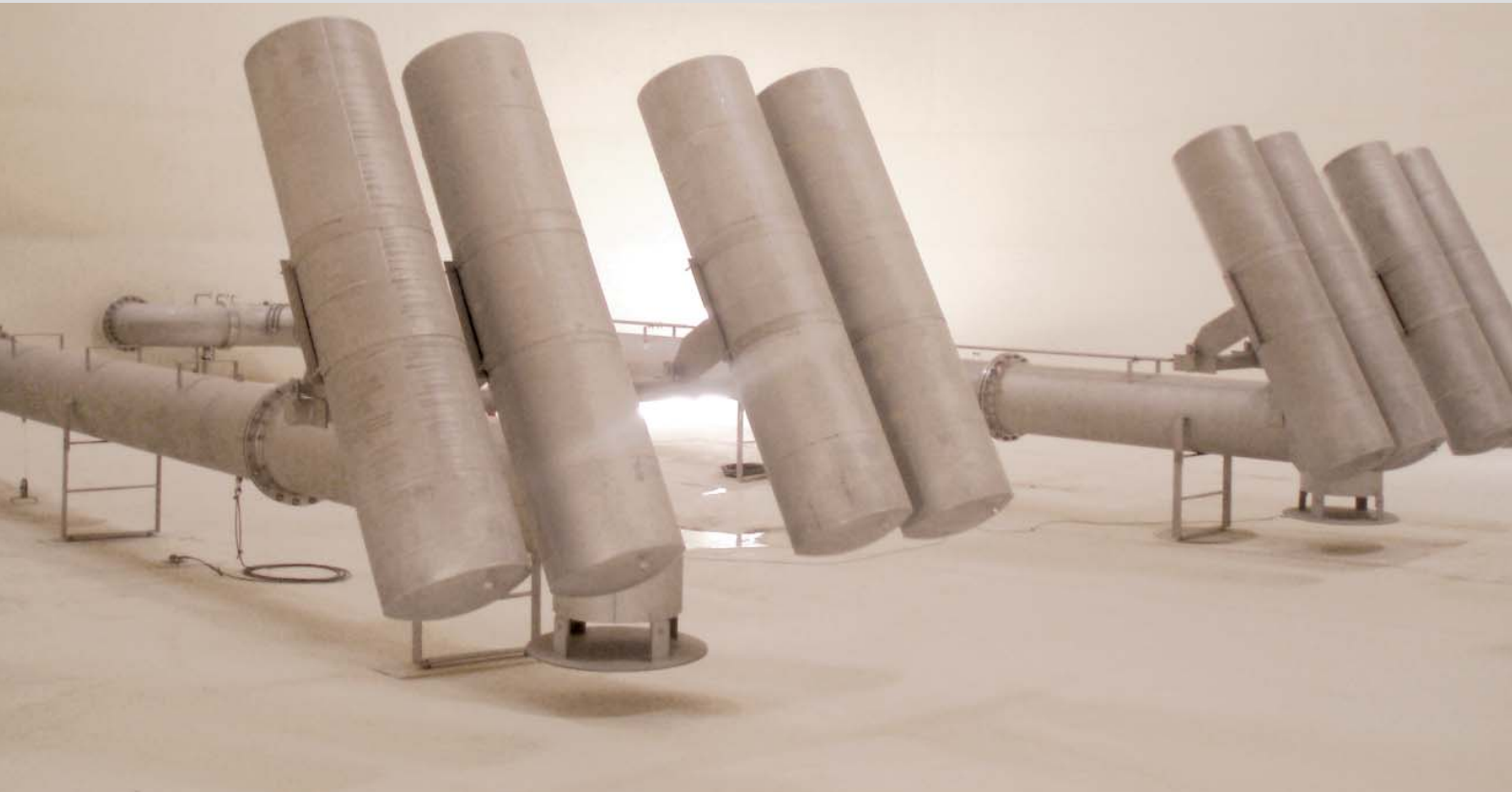


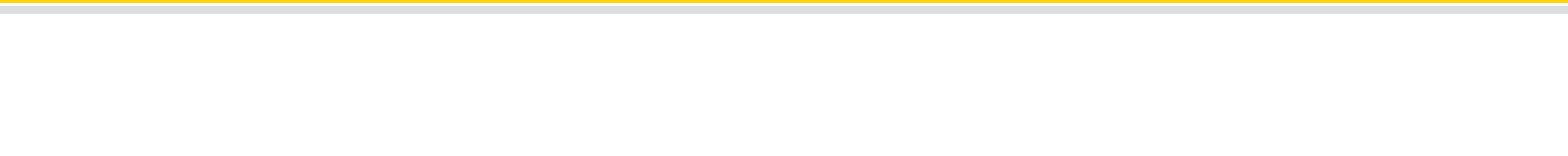
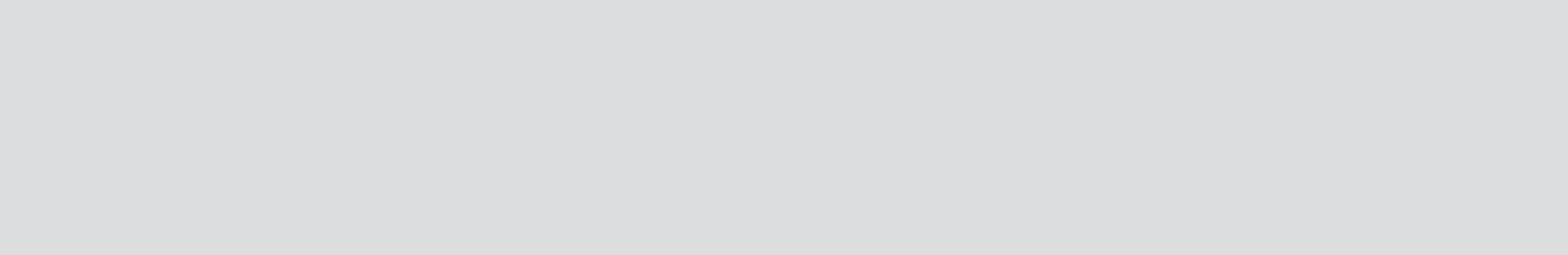
PROTEGO® Tank Accessories and Special Equipment



Volume 8



for safety and environment



Tanks in tank farms and large vessels not only need to be equipped with flame arresters or pressure and vacuum valves but; in addition they need special equipment, which similar meets high requirements to operate safely.

Special Valves with Safety Functions

For emergency shut-off or for extraordinary operating conditions it is necessary to provide **internal safety valves** so that product leakage can be prevented quickly after a pipe burst. **Change-over valves** facilitate trouble-free valve maintenance.

Gauging and Sampling Equipment

Gauge and sampling hatches allow the use of **gauging and sampling devices** in the tank. For horizontal tanks deflagration proof gauging pipes are available.

For sampling and local venting in tanks that store flammable liquids PROTEGO® has designed special sampling and air bleed valves with flame arrester elements.

Explosion-proof floor drains for heliports pass flammable liquids (such as Kerosene) into catch tanks and prevent ignition inside. If an outside ignition source ignites the explosive atmosphere there is no flame transmission.

Floating Suction Units and Skimming Systems

Floating Suction Units PROTEGO® SA/S are designed to ensure that product in a storage tank is drawn off just below the surface of the liquid where it is cleanest.

Fixed roof tanks that store liquids with different density, so-called slop tanks, are fitted with the Float-Operated Skimming System PROTEGO® SA/DA for separating the phases.

Together with the tank operator or tank contractor we develop the best way to ensure both economical and safe operation.

Floating Roof Tank Equipment

For floating roof tanks the **drainage system for the floating roof** must be designed very precisely. Every movement of the floating roof must be taken into account and the load on the joints must not affect the free moving space. In case of restricted movement the system will crack, the pipes will bend and the joints will be stuck. In order to prevent the water in the system from standing and freezing, ensure sufficient drain to the lateral tank nozzle. Many years of experience are incorporated in the supplied systems that work without disruptions – starting from the **roof drain valves** to the systems with ball bearing joints or metal hose joints. With lowered floating roofs in maintenance positions the completely drained space below the floating roof must be vented through a **lift-actuated vent valve**. When storing flammable liquids in the tank venting is to be done through flame arresters.

Special Equipment

Hygroscopic products must be vented with dry air when stored. **Air-drying devices** with drying pearls prevent the air from saturating with humidity.





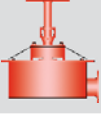



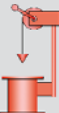

A special safety device is the **hydraulic flame arrester**. It is a collection device for large volume flows in pipelines collecting exhaust air from various plant areas, and it also functions as a backflow prevention device as it prevents the exchange of vapours. With extremely low pressure losses thanks to its relatively large drill holes in the sparge pipes the hydraulic flame arrester is insusceptible to clogging and therefore provides high plant availability. It can be used as flame arrester with substances of all explosion groups and provides protection against all types of combustion. The hydraulic flame arrester has to be monitored and controlled by instrumentation. Early involvement of our engineers in plant design is necessary to make the right selection.



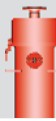


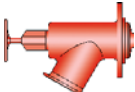

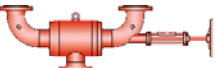
Selection

The special valves, systems and devices are designed together with the operator, engineering company and tank contractor. PROTEGO® prepares a quotation based on the detailed system specifications.



PROTEGO® Tank Accessories and Special Equipment

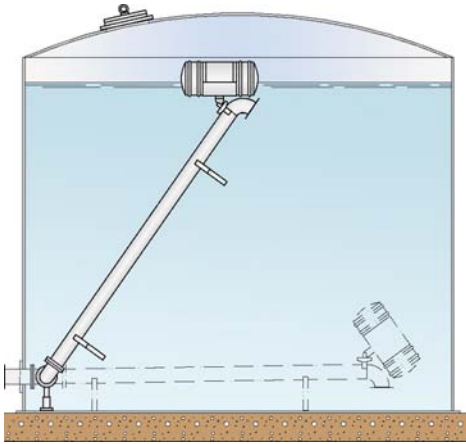
	Type	Size	Description	Page
Floating Suction Unit				
	SA/S		Floating Suction Unit	386 - 387
	SA/DA		Floating Skimmer System	388 - 389
Floating Roof Tank Equipment				
	SE/K	80 - 100 3" - 4"	Floating Roof Drainage System with Metal Hose Joint	390 - 391
	SE/CK	80 - 150 3" - 6"	Floating Roof Drainage System with Swivel Joints	392 - 393
	D/SR D/SR-W	80 - 150 3" - 6"	Roof Drain Valves	394 - 395
	AL/DK AL 200	200 8"	Vent Valve, Lift-actuated	396 - 398
Gauging and Sampling Equipment				
	PF/K PF/TK PS/KF	100 - 200 4" - 8"	Gauge Hatch with flange	400 - 401
	PS/K PS/TK	100 - 200 4" - 8"	Gauge Hatch with welded nozzle	402 - 403
	PU-IIA	25 - 50 1" - 2"	Gauging Pipe, deflagration proof	www.protego.com
	PR/0	25 - 150 1" - 6"	Gauging and Sampling Pipe, verifiable	www.protego.com
	VP/HK with PS/E und PG/H	100 - 150 4" - 6"	Gauging and Sampling Device with accessories	www.protego.com
	VP/G-II-100 PG/H	100 4"	Sampling Device with accessories	www.protego.com

	Type	Size	Description	Page
Deflagration proof Special Valves				
	ZE/WU	15 - 25 G½" - G1"	Sampling and Air Bleed Valve, deflagration proof	404 - 405
	ZE/TK	15 - 25 G½" - G1"	Condensate Drain Valve, deflagration proof	406 - 407
Air-Drying Devices				
	LA	50 - 150 2" - 6"	Air-Drying Device	www.protego.com
	LA/V	50 - 150 2" - 6"	Air-Drying Device with Check Valve	www.protego.com
Special Safety Valves				
	NB/AP	150 - 200 6" - 8"	Fast Action Bottom Drain Valve with pneumatic actuator	408 - 409
	SI/F	50 - 200 2" - 8"	Internal Safety Valve	410 - 411
	SI/DP	150 - 300 6" - 12"	Internal Safety Valve	412 - 413
	WV/T	80 - 250 3" - 10"	Change-Over Valve	414 - 415

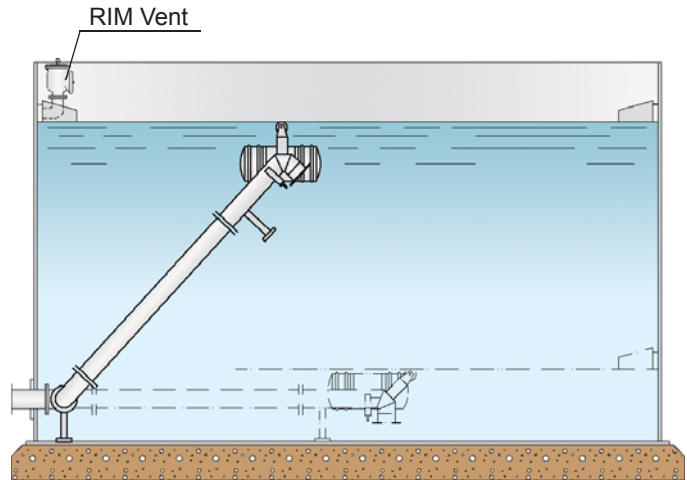


Floating Suction Unit

PROTEGO® SA/S



PROTEGO® SA/S for fixed roof tanks



PROTEGO® SA/S for floating roof tanks

Function and Description

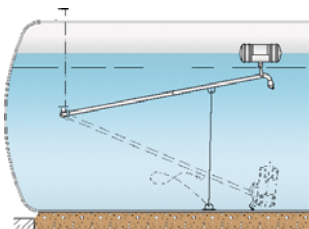
PROTEGO® Floating Suction Units - FSU - are designed to ensure that product in a storage tank is drawn off just below the surface of the liquid where it is cleanest, preventing the suction point being at the bottom of the tank where water and residuals will settle down.

Design Types and Specifications

PROTEGO® Floating Suction Units are designed and sized to suit the individual tank specifications and customer requirements.

PROTEGO® Floating Suction Units are designed for a long life in service. We use carbon steel or stainless steel for highly loaded components or aggressive media.

Solutions are available from 1" to 36" for horizontal or vertical tanks with fixed or floating roofs. Custom designs for unusual stored products are available.



PROTEGO® SA/S for horizontal tanks

Selection and Design

PROTEGO® Floating Suction Units offer experienced technology for a complete solution for the end-user. This includes easy installation and assembly and full documentation with an arrangement drawing showing the FSU placed in the tank with regards to all internals.

Essential for the design of the PROTEGO® Floating Suction Unit is the Heavy Duty Swivel Joint which fulfils the requirement for an in-service installation to avoid high costs of repairs and to extend the tank maintenance to the planned interval.

The Swivel Joint comes with/in

- a sturdy design made of carbon or stainless steel
- maintenance-free greased for a life-time with aviation approved grease
- large sized ball bearings with two races to cover all side-flow forces during operation.

PROTEGO® Floating Suction Units have an intake designed to avoid any forming of vortex. The intake is able to release trapped air.

Floats are all made of stainless steel and are 100 % pressure tested.

Options upon request:

- Sampling pipes
- Function indicator
- Stress calculation due to liquid movement
- On-site support

PROTEGO® Floating Suction Units are „Made in Germany“ and will provide many years of trouble free tank operation.

*Project:
Location:
Client:
*Enduser:
*Engineering:

Tank Main Details

*Fixed roof tank <input type="checkbox"/>	*Fixed roof tank with internal floating roof <input type="checkbox"/>	
*Floating roof tank <input type="checkbox"/>		
*Horizontal tank <input type="checkbox"/>		
Tank-No.:	*Tank height: mm	*Tank diameter: mm
*Maximum filling height: mm		
*Material request of floating suction unit:		

Product details

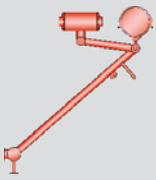
*Stored product:	
*Product specific gravity:	
Maximum product temperature: °C	

Tank details

*Suction line size: DN		
*Shell nozzle centreline height / inwards projection:	mm	
*Manhole size: DN		
Bottom slope: <input type="checkbox"/>	Slope direction:	
*Are there any obstructions? (columns, heating coils,...) <input type="checkbox"/>	if <input type="checkbox"/> - please specify	
*Tank drawing / sketch? <input type="checkbox"/>	if <input type="checkbox"/> - specify request	

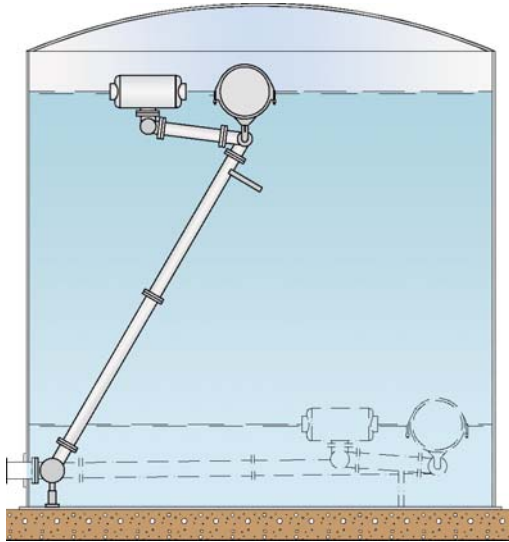
* This information must be indicated on request!
Fill in and tick off, if applicable.



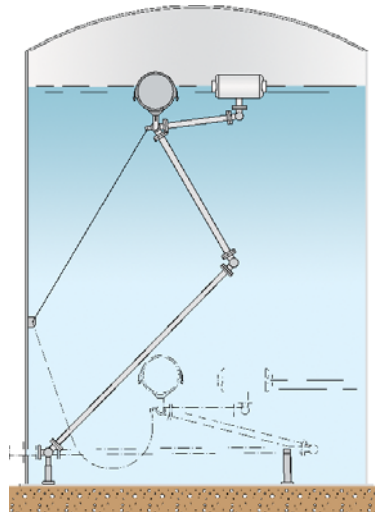


Floating Skimmer System

PROTEGO® SA/DA



PROTEGO® SA/DA for fixed roof tanks



PROTEGO® SA/DA with double-bend for fixed roof tanks

Function and Description

Fixed roof tanks that store liquids with different density these so-called slop tanks are fitted with the Floating Skimmer System PROTEGO® SA/DA for separating the phases. The design of the skimmer results from different densities. They are developed to draw off the product with lower specific weight from the surface of the stored medium.

Design Types and Specifications

PROTEGO® SA/DA Floating Skimmer Systems are designed and sized to suit the individual tank specifications and the stored medium as well as customer requirements.

PROTEGO® SA/DA Floating Skimmer Systems are designed for a long life in service in complete medium contact.

We use carbon steel or stainless steel for highly loaded components or aggressive media.

Solutions are available from 2" to 6" for tanks with fixed roofs.

Selection and Design

PROTEGO® Floating Skimmer Systems offer experienced technology for a complete solution for the end-user. This includes easy installation and assembly of the system in the tank and full documentation with an arrangement drawing showing the Floating Skimmer System placed in the tank with regards to all internals.

Essential for the design of the PROTEGO® Floating Skimmer Systems is the Heavy Duty Swivel Joint which fulfils the requirement for an in-service installation to avoid high costs of repairs and to extend the tank maintenance to the planned interval.

The Swivel Joint comes with/in

- a sturdy design made of carbon or stainless steel
- maintenance-free greased for a life-time with aviation approved grease
- large sized ball bearings with two races to cover all side-flow forces during operation.

PROTEGO® Floating Skimmer Systems SA/DA are fitted with a separate skimming float that is just responsible for separating the different phases. The weight of the complete system is floated by one or more floats.

Floats are always made of stainless steel and are 100 % pressure tested.

PROTEGO® Floating Skimmer Systems are „Made in Germany“ and will provide many years of trouble free tank operation.

*Project:
Location:
Client:
*Enduser:
*Engineering:

Tank Main Details

*Fixed roof tank	<input type="checkbox"/>	
Tank No.:	*Tank height: :	mm *Tank diameter: mm
*Maximum filling height:	mm	
*Material request of Skimming Systems:		

Product Details

*Stored liquid:	Specific gravity:
*Sucked in liquid:	Specific gravity:
Maximum product temperature:	°C

Tank Details

*Skimming System size: DN	
*Shell nozzle centreline height / inwards projection	mm
*Manhole size: DN	
Bottom slope:	<input type="checkbox"/> Slope direction:
*Are there any obstructions? (columns, heating coils,...)	<input type="checkbox"/> if <input type="checkbox"/> - please specify
*Tank drawing / sketch	<input type="checkbox"/> if <input type="checkbox"/> - specify request

* This information must be indicated on request!
Fill in and tick off, if applicable.

