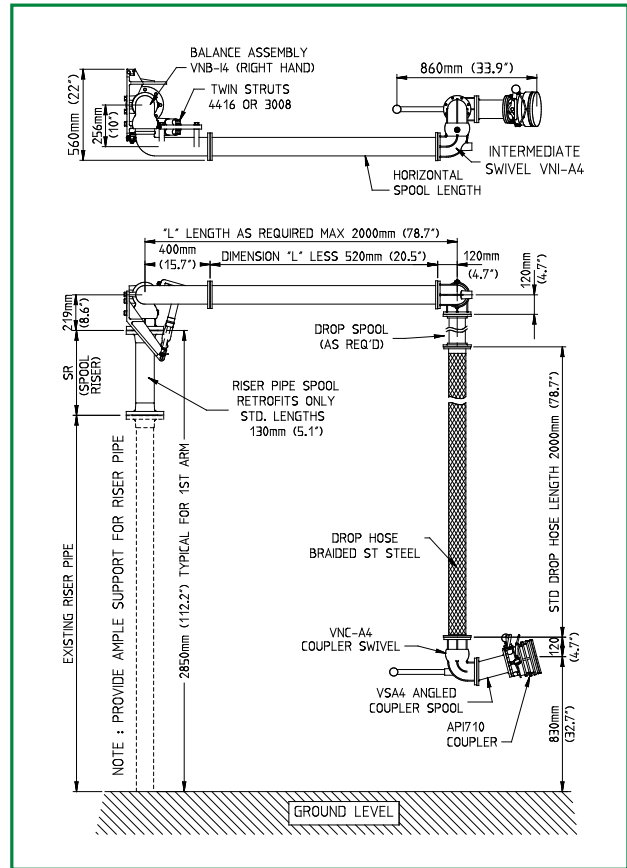
LOW PROFILE

Another popular bottom loading design is the MK3 low profile loading and/or unloading arm. The low profile arm can be used for gravity or pumped discharge of road and rail tankers, as well as for bottom loading. Also commonly used where there are space limitations overhead.

This makes the low profile arm popular for large single compartment tanker loading and unloading, such as railcars and aviation bridging tankers.

The low profile arm is also available in a self draining design.

This arm loads at flow rates up to 2500lpm.

Couplers supplied are compliant with API RP1004.

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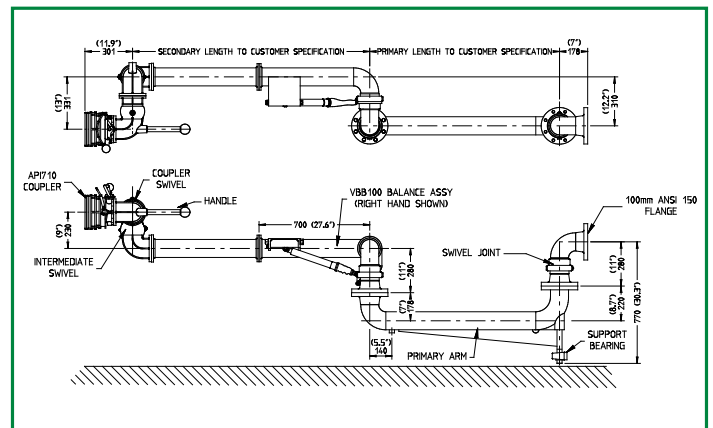
LPG

The highly advanced 3" Liquip LPG loading arm is designed to provide efficient loading with an emphasis on occupational health and safety. The balance mechanism has a cantilever action to ensure the loading coupler remains horizontal in any position to accommodate different adaptor heights.

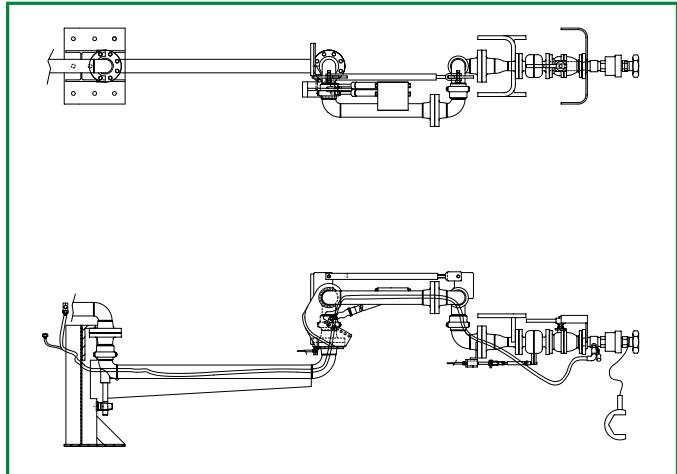The arm folds away for safe compact storage and electronic interlocks ensure the arm is disconnected and stowed. A 50mm double acting stainless steel 'emergency release' valve provides secondary drive-away protection. High pressure swivels enable loading up to 120m3/hr.

VAPOUR RECOVERY

Available in all bottom loading configurations, the Liquip vapour recovery arms provide a safe and efficient method of vapour collection.

The Liquip vapour recovery arm removes the potential safety risk of vapour hoses in load bays and also eliminates the need for costly hose replacement.

The vapour coupler used is the low pressure drop VCF500 vapour coupler which allows for multiple compartment loading.
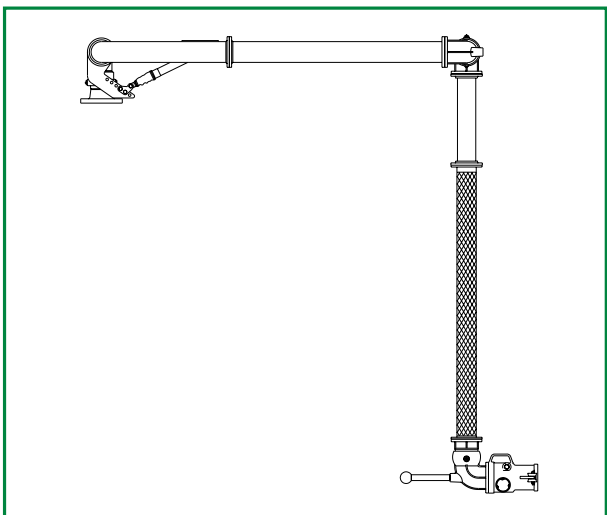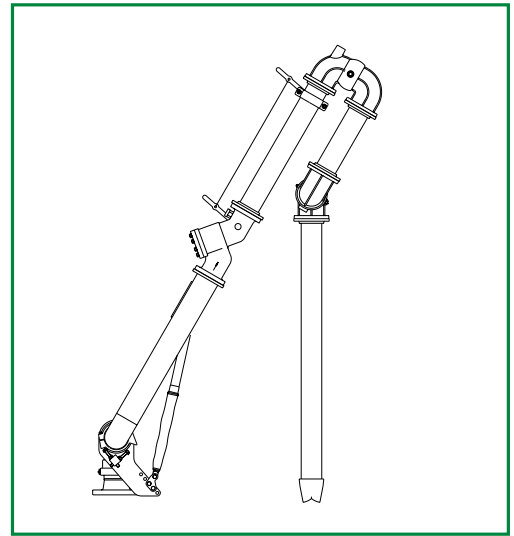
PANTOGRAPH

Top loading is still a popular method of loading road and rail tankers.

The "Pantograph" top loading arm is a very common style used around the world. It is a simple and inexpensive design for medium duty applications with a horizontal reach of up to 2600mm (longer horizontal reach is possible but dependent on design. Please consult Liquip for assistance).

Typical flow rates for top loading are up to 1500 lpm. Loading with pantograph style arms is generally limited to loading a single sided loading bay.

Options for the pantograph arm include top loading valves with or without remote operating handle, overfill protection, spear diffuser, drip buckets and parking adaptors. Vacuum breakers are also available to assist drainage of the loading arm.

LONGREACH

The "Longreach" top loading arm has some distinct advantages over Pantograph style arms. With full crossover ability and a horizontal reach of up to 5500mm, the Longreach arms can load both sides of the gantry and reach all compartments on a typical road tanker without the need to move the tanker. Considering the operational and commercial advantages of this, the Long Reach arm becomes a very economical alternative. Typical flow rates for top loading are up to 1500 lpm.

Options for the Long Reach arm include loading valves with or without remote operating handle, overfill protection, vapour recovery, spear diffuser and parking adaptors. Vacuum breakers are also available to assist drainage of the arm.

A special high load base swivel may be required for longer or "wet" arms. See LCB4-1.

Liquip's gas strut technology enables finger tip control of up to 4 arms per bay. (5 or 6 arm bays are possible but consult Liquip for details)

OTHER LOADING ARMS & APPLICATIONS

Liquip manufactures loading arms for a wide range of liquid transfer applications. Nearly any application currently using a hose is a potential loading arm application.

Aside from standard loading applications listed, some of the applications using Liquip loading arms include:

• Liquid sugar syrup loading of rail cars

• Waste water unloading of railcars

• Railcar locomotive refuelling

• Mine service vehicle loading

• Aviation refueller loading

• Fuel barge loading and unloading

• LPG condensate loading

• Bitumen top loading

Liquip can design a loading arm to your specification. With an already extensive range, we are able to respond rapidly to specific and specialised requests. Using the Velvet Touch as the "backbone" of the arm, Liquip can tailor-design an arm to suit your operational requirements. Check with Liquip regarding your application if you are unsure.

STORAGE TANK SYSTEMS   ELECTRONIC REGISTERS   OVERFILL PROTECTION   FLOATING SUCTIONS   PARKING ADAPTORS   LOADING EQUIPMENT   SPOOLS, HOSES & ACCESSORIES   SWIVELS   LOADING ARMS

LOADING ARMS

VELVET TOUCH MK2 AND MK3 BALANCE MECHANISMS

LOADING ARMS

SWIVELS

SPOOLS, HOSES & ACCESSORIES

LOADING EQUIPMENT

PARKING ADAPTORS

FLOATING SUCTIONS

OVERFILL PROTECTION

ELECTRONIC REGISTERS

STORAGE TANK SYSTEMS

MK2 BALANCE MECHANISMS

The MK2 Loading arm balance assembly is the premier balance mechanism offered with a host of features not found in any other loading arm.

FEATURES

• Cast steel for durability and compatibility with aviation fuel

• Simple and safe balance mechanism

• Ball and roller bearings for smooth effortless operation

• No hazardous coil springs

• Twin gas struts for improved safety

• Adjustable up and down travel limitation stops to prevent arms clashing with pipe work etc above the arms and a passive safety feature.

• Left and right hand orientation, changeable if necessary in the field

Note that all Liquip balance assemblies are mounted on ANSI150RF base flanges.

INSTALLATION

The Velvet Touch balance mechanism is compact and light, making it easy and safe to install. The compact design and large range of adjustment allows for up to 6 arms per bay with complete crossover capability.

ADJUSTMENT

Gas struts are used whatever the combination of pipe material, pipe length and product density. Different weights are compensated for by adjusting the leverage exerted by the strut on the loading arm. Setting the balance of the loading arm is a very quick and simple operation and is achieved by simply adjusting two bolts.

Refer to the Liquip MK2 Loading Arm Manual for detailed instructions.

REPLACEMENT

The gas struts are maintenance free. However should replacement be necessary, simply lift and support the horizontal pipe to allow the full extension of the gas-struts, remove the R-clips from the upper and lower spindles, remove the strut and replace with a new one. A five minute job.

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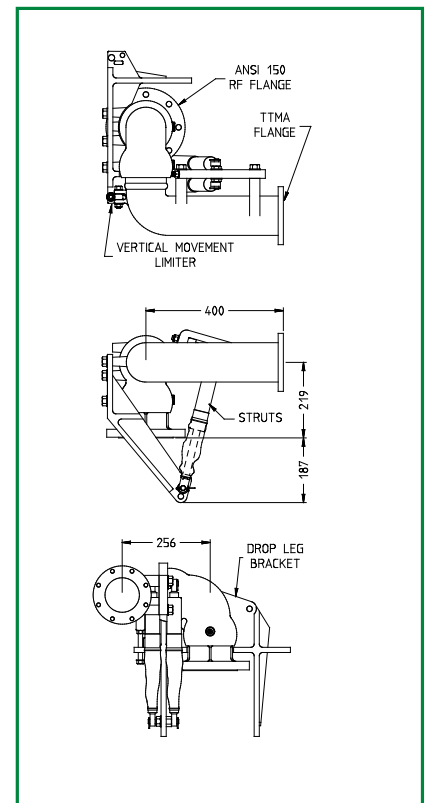
MK3 BALANCE MECHANISMS

The MK3 Loading Arm Balance assembly provides all the benefits of gas strut technology such as ease of replacement and maintenance, with a range of features not found in conventional loading arm mechanisms.

FEATURES

• Single gas strut for ease of operation

• Simple and safe balance adjustment

• No hazardous coil or torsion spring adjustment

• 3" and 4" designs

• Welded steel construction

• Extremely versatile and cost effective

Note that all Liquip balance assemblies are mounted on ANSI150RF base flanges.

Balance assembly is double swivel incorporating Liquip's ball and needle roller bearing design for lowest possible friction and ease of rotation. In a further design advance, the primary seal is a vee-lip seal with two separate `O' rings, protecting the bearings. A telltale weep indicating hole ensures any product leaks will become visible but the integrity of the bearing will not be affected.