



LAND LOADING AND UNLOADING ARMS



CHANGLONG TECHNOLOGIES



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INTRODUCTION

Changlong Group(CCL Technologies)Co.,Ltd is one of the world's leading companies of fluid loading systems with a high reputation in solutions for marine, truck and railcar fluid handling systems. Our services include design, manufacture, installation and maintenance of marine loading arm, truck/railcar loading arm, emergency release coupler, twin seal guide way valve, quick release hook. Supported by COSCO Group (China Ocean Shipping Group Company) and Changlong Group, the loading systems offer customers advanced technology and qualified certificates: ISO 9001:2000, API. Our customers include SINOPEC, CNPC, CAOSC, BSSO, SHELL, TOTAL, ArC, ELF, BP, BASF and other brand companies.

Benefited from the booming Chinese economy and development of technology, we are trying to be the best supplier in this area, contributing high quality and cost-effective products to our customers.





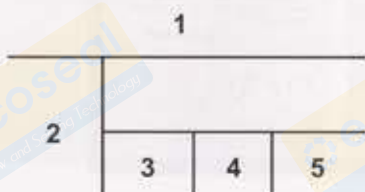
Other Products



Quality guarantee



Quality assurance



1. Research and development department
2. Ultrasonic detection gage
3. Magnetic particle test
4. Shot blasting
5. Loading arm assembly

Manufacture and Test



1. Numerical control lathe workshop
2. Cryogenic test
3. Balance adjusting
4. Chemical analysis
5. Swivel joint life test

LAND LOADING & UNLOADING ARM

Application Example



Loading & Unloading Arm,
Platform, Folding Stair
Trusswork Loading Arm

on spot loading facilities



Cryogenic Loading Arm



Summary

- Designed for transferring fluid between piping system and tanker
- Suitable for different tanker
- By level location or quantitative monitoring, while exceeding the preset value, emitting the aural and visual alerting or providing the far-transfer signal
- According to the medium, model and demands of customers, the operating modes can be manual, pneumatic, hydraulic, etc
- Nominal diameter: DN40~DN200(1.5"~8")
- Designed Pressure: -0.06MPa~5.0Mpa
- Designed Temperature: -196°C~250°C
- Material of Pipeline: Carbon Steel, Stainless Steel, Aluminium and Aluminium Alloy, PTFE-lined

Arm Designation

T 0 1 4 3 / L
1 2 3 4 5 6

- 1、 **Arm type:** T- top, B- Bottom, TE- For special medium (e.g. LPG, etc)
- 2、 **Function:** 0- Loading, 1- Unloading
- 3、 **Structure:** 1- Lower inlet, bend alow, 2- Upper inlet, bend alow, 3- Lower inlet, bend up, 4- Two rigid pipes (liquid and vapour lines) closed loading, 5-Rigid and flexible pipes(Vapour line) combined closed loading.
Details see **Styles schedule.**
- 4、 **Number of swivel joints.** (When the type is TE and structure is 5, the number of swivel joints is not showed.)
- 5、 **Nominal diameter** (Unit: inch)
- 6、 **Configuration.** Details see configuration schedule.

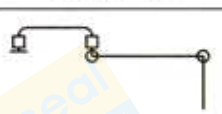
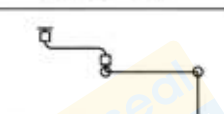
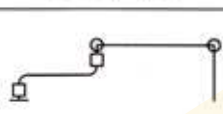
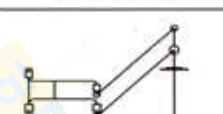
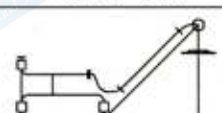
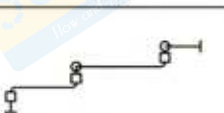
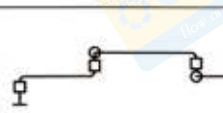
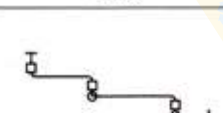
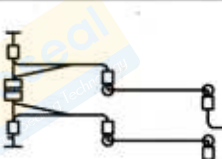
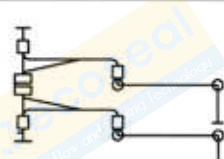
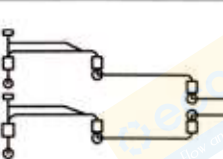
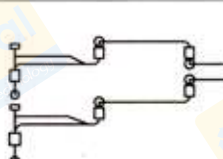
note: The number in the brackets is the nominal diameter (unit: inch) of vapour line.

Schedule of configuration and styles Configuration schedule

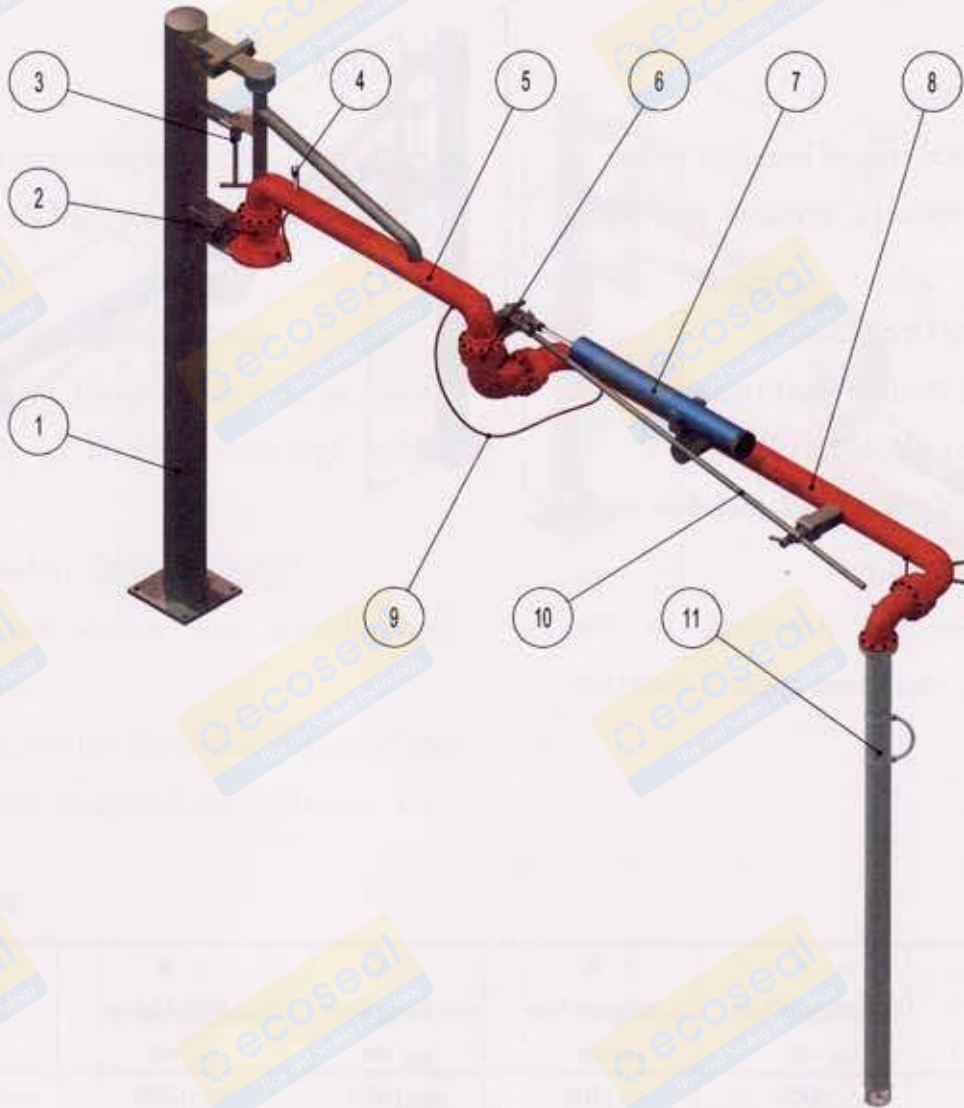
Configuration schedule

Name	Code	Remarks	Name	Code	Remarks
Outboard Arm Lock	L	For lock outboard arm, while filling	Base Riser	R	Supporting the arm, reducing the stress of arm and pipeline
Submersible Pump	P	Provided with hydraulic station	Sealed Cap	C	For vapor recovery
PTFE-Lined	F	For loading high corrosive medium	Telescopic Drop pipe	T	For Submersible loading, telescopic structure
Pneumatic	A	Driven with compressed air, instead of manual labour	Hydraulic	H	Driven with hydraulic oil, instead of manual labour
Steam Tracing	S	For mediums with high solidifying point, jacket structure	Electrically Heat Tracing	E	For mediums with high solidifying point, using ribbon heater
Level Alarm	I	Emitting alarm signal or remote signal, while the level exceeding the pre-set value	Break-away Valve	B	Quick releasing in case of emergency

Styles schedule

T01、T11	T02、T12	T03、T13	T04、T14
			
T05、T15	B01	B02	B03
			
TE1	TE2	TE3	TE4
			

Components of arms



- 1、 Base Riser 2、 Inlet 3、 Inboard Arm Lock 4、 Vacuum Breaker 5、 Inboard Arm 6、 Swivel joint
7、 Spring Cylinder Balance System 8、 Outboard Arm 9、 Conduct System 10、 Outboard Arm Lock
11、 Drop Pipe

Typical Styles

T□14□/L

Loading Arm

T014□/L is a typical style of loading arms.

It can be easily operated, installed and maintained.

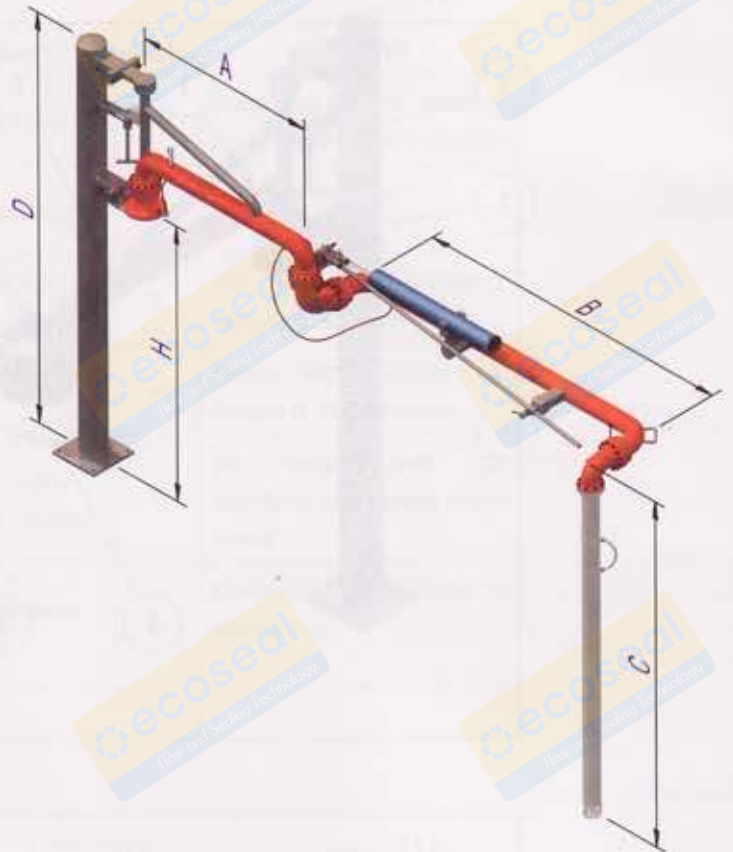
Places Applied: Top Open Loading

Medium Handled: Product oil, chemicals

Nominal diameter: DN40~DN200

Materials of arm: Carbon Steel, Stainless Steel, Aluminum, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Typical Sizes

Sizes	A	B	C	H	D
Name	Outboard Arm	Inboard Arm	Drop Pipe	Inlet Flange	Base Riser
	mm	mm	mm	mm	mm
Truck Loading Arm	1000	1800	1400	1200	2100
Train Loading Arm	1400	2500	2100	1400	2300

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

T□24□/L

Loading Arm

T024□/L is a typical style of loading arms.

It can be easily operated, installed and maintained.

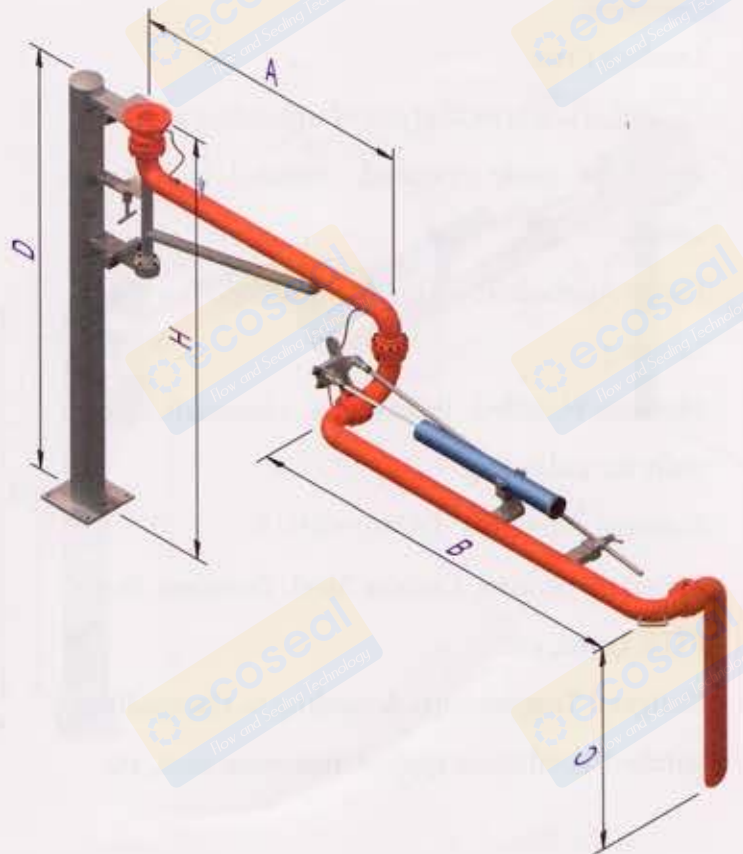
Places Applied: Top Open Loading

Medium Handled: Heavy Oil, Product oil, chemicals, especially for mediums with high melting point

Nominal diameter: DN40~DN200

Materials of arm: Carbon Steel, Stainless Steel, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Typical Sizes

Sizes	A	B	C	H	D
Name	Outboard Arm	Inboard Arm	Drop Pipe	Inlet Flange	Base Riser
	mm	mm	mm	mm	mm
Truck Loading Arm	1000	1800	1400	2000	2000
Train Loading Arm	1400	2500	2100	2100	2100

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

T□34□

Loading Arm

T□34□/L is typical styles of unloading arm.

It can be easily operated, installed and maintained.

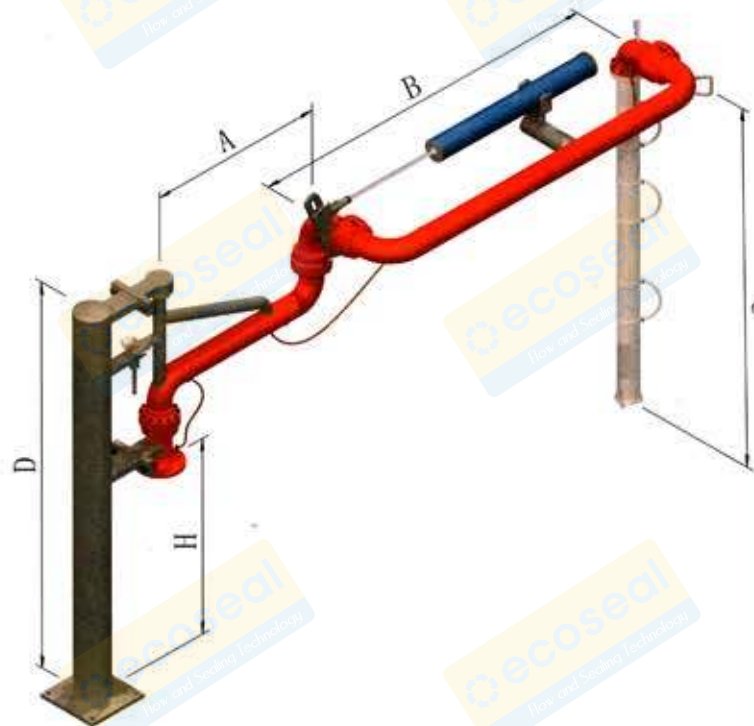
Places Applied: Top Open Unloading, Top Open Loading

Medium Handled: Product oil, chemicals, especially for unloading

Nominal diameter: DN40~DN15

Materials of arm: Carbon Steel, Stainless Steel, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Typical Sizes

Sizes Name	A Outboard Arm mm	B Inboard Arm mm	C Drop Pipe mm	H Inlet Flange mm	D Base Riser mm
Truck Unloading Arm	1000	2500	3000	1000	2000
Train Unloading Arm	1400	3400	3700	900	1900

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

T05□(□)

Loading Arm

T05□(□) is a typical style of closed loading arms.

It can be easily operated, installed and maintained and has good vapor recovery ratio.

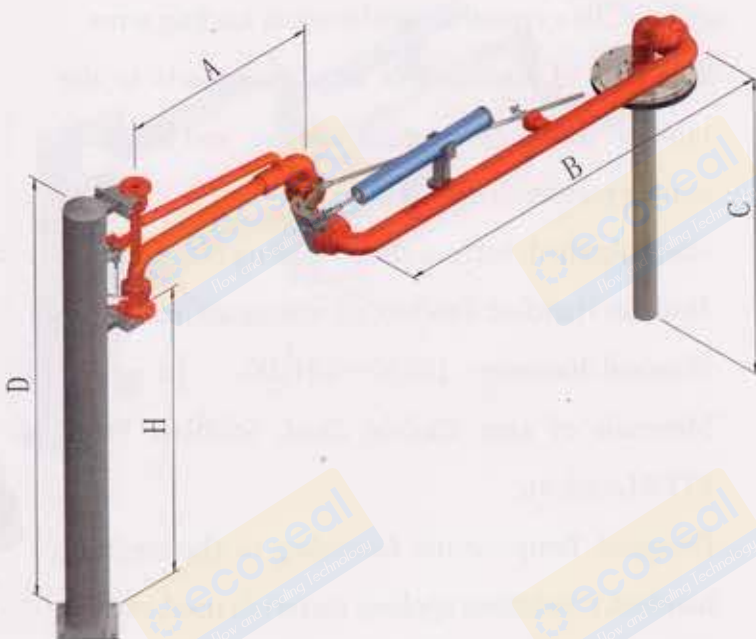
Places Applied: Open Top Loading

Medium Handled: Heavy Oil, Product oil, chemicals, especially for highly volatile and toxic liquids

Nominal diameter: DN50~DN150 (Liquid),
DN40~DN100(Gas)

Materials of arm: Carbon Steel, Stainless Steel,
PTFE Lined, etc.

Designed Temperature: According to the medium
handled, conditions applied, materials used, etc.



Typical Sizes

Sizes Name	A Outboard Arm mm	B Inboard Arm mm	C Drop Pipe mm	H Liquid Inlet Flange mm	D Base Riser mm
Truck Loading Arm	1200	2200	1800	1400	2550
Train Loading Arm	1400	3000	2200	1400	2550

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

B015□

Bottom Loading Arm

B0□5□ is a typical style of bottom loading arms.

This type of loading arm usually connects to the tank car by flanges or quick couples, and has good sealing performance.

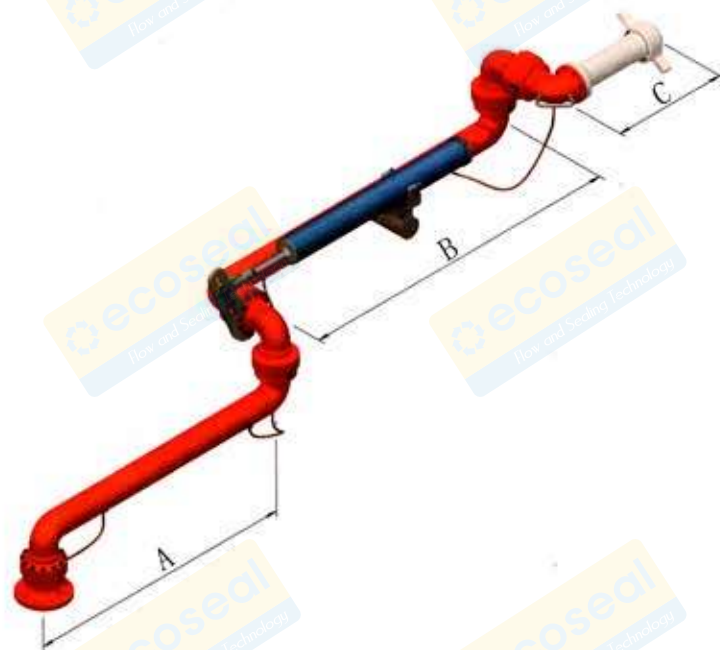
Places Applied: bottom closed loading & unloading

Medium Handled: Product oil, chemicals, etc.

Nominal diameter: DN50~DN100

Materials of arm: Carbon Steel, Stainless Steel, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Typical Sizes

Name	Sizes	A Outboard Arm mm	B Inboard Arm mm	C Drop Pipe mm	H Liquid Inlet Flange mm	D Base Riser mm
Truck Loading Arm		1200	1500	600	300	1350
Train Loading Arm		1000	1300	500	200	1000

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

TE□(□)□

Special Loading Arm

TE□(□)□ is a special type arm for loading & unloading, mainly for mediums, such as LPG, liquid ammonia, liquid chlorine, etc.

This type of loading arm usually connects to the tank car by flanges or quick couples, and has good sealing performance.

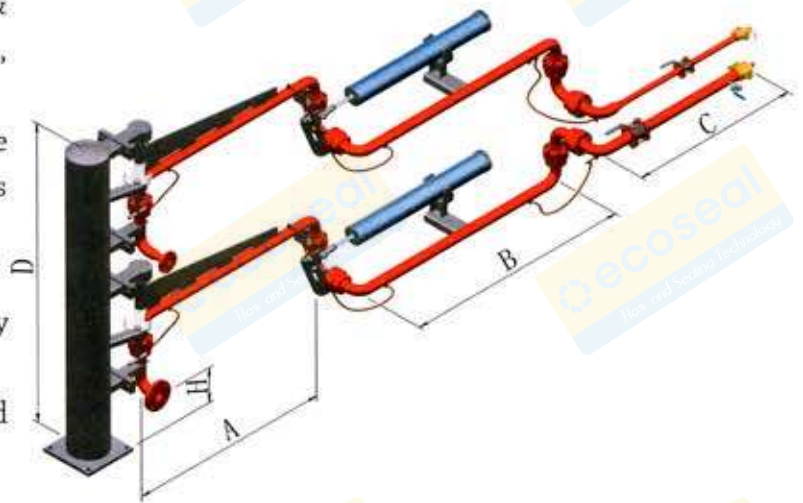
Places Applied: bottom closed Loading

Medium Handled: mediums which easy to gasify at normal temperature and pressure

Nominal diameter: DN50 ~ DN80 (Liquid Phase), DN25 ~ DN50 (Gas Phase)

Materials of arm: Carbon Steel, Stainless Steel, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Typical Sizes

Sizes Name	A Outboard Arm mm	B Inboard Arm mm	C Drop Pipe mm	H Liquid Inlet Flange mm	D Base Riser mm
Truck Loading Arm	1100	1300	500	300	1800
Train Loading Arm	1400	2000	300	1300	2700

Remarks:

- Sizes above for reference only
- Sizes can be designed according to the on-site parameters and other parameters provided by the customer.

API RP1004- Bottom Loading Arm

API RP1004- bottom loading arm is composed from loading arm, dry-breaker coupler, valve, etc. It is specially designed for the tanker car with vapor and oil recovery system. The dry-breaker coupler is designed and manufactured with the leading technology in the world, and can meet the requirement of API RP 1004 and the related Chinese criterions.

This type of loading arm usually connects to the tank car by flanges or quick couplers, and has good sealing performance.

Places Applied: bottom closed Loading

Medium Handled: mediums which easy to gasify at normal temperature and pressure

Nominal diameter: DN50~DN80 (Liquid Phase), DN25~DN50(Gas Phase)

Materials of arm: Carbon Steel, Stainless Steel, PTFE Lined, etc.

Designed Temperature: According to the medium handled, conditions applied, materials used, etc.



Swivel Joint

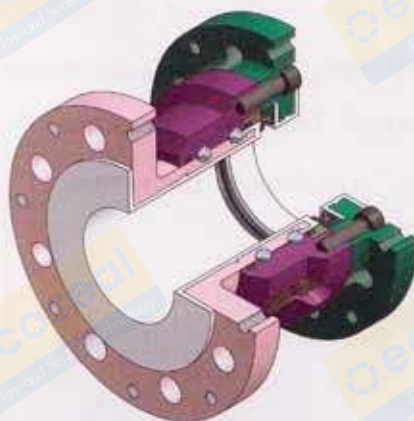
- Normally Model-WFS swivel joints are used for land loading arm. Model-DFS swivel joint can also used for land loading arm.

- The technical parameter of swivel joints are as follows:

Nominal diameter: DN40~DN200(1.5"~8")

Designed Pressure: -0.08MPa~5.0Mpa

Designed Temperature: -196℃~250℃



Double flange-PTFE lined



Welding flange



Double flange-Cryogenic

Single Pillar Platform

This platform is designed for the operator to access the road tankers' top by folding stairs. The platform consists of pillar, deck, inclined ladder, guard rails, etc.

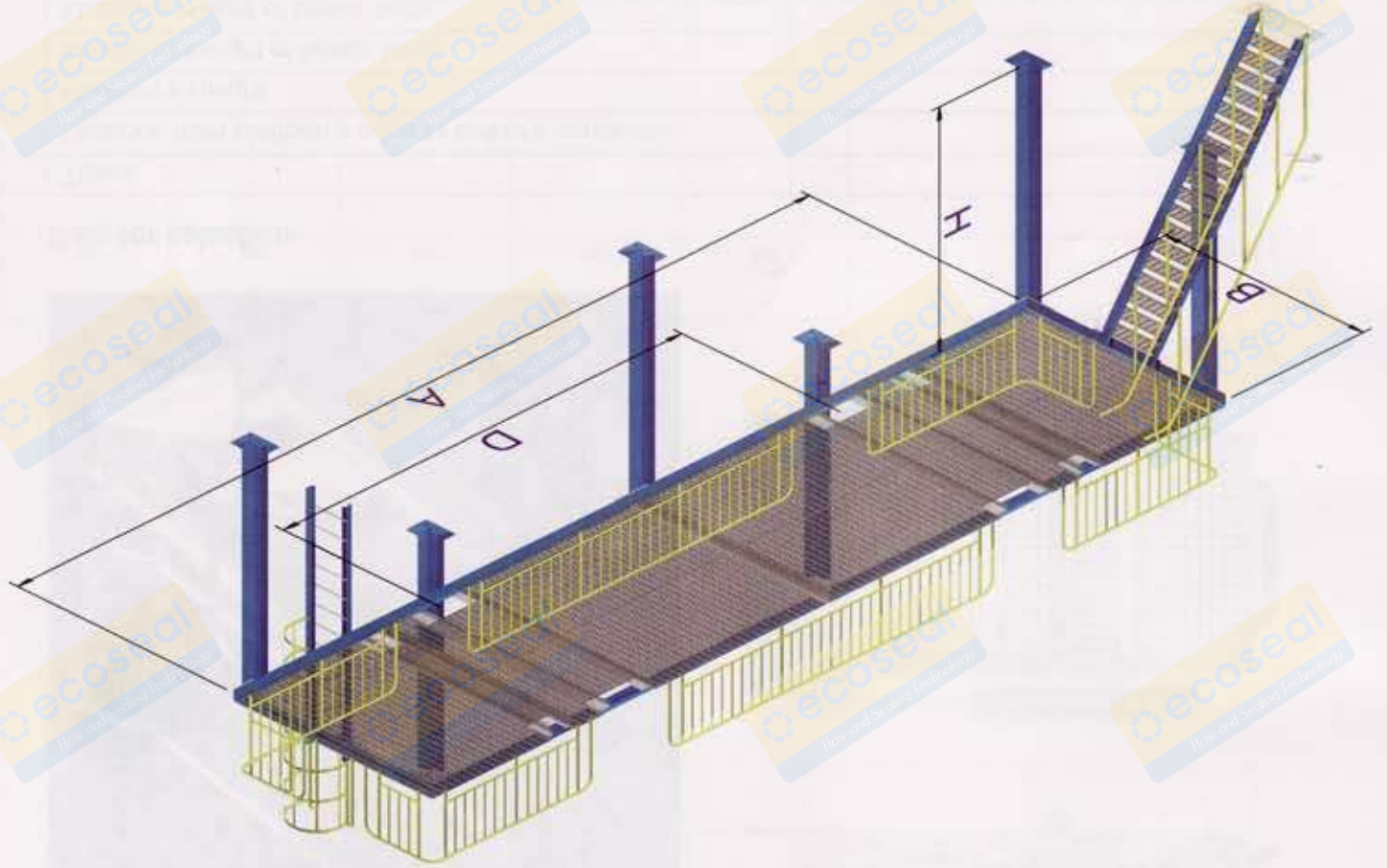
Usually it is designed to mount a loading arm and a folding stairs, up to four loading arms and two folding stairs.

The deck is paved with checkered steel plate or galvanized steel grid plate.

This platform can also be used for rail tankers.

Above are typical dimensions and structure. The final dimensions, structure and materials can be changed according to the requirements of customers.





Fabricated Platform

This platform is designed for the operator to access the rail tankers' top by folding stairs. The platform consists of pillars, decks, inclined ladder, safe ladder, guard rails, etc.

According to the handling operation, the platform can be mounted loading arms, folding stairs, etc.

The decks are usually paved with galvanized steel grid plates.

This platform can also be used for road tankers.

Above are typical dimensions and structure. The final dimensions, structure and materials can be changed according to the requirements of customers. Also we can design canopy mounted on the platform.

Folding Stair

Folding stairs are used to establish safe passages between platforms and tankers. The folding stairs consist of steps, rails, spring cylinder balance system, etc.

The steps are made from dentiform grid plate, preventing the operator from falling while raining, snowing or in heavy greasy condition.

The structure is very solid, maximum design load is more than 300Kg.

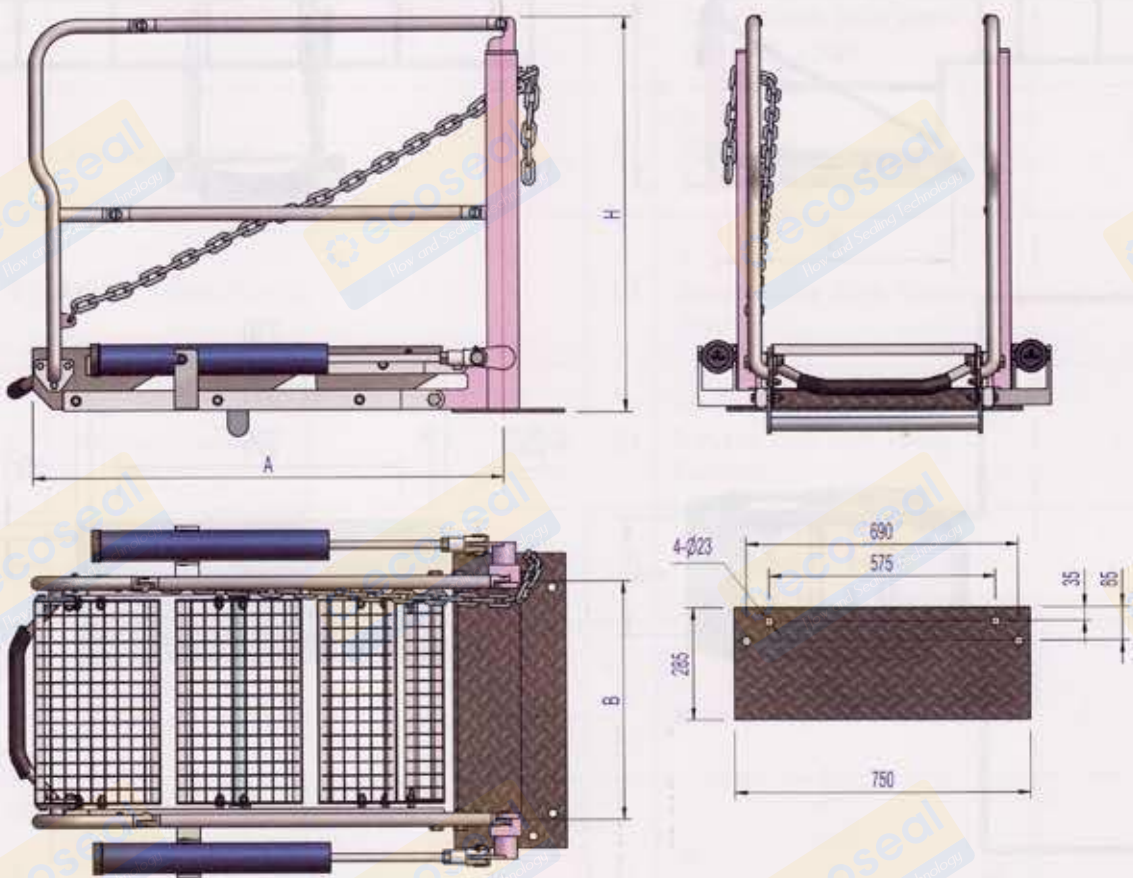
The whole folding stairs are zinc coated. The coating is elegant and durable.



Data for selection

Types	
Distance from platform's edge to tanker's centerline	
Platform's Height	
Maximum Height of tanker body	
Minimum Height of tanker body	

Type PSG Folding stairs



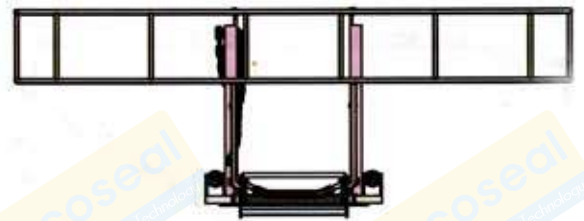
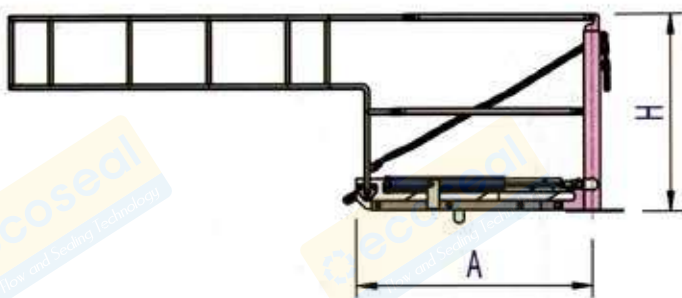
Typical Sizes

Sizes	A	B	C	D	E	F
Name	mm	mm	mm	mm	mm	mm
PSG2D						
PSG3D						
PSG4D						

Remarks:

- Sizes above for reference only
- Sizes maybe change, according to the parameters provided by the customer.

Type PSG03 Folding stairs



Typical Sizes

Sizes	A	B	C	D	E	F
Name	mm	mm	mm	mm	mm	mm
PSG2D02						
PSG3D02						
PSG4D02						

Remarks:

- Sizes above for reference only
- Sizes maybe change, according to the parameters provided by the customer.

Design Information For Land Loading Arms

1	Model		15	H Height of Platform	mm
2	Nomi. Diamete	Liquid () /Gas ()	16	E Distance from Inlet Center to Platform' s Edge	mm
3	Medium handled		17	W Distance from Inlet Center to Tanker' s Center	mm
4	Medium Temperature	°C	18	F Distance from Inlet Flange to Platform	mm
5	Medium Pressure	MPa	19	F1 Distance from Inlet Flange to Platform	mm
6	Pipeline Material		20	Process Piping on site	<input type="checkbox"/> Yes <input type="checkbox"/> No
7	Retraction position (to folding stair)	<input type="checkbox"/> Left <input type="checkbox"/> Right	21	H1 Minimum Height of Loading Hole H1	mm
8	Flange of Loading Station Side		22	H2 Maximum Height of Loading Hole	mm
9	Connection Method with Tanker	<input type="checkbox"/> Free Drop <input type="checkbox"/> Flange <input type="checkbox"/> Quick coupling	23	Inner Diameter of Loading Hole	mm
			24	Operation Mode	<input type="checkbox"/> Manual <input type="checkbox"/> Pneumatic <input type="checkbox"/> Hydraulic
10	Type of Loading	<input type="checkbox"/> Top Open <input type="checkbox"/> Top Closed	25	Height of Guardrail	mm

Accessories

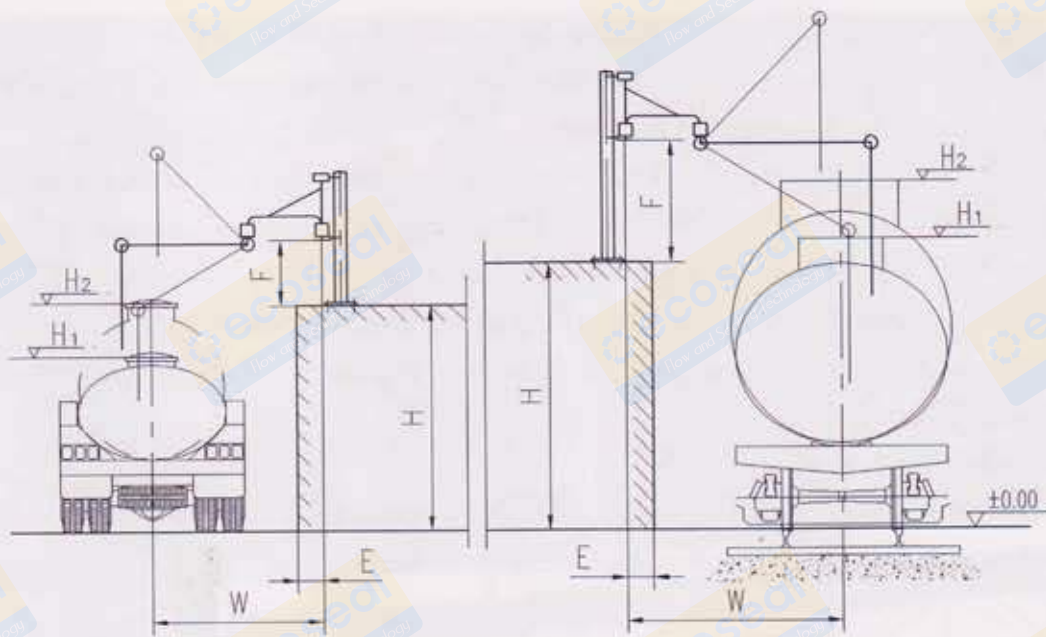
1.	Sealed cap		7.	PTFE-Lined	
2.	Level Alarm		8.	Collection Keg	
3.	Telescopic Drop Pipe		9.	Submersible Pump System	
4.	Jacketed Tracing		10.	Pneumatic Cylinder to Drive Outboard Arm	
5.	Electrically Heat Tracing		11.	Break-away Valve	
6.	Automatic		12.	Others	

Client: _____

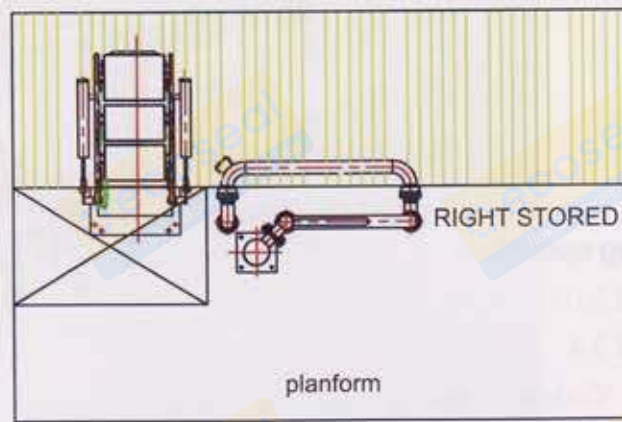
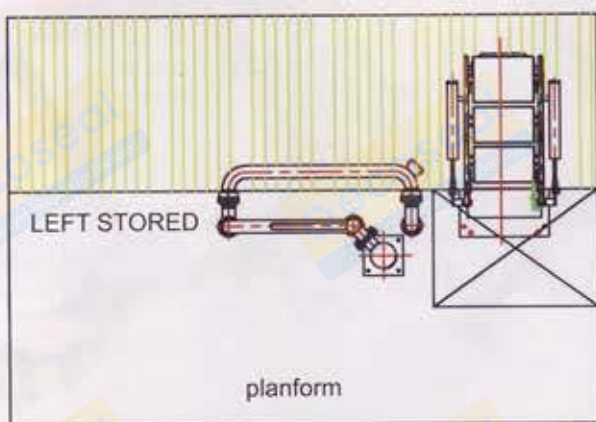
Item: _____

Contact person: _____ Dep: _____

Tel: _____ Fax: _____ E-mail: _____



side-loading drawing



road surface



surface of trestle



operation position

Trusswork Loading Arm

Trusswork loading arm is a new type of loading equipment for petrochemical industry. It is constituted with trussmember, tee junction, automatic follow-down fitting, hydraulic cylinder, sealed cap, drop pipe, motorized valve, electric and hydraulic control system, etc.

This equipment has an X-axis carriage and a Y-axis carriage on the Trusswork. These carriages are driven by hydraulic cylinders and Drop pipe is controlled by lifting cylinder, so the equipment can move to any positions freely. The specially designed electric control system have many functions, such as two circuits output, static and grounding protection interlock, sound and light alarm, automatic alarm interlock, etc.

The hydraulic cylinders can be instead of hydraulic motor, pneumatic cylinders or motors.

Places Applied: Top Loading

Medium Handled: Product oil, chemicals

Nominal diameter: DN80~DN100 (Liquid), DN50~DN80(Gas)

Materials of arm: Carbon Steel, Stainless Steel, Aluminum, etc.



Tag specified:

Y 2 1 03

1 2 3 4

- 1、 Code of Trusswork Loading Arm: Y
- 2、 Type of tank car: 1-Road Tank Car, 2- Rail Tank Car
- 3、 Driving Method: 1-Hydraulic, 2- Pneumatic
- 4、 Nominal diameter (Unit: inch)



Hydraulic cylinder Trusswork Loading Arm



Full Automatic Trusswork Loading Arm

On spot loading facility system

summary

The on spot loading facility system which designed by CCL is a specialized equipment for railcar loading. This system can save the length of loading platform greatly, decrease the area of pipe racks and many ancillary facilities. Most operations can be processed in the control room. The system is easy to be managed and maintained. Closed submersed loading can reduce the liquid's volatilization, as so to protect the environment and reduce the economic losses.

The loading system is mainly comprised of closed submersed on spot loading facility, traction device and automatic loading control system.

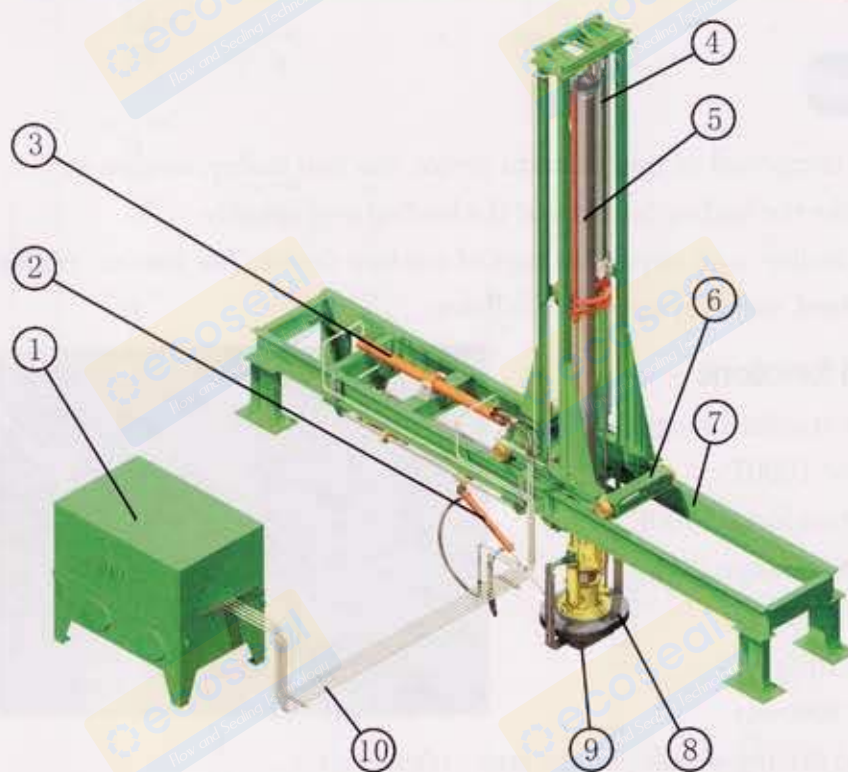
Characteristic

- **Hydraulic drive:** smooth, safe and reliable
- **Closed submersed loading:** less volatilization, less pollution
- **Collection Dipper:** collection dipper can be put under the loading mouth automatically while loading process is finished, and can recycle the liquid which dripping from the surface of pipe.
- **High level alarm:** keep from overflow accident while loading
- **Industrial monitoring system for traction trolley:** less labor, easy to operate
- **Safe electrical and control system:** Using intrinsically safe and flameproof electrical apparatus for program control, quantitative loading control, and overflow interlock control.

Type And Parameters We Main Supply

— Hydraulic Closed Submersed Tower Loading Arm

Hydraulic closed submersed tower loading arm is comprised of elevation device, trolley, oil collector, hydraulic power pack, etc.



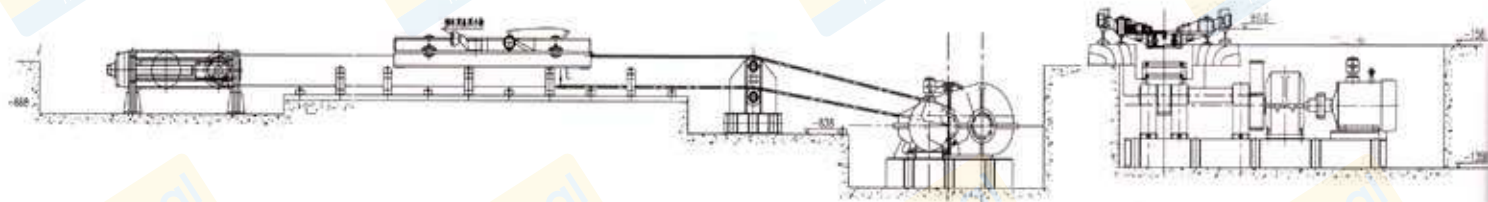
1.hydraulic power pack 2.hydraulic cylinder of oil collector 3.hydraulic cylinder of horizontal drive 4.main pipeline for loading 5. elevation device 6.trolley 7.guide structure 8.sealing hood 9.oil collector 10.hydraulic tubes

Parameters

- Model: WH-S—telescopic
- Model: WH-R—Metal flexible hose
- Nominal Diameter: DN200
- Design Pressure: 0.6Mpa ~ 2.5Mpa
- Design Temperature: $-40^{\circ}\text{C} \sim +50^{\circ}\text{C}$
- Material of Pipeline: Carbon Steel, Stainless Steel(18-8, 304, 316, 316L)
- Control Mode: Electro-hydraulic

Fluid Handled

- Crude Oil, naphtha, diesel, gasoline, kerosene
- Alcohol, methonal
- Water



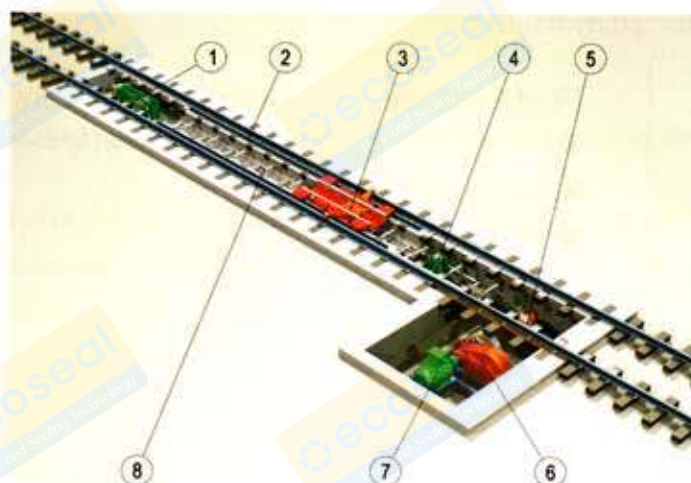
Traction Device

Traction device is comprised of transmission device, traction trolley, tension device, etc. It tows the tank cars moving to make the loading hole aim at the loading arm roughly.

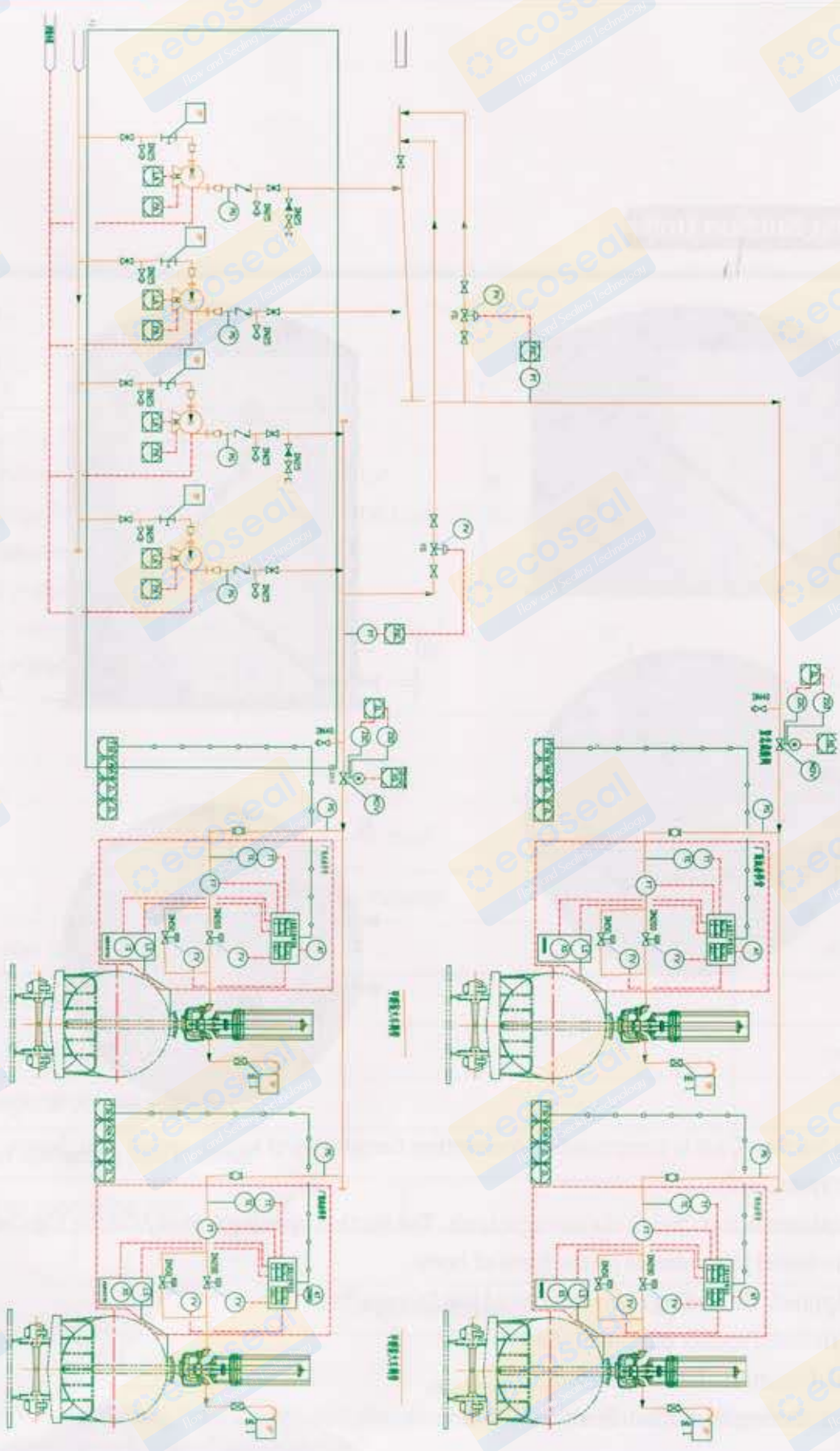
Ex-proof traction trolley is an important part of traction device. The traction trolley is made from bodywork, travelling wheel, rocker arm, etc. See follows:

Parameters and functions

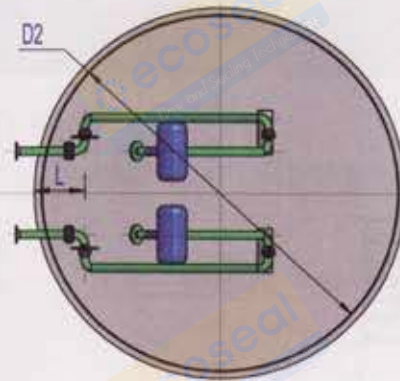
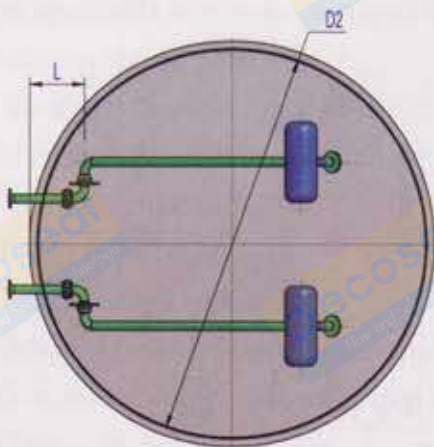
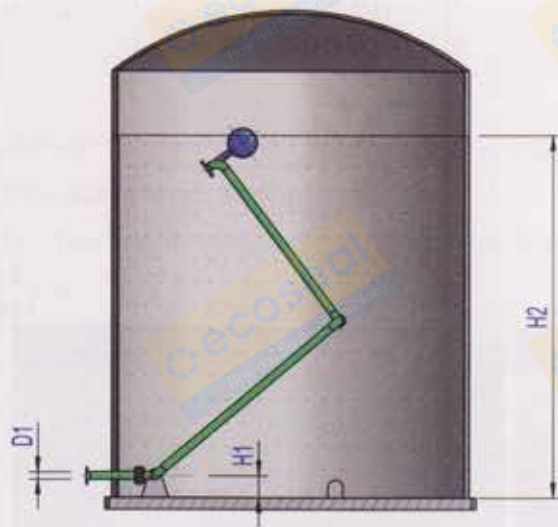
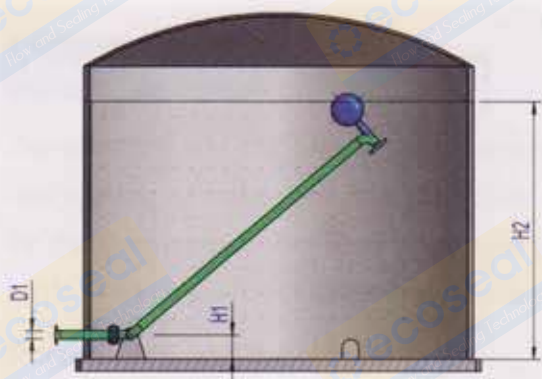
- be applicable to standard gauge: 1435mm
- traction capacity: 1000T
- Maximum traction force: 1700Kgf
- Maximum traction range: 20m
- Working range: 19m
- Travel speed: 0.2m/s
- Traction mode: two-way
- Driving Method: driving wheels pull the tank car's wheels.
- Retraction height: not exceed the track more than 25mm and meet GB146.1~146.2-83
- Class of ex-proof: de II BT4
- Power supply: 380V/AC



1. wheel support structure
2. guide way
3. trolley
4. guide wheel
5. gear
6. reducer
7. motor
8. crosstie



Floating Suction Unit



Floating Suction Unit is comprised of connection flange, swivel joints, swivel arm, buoys, supporting pieces, conduct systems, etc.

The equipment is installed in the storage tank.. The suction opening is always at the high position of the liquid while the swivel joint rotates by the force of buoy.

Places Applied: Unloading from Interior of the Storage Tank

Fluid Handled: Product oil, chemicals

Nominal diameter: DN80~DN600

Materials: Carbon Steel, Stainless Steel, Aluminum, etc.

Tag specified:

F 2 V 06 – 12/15

1 2 3 4 5 6

- 1、 Code of Floating Unloading Arm: U
- 2、 Structure of Arm: 1-Straight Pipe, 2- Folding Pipe
- 3、 Type of Storage Tanker: Vertical tank, Horizontal tank, Floating Roof Vertical tank, etc.
- 4、 Nominal diameter (Unit: inch)
- 5、 Liquid level in the tank (Unit: M)
- 6、 Diameter of vertical tank (Length of horizontal tank)

Data Sheet For Reference:

Client: _____

Item: _____

Contact person: _____ Dep: _____

Tel: _____ Fax: _____ E-mail: _____

Model		Pipe material	
D1	Nominal bore of floating suction unit		mm
D2	Diameter of tanker		m
H1	Height of outlet centre line		mm
H2	Max. height of oil level in tanker		m
L	length of connecting pipe in tanker		mm
Code of flange on connecting pipe			
Cargo			
Left hand design		Right hand design	
Others			

Note: The form is used for inquiry, design and as order's attachments of the floating suction unit, filled in by customer or with help of our engineer.