a presentation on .... All Products

Tank Cleaning Equipment, CIP Systems Tank Management, Level Gauging, VECS High Level Alarms, Engineering, Vessel Security, Tank Venting, Biological Detection

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TCT
Tank Cleaning Technologies

...an orbijet company

Complete Industrial and Marine
Clean in Place
(CIP) System Designs

Orbijet Cleans the World

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orbijet.com

Tank Cleaning Technology
for Industrial & Marine

15200 Middlebrook Drive; Suite E
Houston, Texas 77058 - USA

Phone: **281.218.9400** | Fax: 713.513.5884

sales@orbijet.com

www.orbijet.com

CIP Cleaning in Place

Tank Cleaning Systems

orbijet

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COMPLETE CLEAN IN PLACE (CIP) SYSTEM DESIGNS

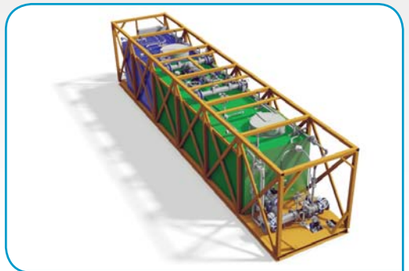
CIP Cleaning in Place | Tank Cleaning Systems

1 PUMP & CONTROL SKIDS

Our skid mounted and loose component CIP Systems for Industrial and Marine industries are built for...

- Offshore Drilling Rigs
- Platform Supply Vessels
- Road and Rail Tankers
- Paper and Pulp
- Chemical Processing
- Paints and Coatings
- ... and more

2 TANK SKIDS



Orbijet produces various types of tank skids in support and as part of our CIP System design. Tanks skids typically range in capacity from 50 gallons (189 liters) to 10,000 gallons (38 m³) and are constructed in carbon steel and/or stainless steel. Full support frame are available and with type approvals where necessary.

3 PORTABLE CIP

Orbijet produces Portable CIP Systems that are easy to move about with a forklift or crane. Electric or diesel powered systems.

4 FILTRATION SKIDS

Our filtration methodologies range from a simple strainer to that of advanced hydrocyclone/shaker technology where high solids are expected... to that of advanced weir tank designs... to that of decanter centrifuge. Whatever the filtration challenge for the CIP System may exist... Orbijet will have the solution.

ENGINEERING

Orbijet, Inc. offers detailed engineering support in terms of 3D AutoCAD analysis so as to avoid unexpected shadow areas in the tank to be cleaned. We offer on site startup/commissioning services and training.

TANK CLEANING SYSTEMS

Our systems routinely include the pumping and control skid; inclusive of tanks where needed. Solids separation systems where required. Validation methodology for cleaning verification. Control methodology can be manual or fully automated with data highway to master control rooms and more. In tank cleaning devices are specifically chosen for the best efficiency available.

CHEMISTRIES

Orbijet, Inc. produces chemistries that are highly effective against hydrocarbon based tank soilage. Our microemulsion chemistries will render the tank water-white whilst also remediating slops and separating oil from water and reducing oil on solids to less and 5%. Our solvent cleaners can remove paraffins and asphaltenes without heat.

INDUSTRIES SERVED

Transportation • Offshore Drilling • Land Based Drilling • Paint and Coatings
Paper and Pulp • Road and Rail Tankers • Contractors • Chemical Processing
Ships • Oil Refineries • Plastic Manufacturers • Storage Terminals • Tank Farms
Crude Oil Washing • Crude Oil Storage Tanks • Ethanol Fermenters • ...& more

Let Orbijet make your tank cleaning process easier...

+

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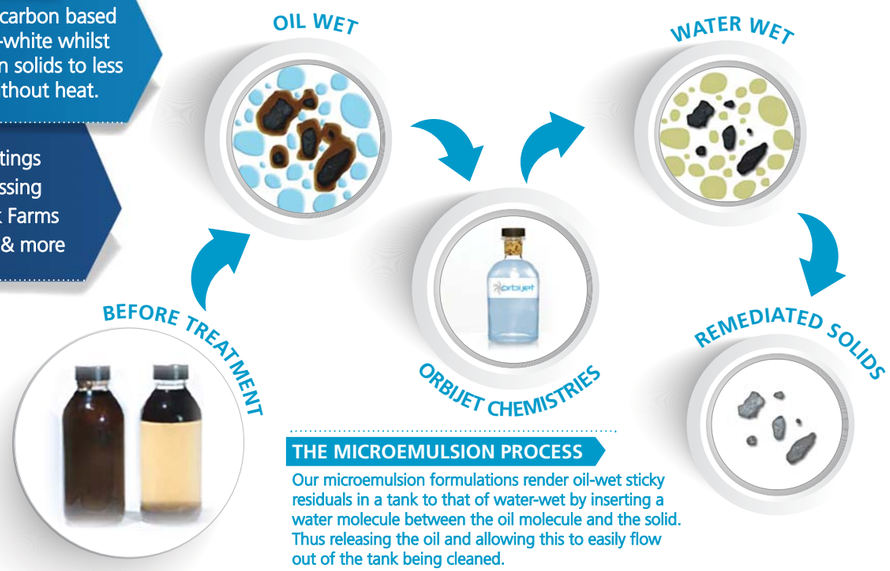
- Reduce cost
- Improve efficiency
- Clean faster
- Improve safety

When cleaning oil-based products/residuals



TURN OIL-WET TO WATER WET

Our patented Orbijet Chemistries take oil wet solids to water wet making the cleaning process for Hydrocarbon residual an easy task. The ability of the Orbijet chemistries to split the water/oil/solids phase also makes the recovery of oil and disposal process highly efficient.

THE MICROEMULSION PROCESS

Our microemulsion formulations render oil-wet sticky residuals in a tank to that of water-wet by inserting a water molecule between the oil molecule and the solid. Thus releasing the oil and allowing this to easily flow out of the tank being cleaned.

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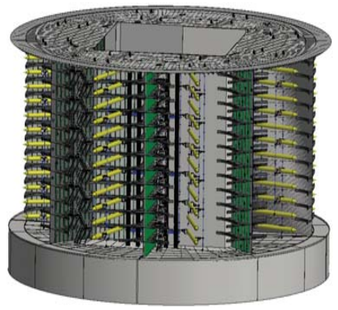


SPAR Drilling Rig Oil Tank Storage

ENGINEERING

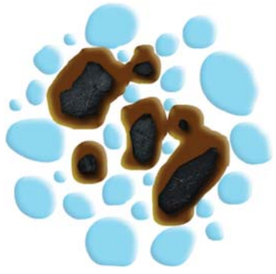
Orbijet, Inc. offers detailed engineering support in terms of 3D AutoCAD analysis so as to avoid unexpected shadow areas in the tank to be cleaned. We offer on site startup/commissioning services and training.

TANK CLEANING SYSTEMS

System design for your application that include solids separation equipment and process along with remediation of oil waste is a daily part of what we do at Orbijet, Inc. Our Systems in many cases can allow the operator to discharge the remediated solids on the ground around the drilling rig or overboard into the sea. Recover the oil and reduce waste generation by 50% or more.

MICRO-EMULSION

Our microemulsion technology offers patented technology for the cleaning of oil based mud, synthetic muds, and water based muds. These chemistries reduce and remediate the cleaning fluids and solids in the cleaning process by over 50% and in some cases greater than 75% compared to other methods.



STEP 1

STEP 2

STEP 3

TURN OIL-WET TO WATER WET

Our patented MicroEmulsion Chemistries take oil wet solids to water wet making the cleaning process for mud pits an easy task. The ability of the MicroEmulsion chemistries to split the water/oil/solids phase also makes the recovery of oil and disposal process highly efficient.

WELLBORE CLEANUP

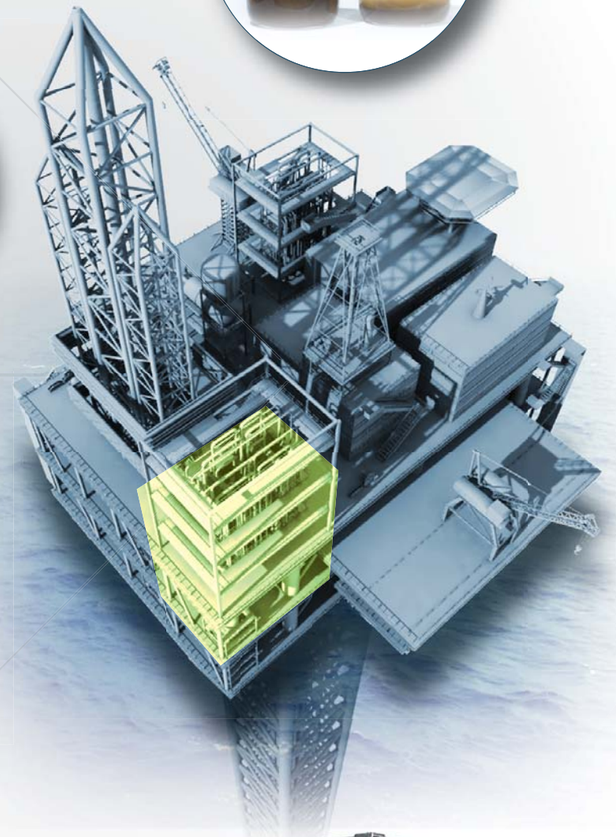
Our microemulsion solutions also greatly improve the wellbore cleanup process and help our clients reduce cost whilst improving efficiency

MUD PIT SPLIT

Most cleaning solutions form a tight emulsion that must be wholly disposed of. Our Micro-Emulsion Chemistry allows for a three part split with Oil on top for recovery, Aqueous and Solids Phase for discharge overboard. Retorts have shown less than 2% hydrocarbons on solids or less.

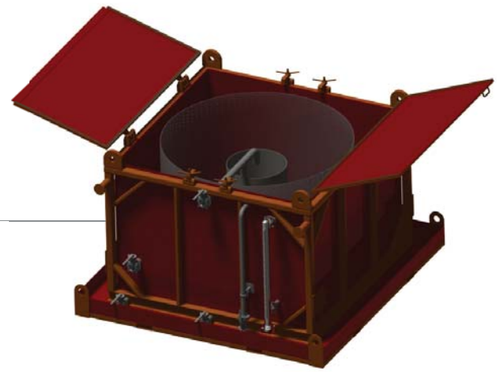
WELLBORE SPLIT

Our microemulsion technology greatly improves the wellbore split of hydrocarbons and water, thus highly reducing associated cost with the disposal of unwanted waste steams.



PSV SOLIDS SEPARATION SYSTEMS

Our patent pending solids separation system designed for PSV use allows for removal of all solids from the cleaning process minimizes effluent.



COMPLETE OFFSHORE/ONSHORE AND PSV/OSV CLEAN IN PLACE (CIP) SYSTEM DESIGNS

Our skid mounted and loose component CIP Systems for the Offshore Drilling Market are compact and powerful... skid mounted systems are complete with heavy lift certified frame, filtration, chemical injection, and over 250 PSI pressure capacity for cleaning multiple tanks via our automatic cleaning machines. Designs for Platform Supply Vessels can be loose components or skid mounted. Custom designs are available via our engineering group.

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Chemistries

for Industrial and Marine

www.orbijet.com

GENERAL PRODUCT USERS GUIDE

PRODUCT NAME	DRILLING MUDS (Oil-Based)	LIGHT OILS	FUEL OIL	CRUDE OIL	TANK BOTTOMS	ASPHALT AND HEAVY HYDROCARBONS	LIGHT SLOPS	HEAVY OIL SLOPS	PRODUCT TYPE	DILUTE WITH...
	Product To Clean									
ORB101SC	*	*	*	*	*	*	0.1%-0.5%	0.1%-0.5%	Water Based MicroEmulsion	Fresh Water (Best) Sea Water
ORB102C	2%-5%	2%-5%	*	*	*	*	*	*	Water Based MicroEmulsion	Sea Water (Best) Fresh Water
ORB102SC	0.5%-5%	0.5%-5%	*	*	*	*	*	*	Water Based MicroEmulsion	Sea Water (Best) Fresh Water
ORB102D	0% Ready To Use	0% Ready To Use	0% Ready To Use	*	*	*	0% Ready To Use	0% Ready To Use	Water Based MicroEmulsion	Nothing Ready To Use
ORB116B	1%-15%	1%-15%	*	*	*	*	*	*	Water Based MicroEmulsion	Sea Water
ORB116SC	1%-15%	1%-15%	*	*	*	*	*	*	Water Based MicroEmulsion	Sea Water
ORB135SC	1%-10%	1%-10%	5%-10%	5%-15%	5%-15%	*	0.1%-2%	0.5%-5%	Water Based MicroEmulsion	Fresh Water
ORB156SC	1%-10%	1%-10%	5%-10%	5%-15%	1%-15%	5%-20%	0.1%-2%	0.5%-2%	Water Based MicroEmulsion	Sea Water Fresh Water
ORB2000C	*	*	*	3%-10% Paraffin Dispersant	3%-10% Paraffin Dispersant	*	*	3%-10%	Solvent Based	Diesel, Toluene Xylene, Naphtha
ORB2100C	*	*	*	*	*	3%-10% Asphaltine Dispersant	*	*	Solvent Based	Diesel, Toluene Xylene, Naphtha
ORB2200C	*	1%-10%	1%-10%	*	*	*	1%-10%	*	Water Based	Fresh Water
ORB2300C	*	*	*	0% Ready To Use	0% Ready To Use	*	*	*	Solvent Based	Nothing Ready To Use
ORB3000SC	This product is a 50% caustic soda additive to enhance the cleaning power of caustic soda. Dosage is based on water hardness. See your Orbijet Sales Engineer for details and site visit to determine dosage rates. Caustic Soda usage can be reduced by 50% or more with this product.								Additive for Caustic Soda	Water and Caustic Soda

LEGEND: * = NOT TESTED FOR THESE PRODUCTS

This is a guide only with generic percentages recommended based on past performances. For a detailed lab analysis on your particular cleaning and/or treatment requirement, contact our engineering group at **eng@orbijet.com** and arrange for an assay on your cleaning requirement.

Drill Cuttings

BEFORE | AFTER

Cleaning Slops

BEFORE | AFTER

Tank Cleaning

BEFORE | AFTER

GENERAL PRODUCT SUMMARY

PRODUCT NAME	DESCRIPTION AND PURPOSE
ORB101SC	**ORB101SC** is a waterbased microemulsion chemistry for use primarily to recover oil from hydrocarbon laden slop wastes by either gravity or the use of a centrifuge. • This is a super concentrated chemistry for dilution in Sea-Water or Fresh-Water with equal performance
ORB102C	**ORB102C** is a waterbased microemulsion chemistry for use in the removal of hydrocarbon residuals whilst not forming a tight emulsion that would be more costly to dispose of. Solids and surfaces are taken from oil wet to water wet thus gas-freeing/water-whiteing the tank that is being cleaned. Oil/water separation is fully achieved on the tank cleaning slops. Typical recirculation solutions can be reused several times before spent thus reducing the running cost of this chemistry. • This is a concentrated chemistry designed for dilution in Sea-Water (primary) and Fresh-Water (secondary) • Certification by CEFAS
ORB102SC	**ORB102SC** is the same as **ORB102C** with the exception that it is a super concentrated formula allowing for this chemistry to be diluted at a lower portion of **ORB102SC** to the recommended dilutant. • This is a super concentrated chemistry for dilution in Sea-Water (primary) and Fresh-Water (secondary) • Certiication by CEFAS
ORB102D	**ORB102D** is a Ready-To-Use microemulsion degreaser for use in hand sprayers and/or tank cleaning systems. This type of product is typically called a Rig Wash and is commonly used to degrease oil ladened surfaces found on drilling rigs or in refineries.
ORB116B	**ORB116B** is a concentrated microemulsion forming surfactant system. The product has been specifically designed to microemulsify (solubilise) base oils into water. The product is soluble for dilution with Sea-Water. **ORB116B** provides a highly efficient and fully integrated chemical cleaning system offering a complete waste management solution to provide zero waste production at source. • This is a concentrated chemistry for dilution in Sea-Water or Fres-Water. • Can reduce oil on solids to below 1% weight oil on dry solids • Certification by CEFAS
ORB116SC	**ORB116SC** is a super concentrate microemulsion forming surfactant system. The product has been specifically designed to microemulsify (solubilise) base oils into water and vice versa. The product is soluble for dilution with Sea-Water. This product is similar to ORB116B but in a super concentrated form. • Certification by CEFAS • Hydrocarbon removal, treatment, and slurrification of drill cuttings, mud slops, and hydrcarbon wastes.
ORB135SC	**ORB135SC** is the same as ORB102SC except this formulation is formulated for use with Fresh-Water instead of Sea-Water. Highly effective in the cleaning and remediation of hydrocarbon residuals such as those found in crude oil storage tanks, mud pits, and other sludge type residuals that need to be cleaned in tanks for storage and transportation. • Certification by CEFAS
ORB156SC	**ORB156SC** is a highly effective hydrocarbon sludge treatment product. Effective on oil-refinery waste and heavy viscous tank bottoms. Separates oil from water and reduces hydrocarbons on solids to as much as 1% or less oil on solids. • For dilution with Fresh-Water
ORB2000C	**ORB2000C** is a paraffin dispersant for use in liquifying paraffin laden crude oils and/or heavy wastes without the use of heat. • For dilution with diesel fuel, toluene, xylene, and other aromatic hydrocarbons.
ORB2100C	**ORB2100C** is an asphaltene dispersant for use in liquifying asphalts, coal tar, and other heavily laden asphaltene hydrocarbons without the use of heat or reduced heat. • For dilution with diesel fuel, toluene, xylene, and other aromatic hydrocarbons.
ORB2200C	**ORB2200C** is a basic water-based degreaser used for the removal of hydrocarbons • For dilution with Fresh-Water.
ORB2300	**ORB2300** is a Ready-To-Use paraffin dispersant.
ORB3000SC	**ORB3000SC** is a water-based surfactant system that enhances the use of caustic soda so that the rinsing of Caustic Soda solutions is optimized and the caustic soda solution in itself is more effective. This is done in part by controlling the water hardness of the makeup water when using this product. Consult your Orbijet Sales Engineer.

* for detailed information and datasheets, go to our website at **www.orbijet.com**

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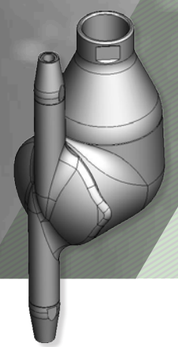
TCT® Tank Cleaning Technologies

A subsidiary of: orbijet®



Tank Cleaning Technology for

the Ethanol Industry

Tank Cleaning Machines

Tank Cleaning Technologies offers the state of the art tank cleaning machines and covers the full realm of technology that is available today. Whether your need and/or budget prefers to use conventional tank cleaning machines or upgrade to the state of the art external drive tank cleaning machines or perhaps single nozzle programmable cleaning technology.... we have it all.

A subsidiary of: orbijet®

Your Options...

SC40RT

The **SC40RT** is the premier tank cleaning machine for the ethanol industry. Virtually Zero "0" maintenance for as much as 7 years. Highest solids handling capability of all tank cleaning machines.

- Drive type: External
- Pressure: 0-200 PSIG
- Flow: 0-300 USGPM
- Pattern time: 15-50 minutes
- Jet-Length: 0-72 feet radius >700mm WC

BIO25

The **BIO25** is a conventional tank cleaning machine for use in Ethanol operations where a hygienically designed tank cleaning machine is desired. It is only available in a 4 nozzle hub version.

- Drive type: Integrated turbine
- Pressure: 0-175 PSIG
- Flow: 0-250 USGPM
- Pattern time: 6-27 minutes
- Jet-Length: 0-48 feet radius > 300mm WC

BIO50 2N

The **BIO50 2N** is a conventional tank cleaning machines for use in Ethanol operations where a hygienically designed tank cleaning machine is desired and long jet-lengths with higher impact is required.

- Drive type: Integrated turbine
- Pressure: 0-175 PSIG
- Flow: 0-300 USGPM
- Pattern time: 6-28 minutes
- Jet-Length: 0-55 feet radius >400mm WC

ORB3000SC

ORB3000SC is an additive to caustic soda where caustic soda is used as the cleaning agent for cleaning process within Ethanol Plants. **ORB3000SC** highly improves caustic soda so that less is required and **ORB3000SC** controls water hardness thus allowing for greater cleaning.

- Reduce caustic soda use by 50% or more
- Control water hardness; thus improve cleaning
- Clean faster due to higher efficiencies and save money
- Improve equipment turnover time
- Increase production

SC15TW

The **SC15TW** is a conventional tank cleaning machines for use in Ethanol operations where a conventional tank cleaning machine is desired and hygienic designs are not required.

- Drive type: Integrated turbine
- Pressure: 0-200 PSIG
- Flow: 0-110 USGPM
- Pattern time: 6-28 minutes
- Jet-Length: 0-53 feet radius >300mm WC

SC45TW

The **SC45TW** is the big brother to the SC15TW. It is a conventional tank cleaning machine and produces longer jet-lengths and higher flows than the **SC15TW.**

- Drive type: Integrated Turbine
- Pressure: 0-200 PSIG
- Flow: 0-220 USGPM
- Pattern time: 6-28 minutes
- Jet-Length: 0-63 feet radius >300mm WC

SC30T

The **SC30T** is an external drive machine and is a single nozzle programmable cleaning system. Impact values and jet-lengths are the highest of all known tank cleaning machines. Pattern times for this machine are typically longer so as to allow for more jet dwell time.

- Drive type: External
- Pressure: 0-200 PSIG
- Flow: 0-300 USGPM
- Pattern time: 30-200 minutes
- Jet-Length: 0-100 feet radius > 700mm WC

Tank Cleaning Technologies (TCT) is a subsidiary of Orbijet, Inc. offers numerous types and styles of tank cleaning machines and those units show above represent only a portion of what we have to offer. Should you have any questions, please do not hesitate to contact us at _**+1 281.480.4041** and ask for the Sales Department.

Details on the machines listed here can be found on our website at **www.tankcleantech.com** where you will find
***Data Sheets **Videos **Drawings and ** Operations Manuals (on request)*

Ethanol_brochure_TCT_2016.06.01

CIP (Clean In Place) Optimization ...for your Tank Cleaning Needs

- **Never over rinse again**
- **Never under rinse again**
- **Reduce effluent waste by 50%**
- **Eliminate undetected bad tank cleans**

Tank Cleaning Technologies BioMass detection process can tell you in less than two minutes when your tank is clean after an optimization assay has been completed to establish your standards and requirements.

Let us show you in real time how!

Collect Rinse Sample

Test Sample

Validate against Assay Standard

Produce more Ethanol in less time and lower costs.

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www.orbijet.com

TCT®
Tank Cleaning Technologies

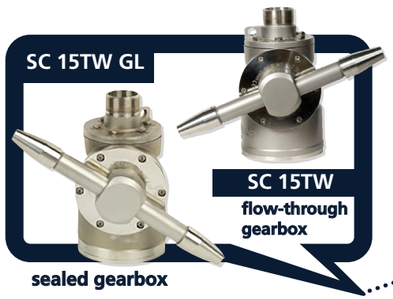
...an orbijet company

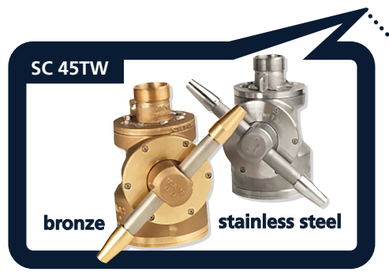
Tank Cleaning Technology for

Portable Deck Equipment

Portable Deck Equipment

Tank Cleaning Technologies offers the state of the art portable tank cleaning machines, gas freeing fans, deck covers, associated hoses, and spare parts for all Orbijet and Scanjet equipment.





Tank Cleaning Machines: SC 15TW

The turbine driven SC **15TW** is available in stainless steel. It is a light weight portable tank cleaning machine; weighing aproximately 21 pounds. The inlet connections of the machine is available in 1.5 inch NPT(M) and BSP(M). Gearbox designs are available in flow-through and sealed versions.

**See product datasheet for further details.*

- Portable Cleaning Machine
- 0-200 PSIG
- 0-110 USGPM
- 12-20 Minute Full Cycles
- Weight: 21 lbs.
- MOC: 316 SS & Bronze

Water Driven Gas Freeing Fan: SC F150W

The **SC F150W** Portable Water Driven Gas Freeing Fan is suitable for use on all sizes and types of vessels. The fan is designed as a High Performance, Deep Penetration Unit. Constructed from Stainless Steel and Aluminium it is lightweight and easily moved around the deck.

**See product datasheet for further details.*

- Portable Gas Freeing Fans
- Water Driven
- 0-175 PSIG Inlet Water Pressure
- 0-273 USGPM Water consumption
- 0-9000 ft3/min Displacement

Air Driven Gas Freeing Fans: SC F90A

The SC **F90A** is a Portable Air Driven Fan specifically designed for use on Chemical Carriers. It can also be used on all other types of vessels where air is preferable to water for operational reasons.

**See product datasheet for further details.*

- Portable Gas Freeing Fans
- Air Driven
- 0-100 PSIG Inlet Air Pressure
- 0-117 ft3/min Air consumption
- 0-5000 ft3/min Displacement

Service Kits

Tank Cleaning Technologies inventories and supplies all parts and provides service requirements on all Scanjet equipment. Service engineers and parts are typically dispatched in a few days.

**See product datasheet for further details.*

- Factory Direct Spare Parts for all Scanjet Made Equipment
- Inventoried in Houston, Texas - USA
- Fast Delivery
  - Stock: 1-2 day shipments
  - Out of Stock: 5-7 day shipments
- Service Engineers available for on-site surveys

Hoses

Hoses for tank cleaning machines and gas freeing fans are available in various lengths, styles, and coupling requirements.

**See product datasheet for further details.*

- Hose Assemblies and Couplings
- Tank Cleaning Hose for Portable Tank Cleaning Machines
- Hoses for Gas Freeing Fans
  - Air
  - Water

Hose Saddles

Hose saddles are available for your portable tank cleaning deck openings (butterworth openings) for use with 1.5 inch and 2 inch hose.

**See product datasheet for further details.*

- Portable Tank Cleaning Machine Openings
- Hose Saddles in 1.50" and 2.00"; Light Weight
- Deck Covers

Connections and Adapters

A variety of connections and adapters are available in stainless steel, aluminun, bronze, and other corrosion resistance materials.

**See product datasheet for further details.*

- Connections and Adapters
  - BSP, NPT, Storz, NST, and others
  - Hose connectors and menders
  - Bronze and Stainless Steel
  - Gaskets

Tank cleaning machines: SC 45TW

The turbine driven **SC 45TW** is available in stainless steel. It is a durable portable tank cleaning machine; weighing aproximately 31 pounds. The inlet connections of the machine is available in 2.0 inch NPT(M) and BSP(M), and 2.50 inch NST(M). Gearbox designs are available in a flow-through version only.

**See product datasheet for further details.*

- Portable Cleaning Machine
- 0-200 PSIG
- 0-215 USGPM
- 10-47 Minutes
- Weight: 31 lbs.
- MOC: 316SS & Bronze

Tripod Hoist

Portable hoist are available for the removal of fixed installed tank cleaning machines up to 6 meters (20 feet).

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Tank Cleaning Technology for

Sanitary Applications...

Orbijet_Sanitary_2016.04.24

Clean In Place Equipment and Systems

...sanitary applications

CIP Systems

Accessories...


Cart


Rotation


Installation Assemblies

Clean In Place Systems
Sanitary Design per FDA, USDA, cGMP, EEHEDG
MOC: 316SS; Surface Roughness to customer specification
Electropolishing available where needed
Basic Automation to Fully Automated with Remote and Touch Screen
Web page: http://orbijet.com/products/tank-cleaning-systems/

- Design specific to customer.
- Standard systems available
- Skid based construction
- Easy site installation
- Startup and commissioning
- On-site training

Bio 10

Rotating Jet-Head Technology - Integrated Turbine
High Impact Tank Cleaning Machine
Patented Self-Washing Features
Small to Medium Size Tanks
**See product datasheet for further details.*
Web page: http://tankcleantech.com/tank-cleaning-machines/

- Pressure Range: 0-175 PSIG
- Flow Range: 0-80 USGPM
- Max Amb. Temp: 140°C
- Max Temp Working: 95°
- MOC: 316SS and PEEK
- Steam: Yes, low pressure

Bio 20

Rotating Jet-Head Technology - External Drive Turbine
High Impact Tank Cleaning Machine
Patented Self-Washing Features
Small to Medium Size Tanks
**See product datasheet for further details.*
Web page: http://tankcleantech.com/tank-cleaning-machines/

- Pressure Range: 0-175 PSIG
- Flow Range: 0-80 USGPM
- Max Amb. Temp: 140°C
- Max Temp Working: 95°
- MOC: 316SS and PEEK
- Steam: Yes, low pressure

Bio 25

Rotating Jet-Head Technology - Integrated Turbine
High Impact Tank Cleaning Machine
Patented Self-Washing Features
Medium to Large Size Tanks
**See product datasheet for further details.*
Web page: http://tankcleantech.com/tank-cleaning-machines/

- Pressure Range: 0-175 PSIG
- Flow Range: 0-200 USGPM
- Max Amb. Temp: 140°C
- Max Temp Working: 95°
- MOC: 316SS and PEEK
- Steam: Yes, low pressure

Bio 50

Rotating Jet-Head Technology - Integrated Turbine
High Impact Tank Cleaning Machine
Self-Washing Features
Medium to Very Large Size Tanks
**See product datasheet for further details.*
Web page: http://tankcleantech.com/tank-cleaning-machines/

- Pressure Range: 0-300 PSIG
- Flow Range: 0-432 USGPM
- Max Amb. Temp: 140°C
- Max Temp Working: 95°
- MOC: 316SS and PEEK
- Steam: Yes, low pressure

CIP Optimization

CIP Optimization
Minimize Pre and Post Rinse Cycles
Validate cleaning in less than one minute
**See product datasheet for further details.*
Web page: http://tankcleantech.com/cleaning-validation/

- Uses ATP Method
- Cleaning values related in Relative Light Units (RLU)
- Measures total residual biomass
- Measures both alive and dead bio organisms
- Optimizes total CIP Recipe

Chemistries

Enhancement Chemistries for Caustic Soda
Controls water hardness
Reduces Caustic Soda Consumption
Improved Cleaning
**See product datasheet for further details.*

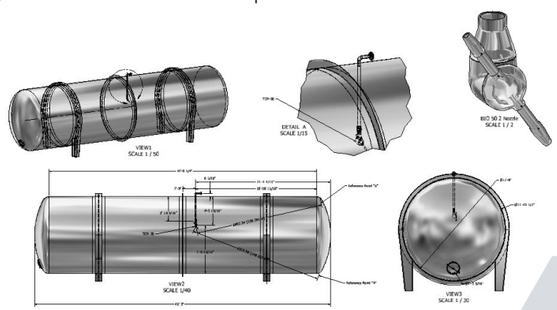
- Scientific Approach
- Additive to Caustic Soda
- Reduces annual cleaning costs
- Reduces rinse time
- Improves water conservation
- Reduces set point on Caustic %

Bio 2, 5, 7

Rotating Spray Head Technology
Low Impact Tank Cleaning Machines
Self-Washing Features
Small to Medium Size Tanks
**See product datasheet for further details.*
Web page: http://tankcleantech.com/tank-cleaning-machines/

- Pressure Range: 0-50 PSIG
- Flow Range: 0-150 USGPM
- Max Amb. Temp: 140°C
- Max Temp Working: 95°
- MOC: 316SS and PEEK
- Steam: Yes, low pressure

Installation Drawings detailing
- Cleaning installation locations
- Pressures and Flows
- Recipes
- Shadowing
- Pattern Density
- Jet Peripheral Velocities
- Impact Values



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Orbijet Cleans the World

Orbijet, Inc.
15200 Middlebrook Drive, Suite E
Houston, Texas 77058
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Phone: 281.218.9400
Fax: 713.513.5884
Email: info@orbijet.com

www.orbijet.com

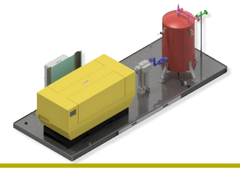
Railcar Tank Cleaning Systems

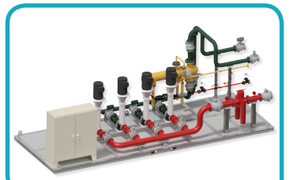
Railcar | Tank Cleaning Systems

Orbijet is an advanced designer and fabricator of CIP (Clean In Place) Systems for Transportation, Process, and Storage. Our system designs are used by Railcar Repair Facilities, Railcar Cleaning Facilities, Over-The-Road Truck Tankers, Crude Oil Storage Tanks, Ships, Platform Supply Vessels, Food, Beverage, Pharmaceutical, Biotech, Paints and Coatings, and more...

1 Air supply for the CIP System can be incorporated in our design or supplied as part of the Orbijet Scope. Systems are available powered by electricity or diesel engine.

1 AIR COMPRESSOR SKID



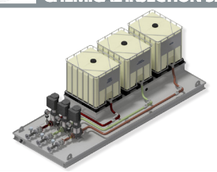


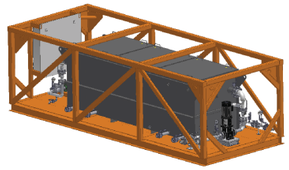
2 CIP PUMP SKID

2 The CIP Pump Skid is the heart and brains of the system. Supply flow, pressure, temperature, and logistics to the cleaning design along with cleaning recipes for your cleaning needs are controlled by this module.

3 Chemistries are required for many of the cleaning requirements when cleaning railcars. Our Chemistry skid can carry up to 3 different chemistries; with additions for more if needed.

3 CHEMICAL INJECTION SKID



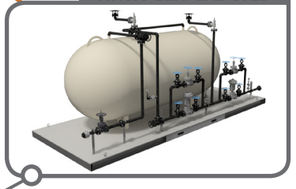


4 OIL WATER SEPARATIONS SKID

4 Our oil/water separator technology has a good fit when you are cleaning hydrocarbon and you want to polish the captured water and remove any and all oils from that waste stream.

5 Not all railcar cleaning applications will required an inert gas blanket in the tank being cleaned. But if and when that is a part of your safety protocols we have the experience.

5 NITROGEN GAS SKID

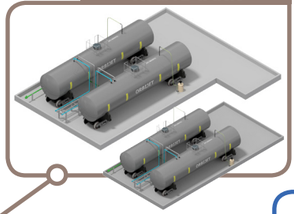


6 VAPOR RECOVERY

6 Vapor recovery created by the cleaning fumes can be a simple as diverting the exhaust to a charcoal cannister or via a scrubber or flare stack. We have the experience on all.

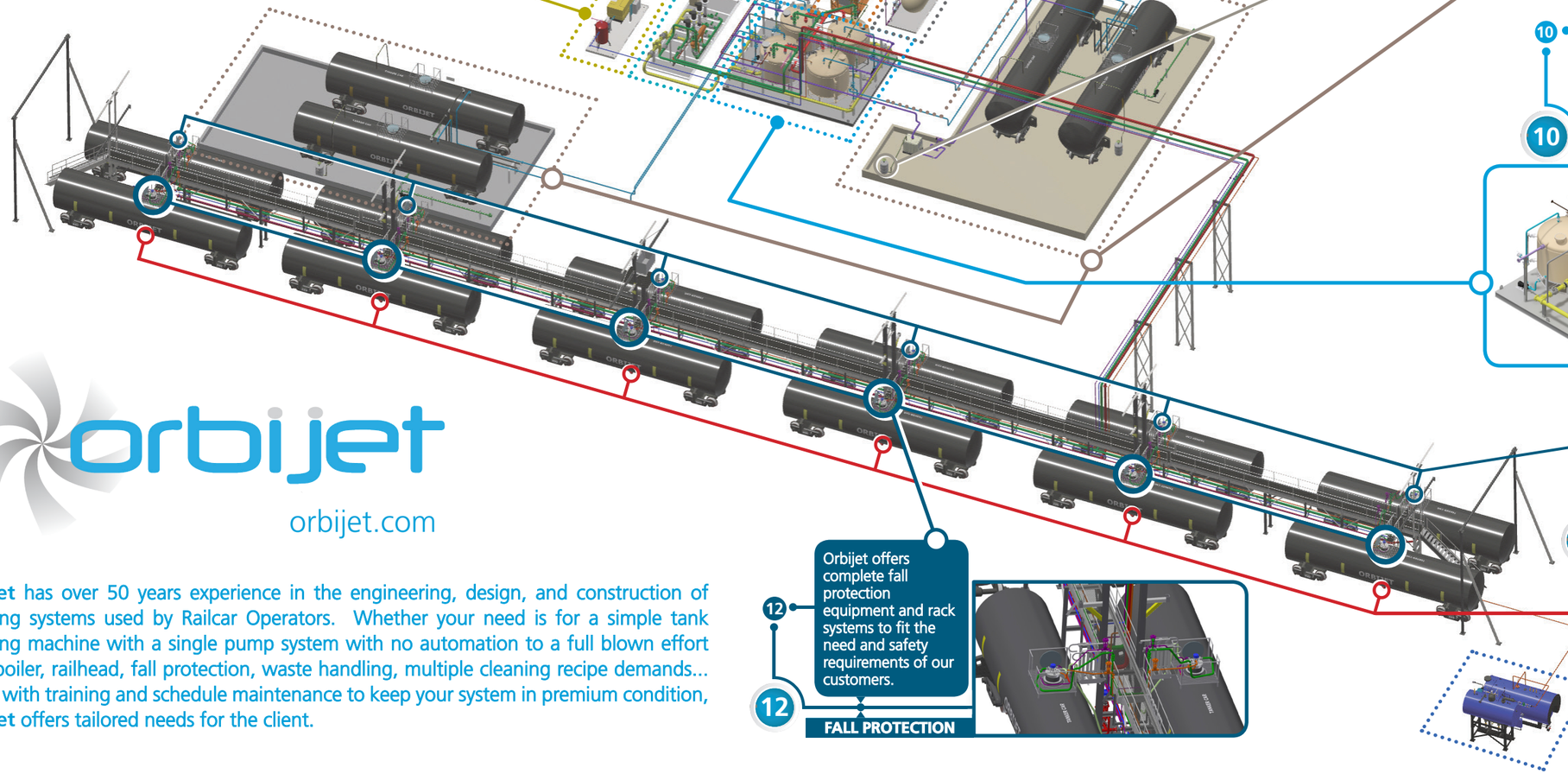
7 Waste holding tanks are must for any operation as slops will be generated during the cleaning process. Utilization of existing out-of-service railcars can be use or new tankage considered.

7 WASTE TANK



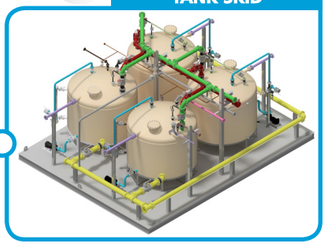
8 RETURN SKID

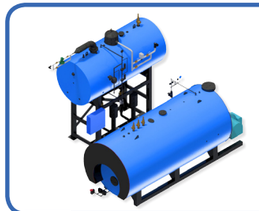
8 The return skid for this system utilizes simple double diaphragm pumps sized to insure that the cleaning in-flows to not allow puddling. Controls can be local or remote depending on the level of automation wanted by the client.



10 Our tank skids are designed to accommodate multiple requirements or just a simple one-tank system if that is all that is needed. This design uses 4 tanks for rinse water and chemistries.

10 TANK SKID





BOILER SKID

9 Boilers are sized and installed based on detailed calculations. Typical supply is the boiler plus water package. Steam supply is used by the heat exchanger on the pump skid and to steam tanks where prudent.

11 Our manway assemblies are designed to accommodate a tank cleaning machine, inert gas purge, steam, and vapor recovery all in one package.

11 MANWAY ASSEMBLY

12 Orbijet offers complete fall protection equipment and rack systems to fit the need and safety requirements of our customers.

12 FALL PROTECTION

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orbijet.com

Orbijet has over 50 years experience in the engineering, design, and construction of cleaning systems used by Railcar Operators. Whether your need is for a simple tank cleaning machine with a single pump system with no automation to a full blown effort with boiler, railhead, fall protection, waste handling, multiple cleaning recipe demands... along with training and schedule maintenance to keep your system in premium condition, **Orbijet** offers tailored needs for the client.

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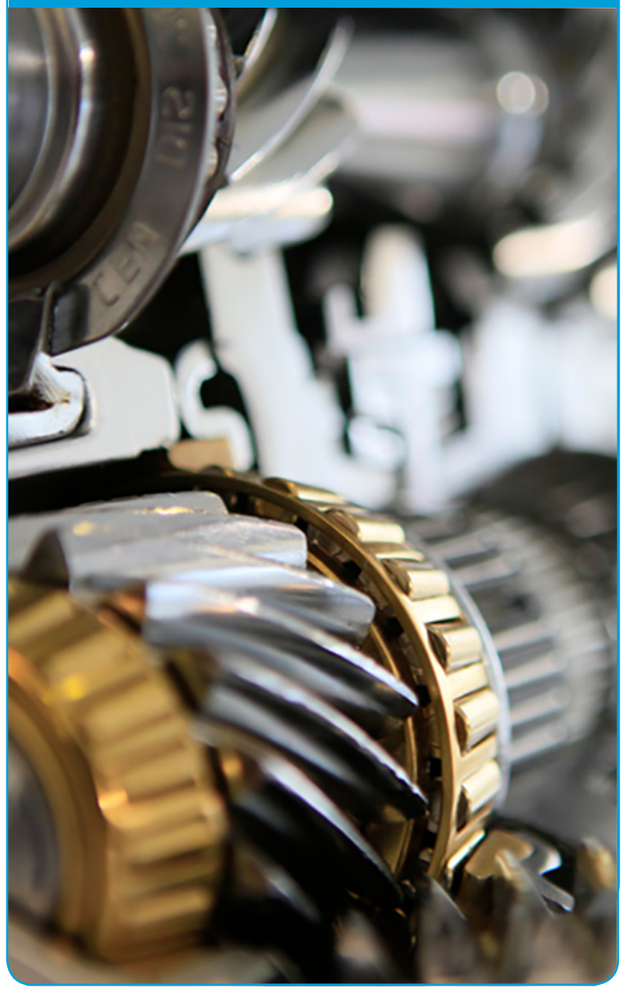
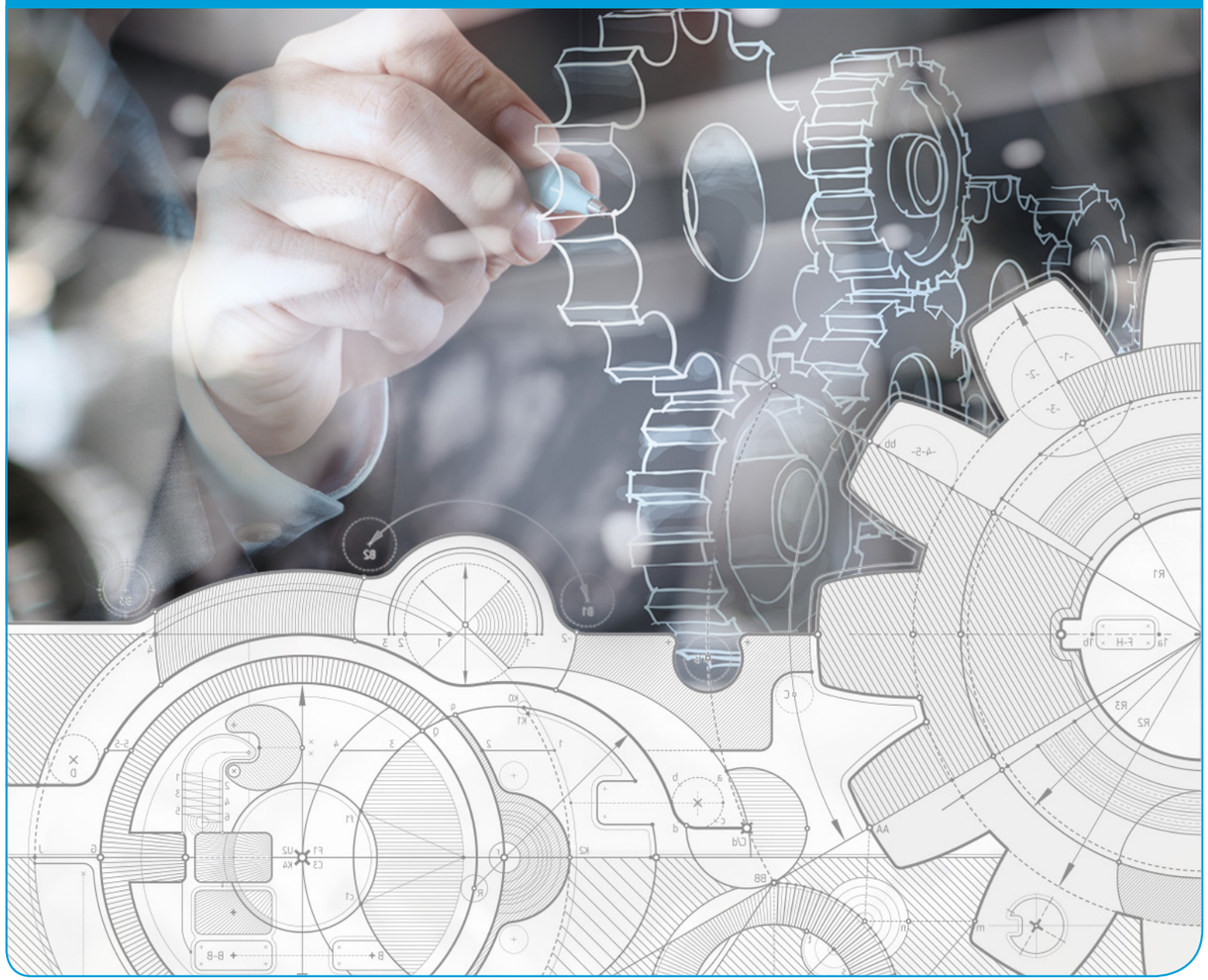
Website: ***www.orbijet.com***

Engineering Services



Engineering Services



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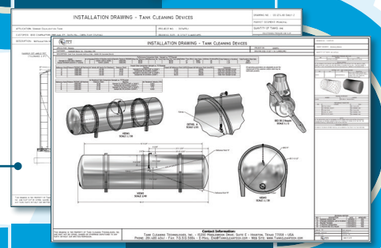
Clean In Place Design, Construction, and Implementation

Orbijet has over 50 years experience in the engineering, design, and construction of cleaning systems used by virtually all type of Industries... Food and Beverage, Transportation, Offshore Drilling, Paper & Pulp, Paints & Coatings, Brewing, Wineries, ISO Containers, Reactors, and more. Whether your need is for a simple tank cleaning machine with a single pump system with no automation to a full blown effort with boiler, railhead, fall protection, waste handling, and multiple cleaning recipe demands... along with training and schedule maintenance to keep your system in premium condition, **Orbijet** offers tailored needs for the client.

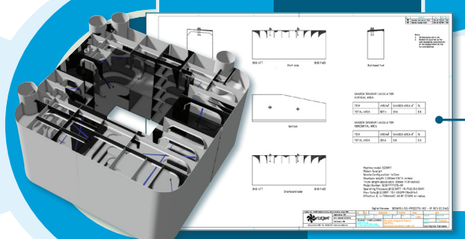
Orbijet | Engineering Services

01 CIP Systems

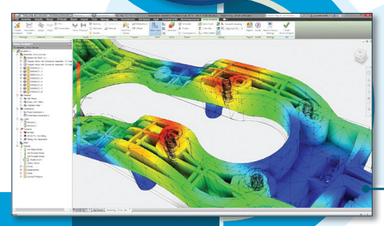
02 3D Modeling



03 Installation Drawings



04 Shadow Studies



05 Stress Analysis

06 Chemical Analysis

07 Commissioning

Survey and Maintenance Service Report

CONTACT INFORMATION			
Customer Name & Contact	Rick Hammer Dorson Shipbuilding and Repair 1 Dorson Shipyard Rd Erie, PA 16507-2402 Email: rhammer@dorsonship.com Phone: (814) 452-5442 Fax: (814) 452-5443 Account Number: 8768	Date of report Dates on site visits Time of departure Hours spent on site	2/5/2018 2/2/2018 to 2/3/2018 2:00 PM 18 hours
Other Contact Info	None	Ship Agency	None
Time Log			
Time of departure @ home	2/1/2018 08:00	Time of arrival @ site	2/2/2018 08:00
Time of departure @ site	2/3/2018 11:45	Time of arrival @ home	2/3/2018 18:30
Total time spent to finish (hours) away from home: 83.5 hour		Mode of Travel Driver or Car Differed Car Airplane Other:	

Survey/Maintenance Report

Total time billed: 2 days of travel plus 2 days of on-site.
Hours for engineering works after survey billed on hourly basis.

Vessel Gabriel Johnson (HULL-nation) the new building hull 1136 to survey all deck structures as they related to the current Deckplan and Shadow Studies on this structure. Purpose of this survey was to determined available locations for fixed and portable tank cleaning machines wherein the shadowing within the tanks were 6% or less as per the structure nominations for Crude Oil Washing as set by IMO (International Maritime Organization). On completion of the survey, it is to update the various and associated drawings for this case and submit to client for review and approvals prior to running the next iteration of the shadow analysis for this vessel.

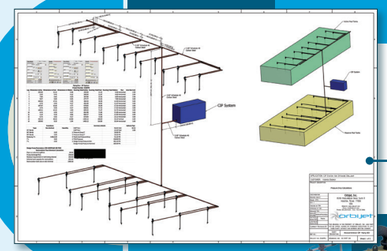
Engineering deliverables to be...

a) Updated deck drawing with surveyed deck structures
b) Updated revised deck plan with projected locations for fixed TCH and Portable TCH
c) Update projected shadowing on new locations.

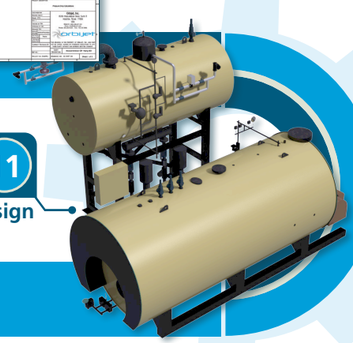
Technician Name: | Vessel: Gabriel Johnson / Filename: Vessel Survey – 2018.02.01.docx

08 Engineering Survey

09 Vessel Design



10 Piping ISO



11 Boiler Design

Orbijet | Engineering Services

01 **CIP Systems** designed for all industries... Transportation, Offshore Drilling, Soft Drink, Brewing, Wine, Paper and Pulp, Railcar, Plastics, and more.

02 **3D Modeling** of all systems and products.

03 **Installation Drawings** on cleaning arrangements with details on location and operating parameters.

04 **Shadow Studies** for all types of tanks and process vessels that will specifically detail shadow locations and how to overcome these anomalies relative to cleaning.

05 **Stress Analysis** can be completed on all structures that Orbijet designs and builds

06 **Chemical Analysis** or assays can be performed on a number of applications in our labs and thus eliminate the purchase of any non-performing chemistries.

07 **Commissioning** services are offered on all installations that Orbijet designs and builds.

08 **Engineering Surveys** on site to determine best approach for retrofits and upgrades.

09 **Vessel Design** to insure that our CIP Systems are fitted with the best tankage for the job.

10 **Piping ISO** drawings completed to detail all travels and runs to insure proper volume and pressure drop calculations.

11 **Boiler Design** calculations to insure spot on boiler sizing and installation efficiencies for the best operating efficiencies.

Tank and hold cleaning equipment

Responsible tank cleaning

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Phone: +1 281.480.4041
Fax: +1 713 516.5883
Email: sales@tankcleantech.com

www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

Our concept – Direct from producer to user

Scanjet production plant in Sweden

Our business mission continues to centre on direct co-operation between the customers and Scanjet Marine AB. This concept, together with the specialised fabrication in our own workshops using the latest production technology, ensures our customers of an operator friendly and high quality range of products.

SCANJET – The leading product range for marine and offshore applications

Scanjet produces a range of tank cleaning machines to match any marine or industrial demand for an efficient and environmentally friendly installation. Our qualified design team are always ready to assist in providing optimised technical specifications prior to installation ensuring that our clients will receive a Scanjet tank cleaning machine installation which will consist of the most modern and efficient tank cleaning technology available.

For any installation there is an optimised Scanjet product

Crude oil carriers require our larger machines with high capacities for sediment control to meet Marpol regulations.

For bulkcarriers Scanjet provides different solutions for the cleaning of holds.

River tankers and barges are using Scanjet following an increased demand for an environmentally friendly and safe tank cleaning operation with closed hatches.

Scanjet are committed to meet the highest standards of quality and performance. We continuously develop and improve our product range to meet the market demand for optimal technical performance.

For chemical and products carriers the Scanjet installation is of utmost importance for the safety and economical performance of the vessel.

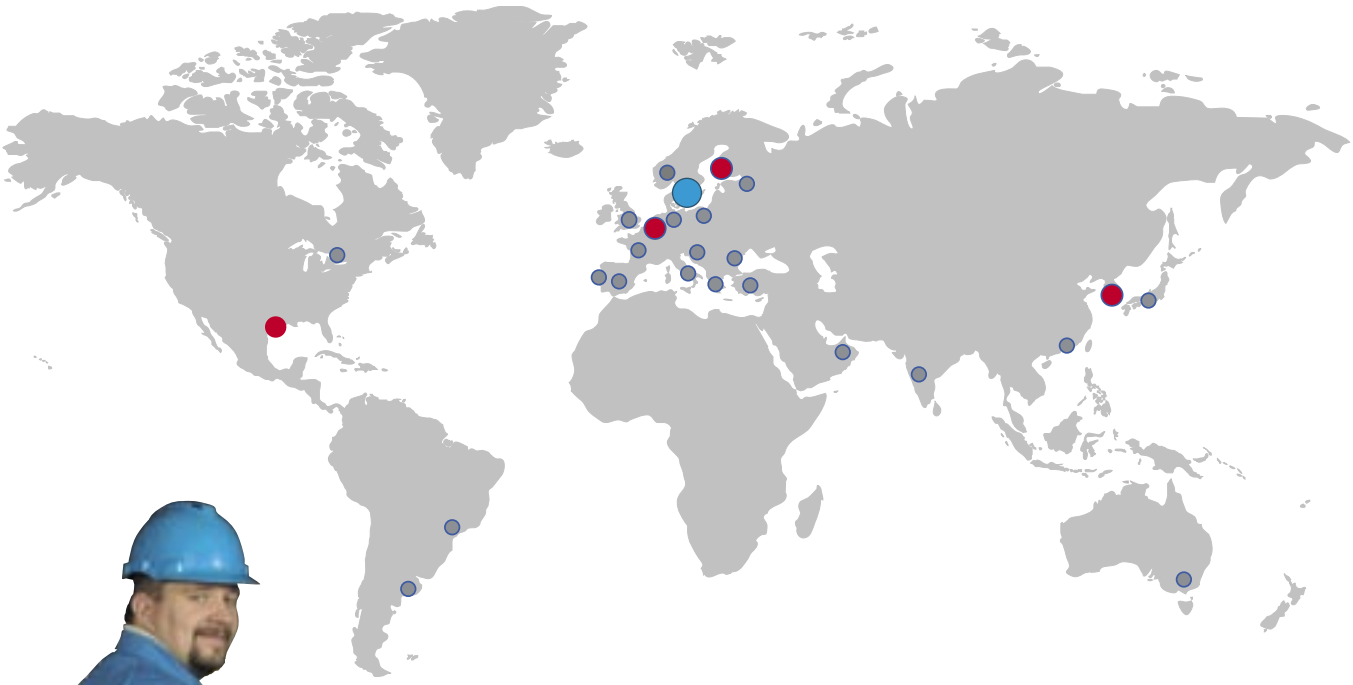
For FPSO vessels there are Scanjet installations available meeting all operational requirements.

Offshore supply vessels and platforms are using our low capacity machines for cleaning of drilling mud and brine tanks.

scanjet

www.scanjet.se

Sales and Service



Scanjet Head office and production

Scanjet Branch office

Scanjet Representative

Scanjet has a test plant at your service with facilities for full scale testing of machines.

Spare parts and service kits are produced in our own factory and available within 24 hours.

Scanjet installation on board a 37 000 dwt product carrier.

Skilled service engineers are ready to serve wherever and whenever you need them.

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Stocking Locations in USA, Canada and Mexico

1006.2008.10.13

Scanjet portable tank cleaning machines and accessories

Shaping the future in tank cleaning

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www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

For any installation there is an optimum Scanjet product

Portable tank cleaning

Scanjet in Sweden has a concept of direct producer to user for tank cleaning equipment to the marine industry.

Scanjet production plant in Sweden

Turnaround time in ports is today crucial and the time to get the tanks clean should be kept at a minimum. In most cases these requirements are met by fixed installed equipment but Scanjet can also provide portable tank cleaning machines for reducing time and cover shadowed spots in the tanks.

The portable machines are turbine driven by the cleaning media and of twin nozzle type. The machine automatically creates a criss-cross cleaning pattern in the tank and ensures a safe and reliable back-up cleaning.

We have used all our expertise in nozzle optimization and have managed to develop a cleaning machine with excellent performance for all type of cargo.

The stainless steel machines are also possible to use for passivation/pickling of stainless steel tanks following our standards procedures.

The portable machines are lightweight and easy to operate, by lowering the machines into the tank to decried cleaning position in the tank. The light weight hose saddle provides a stable and reliable fixation of the machine and hose.

Cleaning Pattern

SC 15TW
stainless steel

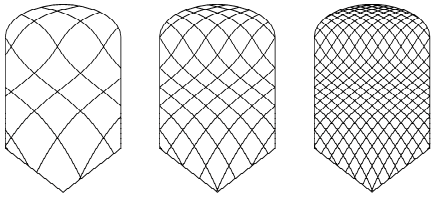


Fig 1. After one cycle

Fig 2. Full pattern

Tank Cleaning machines

Scanjet provides all needed accessories for portable tank cleaning equipment and is available in the major ports around the globe.

Tank cleaning machines: SC 15TW, SC 45TW and SC 15 TWGL

The turbine driven SC 15TW is available in stainless steel and SC 45TW is available in both bronze and stainless steel versions and are therefore suitable for any type of tank cleaning operation.
The machines are normally lubricated with cleaning media, however the SC15TWGL can also be supplied with closed oil lubricated gearbox. This will increase time between service intervals.

SC 15TW
21 m³/h weight

SC 45TW
51 m³/h weight

SC 15TWGL
21 m³/h weight

SC 45TW stainless steel

SC 45TW bronze

SC 15TW GL stainless steel with closed gear box

SC 15TW stainless steel

Accessories for portable equipment

Hose saddle

The hose saddle is designed to minimise the deck opening for the supply hose during a tank cleaning operation and gives a stable fixation of the hose

Rubber bumpers

For cleaning in coated tanks close to the tank walls Scanjet recommend the use of rubber bumpers that minimises risk for coating damage.

Connections and adapters

To suit any type of connections, various types of adapters and couplings are available in suitable materials for the marine environment.

Hoses

Tank cleaning hoses are available in various length and in different qualities suitable for any requirements.

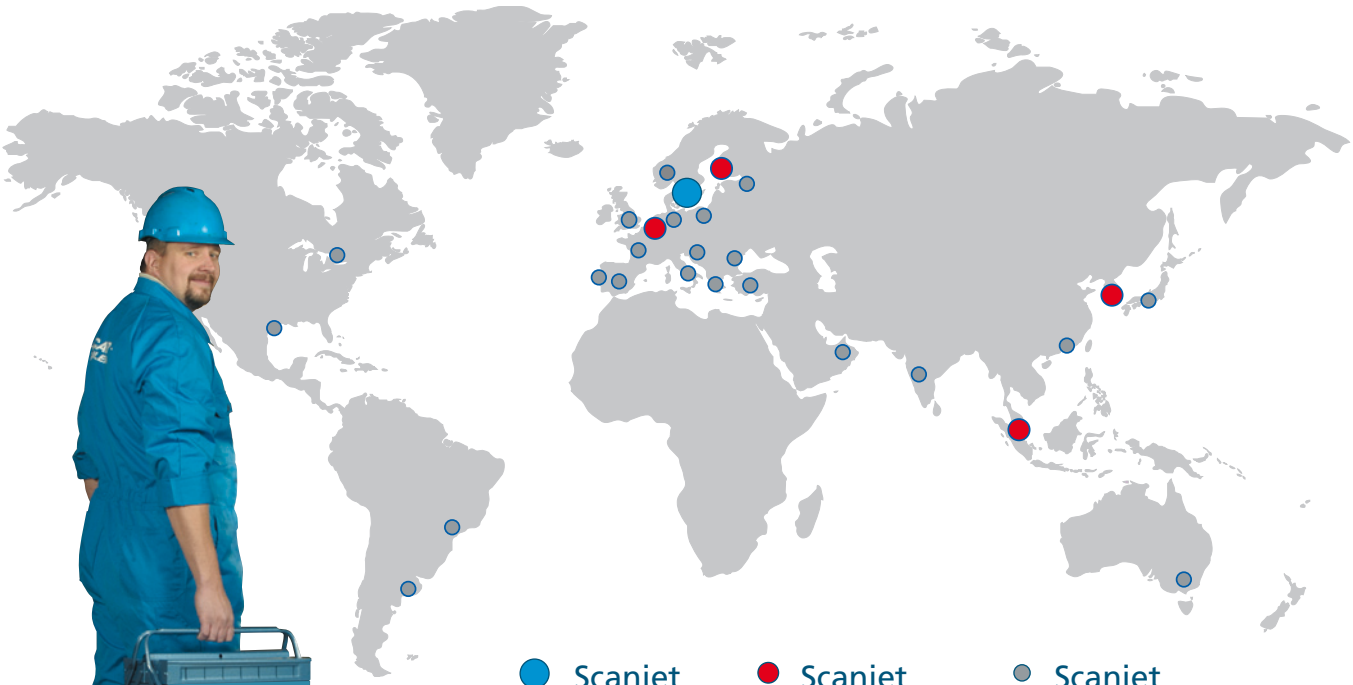
The standard hoses are made in EPDM rubber and come with two stainless steel bonding wires, incorporated in the hose core for electrostatic protection. Scanjet can also supply hoses in stainless steel for special services.

We also provide hoses suitable for cleaning with aggressive cleaning media i.e. various acids etc.

Service Kits

For easy maintenance Scanjet can provide a complete package including all parts needed and instructions for the work. This ensures that the planned maintenance will be easy and effective.

Sales and Service



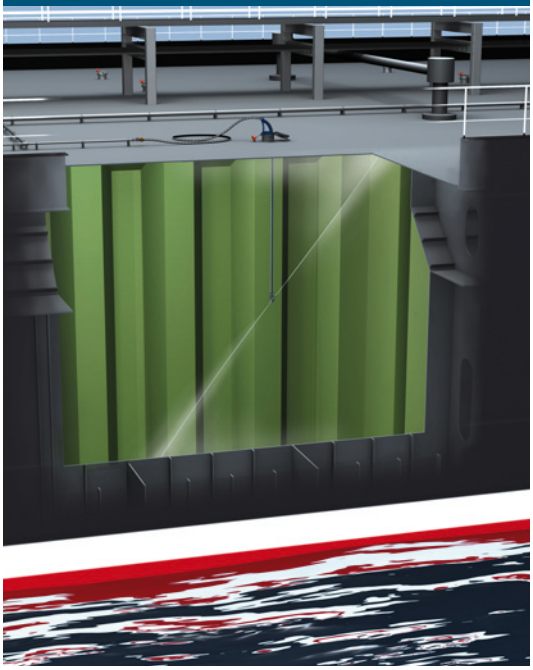
Scanjet
Head office
and production

Scanjet
Branch office

Scanjet
Representative

Skilled service engineers are ready to serve wherever and whenever you need them.

Portable tank cleaning Installation



Chemical carrier

Product carrier

Crude oil carrier

Offshore supply vessels

Our machines are approved by all major classification societies and commonly used on boat both vessels and offshore platforms

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www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

2016.01.14

IN LINE WITH
IMO RECOMMENDATION
"MSC.1/CIRC. 1334"

Marine Protection System - MPS

Anti-Pirate water cannon

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Marine Protection system - MPS

The Situation

The oceans have always been our main channel for shipping goods between countries. For as long as we have been trading by sea, pirates and piracy has always been a problem, a problem that still exists today. Many pirate attacks are often carried out within 15 minutes and even if there is Navy nearby, it is often impossible to make it in time.

As one of the worlds leading manufacturer of tank cleaning equipment Scanjet has over the years established a strong bond with our marine customers. We have listened to their wishes and demands and built our equipment to suit.

We have been using water jet technology to clean some of the toughest tanks in the harshest environments for decades, so when we were approached to see if we could adapt our existing technology to be used in the line of defence against the modern day pirate, we were more than prepared to accept the challenge.

Ideal for sunke

The Solution

In line with IMO recommendations, MSC. 1/Circ. 1334, Scanjet has produced an all new water cannon defence system, a system that will protect all types of ships, their crew and cargo.

How have we done this? Simple, by looking at existing water cannon technology used by police forces and armies around the world, and then taken an in-depth look at our own tank cleaning jet nozzles and merged the two concepts in to a modern, effective and cost efficient pirate defensive system. We call this the Scanjet Marine Protection System - MPS.

In the past water cannon systems performance has been restricted to the size of the water tank behind the cannon, but as an ocean going vessel, lack of water is not an issue for concern. With this problem eliminated the water cannon system can now fully live up to its true potential and keep you safe.

Automatic protection

n deck protection

SC 360 APR combined with razor wire

Adjustable +/-4°,
eliminates the void along the ship´s side

Key Features

- **Protects your crew and ship**
- **Non provocative, non lethal anti-piracy jet**
- **Proven system to more than 250 vessels**
- **No need for manual operation**
- **Easy mounting without hot work**
- **Individually adjusted machine length and horizontal position**
- **Easy removable after use**
- **High strike frequency**
- **Adjustable rotating speed**
- **180° optimised downward operation**
- **Can be combined with razor wire**
- **Ideal for sunken deck protection**

Working principle

Once activated, the system requires no further manual operation, allowing the crew if necessary to seek cover in the designated safe zones.

The Anti-pirate water cannons are driven by the pressured water and will remain running until the vessel is safe and the pumps are switched off. The water beam is fully effective, with rotation speed of 3-6 rpm. To optimise the downward pressure of the water, a block has been installed to restrict the water from being projected upwards. The water cannons can be installed as either a permanent or portable solution and requires no chemicals or steam additives.

SC 360 APR

Patent pending,
PCT/SE2010/050370,
Priority date 2009-04-08
Patent pending, 1050695-4
Priority date 2010-06-24

Marine Protection System - MPS

PROJECT PROCEDURE - THE SCANJET WAY

INTEREST → **ENGINEERING** → **SOLUTION** → **SATISFACTION**

Easy mounting with no need for hot works

Adjustable length and angle. Easily removable. 90 degrees free bend

High pressure anti-piracy jet in full scale action

Crude oil tanker with sunken deck design

Very effective jet length

TCT Tank Cleaning Technologies

...an orbijet company

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15200 Middlebrook Dr.
Suite E
Houston, TX 77058

Telephone + 1 281.480.4041
Telefax + 1 713.513.5883
E-mail eng@scanjetinc.com
Web www.scanjetinc.com

Hold cleaning equipment

Shaping the future in hold cleaning

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Email: sales@tankcleantech.com

www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

Bulk Carriers

Scanjet hold cleaning equipment

Efficient single nozzle cleaning

KEY FEATURES

- Allows quick change of cargo type
- Allows cleaning with closed hatches
- More frequent and economical cleaning
- Cleaning operations is controlled from deck
- Improved corrosion protection
- Improved safety

Hold cleaning in bulk carriers

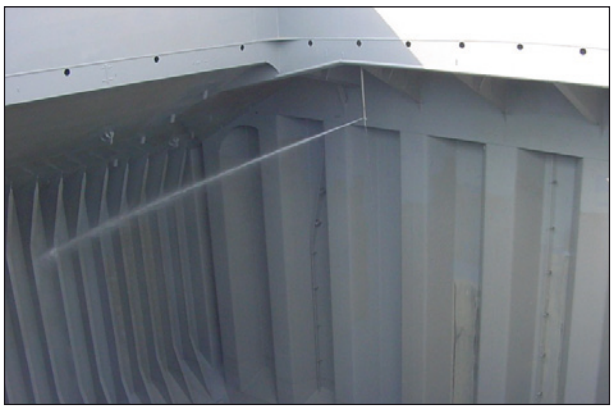
There is a need of cleaning the holds even if the vessel is carrying the same cargo time after time. Regardless of the previous cargo carried, all cargo holds should be thoroughly cleaned prior to loading the next cargo. If a vessel is carrying cargoes, where residues will solidify on the surfaces, they may be next to impossible to remove if the vessel is not cleaned immediately after discharge. Many dry bulk cargoes do not allow any contamination from residues of a previous cargo. Remaining residues may damage not only the next cargo, but also cause damage to painted surfaces and increase corrosion.

Todays voyage and time charter more and more replace traditional liner trade, which increase the demand for a higher flexibility, i.e. more frequent and sometimes very thorough cleaning.

The old conventional way of cleaning a bulk carrier was to sweep the cargo holds, wash them down with fire hoses or other portable washing units, sometimes in combination with compressed air. The cleaning of the cargo holds had to take place after discharge and prior to loading the next cargo. In really bad weather the hatches had to be secured and conventional cleaning was impossible to carry out.

The cleaning of one cargo hold could take days and involve the whole crew. It was also a very uncomfortable, dirty and sometimes even dangerous work.

The old conventional way of sweeping down cargo in a bulk carrier



Hold cleaning process by Scanjet in a bulk carrier

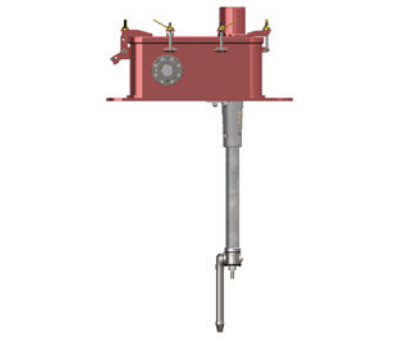
Modern hold cleaning

For the best and most economical solution standard Scanjet machines are used, with different mounting arrangements designed to fit the ship's structure and to prevent damage to equipment during cargo operations.

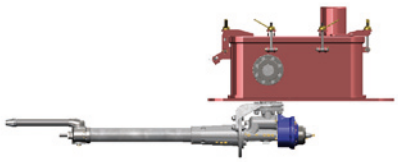
Bulk carriers often make quick changes from one type of cargo to another. Many times this has to be done in a matter of hours and the time saved in just one quick change can pay for the cost of a Scanjet installation. The washing process makes use of sea water and the cargo holds are then rinsed with fresh water to minimize the effects of corrosion and prevent salt from contaminating the next cargoes.

Scanjet has a wide range of proposals for bulk carriers and we consider each ship's individual requirements. In each case we make a preliminary study of all drawings and other relevant information, such as internal steel structure of holds, hatches, general arrangements, piping etc. We then make a tailor-made proposal for that particular vessel, after discussions with the owner/shipyard.

Foldable installation

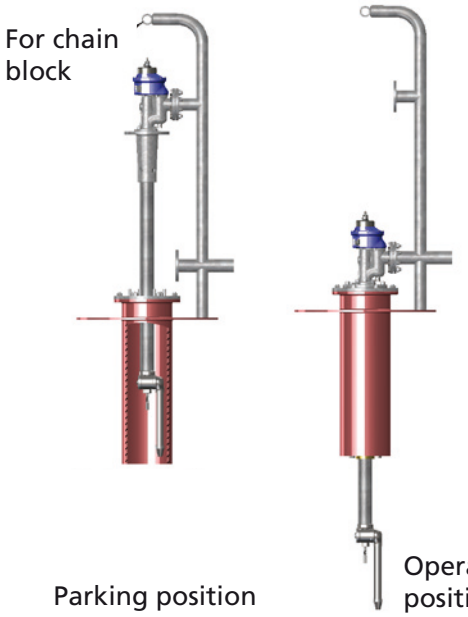


Operation position

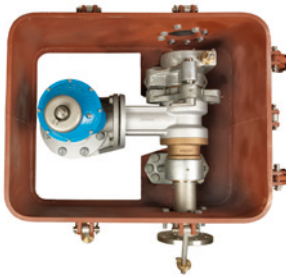


Parking position

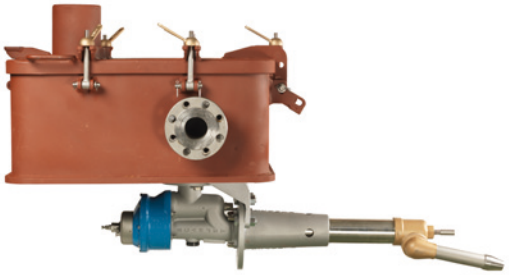
Vertically retractable installation



Scanjet equipment



Operation position



Parking position

SC 90T2 SC 30T

Scanjet Marine standard scope
for portable hold cleaning

Tank cleaning gasfreeing hatch

For more information about the machines for bulk carrier installation, SC 90T2, SC 30T and portable equipment, please refer to separate brochures.

Scanjet Tank Cleaning Equipment
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Web: www.tankcleantech.com

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Orbijet manway assembly for external drive tank cleaning machines consist of the main cone assembly, plus the valve assembly, and plus the quick coupled inlet assembly. The primary tank cleaning systems that this manway has been designed for is our SC40RT dual nozzle tank cleaning system with external drive and/or our SC30T single nozzle programmable tank cleaning system. These component assemblies can be purchased separately or installed by our factory on the SC40RT and/or SC30RT specification of your choice. This manway assembly is designed for portable use in that it is intended that the SC30T and/or SC40RT units are installed into the tank to be cleaned and then removed when cleaning has been completed. Maximum downpipe lengths of the SC40RT and/or SC30RT is approximately 7 feet. Standard length is 60 inches (approx) or 1500mm.

Manway Assembly External Drive Units

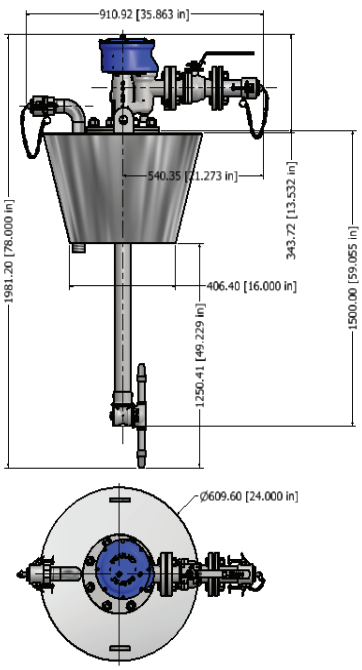
Features

- **316 Stainless Steel**
- **Quick Couplings**
- **Fits Most Tankers**
- **Ball Valves**
- **Capped Fittings**

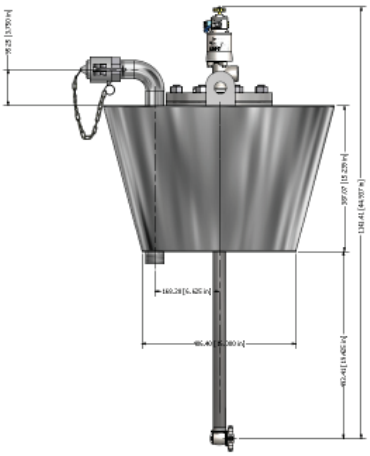
Industries

- **Road Transportation**
- **Rail Transportation**
- **Chemical Processing**
- **Oil and Gas**
- **Refineries**

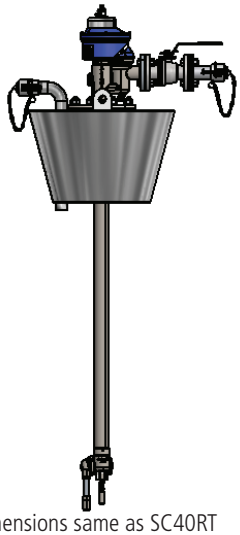
SC40RT Manway Assembly



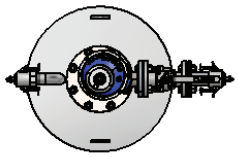
SC20AHP Manway Assembly



SC30T Manway Assembly

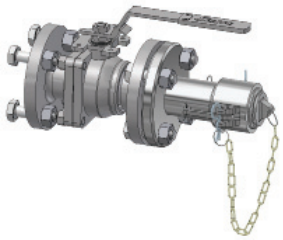


Dimensions same as SC40RT



Adapter Flange - Ref 04

Cone Assembly - Ref 01



Valve Assembly - Ref 02

Ref	Part Number	Qty	Material	Drawing	Weight	Description
01	01PN.1029-00	1	316 SS	01.8877.02	91.45 lbs.	Manway cone; with mounting hardware and vapor recovery port
02	01PN.1030-00	1	316 SS	01.8878.02	33.51 lbs.	Ball valve and quick coupling assembly; 2.00" ANSI 150#; with mounting hardware
03	01PN.1031-00	1	316 SS	01.8406.01	124.96 lbs	Complete assembly; including reference 01 and 02
04	06PN.1674-00	1	316 SS	01.8836.00	21.88 lbs	6.00" Adapter flange for SC20AHP

Weight of an SC40RT with a length of 1500mm or 60 inches complete with reference 01 and 02 attached is approximately: 219.56 lbs.
Weight of and SC30T with a length of 1500mm or 60 inches complete with reference 091 and 02 attached is approximately 219.56 lbs.
Weight of and SC20AHP with a length of 915mm or 36 inches complete with reference 01 and 04 attached is approximately 128.13 lbs.

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1082.2016.06.16

Product Data Sheet

Product: ManWay Assembly

The Tank Cleaning Technologies ManWay Assembly is specifically designed to seat in most all center entry manway's located on Road and Rail Tankers. This assembly is complete with 1.50" NPT(M) inlet connection x 1.50" NPT(F) discharge connection. A vapor recovery port and deflection plate is also fitted as standard with this item.

Quick Couplings and Machine are not included in this Manway Assembly. Shown for clarity only.

Part No.	Weight	Description
177602-01	66 lbs	No vulcanized cone

General Specifications

M.O.C.	: 316L S/S
Finish	: 2B Mill
Vapor Port	: Yes
Maximum Opening	: 24.00"
Minimum Opening	: 18.00"

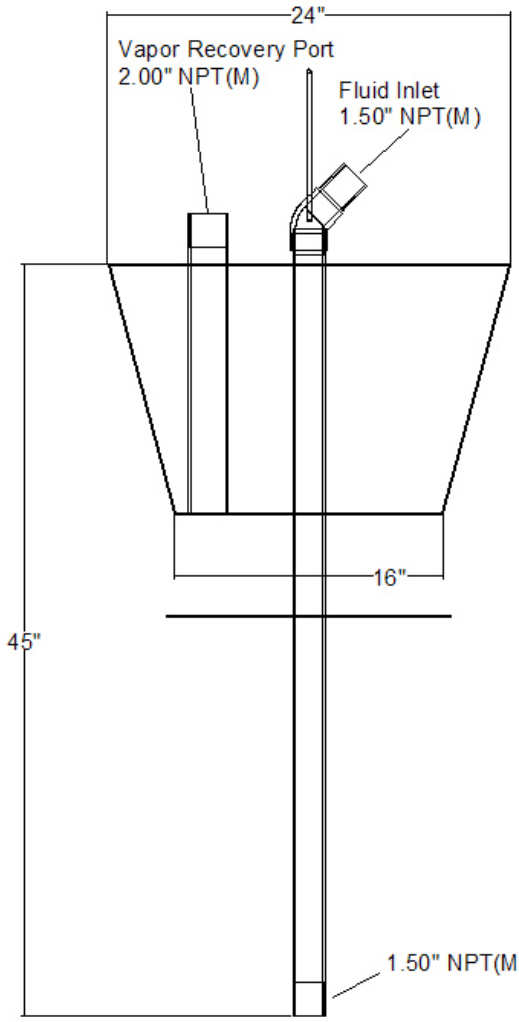

Image shown here is for the standard 177602-01 Manway Assembly. Add 1.00" on diameter of cone if Viton Vulcanization is included; part number 177602-05.

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Manway Assembly

...portable tank cleaning accessories

KEY FEATURES
01.1341.00

- 316L Stainless Steel
- AutoFit Cone
- Quick Couplings
- Splash Plate
- Vapor Recovery
- Modular Construction
- Two Machine Config.
- Focused Impact

Product summary...

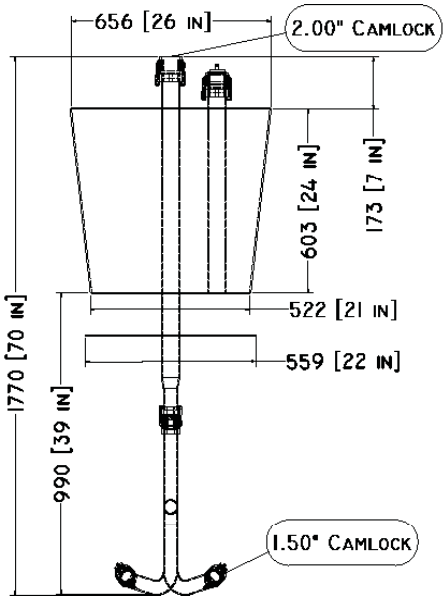
The 01.1341.00 is a manway assembly for use in portable cleaning Over-The-Road Tankers and Lorries as well as Tanker Railcars. The 01.1341.00 will autofit the manway opening by virtue of it's conical design. The piping arrangement is designed to focus the jet cleaning pattern that is more dense in the polar regions of the machine towards the end of the tank geometry typically found in Road Tankers and Tanker Railcars. Thus allowing the cleaning jets to focus more on the end domes and more difficult to clean areas. A 2.00" vapor recovery port is designed into this unit along with a splash plate to avoid the impact of the high velocity jets from impacting directly on the conical sealings of the assembly or into the vapor port piping.

Quality Control, Compliances & Certifications...

- ASME
- ISO 9001

Typical applications:

- Over-The-Road Tankers
- Tanker Railcars
- Barge Tanks
- Frac Tanks
- ISO Containers



Typical Setup

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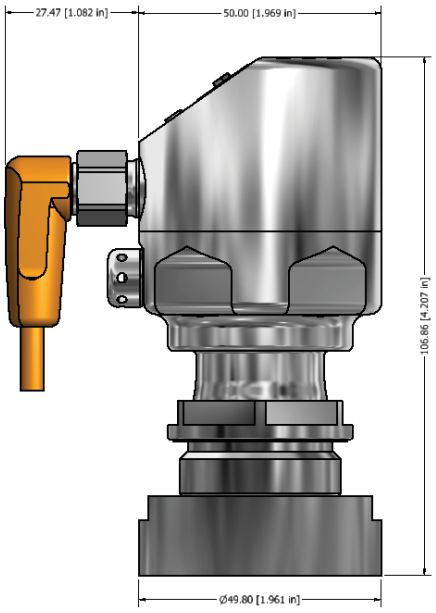
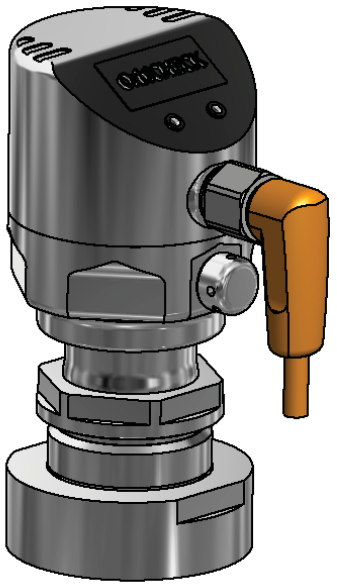
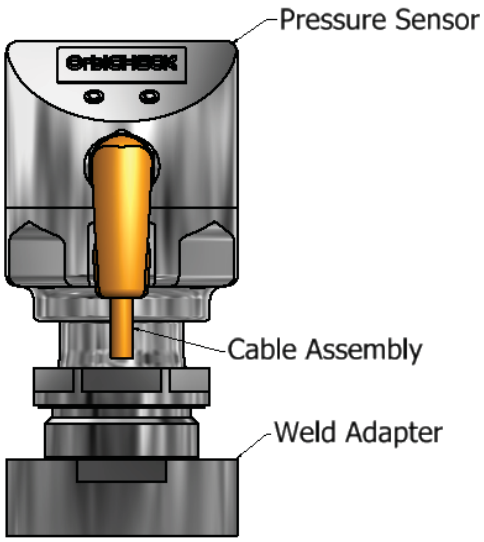
ver. 1053.2013.03.01



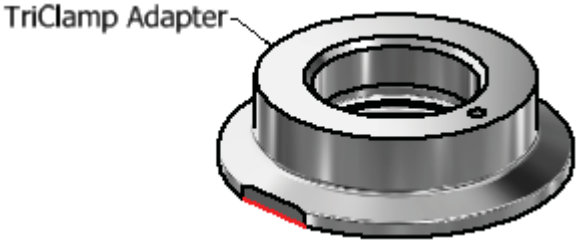


The OrbiCHECK validation sensor is available in both Industrial and Sanitary designs. The OrbiCHECK validates the rotation of tank cleaning devices by monitoring the rotation of the cleaning jet. The OrbiCHECK is designed to validation rotation for Rotating Jet-Head cleaning devices. The OrbiCHECK is typically mounted on the installation flange for the tank cleaning device or other stationary installation mechanism that will maintain a constant geometry with relation to impact locations of the cleaning jet and the OrbiCHECK sensor. A four digit LED display in units of BAR, MPa, and PSI are displayed to measure sensor impact values. The OrbiCHECK comes complete with pressure sensor, power supply/switching amplifier, weld adapter, and cable harness 10 meters in length. An optional TriClamp weld adapter is also available for sanitary connections.



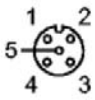
OrbiCHECK components are...

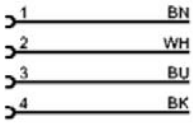
Part Number	Qty Required	Description
PI2794	1	Pressure sensor
DN0012	1	Power supply/switching amplifier
EVT005	1	Cable harness; 10 meters
E33130	1	Weld adapter; industrial
E33209	1	Weld adapter; sanitary
02PN.1829.00	1	Assembly part number that includes PI2794, DN0012, EVT005, and E30130
Contact Orbijet Engineering for any additional details required on these components. Email: eng@orbijet.com or website: www.orbijet.com		



Connector is a type BNC 5 point connector with wiring schematic as in figure 1 below.

Core colors
BK black
BN brown
BU blue
WH white





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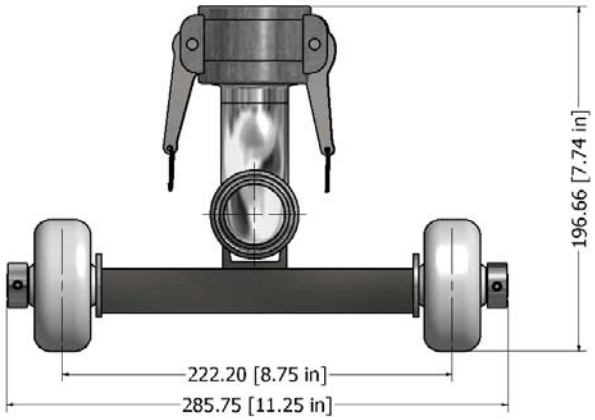

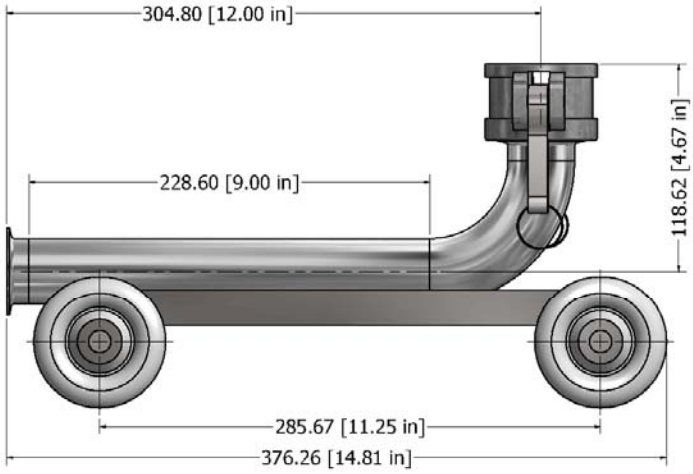

Materials Of Contruction:
316SS; Nylon
Weight of Trolley:
7 pounds (3.18 kg)
Inlet Connection:
1.50" Tri-Clamp
Outlet Connection:
1.50" Quick Coupling Part D

Part Number: 02PN.1721-00

Trolly with BIO50 Cleaning Nozzle Attached
BiO 50 Not Inlcuded - Sold Separately

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Product Data Sheet

Product : Trolley/Cart – SC15TW
Model : 02PN.1658-00

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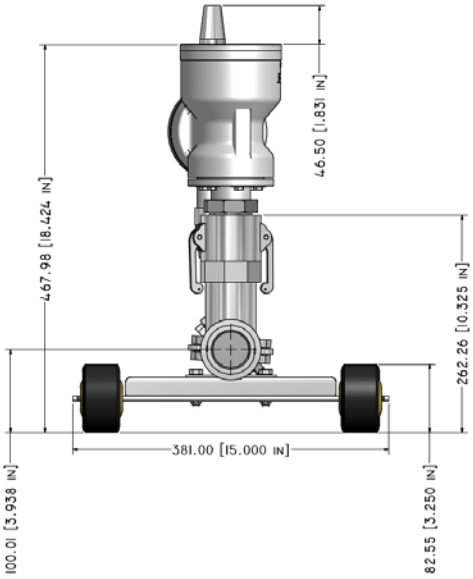
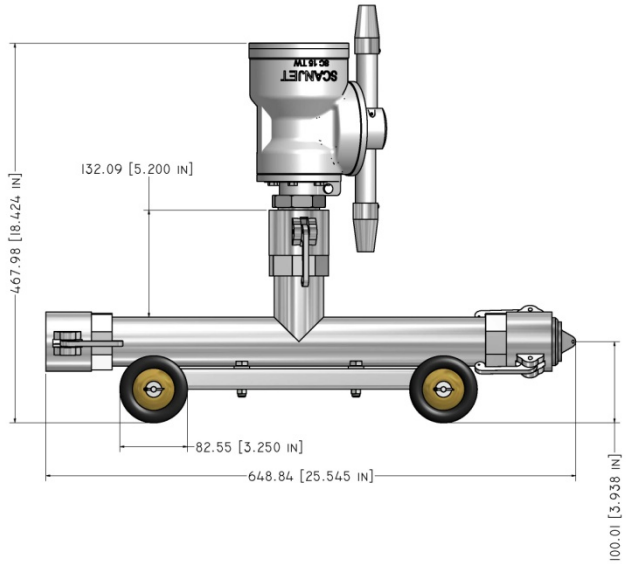
The TCT Trolley is designed for use with the Type SC15TW, SC15TWG, SC45TW, BIO10 and BIO25 tank cleaning machines... specifically in portable cleaning applications. The trolley is designed to fit through most man ways with or without the tank cleaning machine attached. The trolley comes complete with quick disconnect couplings for easy connection to the spray nozzle and for connection in series if more than one trolley is needed for a cleaning application. The trolley is shipped with a plug on one end in case it is used singularly.

Industries

- Brewing
- Distilleries
- Wineries
- Food
- Others...



Trolley with SC15TW – End View (DIM in mm/in)



Trolley with SC15TW – Side View (DIM in mm/in)

Specifications - Summary

Materials of Construction
- 316L Stainless Steel
- Buna N Gaskets
- Nitrile Wheels

Pressure Rating
- 300 PSIG (21 BAR)

Connections
- 2.00" Quick Coupling (Female)
- Note: Shipped with plug on one end

Weight
- Cart Only: 25 lbs. (11.36 kg)

Reference Drawing #
- 177601-01.04

Other materials available on request.

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Stocking Locations in USA, Canada and Mexico

WashTrac™ Integrated Tank Cleaning Surveillance system

BENEFITS

- Shorter turnaround time in port
- Printed prewash reports
- Operating status of tank cleaning machines
- Efficient and economical tank cleaning procedure

WashTrac™ is the only integrated tank cleaning surveillance system that provides true efficiency and control of the tank cleaning procedure. WashTrac™ combines Scanjet tank cleaning machines with TankRadar tank gauging and other methods that are suitable for all types of tankers.

Better control and economy

WashTrac™ secures that the tank cleaning is performed correctly and without interruption. It optimizes the cleaning media consumption and it provides a cost calculation overview. With control over the total running time, correct service intervals can be planned for and the turnaround time in port can be reduced.

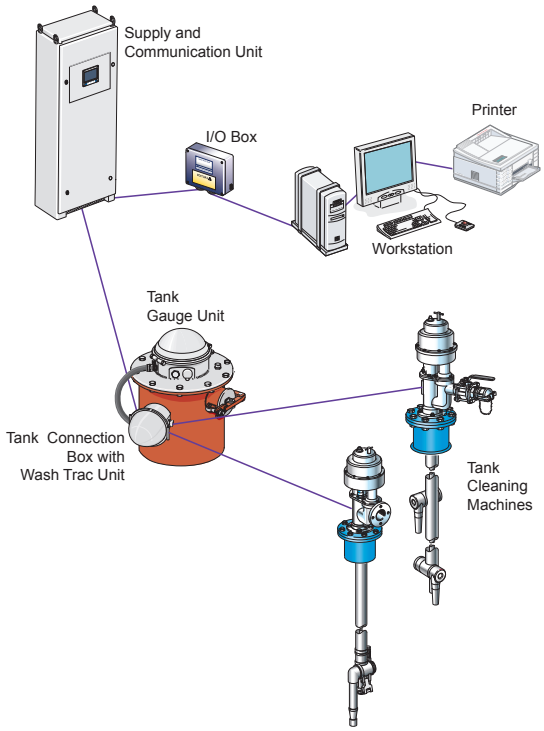
No discussion at prewash procedure inspection

MARPOL 73/78 (1994, 1995 amendments) stipulates that prewash has to be performed after cargo discharge. With a WashTrac™ printed prewash report there will be no discussion about the cleaning performance when port authorities make the prewash procedure inspection.

Overview in real time for full control

Each Scanjet tank cleaning machine is equipped with a sensor that indicates when the machine is running. The sensor is connected to the relay on deck. There is no need for extra cabling as this may commonly work alongside other systems. The optionally supplied control cabinet processes the sensor signals and the status are transferred to the workstation via the Supply and Communication Unit (SCU). At the overview the operator can monitor the cleaning procedure. The status is updated every thirty seconds. Overview in real time gives the operator full control of the tank cleaning procedure.

Intertanko and the Norwegean Superintendent's Association recommend WashTrac™ for monitoring and control of the tank cleaning procedure.

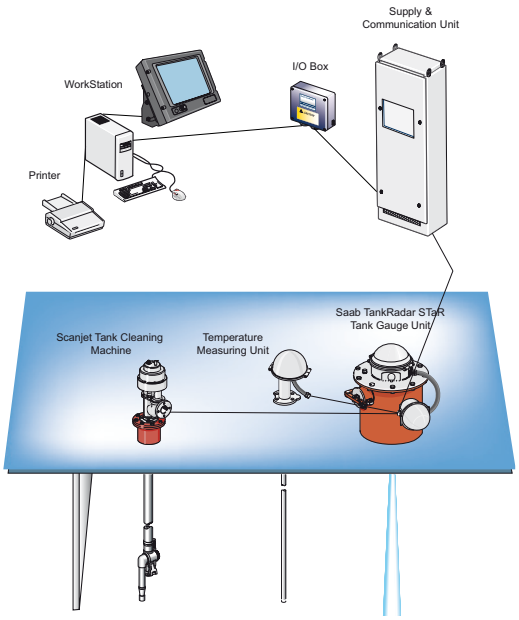


System overview

Printed record–prewash	Data presented on workstation
Name of port	Operating status
Tank number	Start/Stop alarm
Tank capacity	Cleaning pressure
Cargo grade	Cleaning temperature
Tank Cleaning machine	Operating logging on printer
Washing program	Prewash logging on printer
Start time	Overall running time
Running time	Service intervals
Date of report	

WashTrac™

Tank cleaning monitoring system



The innovative tank cleaning monitoring system WashTrac™ improves the efficiency and control of the tank cleaning procedure.

A more efficient tank cleaning procedure gives shorter turn around time in port, increasing the profitability. With WashTrac™ there will be no downtime and no missed charters.

The economical reasons are also obvious. WashTrac™ optimizes the cleaning media consumption and it can provide for cost calculation with immediate control and alarm transferred to headquarters. With control over total running time, correct service intervals can be planned for.

WashTrac™ gives better safety. The systems is a quarantee that the tank cleaning is performed correctly. alarms will indicate if malfunction appears.

No discussion

MARPOL 73/78 (1994,1995 amendments) stipulates that prewash has to be performed after cargo discharge. With WashTrac™ printed prewash record there will be no no discussion about the cleaning performance when the Port authority makes the prewash procedure inspection. with printed prewash reports there is a record of total running time, starts and stops.

KEY FEATURES

WashTrac™

- Operating status of tank cleaning machines
- Start/Stop alram of tank cleaning machines
- Operation and prewash data loggong on printer
- Various options available

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Stocking Locations in USA, Canada and Mexico

Printed Record-Prewash

- Name of port
- Tank number
- Tank capacity
- Cargo grade
- Tank cleaning machine
- Washing program
- Start time
- Running time
- Date of report

Operating status presented on Work Station

Also Intertanko and the Norwegean Superintendent's Association recommended the system for monitoring and control of the tank cleaning procedure.

Each Scanjet tank cleaning machine is equipped with a sensor that indicates when the machineis running. The sensor is connected to the Emerson Process Management gauge on deck. There is no need for extra cabling n order to present the information on the Work Station via the Supply and Communication Unit (SCU).

The operators interface will present an overview where the operator can monitor the cleaning procedure.

Connection to WashTrac™ as option on SC 30T

Connection to WashTrac™ as option on SC 90T2

ISO 9001 QUALITY CERTIFIED

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Service Kits

Scanjet tank cleaning equipment

KEY FEATURES

Service Kits

- Contains parts recommended for service
- Easy to order
- Time saving
- Enables budgeting of spares
- Ensures correct service is carried out
- Step-by-step instruction manual
- "Management by Service Kits"

Tank cleaning machines are installed and operated in extremely harsh marine conditions. In order to ensure continued safe operation of the Scanjet tank cleaning machines it is advised to follow given service instructions.

A Scanjet Service Kit supplies the operator with the essential parts that prolong the life of your tank cleaning machine and ensures safe, smooth trouble free operation.

Provided Scanjet Service kits are available, the maintenance personnel can anytime perform the recommended service. Recommended service intervals are always indicated in the Scanjet general instructions manuals.

Service Kits are available in stock and easy to order. They are designed to make maintenance easier, and more cost efficent.

For each Scanjet machine model the following Service Kits are available:

- O-ring kit drive unit
- O-ring kit gun unit
- Wear kit gun unit

Each kit contains, beside spare parts, also a step-by-step instruction of how to replace the parts.

Service Kits

Service Kits can be installed into the vessels budget and regular service. Normally no other spare parts are required.

It also results in full control over spare parts consumption. A request for other parts than Service Kits may indicate handling failure or lack of maintenance on board.

This is called Management by Service Kits.

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Stocking Locations in USA, Canada and Mexico

Manufactured by...
Scanjet AB
P. O. Box 9316
Sodra Langebergsgatan 36
Goteborg, Sweden SE-400 97

Tripod

Scanjet tank cleaning equipment

KEY FEATURES

Tripod

- Easy to use
- Capacity 500 kg
- Enables rapid overhaul
- Safe operation
- Aluminium
- Split version (option)
- Non-corrosive materials

Scanjet Tripod is a lifting device specially developed for lifting up tankcleaning machines.

There are three standard versions of the Tripod:

1. Tripod 3 meters
2. Tripod 4 meters
3. Tripod 6 meters in split version

The size of the tripod is depends on the size/length of the machine. The tripod consists of two main parts, the tripod and a lifting block. The lifting block is manually operated and has a maximum lifting capacity of 500 kg.

Typical applications for Tripod:

- Crude oil carriers
- Chemical carriers
- Bulk carriers
- OBO carriers
- Industrial applications

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Tank Cleaning Technologies, Inc.
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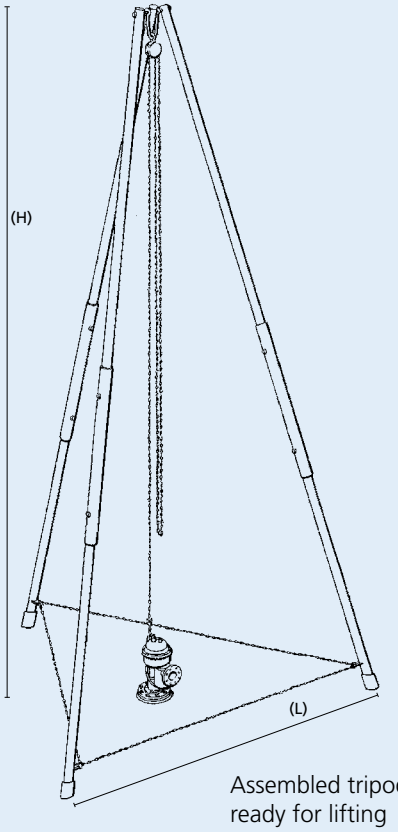
Houston, Texas 77058 - USA
Phone: +1 281.480.4041
Fax: +1 713 516.5883
Email: sales@tankcleantech.com

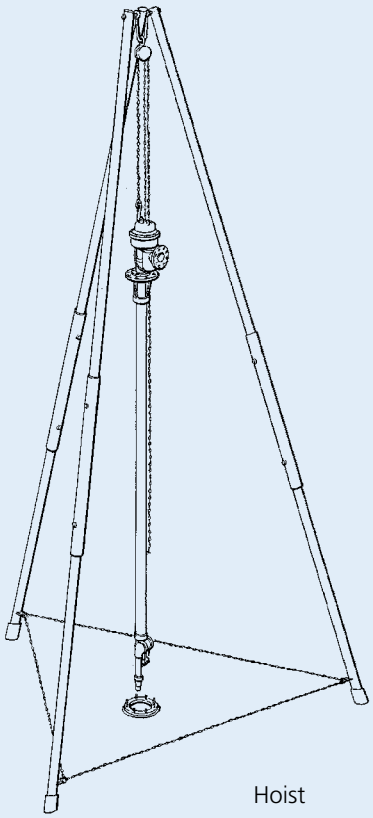
www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

Dimensions

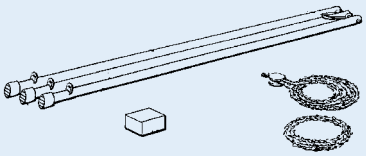


Assembled tripod
ready for lifting

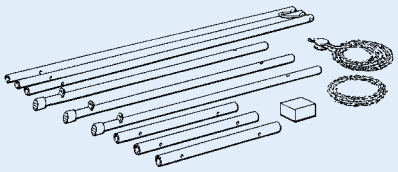


Hoist

3 and 4 meter



6 meter



Specifications

Weight	
3 meters	~ 62 kg
4 meters	~ 70 kg
6 meters	~ 110 kg
Max lifting weight	500 kg
Height (H)	
3 meters	~ 3,4 m
4 meters	~ 4,4 m
6 meters	~ 6,2 m

Leg distance (L)	
3 meters	~ 2,0 m
4 meters	~ 2,7 m
6 meters	~ 3,0 m
Material	Aluminium

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Stocking Locations in USA, Canada and Mexico

SC F150W

Scanjet Water Driven Gas Freeing Fan

KEY FEATURES
SC F150W

- High Performance
- Lightweight
- Deep penetration
- Reversible
- "Sealed for life" lubrication
- Easy Handling
- Safe Operation

Product Summary:

The SC F150W Portable Water Driven Gas Freeing Fan is suitable for use on all sizes and types of vessels.

The fan is designed as a High Performance, Deep Penetration Unit. Constructed from Stainless Steel and Aluminium it is lightweight and easily moved around the deck.

Quality Control

The SC F150W is produced in accordance with 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Typical application for SC F150W:

- Product Tankers
- Crude Oil Carriers
- Offshore
- Bulk Carriers
- FPSO
- OBO carriers

For accessories such as couplings, valves and hoses, please contact your local representative.

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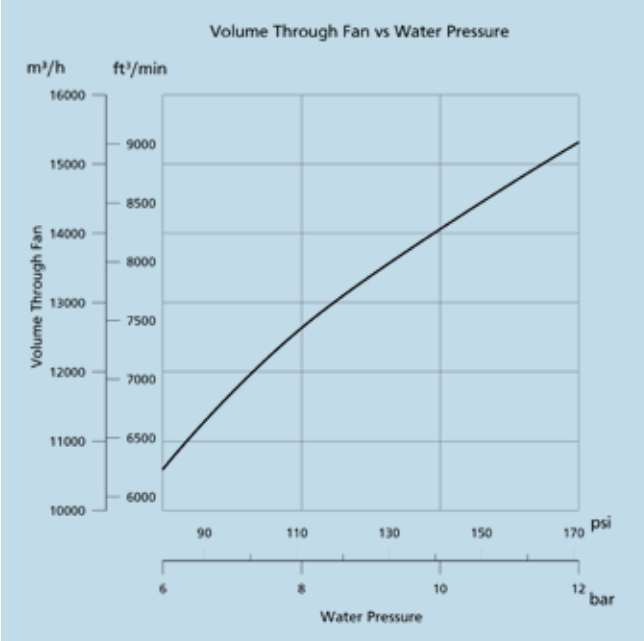
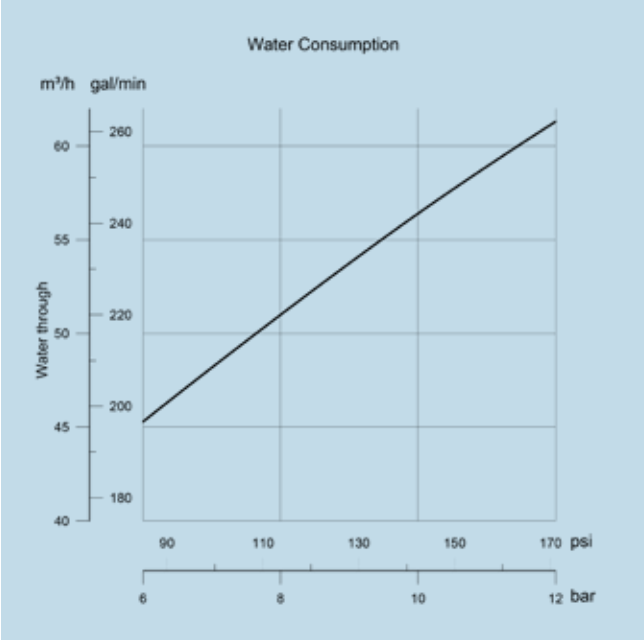
Stocking Locations in USA, Canada and Mexico

Technical performance





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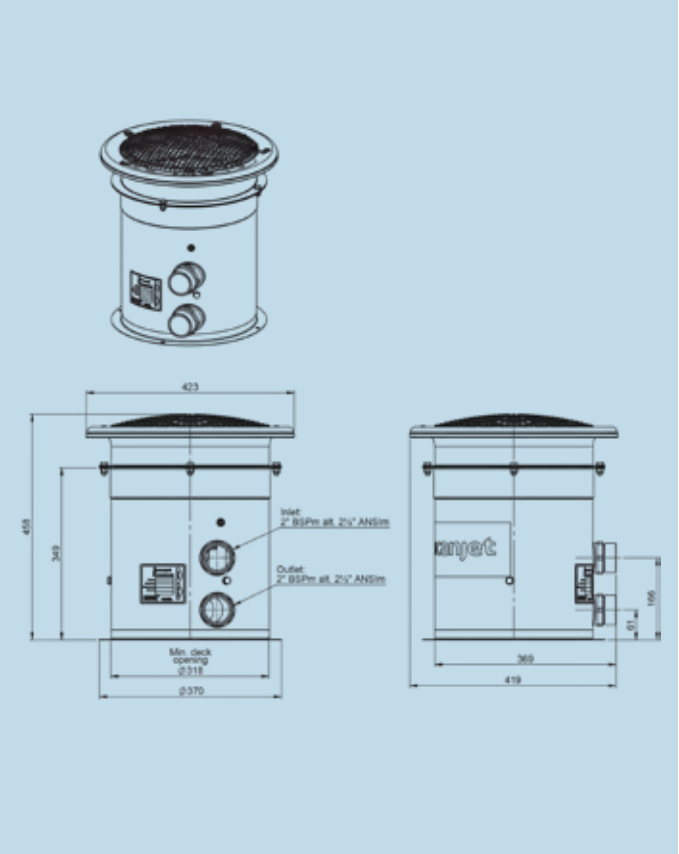

Specifications

Max Throughput:	15,000 m3/hour (8,828 cubic feet/minute)
Water Consumption:	33-55 m3/hour
Operating Press Maximum:	12 bar (174 PSIG)
Operating Press:	5 – 10 bar (0.5 - 1 Mpa)
Water Connections:	Standard 2" BSP or 2.5" ANSI male thread

Materials

Casing:	Stainless Steel
Impeller:	Nickel Coated Aluminium
Lubrication:	Permanetly lubricated

Installation

Minimum Deck Opening:	260 mm (10.24 inches)
Standard Deck Opening:	318 mm with 390 mm PCD

Weight

Operational:	19.8 Kgs.
Packed:	23 Kgs (appr).

Adaptors can be supplied to suit other deck openings.
Other types of water connections available on request.

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Stocking Locations in USA, Canada and Mexico

SC F90A

Scanjet AirDriven Gas Freeing Fan

KEY FEATURES
SC F90A

- High Performance
- Lightweight
- Deep penetration
- Reversible
- "Sealed for life" lubrication
- Easy Handling
- Safe Operation
- Airdriven

Product Summary:

The SC F90A is a Portable Air Driven Fan specifically designed for use on Chemical Carriers. It can also be used on all other types of vessels where air is preferable to water for operational reasons.

The fan is designed as a High Performance, Deep Penetration unit. Constructed from stainless steel and aluminium it is lightweight and easily moved around the deck.

Quality Control

The SC F90A is produced in accordance with 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Typical application for SC F90A:

- Chemical Tankers
- Product Tankers
- Any other Tankers

For accessories such as couplings, valves and hoses, please contact your local representative.

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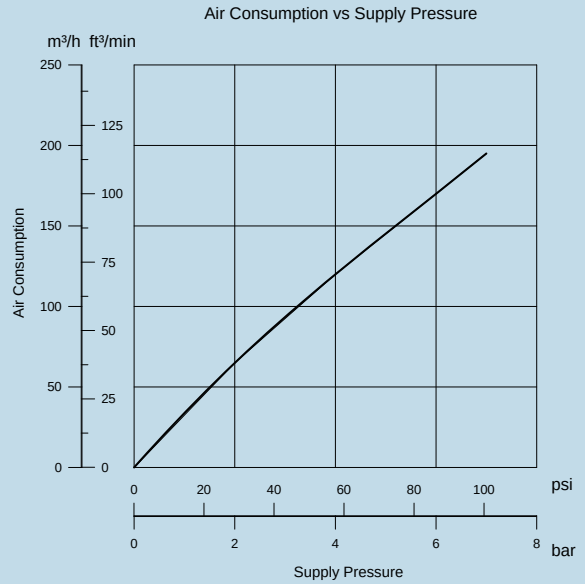
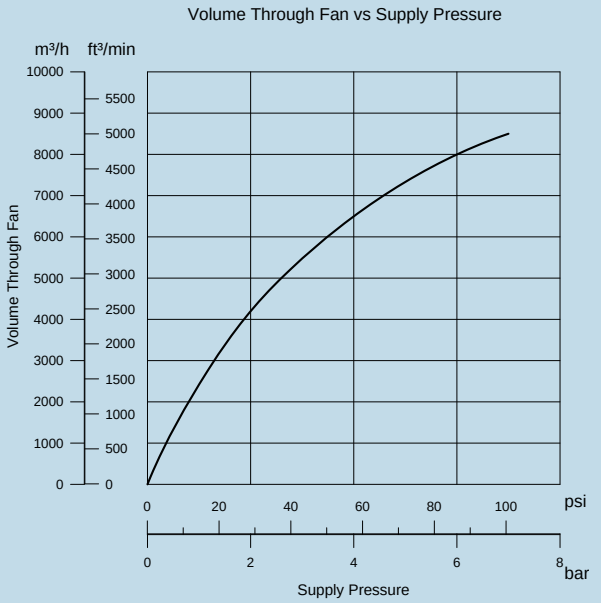
Stocking Locations in USA, Canada and Mexico

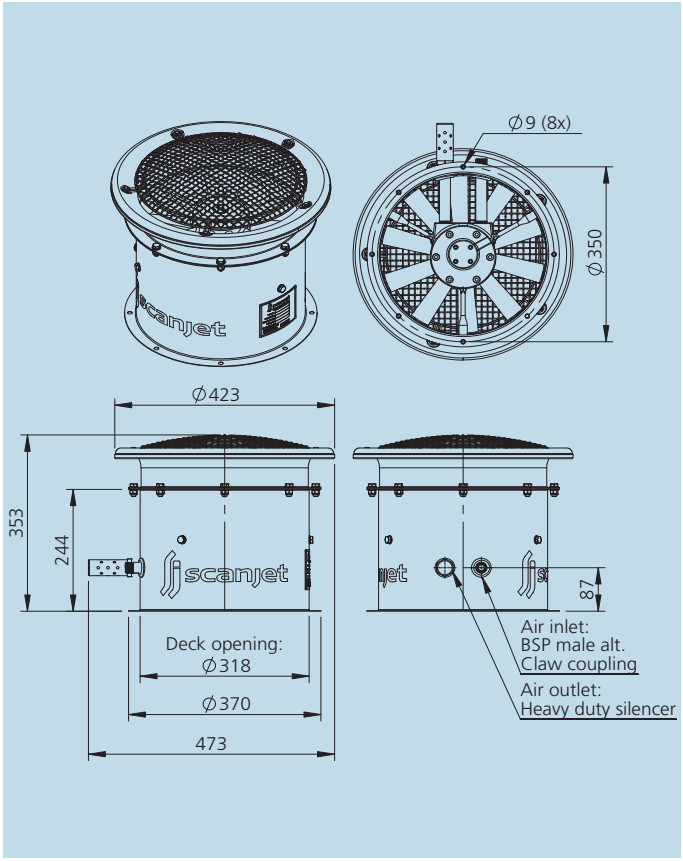
Technical performance





Adaptors can be supplied to suit other deck openings.

Dimensions



Specifications

Max Throughput:	9000 m3/hour (5297 CFM)
Max Air Consumption:	220 m3/hour (130 SCFM)
Operation Pressure:	Max 7,5 bar (109 PSI)
Supply Air Connection:	1" BSP male alt. Claw coupling Other couplings available

Materials

Casing:	Stainless Steel
Impeller:	Nickel Coated Aluminium
Lubrication:	Permanetly lubricated

Installation

Minimum Deck Opening:	318 mm (12.52 inches)

Weight

Operational:	18,5 kg (40.7 lbs.)
Packed:	21 kg (46.2 lbs.)

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Stocking Locations in USA, Canada and Mexico

UNI-*LITE*® NG

Uni-Lite®NG, the Next Generation luminometer from **Orbijet®** boasts many valuable features. Compact enough to be truly handheld and extremely lightweight and portable, the **Uni-Lite®NG** offers advanced data trending and re-test facilities. Used with **Clean-Trace®** and **Aqua-Trace®** to determine the level of biological contamination in a sample, results are available within 30 seconds.

KEY FEATURES:

- Truly handheld, only 400g(0.88 lbs.) in weight
- Optional docking station for instant connection to PC and charger
- New data handling facilities for maximum convenience
- Seven languages – English, French, Spanish German, Italian, Portuguese and Japanese
- Capable of conducting own calibration and background check
- Simple menu driven operation
- **Optional accessories:**
  - Docking station
  - Printer
  - Carry pouch – holds the **Uni-Lite® NG** and up to 20 **Clean-Trace®** or **Aqua-Trace®**
  - Hard carry case

OUR CUSTOMERS USE THE UNI-LITE® NG TO...

- Determine the cleanliness of surfaces in food and beverage plants, supermarkets, restaurants and other industries.
- Determine the cleaning effectiveness of Clean in Place (CIP) systems
- Monitor and control biocide programmes in process waters
- Detect contamination in water samples in industries such as paper & pulp, oil extraction, fractionation and water treatment
- Detect contamination in filterable beverages

DATA MANAGEMENT AND TREND ANALYSIS

The **Uni-Lite®NG** is provided with **Biotrack®** + data trending software. This software and the data handling features on the instrument allow you to:

- Create sample plans and set pass/fail levels
- Capture data and produce trend analysis graphs and reports
- Record re-test results when remedial action has been taken
- Identify problem areas by pinpointing those areas that fail the most frequently
- Manage your HACCP data requirements

HOW DOES THE UNI-LITE® NG WORK?

The **Uni-Lite®NG** is used with **Clean-Trace®** and **Aqua-Trace®**, these tests are based on the measurement of adenosine triphosphate (ATP), which is present in all animal, vegetable, bacteria, yeast and mould cells. Detection of ATP indicates the presence of contamination by any one of these sources.

When ATP is brought into contact with the reagent combination luciferin/luciferase, a reaction takes place which emits light in direct proportion to the amount of ATP present. The **Uni-Lite®NG** measures the amount of light generated and provides information as to how much contamination is present within 30 seconds!

A COMPLETE SYSTEM TO SUIT YOUR NEEDS

The **Uni-Lite® NG** can be as simple or as sophisticated as you want or need it to be. Whether you just want to measure a sample and nothing more, or you want the system to form part of your HACCP monitoring programme providing management reports, the **Uni-Lite®NG** is the system for you!

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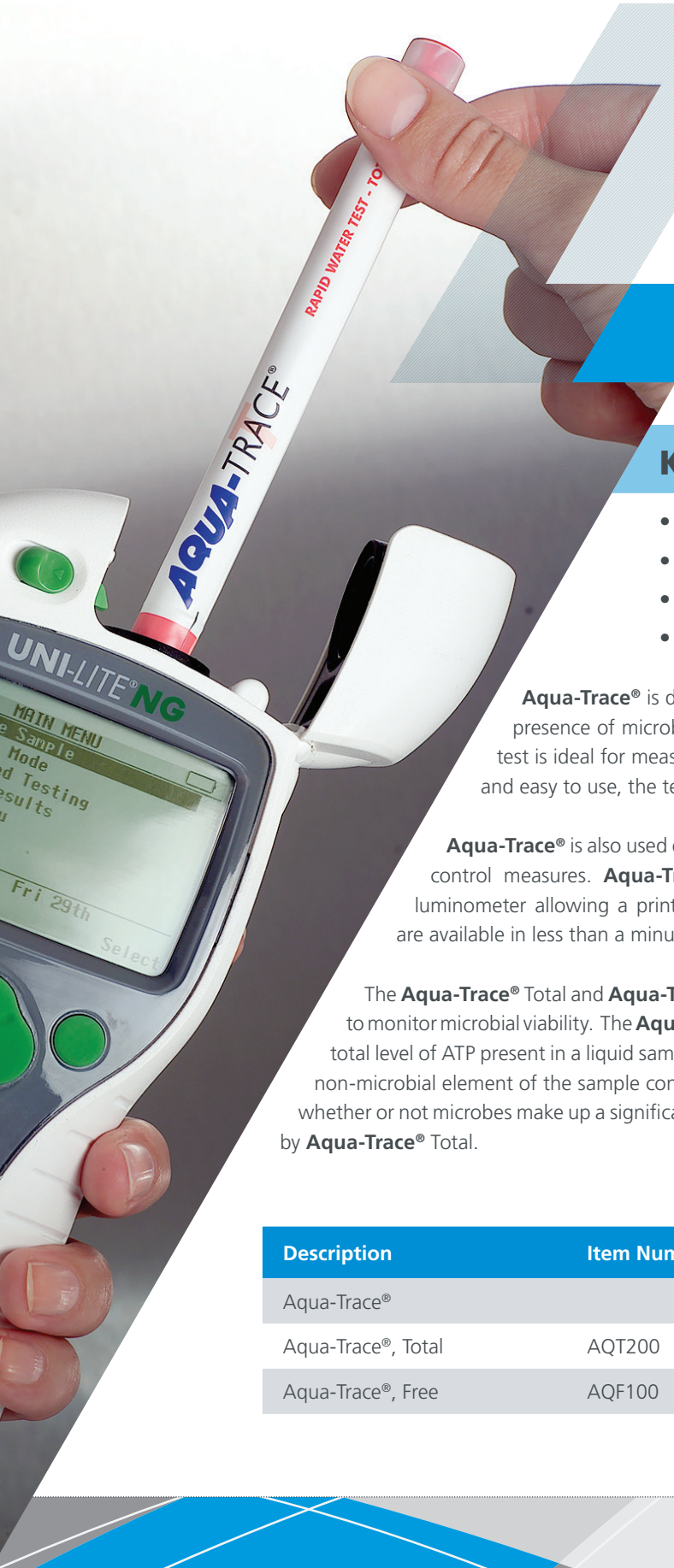
AQUA-TRACE®



KEY FEATURES:

- Detects microbial and product residue contamination in a water sample
- Assesses biocide efficacy
- Assesses biomass levels
- Allows for cost-effective evaluation of CIP real time efficiency

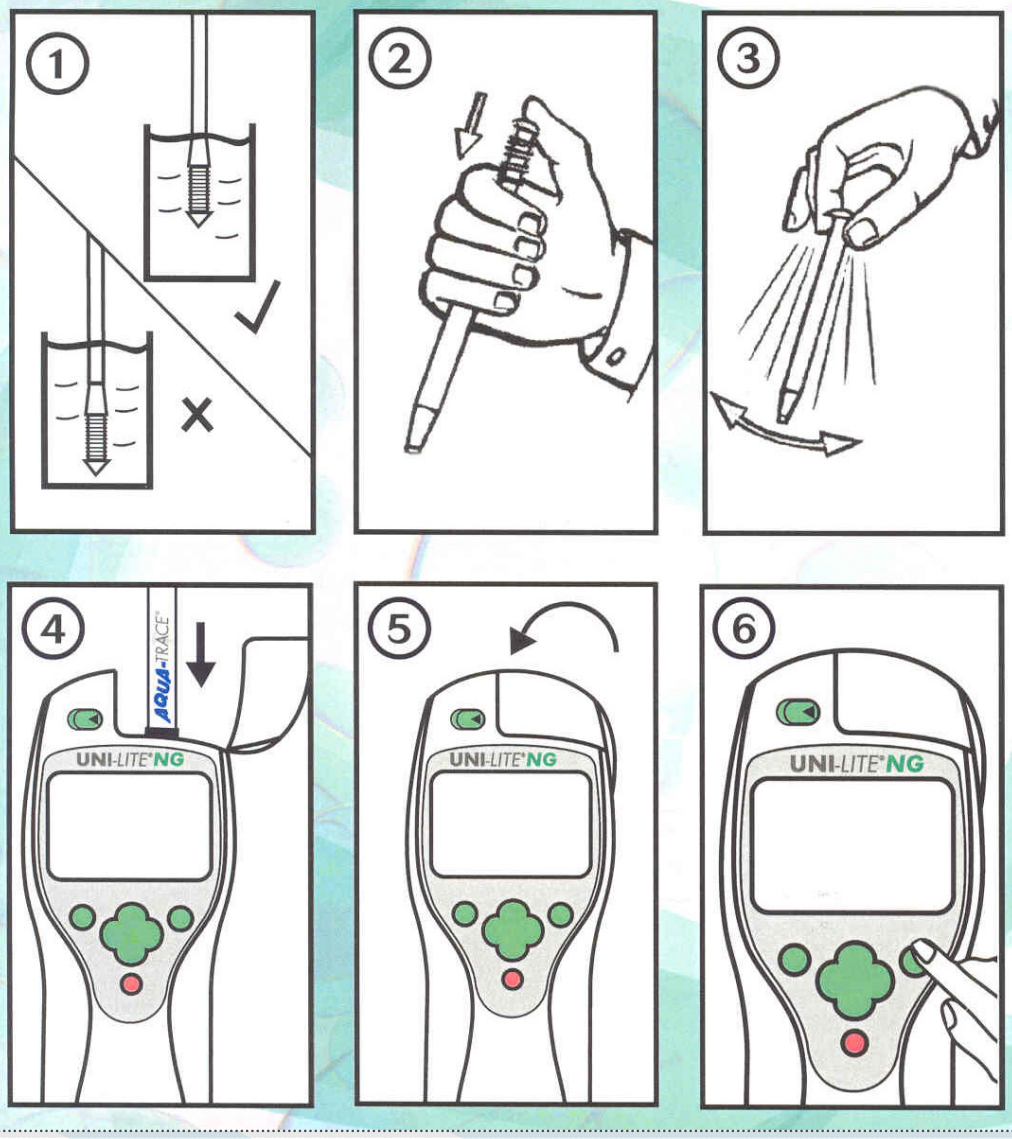
Aqua-Trace® is designed to rapidly assess biomass levels in a water sample by detecting the presence of microbial contamination with the ease of "dip, click and read" technology. The test is ideal for measuring the residual contamination in Clean in Place (CIP) rinse water. Simple and easy to use, the test can be performed with relatively little training.

Aqua-Trace® is also used extensively in the water treatment industry to assess the efficacy of microbial control measures. **Aqua-Trace®** is read in a Biotrace Orbijet® luminometer allowing a print out and/or data capture and results are available in less than a minute.

The **Aqua-Trace®** Total and **Aqua-Trace®** Free tests can be used in concert to monitor microbial viability. The **Aqua-Trace®** Total is designed to detect the total level of ATP present in a liquid sample. Aqua-Trace® Free detects only the non-microbial element of the sample contamination, usually used to determine whether or not microbes make up a significant element of contamination detected by **Aqua-Trace®** Total.

Description	Item Number	Unit
Aqua-Trace®		
Aqua-Trace®, Total	AQT200	100/ca
Aqua-Trace®, Free	AQF100	100/ca

AQUA-TRACE® Rapid Water Test



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CLEAN-*TRACE*®

The world's most user-friendly surface hygiene test, **Clean-Trace®** sets the standard when it comes to rapid surface hygiene de-tection. A self-contained, simple 'pen-like' device contains all the necessary reagents to determine whether surfaces and equipment are sufficiently clean. The device is metal de-tectable and has a blue handle to minimize the possibility of accidental introduction into the product.

KEY FEATURES:

- Rapid results available in less than a minute, allowing corrective action to be taken immediately
- Measure levels of surface contamination by ATP
- Simple and easy to use
- Ability to track test results using **Biotrack®**+ trend analysis software
- Metal detectable device

Clean-Trace® is simple, fast, safe and reliable, allowing you to use one swab at a time with no waste. Just swab, click and measure! The test is read in a Biotrace luminometer allowing a print out and/or data capture and results are available in less than a minute.

INSTRUCTIONS:

1. Swab sample surface.

2. Click pen

3. Place into a luminometer to read results.

Description	Item Number	Unit
Clean-Trace®		
Clean-Trace®	UXL100	100/ca

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BIOTRACE® POSITIVE CONTROLS

Biotrace Positive Controls are complete kits designed to provide cost effective assurance that your Biotrace hygiene monitoring reagents and instruments are being stored and used correctly thus ensuring reliable results. The positive controls are the ideal addition for anyone using Clean-Trace®, Aqua-Trace®, Protect® or Multi-Trace™.

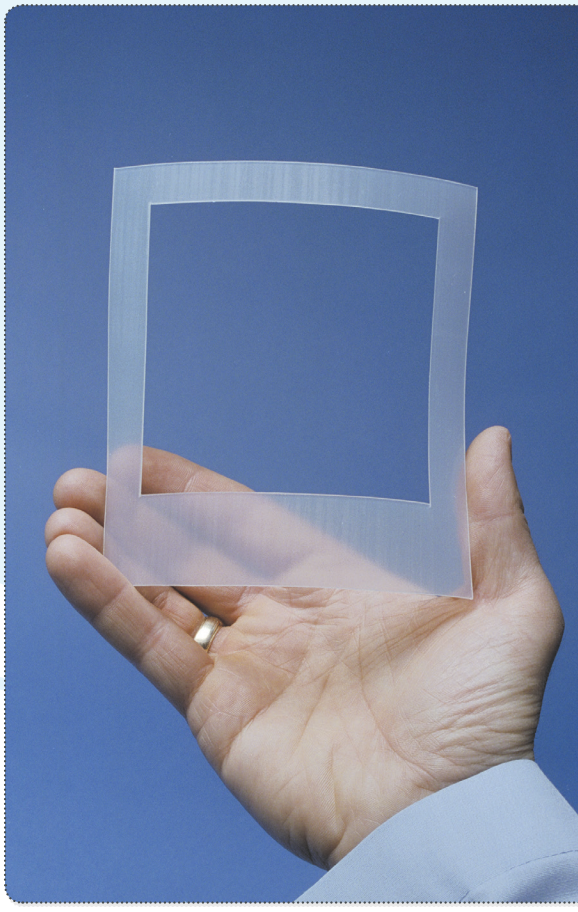
When used with **Aqua-Trace®** and **Multi-Trace™**, Positive Controls can also be used as a quench test to determine whether a component in a sample is reducing the signal.

Description	Item Number	Unit
Biotrace Positive Controls		
ATP positive control, 3ng ATP	ATP10	10/ca
ATP positive control, 30ng ATP w/10ml water	HWATP10	10/ca
ATP positive control, 3ng ATP w/10ml water	LWATP10	10/ca

MEGAREG™ TEMPLATES

We offer flexible plastic, individually wrapped, sterile templates that work with flat or uneven surfaces. These templates can be a valuable part of your Hygiene Monitoring program to help you consistently sample a fixed area at 50 or 100 cm2.

Description	Item Number	Unit
MegaReg™ Templates		
10x10cm2 area, sterile	USDA-100	100/ca
5x10cm2 area, sterile	USDA-50	100/ca



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PRODUCT: ORB102C

Advanced MicroEmulsion Technology

Advanced Chemistry

Platform Supply Vessels

ENVIRONMENTALLY FRIENDLY PRODUCT

ADVANCED MICROEMULSION TECHNOLOGY

Product Certification

CEFAS Gold rated product for use in UK North Sea. Carries no flag for substitution warnings and no taint warnings. **YELLOW** rated for use in Norwegian sector of the North Sea.

Product Description

ORB102C is a concentrated microemulsion *(forming)* surfactant system. **ORB102C** is soluble for dilution with sea water (fresh water as an alternative) and provides a highly efficient alternative to solvent, emulsion forming surfactant or caustic/acid based cleaners.

ORB102C has been designed specifically for the removal of base oil, pipe dope, oil based drilling muds, and filter cake from contaminated pipes, mud pits, formations and equipment. **ORB102C** can also be used for the remediation of emulsion blocking and near wellbore damage as well as remediation of cleaning slops.

ORB102C is:

- "One Stop" mud pit / well clean up system
- A highly efficient water based cleaner to replace organic solvents
- A highly efficient pH neutral cleaner to replace caustic / acid products
- A highly efficient alternative to replace emulsion forming surfactant systems
- No emulsion slop wastes produced
- Non flammable + Non toxic to humans
- Readily Biodegradable
- Non corrosive

Physical & Chemical Properties	
Appearance	Clear Liquid
Colour	Colourless Yellow
Solubility	Completely soluble in sea water
Odour	Orange / Citrus
Specific gravity	0.95 – 1.0 @ 20°C
pH Value (Concentrate)	7 - 10
Flash point	40 – 45°C
Flammability	Non flammable
Recommended	15%

ORB102C_2015.08.06

1-281-218-9400

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ADVANCED MICROEMULSION TECHNOLOGY

Part Number Reference Table	
ORB102C-EU1000	EU 1000L IBCs
ORB102C-EU200	EU 200L Drums
ORB102C-EU25	EU 25L Kegs
ORB102C-US320	US 320 Gallon Tote Tanks
ORB102C-US55	US 55 Gallon Drums
ORB102C-US30	US 30 Gallon Drums
ORB102C-US5	US 5 Gallon Pail

Directions for Product Use

It is recommended that **ORB102C** should be used at concentrations of 10 - 20%wt in sea water or fresh water but can be used at higher concentrations up to neat product as supplied.

This unique microemulsion cleaning product is temperature insensitive and can be used at temperatures in the range of 5°C to over 100°C. The cleaning efficiency of the product typically increases on increasing the temperature of the use solution.

After using **ORB102C**, the removed solids will settle out under gravity or via centrifugation. The aqueous fluids can then be induced to rapidly phase separate (by adding calcium chloride or sodium chloride) in order to release the organic components from aqueous solution. Without the use of filtration equipment the oil-in-water levels may be reduced to below 100ppm. With the use of suitable filtration equipment these oil levels may be reduced still further to below 40ppm. This provides waste minimisation at source thereby significantly reducing transport, treatment and waste disposal costs.

Slops remediation with ORB102C is automatic

Handling and Packaging

ORB102C is safe for handling and no special procedures need be observed. Normal precautions should be observed for the safe handling and storage of all chemicals and protective clothing should be used. Refer to the product MSDS.

ORB102C can be manufactured both in the UK and in the USA. The product is supplied in 25L Kegs, in 200L (55 and 30 Gallon) drums, in 1000L IBCs (320 Gallon Tote Tanks), or in bulk (20 - 25MT) tankers.

Shelf Life

ORB102C is stable for a period of up to 2 years provided that it is stored and handled as specified in the product MSDS.

ORB102C_2015.08.06

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PRODUCT: ORB116SC

Super Concentrate For Salt Water Dilution

with Fresh Water as alternative when used in cleaning process

Advanced Chemistry

Oil & Gas Operations

REMOVAL AND REMEDIATION OF HYDROCARBONS

Product Certifications

CEFAS **GOLD** rated product for mud pit cleaning and drill cuttings cleaning use in UK North Sea. CEFAS **SILVER** rated product for downhole use in UK North Sea. Carries no flag for substitution warnings and no taint warnings. **RED** rated for use in Norwegian sector of the North Sea. CEFAS **Non CHARM product (Category C)** for use in enhanced slurrification applications.

Product Description

ORB116SC is a super concentrate microemulsion forming surfactant system. The product has been specifically designed to microemulsify (solubilise) base oils into water and vice versa. The product is soluble for dilution with **sea water** and **fresh water** as an alternative when used in cleaning process. For only fresh water dilution see our product **ORB135SC**

Physical & Chemical Properties	
Appearance	Clear Liquid
Colour	Colourless / Pink
Solubility	Completely soluble in salt/sea water
Odour	Mild characteristic
Specific gravity	0.95 - 1 .1 @ 20°C
pH Value (Concentrate)	5-8
Flash point	77°c
Flammability	Non flammable
Use concentration	1 - 1 0% by weight

Hydrocarbon Removal, Treatment & Slurrification of:

- Drill cuttings (using sea water as the dilutent)
- Mud slops (using sea water as the best dilutent and fresh water as an alternative)
- Hydrocarbon wastes

ORB116SC provides a highly efficient product for use in the enhanced slurrification process of (oil contaminated) materials eg. waste drill mud cuttings and mud slops.

Cuttings waste generated as a result of drilling operations is usually slurrified using sea water. However, large volumes are required in order to generate a slurry of suitable pumpable characteristics. This is especially the case with shale cuttings and solids comprising significant quantities of clay based materials. These geologies readily hydrate and swell absorbing large volumes of water before becoming suitably fluidised - sometimes requiring up to 6 times their own weight in sea water. Solids also settle out under gravity during transport forming cakes in tanks which is difficult to remove during interfiled transfer.

ORB116SC can be used as a single step solids treatment system to facilitate the process in which drill cuttings and barite particulate solids are fluidised for pumping, transport and possible re-injection. This multifunctional product can be simply applied to the waste stream (active at concentrations of 1%wt and above) and can reduce the viscosity of the waste stream by over 90% increasing mobility and pumpability. **ORB116SC** does not require the addition of large volumes of sea water and/or base oil and therefore minimises the volume of the waste stream for transport by up to 80%. **ORB116SC** suspends the solids preventing barite sag and therefore facilitates the cleaning out of lines and holding tanks following waste storage. **ORB116SC** also prevents the hydration of shale I clay based geologies and optimises lubricity for re-injection purposes.

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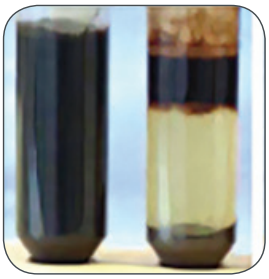
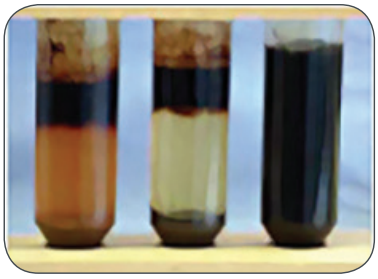
MicroEmulsion Surfactant Chemistries

...for the removal and remediation of Hydrocarbons

Part Number Reference Table	
ORB116SC-EU1000	EU 1000L IBCs
ORB116SC-EU200	EU 200L Drums
ORB116SC-EU25	EU 25L Kegs
ORB116SC-US320	US 320 Gallon Tote Tanks
ORB116SC-US55	US 55 Gallon Drums
ORB116SC-US30	US 30 Gallon Drums
ORB116SC-US5	US 5 Gallon Pail





Slops remediation with ORB116SC is automatic

Directions for Product Use General Instructions

For enhanced applications it is recommended that **ORB116SC** should be added to the waste stream at concentrations of 2 - 5% by weight product. The product can be applied in conjunction with sea water and/or base oil if required. This unique microemulsion forming chemical product is generally temperature insensitive and can be used at temperatures in the range of 5°C to over 100°C.

This unique microemulsion forming chemical cleaning product is generally temperature insensitive and can be used at temperatures in the range of 5°C to over 100°C. The cleaning efficiency of the product increases on increasing the temperature.

Following use of the product to clean wells and mud pits the removed solids will settle out under gravity or via centrifugation. The aqueous fluids can be induced to rapidly phase separate *(by adding calcium chloride or sodium chloride)* in order to release the organic components. Without the use of filtration equipment the oil-in-water levels may be reduced to below 1OOppm. With the use of suitable filtration equipment these oil levels may be reduced still further to below 40ppm. Optionally, and if necessary, the solids recovered may be rinsed with sea water to produce cleaned solids with an oil content of below 1% weight oil on dry solids. This product therefore provides the ultimate in waste minimisation capabilities providing for zero discharge at source thereby significantly reducing transport and disposal costs.

Shelf Life

ORB116SC is stable for a period of up to 6-9 months provided that it is stored and handled as specified in the product MSDS. This product is unstable in aqueous environments and will hydrolyse in water.

ORB116SC_2015.08.07

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ORBIJET TECHNOLOGIES, INC.
15200 Middlebrook Drive, Suite E Houston, Texas, 77058, USA.
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PRODUCT: ORB135SC

Super Concentrate For Fresh Water Dilution

Advanced Chemistry

Drilling Muds and Oil

ENVIRONMENTALLY FRIENDLY PRODUCT

FOR THE CLEANING AND REMEDIATION OF HYDROCARBONS

Product Certification

CEFAS certification not required – product primarily designed for use with fresh water in onshore and offshore applications.

Product Description

ORB135SC is a super concentrate microemulsion (forming) surfactant system. **ORB135SC** is soluble for dilution with fresh water and provides a highly efficient alternative to solvent, emulsion forming surfactant or caustic / acid based cleaners.

Hydrocarbon removal of:

- Base oil and pipe dope
- Oil and synthetic based drilling muds
- Other hydrocarbons
- Filter cake from contaminated tubulars, formations and equipment.

Applications:

- Mud pit cleaning, Railcar cleaning, Ship(Vessel) cleaning, Road Tanker cleaning
- Wellbore cleanup, Filter cake removal
- Refinery waste slops, Waste pit remediation

Advantages:

- Reduced water consumption and slops generation by over 50% compared to other methods. Near zero with proper system.
- A highly efficient water based cleaner to replace organic solvents
- Easier on personnel when compared to alkaline cleanings.
- No tight wemulsion slop wastes produced.
- Non flammable + Non toxic to humans.
- Readily Biodegradable.
- Non corrosive .

Physical & Chemical Properties	
Appearance	Clear Liquid
Colour	Colourless Yellow
Solubility	Completely soluble in fresh water
Odour	Mild characteristic
Specific gravity	0.95 – 1.5 @ 20oC
pH Value (Concentrate)	4.5 – 7.5
Flash point	80°C
Flammability	Non flammable
Use concentration	2 – 20% by weight

ORB135SC_2015.08.07

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MicroEmulsion Surfactant

Removal of Hydrocarbons, Drilling Mud Slops, Remediation

Part Number Reference Table	
ORB135SC-EU1000	EU 1000L IBCs
ORB135SC-EU200	EU 200L Drums
ORB135SC-EU25	EU 25L Kegs
ORB135SC-US320	US 320 Gallon Tote Tanks
ORB135SC-US55	US 55 Gallon Drums
ORB135SC-US30	US 30 Gallon Drums
ORB135SC-US5	US 5 Gallon Pail

Directions for Product Use General Instructions

It is recommended that **ORB135SC** should be used at concentrations of 10 - 20% by weight in fresh water but can be used undiluted when and where the application may require it. Typical "Automated Cleaning Systems" can use **ORB135SC** at 10% by volume in multi-use re-circulatory systems and in many cases use this solution several times before recharging the system.

This unique microemulsion cleaning product is temperature insensitive and can be used at temperatures in the range of 5o°C to over 100°C. The cleaning efficiency of the product typically increases on increasing the temperature. Do not overheat or flash-off.

Following use, the removed solids will settle out under gravity or via centrifugation. The aqueous fluids can then be induced to rapidly phase separate (by adding calcium chloride or sodium chloride) in order to release the organic components from aqueous solution. Without the use of filtration equipment the oil-in-water levels may be reduced to below 100ppm. With the use of suitable filtration equipment these oil levels may be reduced still further to below 40ppm. This provides waste minimisation at source thereby significantly reducing transport, treatment and waste disposal costs.

Slops remediation with ORB135SC is automatic

Shelf Life

ORB135SC is stable for a period of up to 6-9 months provided that it is stored and handled as specified in the product MSDS. This product is unstable in aqueous environments and will hydrolyse in water.

ORB102C_2015.08.05

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PRODUCT: ORB156SC

Orbijet Sludge and Tank Bottoms Treatment

Advanced Chemistry

Tank Bottoms & Sludge

REMEDIATION OF HYDROCARBON SLUDGE AND SLOPS

Product Description

ORB156SC is for use in onshore and offshore waste management operations for the fast and safe treatment of crude oil sludge, refinery waste and heavy viscous tank bottoms.

Product Use in:

- Crude Oil Sludge Treatment
- Refinery Waste Treatment
- Tank Bottom Treatment
- Oil Recovery
- Cleaning Slops Treatment

Physical & Chemical Properties	
Appearance / Color	Clear Yellow Liquid
Solubility	Soluble in Water
Odor	Citrus
Specific Gravity	0.95 – 1.05 @ 20oC
pH Value	8.0 – 11.0
Flash Point	52°C
Flammability	Non Flammable
Biodegradability	Readily Biodegradable
Recommended Concentration	0.1% – 1% by Weight

Benefits of using ORB156SC are:

- **Recovers Virtually all Oil**
- **Reduces waste treatment times by at least 50%**
- **Reduces waste volumes by up to 95%**

ORB156SC does not form difficult to handle tight emulsion waste streams. The chemistry works by splitting emulsions into three separate fractions of oil, water and solids without the need to use thermal treatment processing, which can be expensive and hazardous to the environment.

ORB156SC_2015.08.11

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ORB156SC

Part Number Reference Table	
ORB156SC_US5	5 Gallon Non-Returnable Pails
ORB156SC_US30	30 Gallon Non-Returnable Drums
ORB156SC_US55	55 Gallon Non-Returnable Drums
ORB156SC_US320	320 Gallon Non-Returnable Totes

How to use ORB156SC

1. Add ORB156SC to the oil slop or sludge. Dose circa 0.1% – 1% by weight.
2. Mix by agitation, stirring or chemical injection into the waste stream.
3. Collect waste after dosing and allow waste to separate out under gravity or through centrifugation.
4. Recover oil, send solids fit to landfill and send water to waste water treatment plant.

Health & Safety

ORB156SC is safe for handling and no special procedures need be observed. **ORB156SC** is non flammable, non corrosive, non toxic and readily biodegradable.

Technical Information

ORB156SC is temperature insensitive and can be used at temperatures in the range of 50°C up to 100°C.
ORB156SC does not form oil/water tight emulsion waste which minimize waste production. After use, clean solids separate out under gravity or via centrifugation and can be sent to landfill or may not have to be disposed of due to it's low hydrocarbon on solids percentage. Oil can be recovered from the surface. Waste water can go to a waste water treatment plant for disposal.

Storage

Storage of all chemicals and protective clothing should be used as specified in the product MSDS.

ORB156SC is stable for a period of up to 2 year provided it is stored and handled as specified in the product MSDS.

Shipping & Packaging

ORB156SC is manufactured in the USA under ISO 9001:2008 and ISO 14001:2004 Quality, Environmental and Safety Management System Standards. Minimum orders to blend a batch does apply. Laboratory samples are available in and at a fee.

Un-Treated Slops

Separation

- **Recover oil**
- **Water to waste water treatment plant**
- **Solids to landfill**

ORB156SC_2015.08.11

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PRODUCT: ORB3000SC
ADVANCED TANK CLEANING TECHNOLOGY

Advanced Chemistry

CIP Systems

ENVIRONMENTALLY FRIENDLY PRODUCT

ADVANCED WATER HARDNESS REDUCTION

Proven Success Record

Used and specified by major breweries in the USA and Canada due to it's powerful rinsing enhancements and reduction of CIP Times and water usage.

Product Description

ORB3000SC is a concentrated wash aid including a chelant, dispersant, and surfactant delivery system that is typically used to enhance Caustic Soda when used for the cleaning of tanks and/or other equipment where Caustic Soda is the principal cleaning chemistry used. Use in CIP (Clean In Place) Systems, COP (Clean Out Of Place) Systems, and piping recirculation is common.

ORB3000SC has been designed specifically to enhance Caustic Soda so that the removal of organics via saponification is made highly efficient... thus reducing solution time, rinse time, and high reduction of water usage.

ORB3000SC is:

- "One Stop" Caustic Soda Enhancement System.
- A highly efficient surface tension reducer; thus improves cleaning
- A highly efficient water hardness control agent
- Low foaming and ideal for cleaning applicaitons
- Rinse efficient; thus reducing rinse times and water usage
- Production efficient; thus increasing batch process capabilities
- Reduces Caustic Soda consumption and Set Point Values
- Reduces energy consumption through enhanced cleaning efficiencies

Physical & Chemical Properties	
Appearance	Clear
Color	Light amber
Solubility	Soluble in water and Caustic Soda
Odor	Bland
Specific gravity	1.30 @ 70°F
pH Value (Concentrate)	2.0 - 3.0
Flash point	None
Flammability	Non flammable
Typical Dosage %	10% by weight in Caustic Soda

Performance Properties...

1. Surface tension, 0.3% ORB3000SC in 3.0% NaOH
2. Ross Miles Foam Tests, 0.1% ORB3000SC in 1.0% NaOH

ORB3000SC_2016.03.18

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ADVANCED SURFACTANT TECHNOLOGY

Part Number Reference Table	
ORB3000SC-EU1000	EU 1000L IBCs
ORB3000SC-EU200	EU 200L Drums
ORB3000SC-EU25	EU 25L Kegs
ORB3000SC-US275	US 275 Gallon Tote Tanks
ORB3000SC-US55	US 55 Gallon Drums
ORB3000SC-US30	US 30 Gallon Drums
ORB3000SC-US5	US 5 Gallon Pail

Directions for Product Use

It is recommended that **ORB3000SC** should be used at concentrations of 10% by weight in Caustic Soda (50% concentration). This use solution would then be used at a dosage rate of 3% in fresh water. Custom application of **ORB3000SC** can and should be considered based on the water hardness used in your make-up water for cleaning. Consult with your Orbijet Sales Professional for an on-site evaluation.

This unique cleaning product is temperature insensitive and can be used at temperatures in the range of 41°F to 200°F. The cleaning efficiency of the product typically increases on increasing the temperature of the use solution.

You cleaning routines (CIP Recipe) should be evaluated for reductions in time and water usage when using the **ORB3000SC** product. Consult your Orbijet Sales Professional on our CIP Optimization Programs to insure that you are maximizing your cost benefit options when using this product.

Typical Applications are...

- Fermentation
  - Breweries
  - Wineries
  - Ethanol
  - Yeast
- Brew Kettles
- Lauter Tuns
- Whirpools
- Heat Exchangers

Any and all other applications where Caustic Soda is used as the primary or integral cleaning chemistry.

Handling and Packaging

ORB3000SC is safe for handling and no special procedures need be observed. Normal precautions should be observed for the safe handling and storage of all chemicals and protective clothing should be used. Refer to the product MSDS for details.

ORB3000SC is manufactured in USA and distributed worldwide. The product in North America is supplied in 5 gallon pails, 30 gallon drums, 55 gallon drums, and 275 gallon totes. Truckloads are also available where applicable.

Shelf Life

ORB3000SC is stable for a period of up to 2 years provided that it is stored and handled appropriately.

ORB3000SC_2016.03.18

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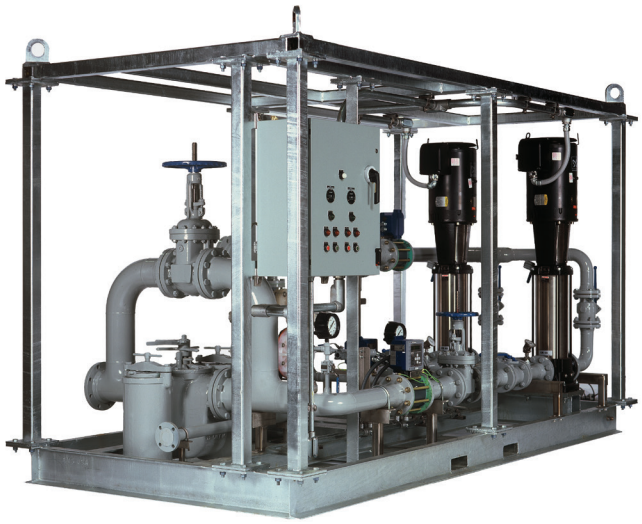
CIP System

...general purpose tank cleaning skid



Type: CIP2546

- Durable Skid Construction
- Heavy Lift Frame
- Hot Dipped Galvenized
- Flow Control
- Pressure Control
- Filtration - Pump Protection
- Safety Relief Valve
- NEMA Rated Control Cabinet
- Chemical Injection Pump
- Pressure Gauges
- Flow Meters
- Fully Conduited

Product summary...

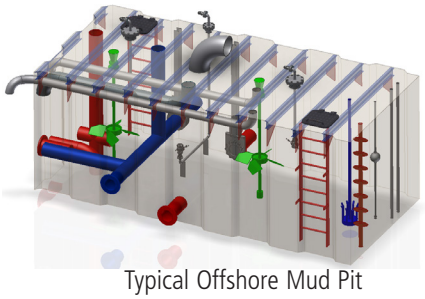
CIP2546 is a skid mounted tank cleaning system designed for use in the offshore oil & gas markets. It is typically used to supply the required pressure and flow to a cleaning head arrangement. Flow control is accomplished with a bypass valve on the pump suction. The skid is transportable by lifting lugs on the top of the skid frame and via forklift. Chemical injection is accomplished via a chemical injection pump on the suction side of the primary CIP pumps. The entire skid is pressure protected by use of a safety relief valve on the CIP discharge.

Quality Control, Compliances & Certifications...

- ASME
- NEMA
- ISO 9001

Typical applications for CIP2546

- OSV/PSV Mud Tank Cleaning
- Drilling Fluids Tank Cleaning
- Mud Pit Tank Cleaning
- Cuttings Box Cleaning



Typical Offshore Mud Pit

Cleaning Tools

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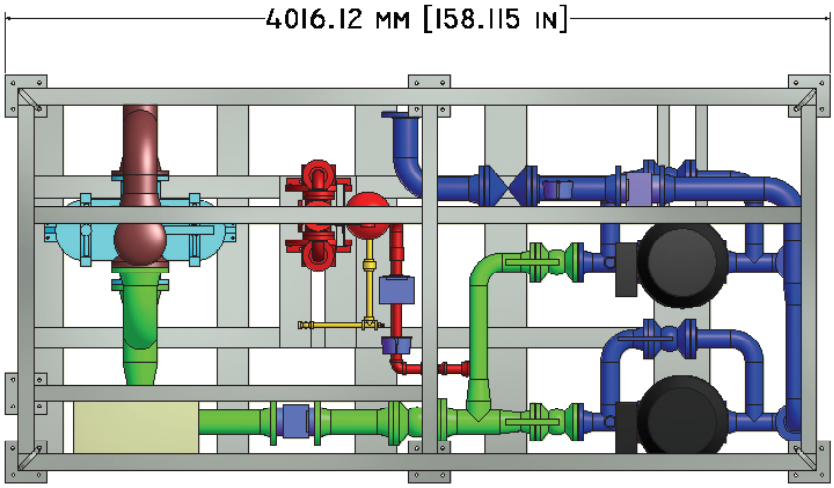

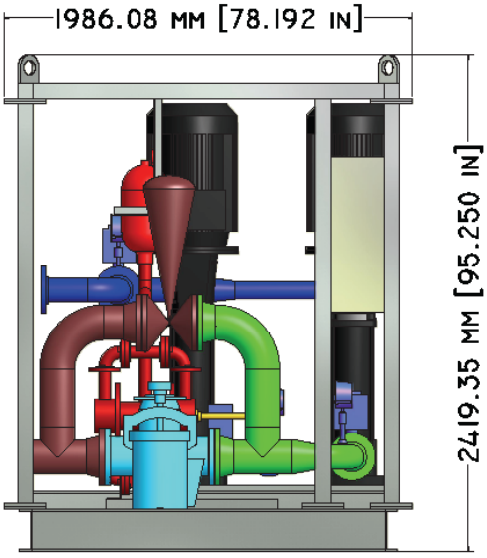

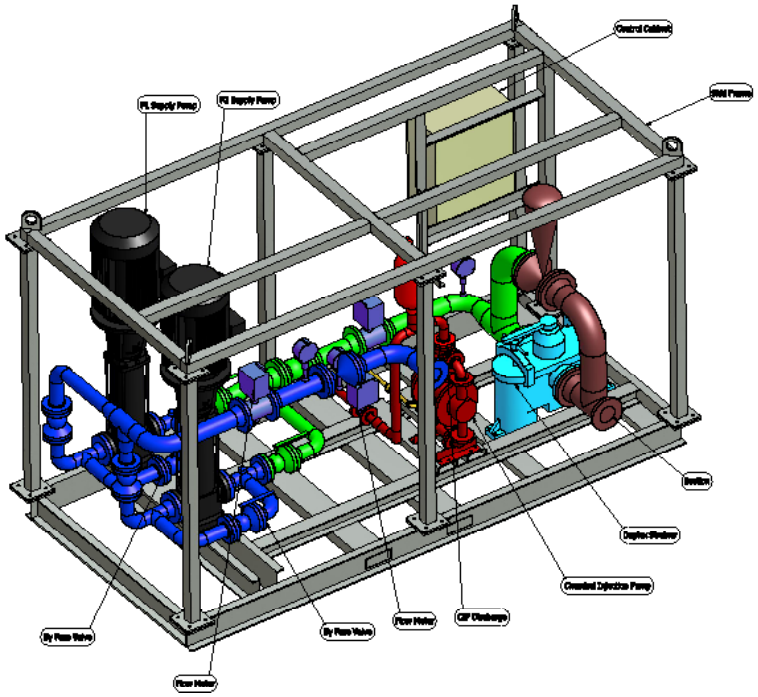

Utilities Requirement	
Electrical	230/460 Volt; 60 or 50 HZ
Fluid Return	>= Operating flow + 10%
Air/Pneumatic	100 PSIG (6.89 BAR)

General Specifications	
Design Operating Pressure	0-270 PSIG (0-18.62 BAR)
Design Operating Flow	0-482 USGPM (0-109.47 m^3/hr)
Filtration - Pump Protection	200 micron
Frame	Hot Dipped Galvanized
Weight	6,900 lbs Empty (3,136 kg)
Pump HP (P1 and P2 Pumps)	50 HP Each
General Dimensions	158.115 in Long x 78.192 in Wide x 95.250in H
P&ID Design Drawing	2546-04-PID
Piping Material	Carbon Steel; coated
Drawing Number	2546-04-PID

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ver. CIP2546_Orbijet_2016.05.02

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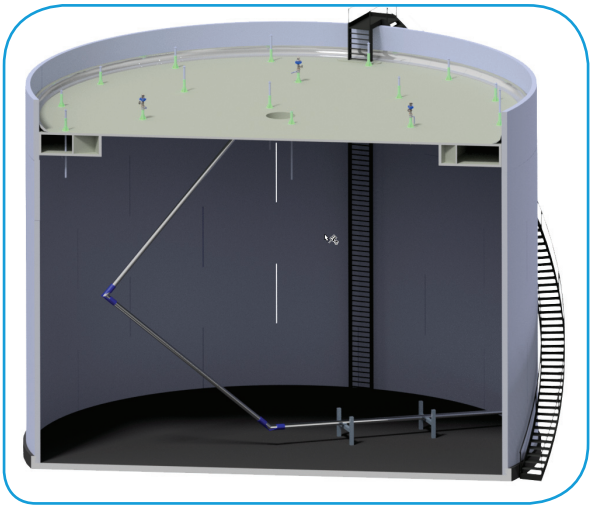
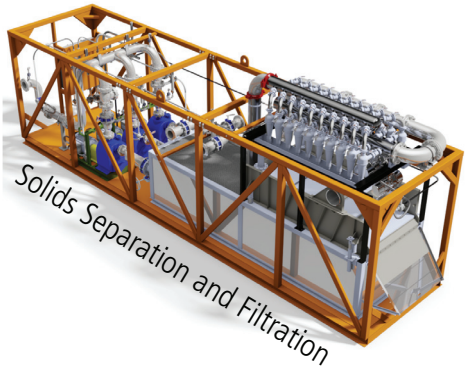
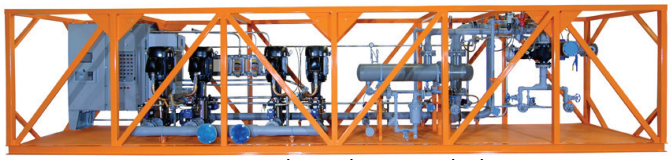


Crude Oil Washing System Type 2571



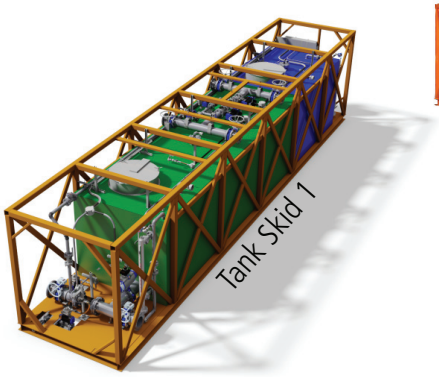
Solids Separation and Filtration



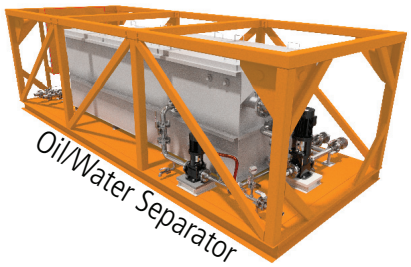
Controls and Pump Skid

Electric Generator - Diesel Fueled

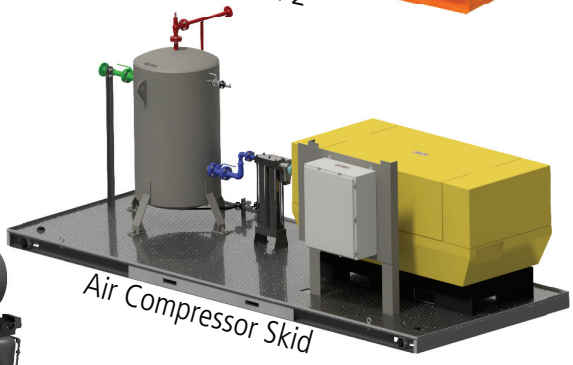
Tank Skid 2



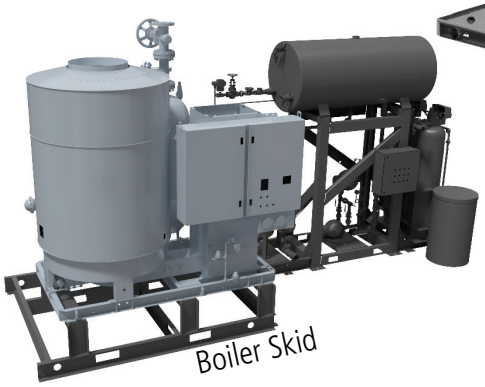
Tank Skid 1



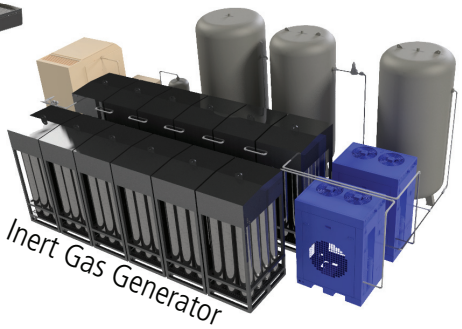
Oil/Water Separator



Air Compressor Skid



Boiler Skid



Inert Gas Generator

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Type 2571 | Crude Oil Washing System

CIP (Clean In Place) System

Clean In Place (CIP) System Portable & Fixed Crude Oil Washing System (COW)

Type 2571 is a Crude Oil Washing system that is designed to clean large hydrocarbon storage tanks with solvents, hot water, and chemistry solutions such as our proprietary microemulsion remediation chemistries.

1 PUMP SKID

SUMMARY: Pumping capacity of 1600 USGPM (364 m3/hr) @175 PSIG (12.06 BAR) @140°F (60°C)

POWER REQUIREMENTS: 460/400V 60/50 Hz

2 TANK SKID 1

SUMMARY: (1)5000 Gal (19 m3) (1)3000 Gal (11 m3) Typical Use... Recirculation Chemical Solutions

POWER REQUIREMENTS: 460/400V 60/50 Hz

3 TANK SKID 2

SUMMARY: (1) 5000 Gal (19 m3) Typical Use... Recirculation Holding Tank Other

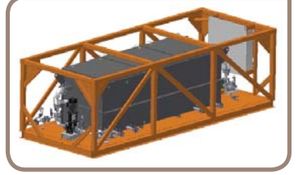
POWER REQUIREMENTS: 460/400V 60/50 Hz

4 SOLIDS SEPARATION SKID

SUMMARY: Combination hydro-cyclone/shaker with capacity of 1600 USGPM (364 m3/hr) with tank and pumps.

POWER REQUIREMENTS: 460/400V 60/50 Hz

5 OIL - WATER SEPARATOR



SUMMARY: Oil/water separator for side stream polishing of surge tanks

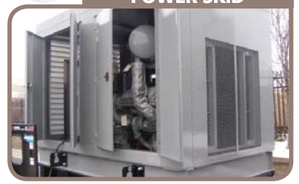
POWER REQUIREMENTS: 460/400V 60/50 Hz

6 INERT GAS SKID

SUMMARY: Nitrogen gas generator skid to provide inert atmosphere in tank to be cleaned.

POWER REQUIREMENTS: 460/400V 60/50 Hz

7 POWER SKID



SUMMARY: Electric generator skid to provide power to all modules; diesel fueled.

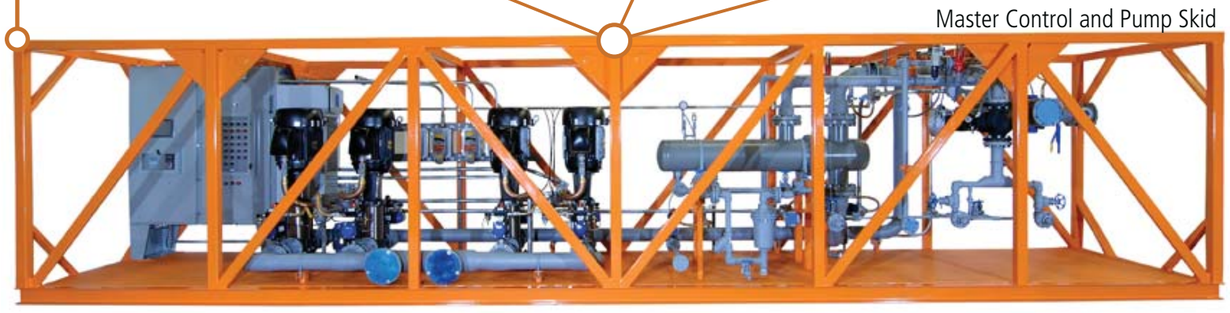
POWER REQUIREMENTS: Diesel Fuel

8 BOILER SKID

SUMMARY:
- Gas or Oil
- Horsepower: 300
- BTU: 12,246,951
- Water package
- Skid mounted

POWER REQUIREMENTS: Diesel & 460/400V 60/50 Hz

Master Control and Pump Skid



11 RETURN PUMPS

SUMMARY: 4 each hydraulically driven submersible pumps; 400 USGPM(91 m3/hr) each

POWER REQUIREMENTS: Hydraulic PowerPac

10 CONVENTIONAL TCM

SUMMARY: (4) Portable tank cleaning machines with hoses and couplings.

TYPE: SC 45TW
Inlet conn: 2.00" NPT(M)
Nozzles: 2x12mm

9 COW MACHINES/FANS

SUMMARY: (6) SC 60A COW Machines (4) Gas Freeing Fans (Air) Assortment of hoses and couplings.

POWER REQUIREMENTS: Air

12 HYDRAULIC POWER PACK

SUMMARY: Diesel powered hydraulic power pack with the capacity to drive 4 each of the return pumps

POWER REQUIREMENTS: Diesel

Clean in Place System (CIP) Type 2571 has the capability to create a recirculation loop within the tank to be cleaned via the selected tank cleaning machines thus dislodging and mixing the tank bottoms to be carried away via the return pump system to our proprietary solids separation system where the fluid stream is reduced of solids to less than 300 micron. The solids fraction is discharged to holding bins for further treatment or disposal by others and the aqueous phase is returned to the tank skids for continued recirculation in the tank(s) to be cleaned until all solids are removed from the tank.

Our **oil/water separation skid** can be engaged for side stream polishing of the aqueous stream thus reducing the oil in water fraction for remediation of the fluid streams and recovery of the oil or microemulsion chemistries that can be used for a more complete recovery of the oil and remediation of the solids. The required heat source is supplied via our boiler skid and power is supplied via our power generation skid. Tanks are inerted with our Nitrogen Gas skid. Each skid frame is uniquely designed for portability on land and offshore use. The majority of the system is PLC controlled from the primary controls/pump skid and connection to other skids are via an Ethernet/IP Network with Remote I/O. Modules that are included with this system are listed in the Skid Modules Table above.

Skid Modules (All modules fit in a 40' Container for shipping purposes)

Modules	Dimensions *(Feet/Meters)*	Function
Pump Skid		Primary pump and master control skid.
Tank Skid 1		Primary tank skid; recirc and chemistries
Tank Skid 2		Secondary tank skid; recirc and storage
Solids Separation		Solids separation of cleaning fluid streams
Oil/Water Separator		Oil/water separations skid
Inert Gas Skid		Inerting of tanks being cleaned
Power Skid		Diesel powered generator.
Boiler Skid		Diesel powered; steam to heat exchanger
Air Compressor Skid		Air supply to entire system.

Summary Performance Characteristics of Products in this Full Package

Component	Summary Description	Reference/Part Number
Controls/Pump Skid	Pumping capacity of 1600 USGPM (364 m3/hr) @175 PSIG (12.06 BAR) @140°F (60°C); VFD	7521467
Tank Skid 1	5000 gallon tank; 3000 gallon chemical tank; automated valves where prudent	7521477
Tank Skid 2	5000 gallon tank; automated valves where prudent	7521494
Separations Skid	Combination hydrocyclone/shaker with capacity of 1600 USGPM (364 m3/hr) with tank	7521527
Oil/water Separator	Oil/water separator for side stream polishing of surge tanks	7521515
Inert Gas Skid	Nitrogen inert gas skid to control LEL levels in tank to be cleaned	7521555
Power Skid	Generator skid to provide power to all modules; diesel powered	7521560
Boiler Skid	Boiler skid to provide steam to the pump skid heat exchanger; diesel powered	7521508
Programmable TCM	6 each Single nozzle programmable type SC 60A Crude Oil Washing Machines	Pending
Conventional TCM	4 each Portable tank cleaning machines type SC 45TW with capacity of 104 USGPM(23.5 m3/hr)	Pending
Return Pumps	4 each hydraulically driven submersible pumps; 400 USGPM(91 m3/hr) each	7521565
Hydraulic Power Pack	Diesel powered hydraulic power pack with the capacity to drive 4 each of the return pumps	7521567
P&ID Drawing	Details drawing of all components, calculations, and flow paths.	2571-09-PID
Sundry	Assortment of supply/return hoses; cables for skid connections; junction boxes; etc.	7521564
Air Compressor Skid	Diesel driven air compressor	7521572

2571CIP_2016.11.28

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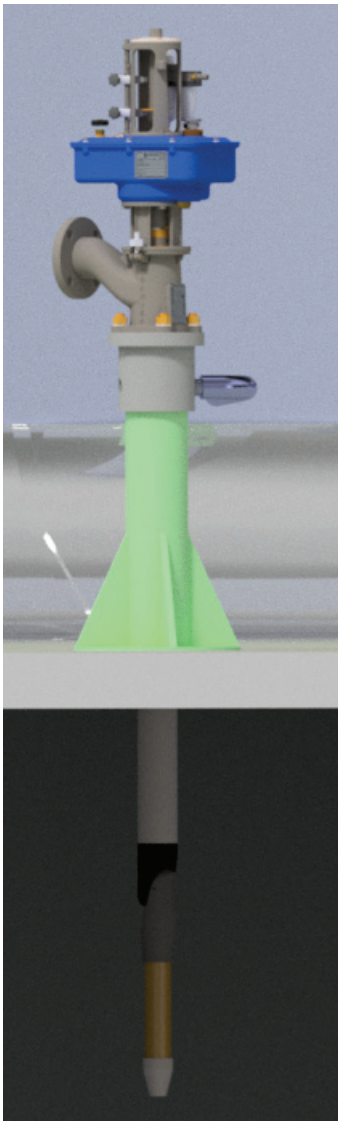

SC 60A Crude Oil Washing Machine

Fits through the support legs for floating roof tanks.

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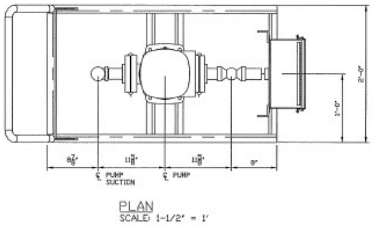
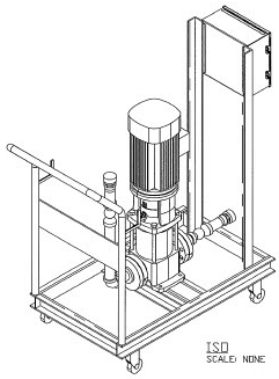
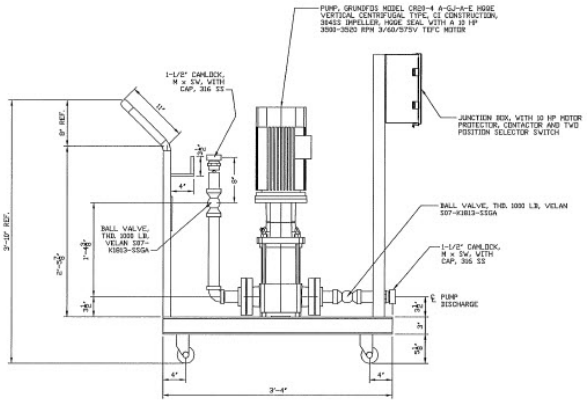
2571CIP_2016.11.28

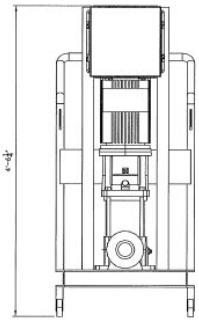
CIP System

CIP2603 is a portable tank cleaning pumping system on casters for easy mobilization within your plant for the portable or fixed cleaning of your tanks for storage, process or transportation. Constructed of carbon steel and then primed and coated with our standard industrial grade coating process. Connections to your tank cleaning machines would typically be via flexible hoses; however fixed piping from the system is possible should that be desired. Actuation of the system is via a selector switch for on or off and a secondary emergency stop switch is also included. The control panel is explosion proof per Class I Div I requirements as is the pump motor. A duplex strainer is provided on the suction side for the pump with a filtration basket of 200 micron.









General Specifications	
Design Operating Pressure	150 PSIG (10.34 BAR)
Design Operating Flow	88 USGPM (20 m3/hr)
Filtration	200 Micron
General Dimensions	3'4" L x 3'10" H x 2' W (1016mm L x 1168mm H x 610mm W)
P&ID Drawing Number	2603-00-PID
Power/Electricity	230/460 V 60 Hz (Others available on request)
Valve Actuation	Manual
Construction Code	ASME as per Class I Div 1 (Explosion Proof)
Drawing Number	Pending

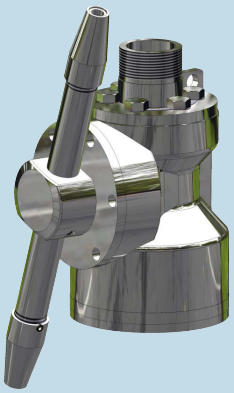
Type: CIP2603

Quick Features

- Explosion Proof
- Portable
- Manual Controls
- Small footprint

Images

Picture is for example only, the actual system may differ in appearance



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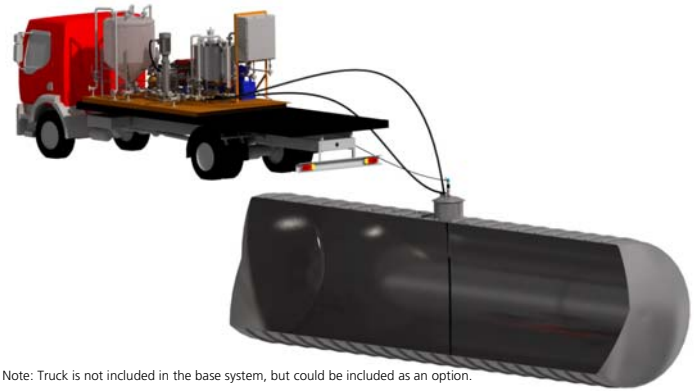
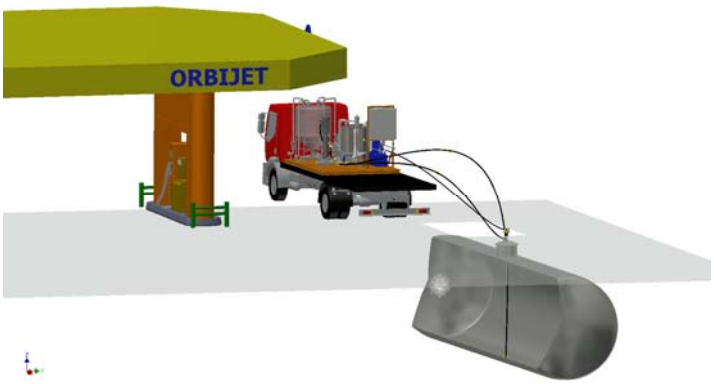
CIP System Type: CIP3056

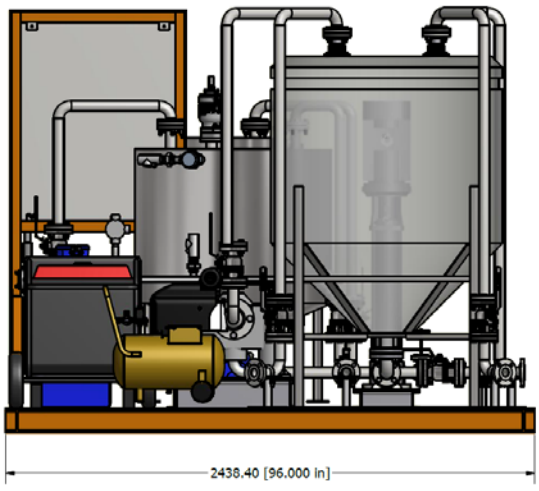
Underground Storage Tank (UST) Cleaning System

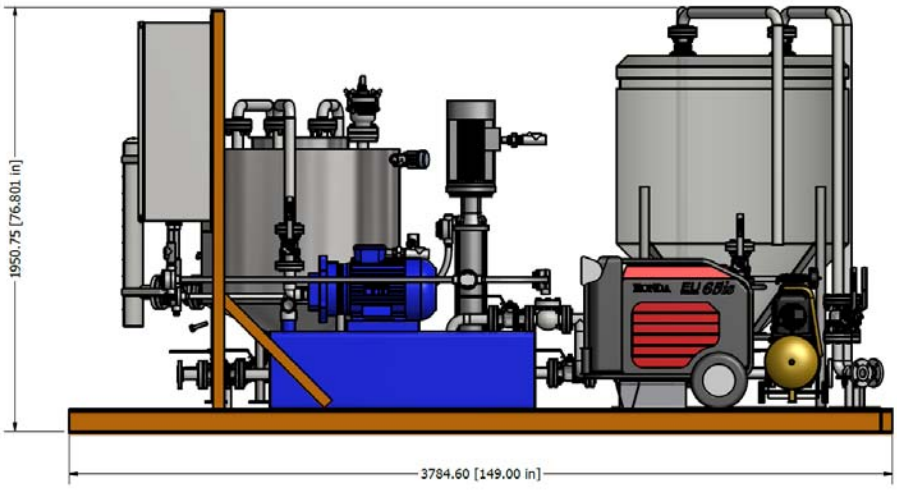




Note: Truck is not included in the base system, but could be included as an option.

CIP3056 Tank Cleaning System is designed to clean underground storage tanks using our SC20RA high pressure cleaning device by inserting this device through a 3.00 inch (76.2mm) or larger tank opening. Evacuation of the tank is accomplished using our precisely designed vacuum pump system that thoroughly strips the tank being cleaning of fluids and solids. A recirculation loop is initially accomplished using water and/or a water and chemical solution so as to solubilize the contents within the tank being cleaned. As this recirculation loop is created the solids that could be in the tank are filtered from the recirculation media via a duplex strainer on the system with filtration to 200 micron. Once the residuals within the tank are solubilized and free of solids, a final rinse with fresh water (if needed) is introduced within the tank via the SC20RA cleaning device and captured in a post-rinse portable tank for disposal according to local authority environmental regulations. All equipment on the **CIP3056** skid is explosion proof to Class I Div 1 standards. ATEX compliance is available upon request.





Summary Performance Parameters and Equipment List	
Design operating pressure	250 PSIG (17.24 BAR)
Design operating flow	32 USGPM (7.27 m³/hr)
Weight (approx.)	6,000 pounds (2728 kg)
Controls	Automated; PLC
Generator	Diesel fueled
Air compressor	Powered by diesel generator
Vacuum tank	150 Gallon Carbon steel painted
Solution tank	200 Gallon Polypropylene Tank
Filtration	Duplex; 200 micron
Drawing Number	3056PRJ-00-PID

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CIP System Type: CIP3056

Underground Storage Tank (UST) Cleaning System

3D Rendering of System

Typical Operating Process

Cleaning machines and CIP return manway assembly are attached to the tank to be cleaned using Orbijet's custom build assembly for this purpose. The vacuum pump is engaged on the CIP3056 System which begins to create a vacuum in the CIP Tank on the system with transference of vacuum to the tank to be cleaned. Once that vacuum is established, the CIP Supply pump on the CIP3056 System is started and set at 250 PSIG (17.24 BAR) of operating pressure. This will hydraulically engage the SC20RAHP cleaning device that is part of the Orbijet Manway Assembly for this system. Simultaneously, the SC20RAHP pneumatic operation is commenced so that the nozzles are set in rotation. At this stage the CIP Return vacuum system is engaged along with the CIP Supply System, creating a recirculation loop in the tank to be clean. The cleaning solution chosen is based on what is required for the relative cleaning operation at hand. Cleaning time will take from 1/2 hour to several hours per tank depending on the level of soiling in the tank. The higher the solids in the tank and/or the more difficult the product is to clean, the longer it will take to clean a particular tank. A cleaning recipe that will determine solutions to be used and estimated cleaning cycles should be developed before commencing cleaning operations. Expect to remove solids from the duplex strainer whilst in the CIP process.

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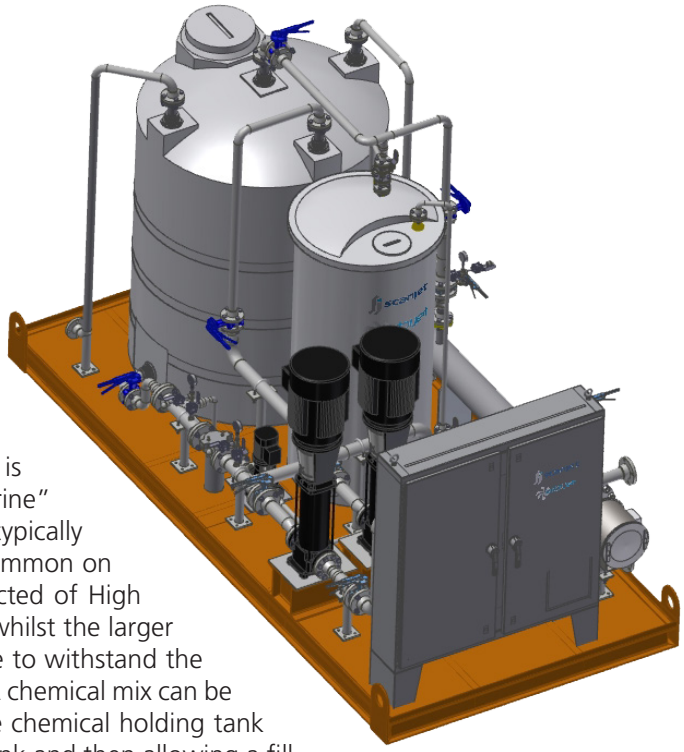
CIP System

Drilling Rig/Ship Cleaning System

Type: CIP3087



CIP3087 is a skid mounted Clean In Place (CIP) System specifically designed for the cleaning of drilling fluid tanks on drilling rigs for both on and offshore and on drill ships. System **CIP3087** is a two tank system with one tank for recirculation of the cleaning fluid and one tank for the holding of cleaning chemistries.

All tanks have overfill pipes that discharge onto and within a containment on the skid in the event of an overfill situation. The vertical multi-stage pumps can be used simultaneously or in singular mode for pump redundancy needs. The entire system is comprised of ATEX certified components and with all certificates of compliance provided with the system documentation package. All piping is constructed of carbon steel and externally coated with a "Marine" quality paint to withstand years of non-corrosive service that is typically experienced in a Marine (Saltwater) environment which is common on Offshore Drilling Rigs and Drillships. The tanks are constructed of High Density Polypropylene (HDPE) for the chemical holding tank whilst the larger recirculation tank is constructed of Cross-Linked Polyethylene to withstand the required temperature and day to day use of this equipment. A chemical mix can be achieved on-skid by taking the required chemistries from the chemical holding tank and transferring the calculated amount to the recirculation tank and then allowing a fill of salt or fresh water into the recirculation tank as required in the cleaning recipe.

Once this is accomplished, the fluid in the recirculation tank is recirculated to mix the water and chemistry components into the proper solution. Heat up to 60˚C (140˚F) can be achieved on the **CIP3087** system by recirculating through the on-board electric heater for the designated number of recirculations required to achieve the ΔT needed. The skid for system **CIP3087** is tested and ran through our frame analysis calculations to insure that it can be lifted by a crane at 4 lift points on the skid when all tanks and lines are empty. System **CIP3087** pumps are controlled by a PLC on the skid and the control cabinet also incorporates a data highway for link to an external primary control center if so wanted.

Performance Parameters and General Specifications			
Ref	Parameter	Value	Comments
1	Design Pressure	208 PSIG (14.35 BAR)	---
2	Design Flow	150 USGPM (34 m^3/hr	---
3	Design Temperature	60˚F (140˚F)	---
4	Filtration	228 micron	Duplex strainer
5	Recirculation/Mix Tank	1,100 Gallons (4,164 liters)	XLPE
6	Chemical Holding Tank	325 Gallons (1,230 liters)	HDPE
7	Construction codes and conformities	ISO9001, ASME, ANSI, ATEX	ABS, DNV, Lloyds, NKK, on request
8	Rated to operated in hazardous zone	Yes	ATEX on all electrical components
9	Controls (Pumps)	PLC with data highway	---
10	Frame	Load and stress analysis for lifting	Stress analysis tables available on request
11	Drawing Number	3087PRJ-05-PID	...
Customization of this skid is available via our engineering services group at eng@orbijet.com			

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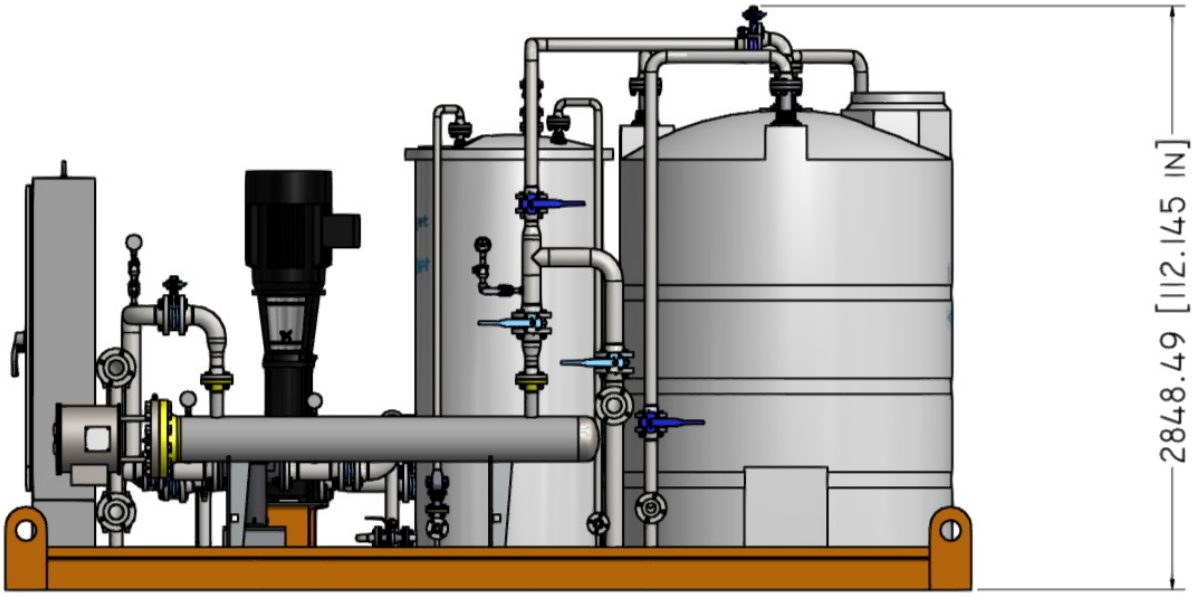
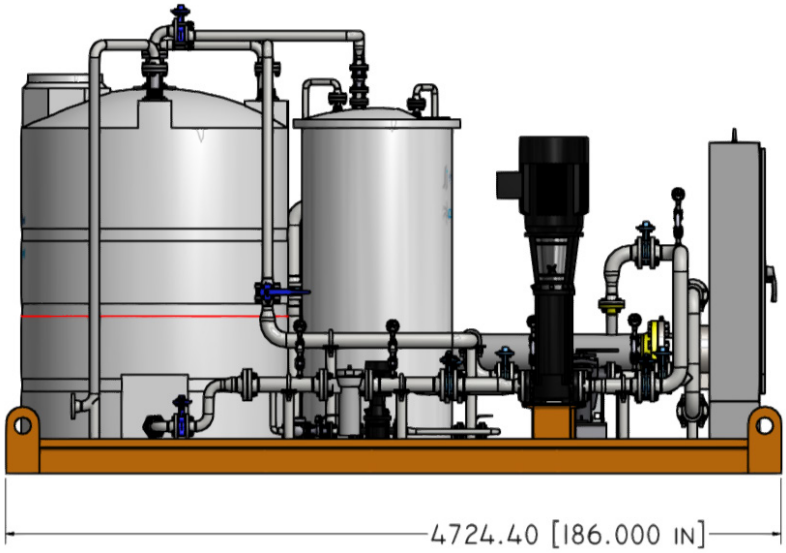
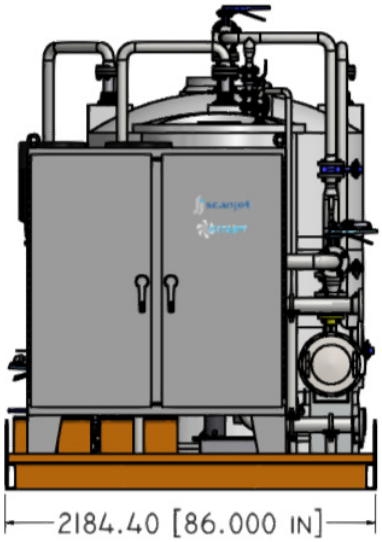
CIP System

Drilling Rig/Ship Cleaning System

Type: CIP3087







Scanjet SC15TW

Scanjet SC40RT

Scanjet SC30T

Typical Tank Cleaning Machines to be installed in tanks to be cleaned.

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Document #: CIP3087_Orbijet_2016.05.02

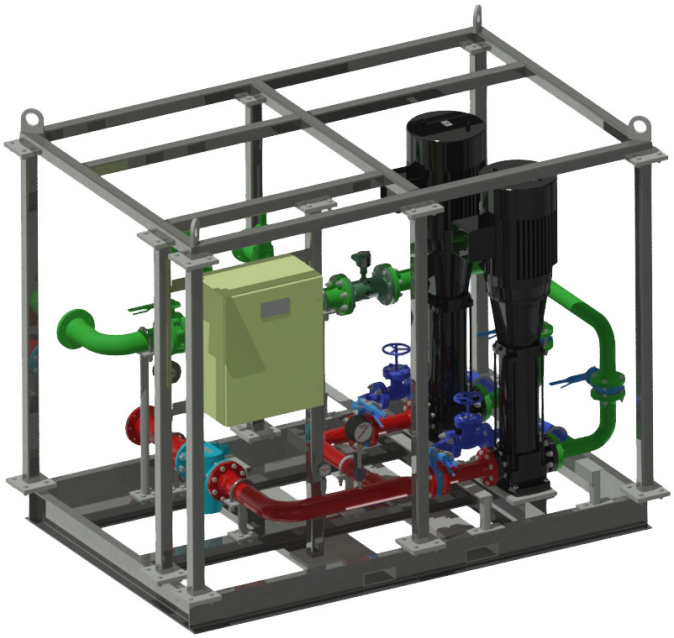
CIP System

Type: CIP3089

CIP3089 is a skid mounted "Portable Tank Cleaning System". **CIP3089** is complete with skid frame that is hot dipped galvanized and can be transported either by fork lift and/or lifting crane. Pumps are redundant so that if one pumps is out the other can be used. They can be ran in tandum for higher pressures and flow rates to a maximum of 250 PSIG and 483 USGPM. Multiple tank cleaning heads can be ran simultaneously with this cleaning System.

Typical applications are...

- Cleaning of Drilling Mud Tanks
- Cleaning of Crude Oil Storage Tanks
- Cleaning of Product Storage Tank
- Portable Cleaning Skid for Service Companies



CIP System Type 3089 3D Model View

Parameter	Value
Design Operating Pressure	225 PSIG @ pump discharge (One Pump Operating)
Design Flow Rate	243 USGPM (One Pump Operating)
Maximum Operating Pressure	250 PSIG @ pump discharge (Two Pumps Operating)
Maximum Flow Rate	482 USGPM (Two Pumps Operating)
Maximum Allowed Pressure	270 PSIG (Pressure Relief Valve Setting)
Electrical Supply Requirements	230V/460V 60 Hz
Explosion Proof	No
Weight - Pump Skid (Net)	4,818 pounds
Redundancy	Yes, Main Supply Pumps
Pressure and Flow Control	By-Pass Valves
Materials	Carbon Steel; Painted and Hot-Dipped Galvanized
Drawing Number	3089PRJ-02-PID

Typical cleaning heads used with this system

SC 15TW

SC60A

SC 40RT

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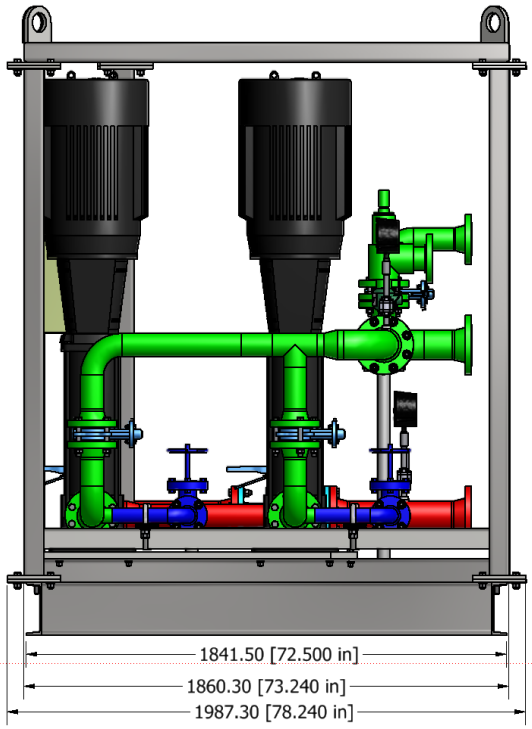
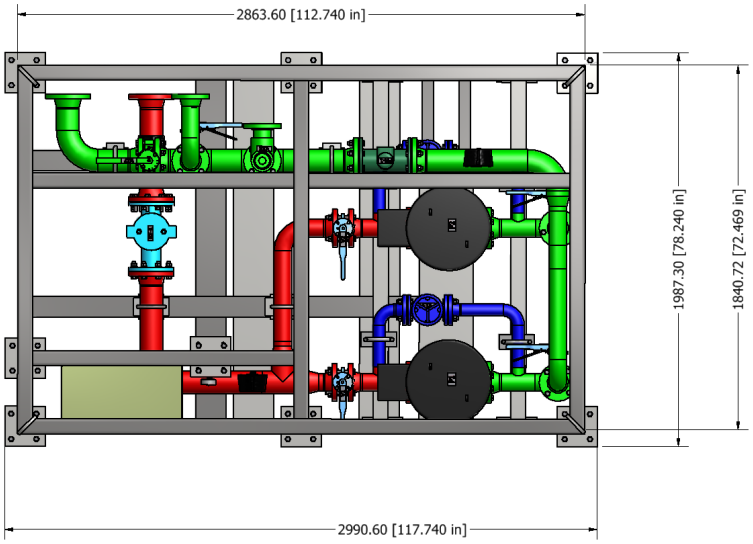
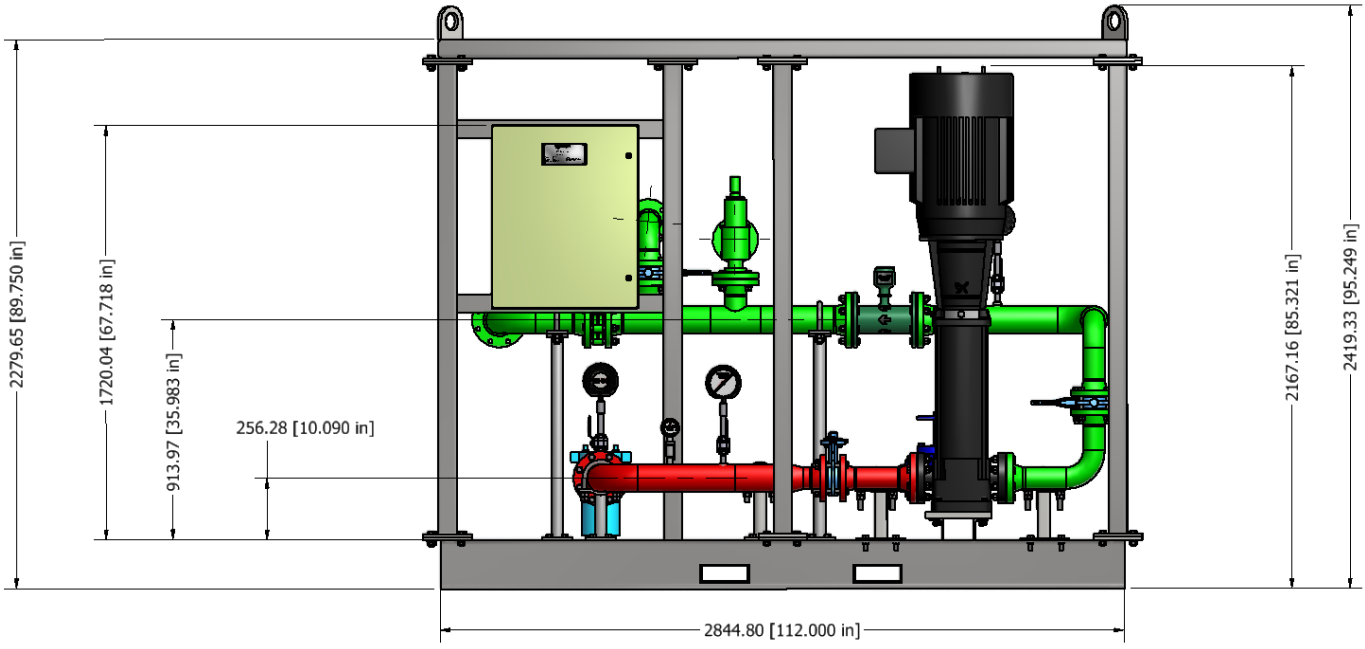
CIP System

Type: CIP3089

All dimensions are in inches and mm.







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CIP System

Type: CIP3106

CIP3106 is a modular system that includes the pumping and control skid along with a solids separation system that uses weir separation technology along with in-process transfer of solids. **CIP3106** is designed for the cleaning of tanks where moderate to high solids loading is expected. Typical applications are...

- Cleaning of Drilling Mud Tanks
- Cleaning of Crude Oil Storage Tanks
- Cleaning of Product Storage Tank

CIP3106 can be stacked with the solids separation system residing on the top of the control and pump module to reduce the footprint required at the cleaning site or the modules can be placed separately at ground level. Connection to the tanks to be cleaned can be hard piped or by means of using flexible hoses.

Parameter	Value
Design Operating Pressure	185 PSIG @ pump discharge
Design Flow Rate	230 USGPM
Weir Tank Capacity	4,000 Gallons (Nominal)
Weir Solids Capacity	254.5 Cubic Feet (80% 1st and 2nd Weir)
Electrical Supply Requirements	690V/460V 60 Hz
Air Requirements	100 PSIG
Includes Hydraulic PowerPac	Yes
Explosion Proof	As per ATEX Zone 2
Weight - Pump Skid (Net)	12,591 pounds
Weight - Weir Skid (Net)	9,917 pounds
Chemical Tank Capacity	200 Gallons
Overflow Tank Capacity	1,000 Gallons
Redundancy	Supply pumps and chemical pumps
Variable Frequency Drives	Supply and Chemical pumps
High level alarm system	Yes
Frame	DNV/ABS Certifications (Optional)
Materials	Carbon steel (painted), HDPE, 316 stainless steel
Drawing Number	3106PRJ-03-PID

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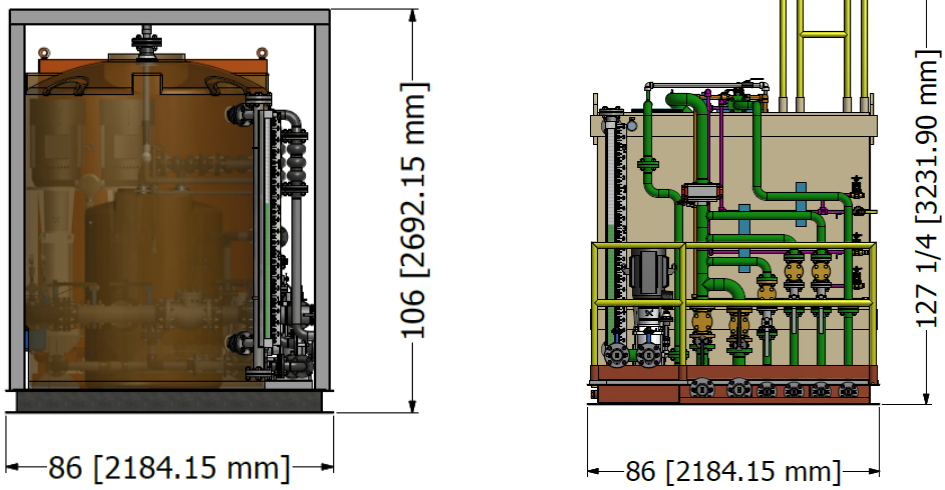
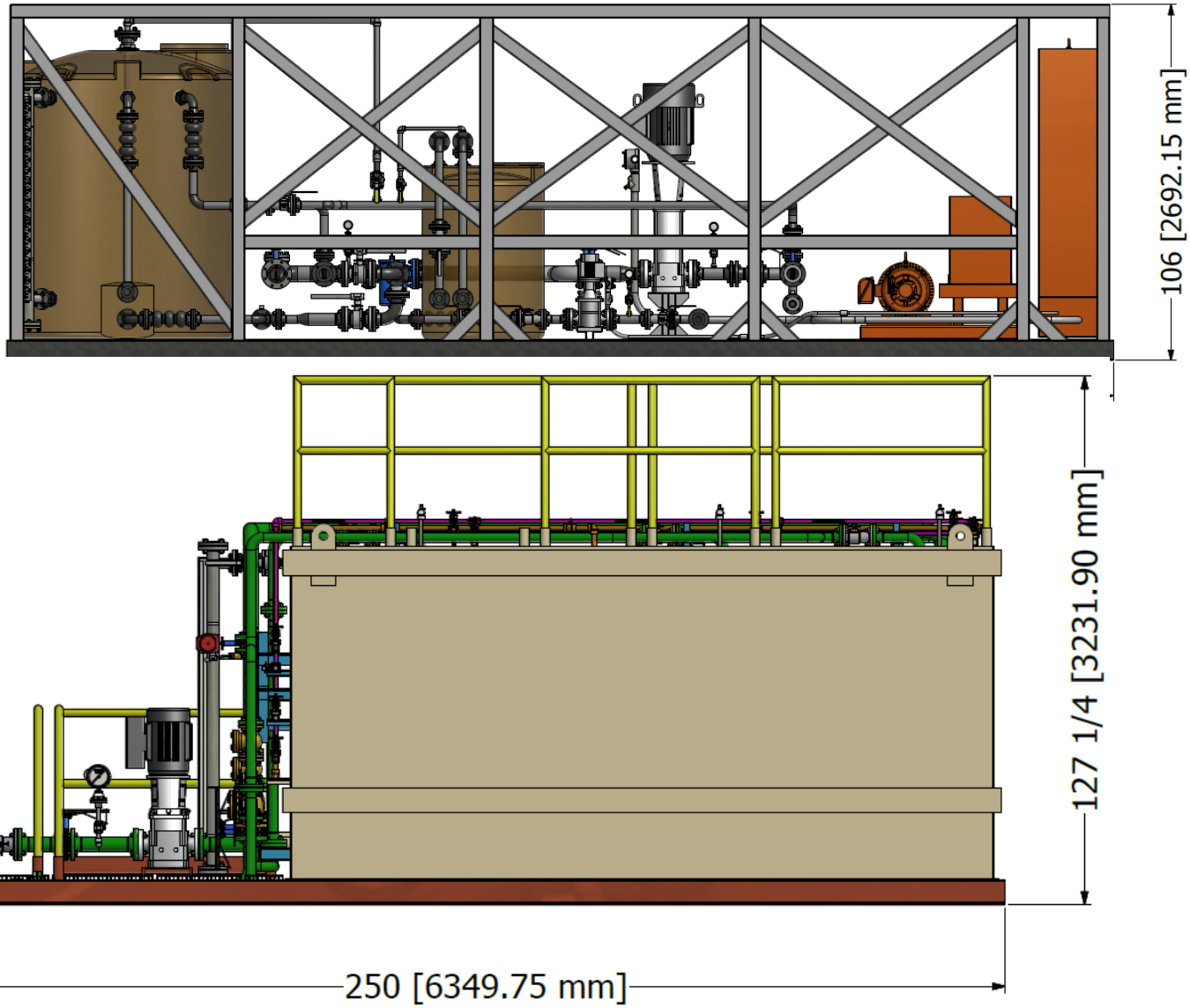
CIP System

Type: CIP3106





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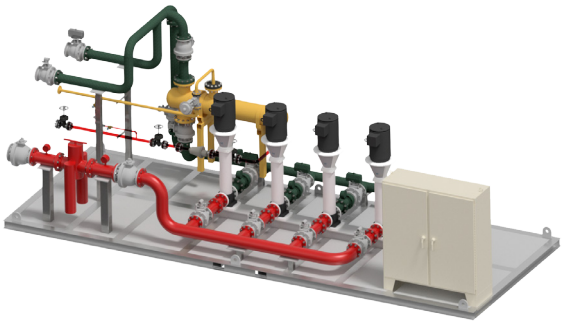
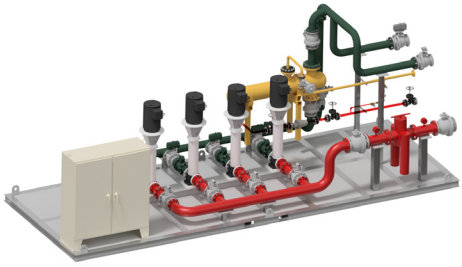
CIP System
Rail Car Washing System





1) CIP Pump Skid

Type: CIP41987

Features

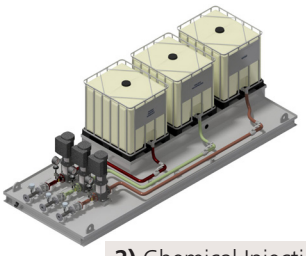
- Master Control Skid
- PLC Controlled
- Oil/Water Separator
- Inert Gas Skid
- Boiler Skid
- Return Pumps
- 1 Tank Skid (16,800 Gallon)
- Chemical Skid
- Tank Cleaning Machines
- Programmable

Industries

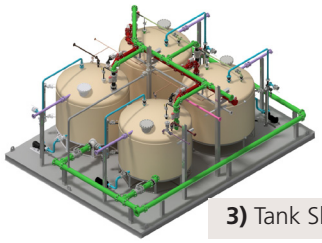
- Oil Refineries
- Railroad Transportation
- Oil Storage Facilities
- Tank Farms

CIP41987 is a Railcar Washing system that is designed to clean six (6) railcars simultaneously and in tandem with water, chemistries, and steam. For Hydrocarbon removal Orbijet's MicroEmulsion Chemistries are available and for cleaning requirements using Caustic Soda our enhancement chemistry ORB3000SC can be used. **CIP41987** has the capability to create a recirculation loop within the tank to be cleaned via the selected tank cleaning machines thus dislodging and mixing the tank bottoms to be carried away via the return pump system to our proprietary solids separation system where the fluid stream is reduced of solids to less than 300 micron. The solids fraction is discharged to holding cars for further treatment or disposal and the aqueous phase is returned to the tank skids for continued recirculation in the tanks to be cleaned until all solids are removed from the tank. Our oil/water separation skid can be engaged for side stream polishing of the aqueous stream thus reducing the oil in water fraction for remediation of the fluid streams and recovery of the oil or microemulsion chemistries can be used for a more complete recovery of the oil and remediation of the solids. The required steam source is supplied via our boiler skid. Tanks are rendered inert with our Nitrogen Gas skid. Each skid frame is uniquely designed for on land use. The majority of the system is PLC controlled from the primary pump skid and connection to other skids are via an RJ45 data highway. Modules that are included with this system are...

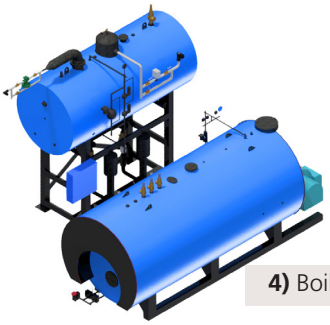
Skid Modules		
Module	**Dimensions (Feet/Meters)**	**Function**
1) CIP Pump Skid	17' 3"(5257mm) X 6' 6"(1981mm)	Primary pump and master control skid.
2) Chemical Injection Skid	17' 3"(5257mm) X 6' 6"(1981mm)	To provide chemical recharge for cleaning solution
3) Tank Skid	26' 6 1/2"(8089mm) X 33' 11 1/2"(10350.5mm)	Primary tank skid
4) Boiler Skid	15' 11 9/16" (4866mm) X 22' 5/8" (6721.6mm)	To provide steam to the pump skid
5) Air Compressor Skid	20' (6096mm) X 7' 6 1/2" (2298mm)	To provide shop air for instrumentation and valve automation
6) Return Pump Skid	6' (1828.8mm) X 3' 11 1/2" (1206.5mm)	To recycle used cleaning solution to tank skid
7) Manway Assembly	2' (609.6mm) Dia. X 4' 11 11/16" (1517.15mm)	Railcar Cleaning Assembly
8) Wash Rack	32' 6 1/2"(9918mm) X 402' 7" (117,630mm)	Rail car cleaning station
9) Waste Storage Tanks	Approx. 76' 1 1/2" (23,202mm) X 38' (11,582mm)	Waste storage
10) Inert Gas Skid	20' (6096mm) X 7' 9" (2362mm)	Nitrogen Storage
11) Programmable TCM	10 7/8" (277.4mm) X 4' 11 11/16" (1517.15mm)	Tank Cleaning Machine
12) Oil/water Separator	18' 6 1/2"(5651.25mm) X 7' 1" (2159mm)	Oil Water Separation
13) Vapor Gas Filtration	1' 11 3/16" (589.28mm) X 3' 9 1/16" (1145.3mm)	Volatile Gas Filtration



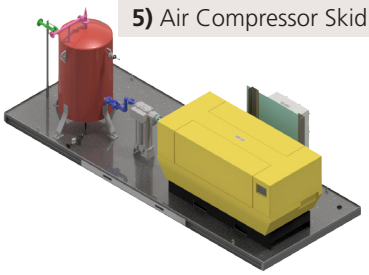
2) Chemical Injection Skid



3) Tank Skid



4) Boiler



5) Air Compressor Skid

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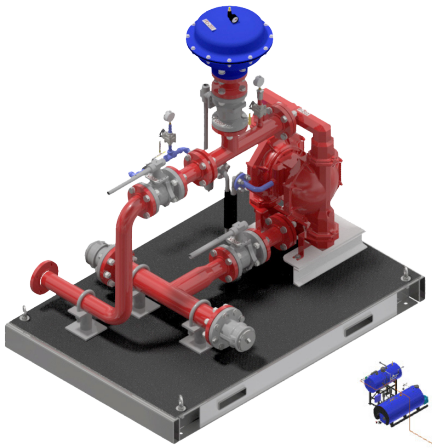
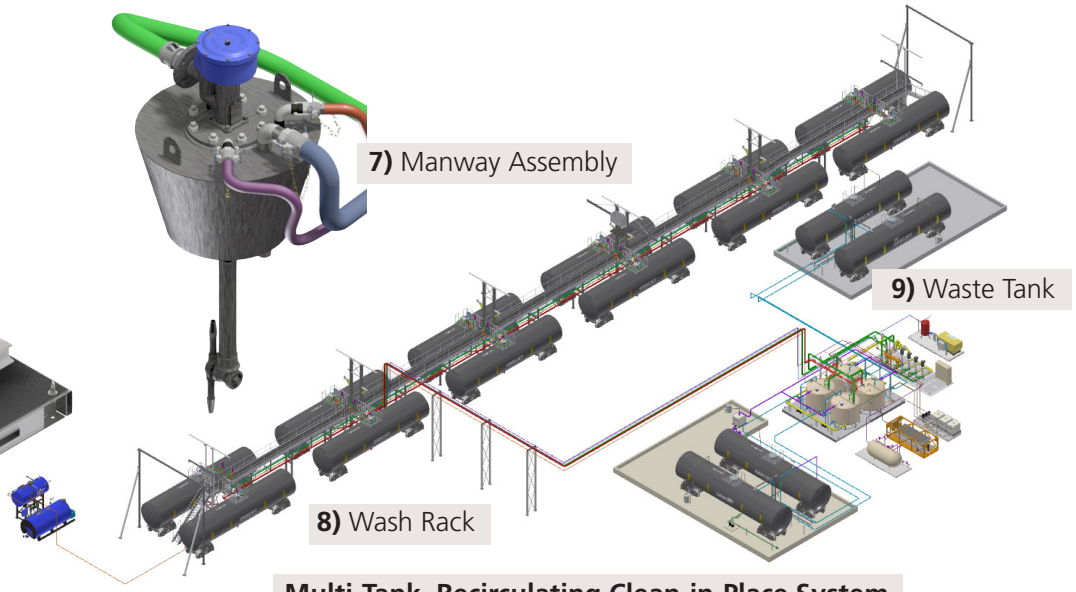


6) Return Pump Skid

7) Manway Assembly

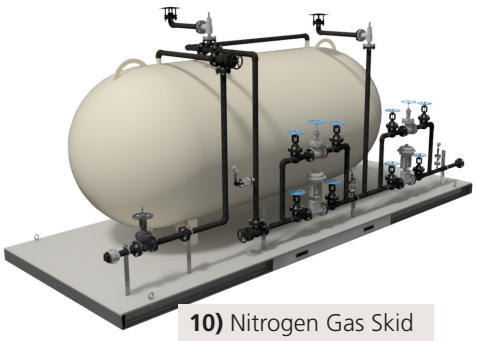


8) Wash Rack

9) Waste Tank

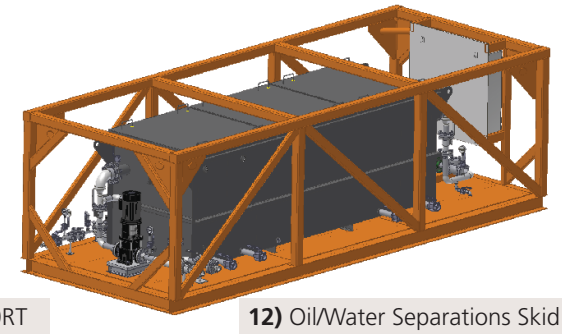
Multi-Tank, Recirculating Clean-in-Place System

Performance Characteristics		
Module	**Summary**	**Power Requirements**
1) CIP Pump Skid	Pumping capacity of USGPM pending (pending m3/hr); 35 PSIG; VFD controlled; command skid; heat to 150°F	460/230 VAC, 3 Phase, 60 Hz
2) Chemical Injection Skid	3 each 320 Gal Totesh; 30 USGPM/8.1m³/hr; 40PSIG/2.75Bar; 5hp	460/230 VAC, 3 Phase, 60 Hz
3) Tank Skid	4 each 4,200 Gallon Solutioning Tanks; complete with valves and pumps	460/230 VAC, 3 Phase, 60 Hz
4) Boiler Skid	Boiler skid to provide steam to the pump skid heat exchanger and/or railcars	460/230 VAC, 3 Phase, 60 Hz
5) Air Compressor Skid	125 PSIG/8.6Bar; 900SCFM/1529m³/hr; 250hp	460/230 VAC, 3 Phase, 60 Hz
6) Return Pump Skid	6 each air driven pump skids; 175 USGPM (39.75m³/hr)	
7) Manway Assembly	CIP Solution; Nitrogen supply; Steam Injection; Vapor Recovery; Self Seating	
8) Wash Rack	12 Bay Railcar Wash Station with Gangway access	
9) Waste Storage Tanks	Capacity 25,000 Gal/94.6m³; 200 USGPM/45.5m³/hr forwarding 32PSI/2.2 Bar; 7.5hp (each)	460/230 VAC, 3 Phase, 60 Hz
10) Inert Gas Skid	Nitrogen inert gas skid to control LEL levels in tank to be cleaned	
11) Tank Cleaning Machine Options	Model SC40RT, SC15, SC45, SC30T (Not included in this system)	
12) Oil/water Separator	Oil/water separator for side stream polishing of surge tanks	460/230 VAC, 3 Phase, 60 Hz
13) Vapor Gas Filtration	55 Gal vertical Cylinder as needed to contain volatile compounds	
14) Drawing Number	41987-03-PID	...
The above characteristics are summary in nature.		



10) Nitrogen Gas Skid

11) SC40RT



12) Oil/Water Separations Skid

13) Vapor Recovery

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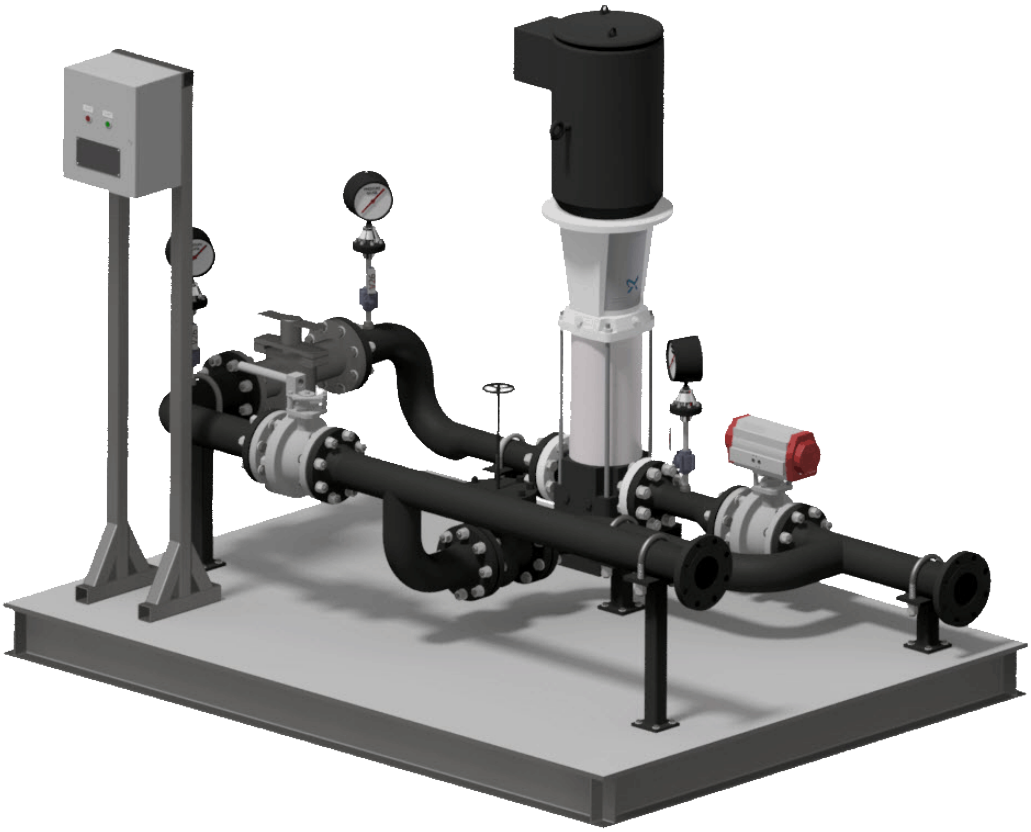
CIP System



Type: CIP42061

Features

- Push Button Controls
- NEMA 3R Elect. Cabinet
- Emergency Stop
- By-Pass Flow Control
- Soft Start
- Skid based construction

Industries

- Municipal Tankage
  - Water run-off
  - Wet Wells
  - Flow Equalization
  - Open Top Tanks
- Environmental Services
- Land Based Drilling

CIP42061 is a skid constructed CIP (Clean In Place) supply module that will supply pressure and flow to a tank cleaning machine arrangement with cleaning design parameters up to 150 PSIG (10.3 BAR) and 250 USGPM (56.78 m^3/hr). A projected pressure drop to the tank cleaning arrangement of 35 PSIG has been built-in to this design. Construction materials are all carbon steel and painted in accordance to Orbijet's standard specifications. Pressure to the cleaning arrangement is applied overtime via our slow opening valve sequencing that will provide full pressure and flow over a 10-20 second time span. A pressure gauge of 0-200 PSIG (13.79 BAR) is installed on the discharge site of the pump and a 200 micron filter is installed on the suction side of the pump to protect the pump from solids along with another pressure gauge from 0-100 PSIG (6.89 BAR) on the suction side of the pump and just downstream from the simplex strainer. This system is designed for use outdoors and indoors. A NEMA 3R control box is included with start and stop buttons, indicator lights, emergency stop, and timer.

Typical Cleaning Machines

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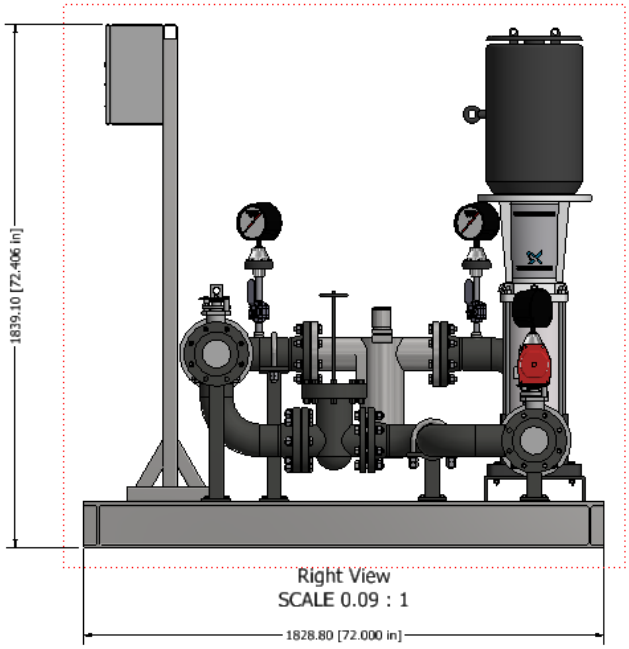
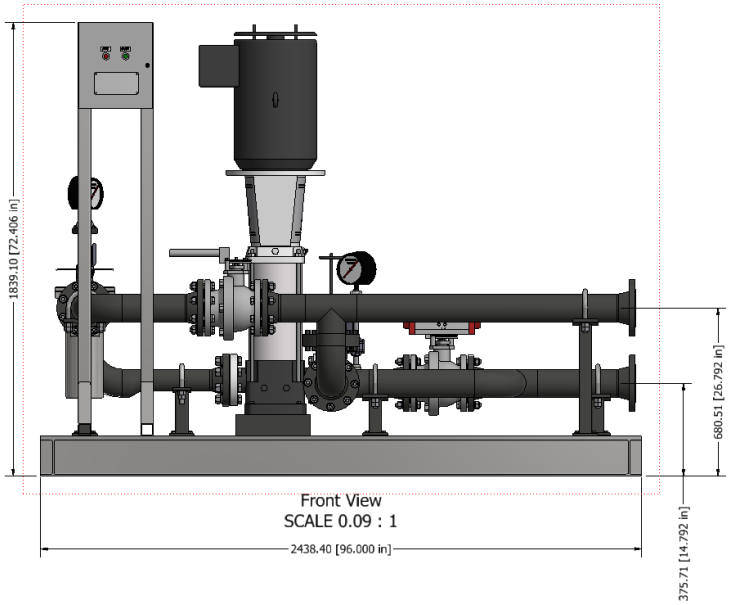
CIP System

Type: CIP42061





Specification Table

Ref	Description	Parameter
1	Maximum design pressure	185 PSIG (12.75 BAR) @ pump
2	Maximum design flow	250 USGPM (56.78 m^3/hr
3	Maximum pressure; pump dead head	255 PSIG (17.58 BAR)
4	Skid construction	Carbon steel; painted
5	Push button controls; with emergency stop	NEMA 3R
6	Inlet and outlet connections	ANSI 150#
7	Electrical Standard	UL508A
8	Maximum Pressure Rating @ 100°F	270 PSIG (18.62 BAR)
8	Power	460V 60Hz
9	Weight	1,191 lbs (541.36 kg)
10	Installation	Outdoor or Indoor
11	Drawing Number	42061-00-PID

CIP42061_2016.05.02

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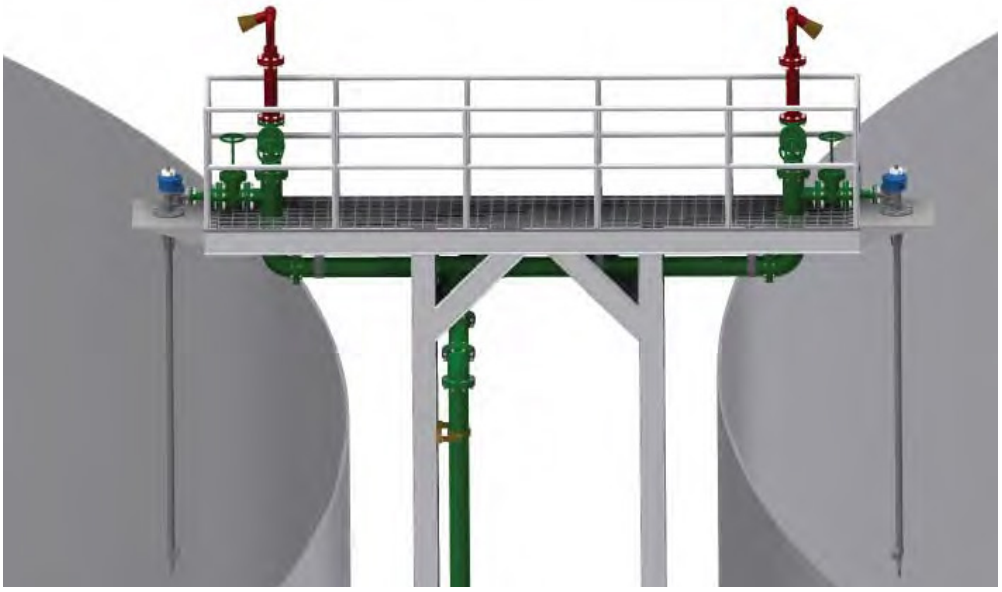
CIP System

Type: CIP4562



Features

- Installation Drawings
- PatternMatrix Projections
- Piping Layouts
- Moment calculations
- Load Calculations
- Stress Calculations

Industries Served

- Municipal Water Tanks
- Storm Event Water Run-Off
- Water Storage
- City Water Tank
- City Sewage Tanks

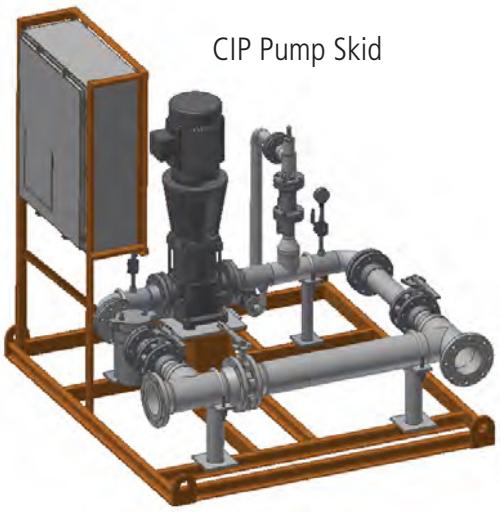
Orbijet open top cleaning solutions are specifi cally designed for the tank being cleaned and include the following optional engineering services...

Typical operating pressures in the range of 150 to 175 PSIG as measured at the inlet of the tank cleaning machine and with fl ow rates from 100 USGPM to 500 USGPM and effective jet-lengths to 80 feet on the ra-dius. Pattern densities are programmabble from 1.5° to 4.5°. Drive options include Turbine, Pneumatic, and Hydraulic types. Sector cleaning is also available when required. Tanks in excess of 200 foot diameter can be cleaned with these systems. Orbijet can provide the engineering desing for the relative tank to be cleaned, the prescribed tank cleaning machine, and the pumping system to supply the required pressures and flow.

Drawing Reference Number: Pending

Model: SC30T

CIP Pump Skid



Model: SC180

Model: SC30A

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orbijet
Systems and Engineering Services

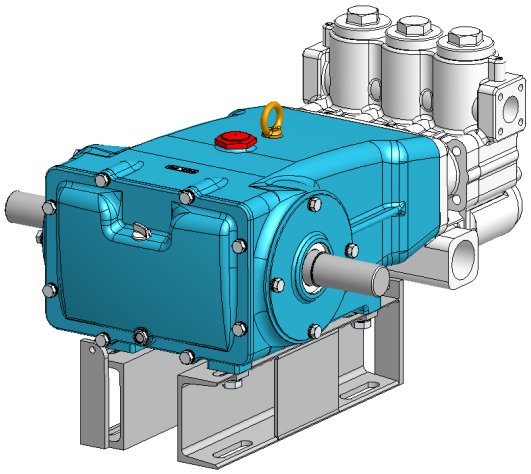
Engineering and 3D Modeling Services

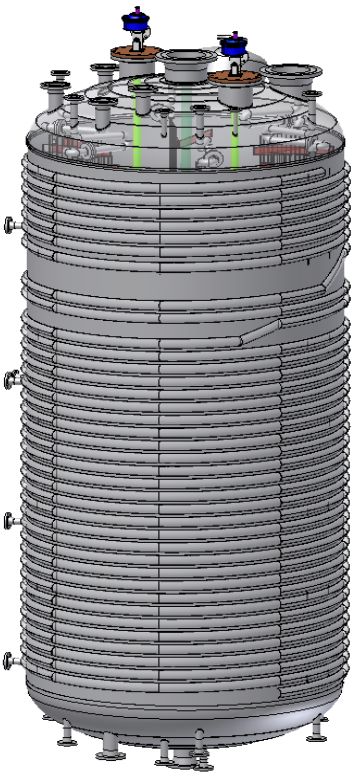
Features

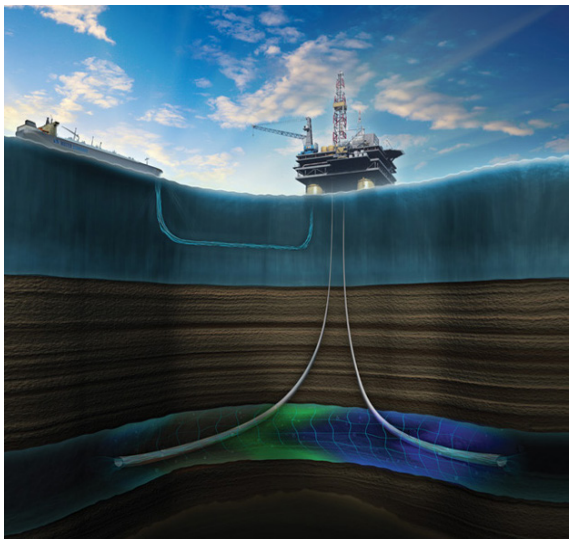
- 3D Modeling
  - AutoDesk Inventor
  - SolidWorks
  - Step and Iges
- Stress Analysis
- Animations
- Photo Realistic Imagery
- Technical Writing
- Operations Manual Creation
- Process Design
- P&ID Drawings
- Vendor Qualification
- CIP Optimization
- Equipment Analysis

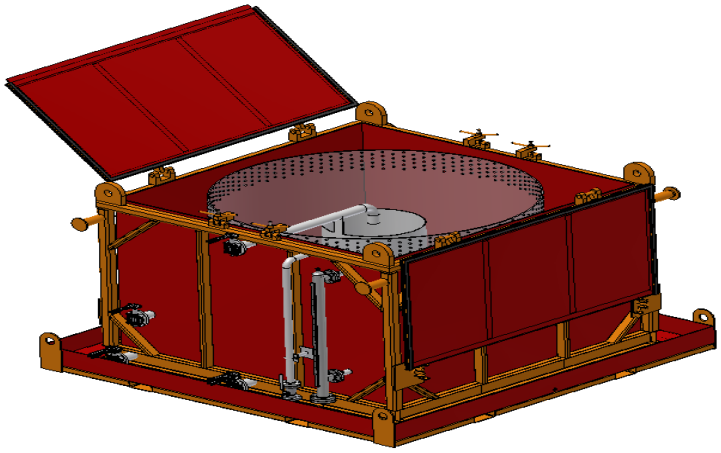
Industries

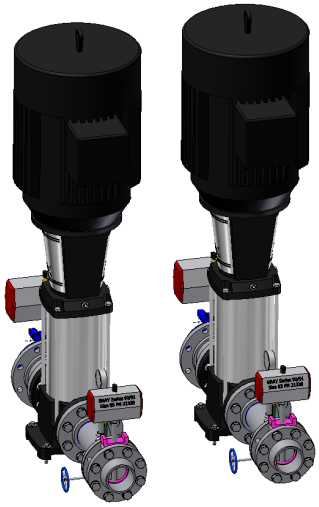
- Energy
- Offshore Drilling
- Oilfield Services
- Sanitary
- Beverage
- Food
- Paper & Pulp
- Ethanol

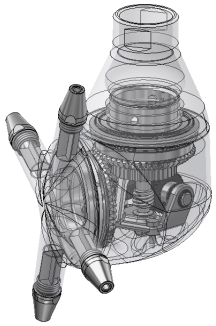












Orbijet offers design and build engineer services for a variety of industries. Our 3D modeling capabilities are extensive along with our process design background that encompasses over 30 years of experience.

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4561.2012.11.20

4” HYDRAULIC SUBMERSIBLE CENTRIFUGAL SCREW PUMP

MODEL S4SCR

4” (100 mm) Discharge

The S4SCR is ideal for pumping high viscosity liquids such as crude oils, latex, molasses and refinery wastes using a positive displacement screw. When pumping lighter materials, the impeller acts as a centrifugal type providing high capacity.

CE

FEATURES

- Unique Centrifugal Screw Impeller for pumping of liquids with higher viscosities
- Small Overall Size allows for use in confined spaces
- Oil Lubricated Seals (can run dry)
- Ceramic coated case for abrasion resistance
- Can be used inline as a booster pump
- Safe Hydraulic Drive can be used where electric power is hazardous or impractical
- Operates with our HT15 to HT35 power units or other hydraulic power sources capable of flows of 7 - 12 GPM

SPECIFICATIONS

WEIGHT:..... 54 lbs. (25 kg)
HEIGHT:..... 20 3/4" (53 cm)
DIAMETER (@ widest point):..... 11 3/4" (30 cm)
DISCHARGE:..... 4" Camlock or Flange Adaptor
INLET FLANGE:..... 4" 125# ASA or 100 mm metric
SOLIDS HANDLING:..... 2" (50 mm)
1-1/2" with strainer
HOSE PORTS:..... 3/4" JIC (M)
PUMP BODY:..... Seawater Resistant Aluminum
IMPELLER / SCREW:..... Nodular Cast Iron
SUCTION CASE:..... Ceramic Coated
ELASTOMERS:..... Viton (Std)
HYDRAULIC OIL:.....214-320 s.s.u. @ 100°F (64°C)
INPUT FLOW:..... Max. 12 GPM (45 LPM)
OPERATING PRESSURE:.. Max. 4000 PSI (272 Bar)
POWER SOURCE:.. Any Open Center Hydraulic System

E0413

Specifications are subject to change without notice

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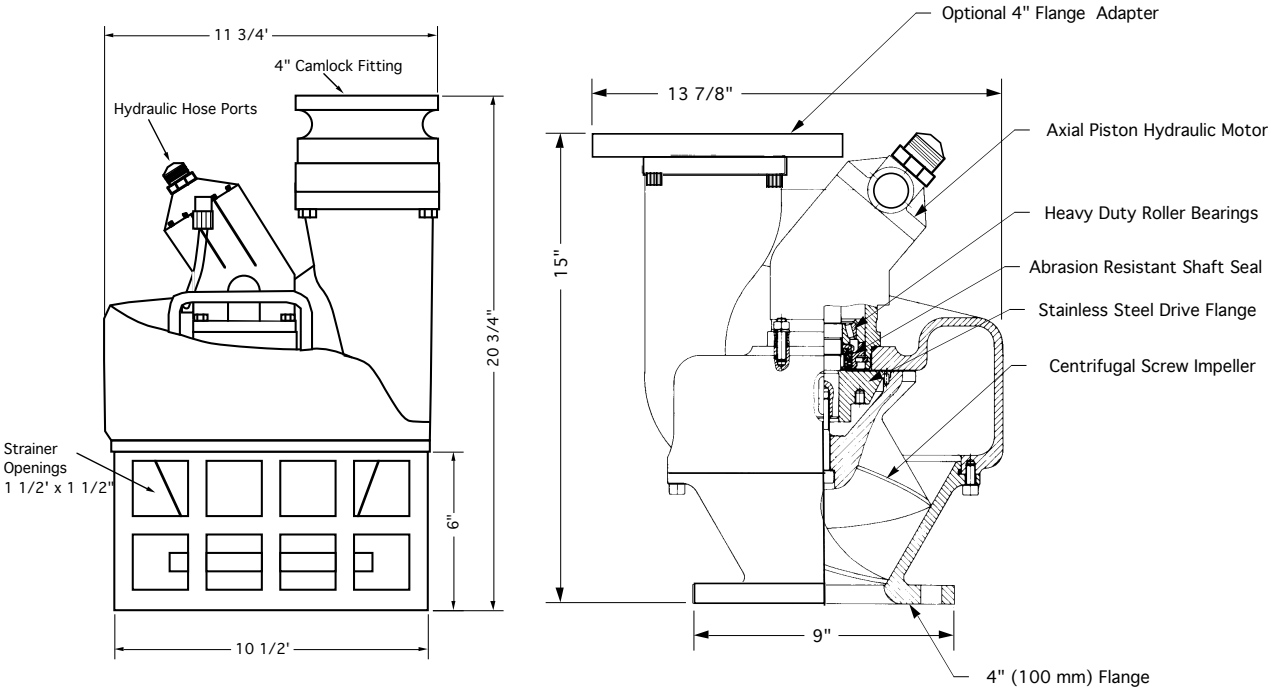
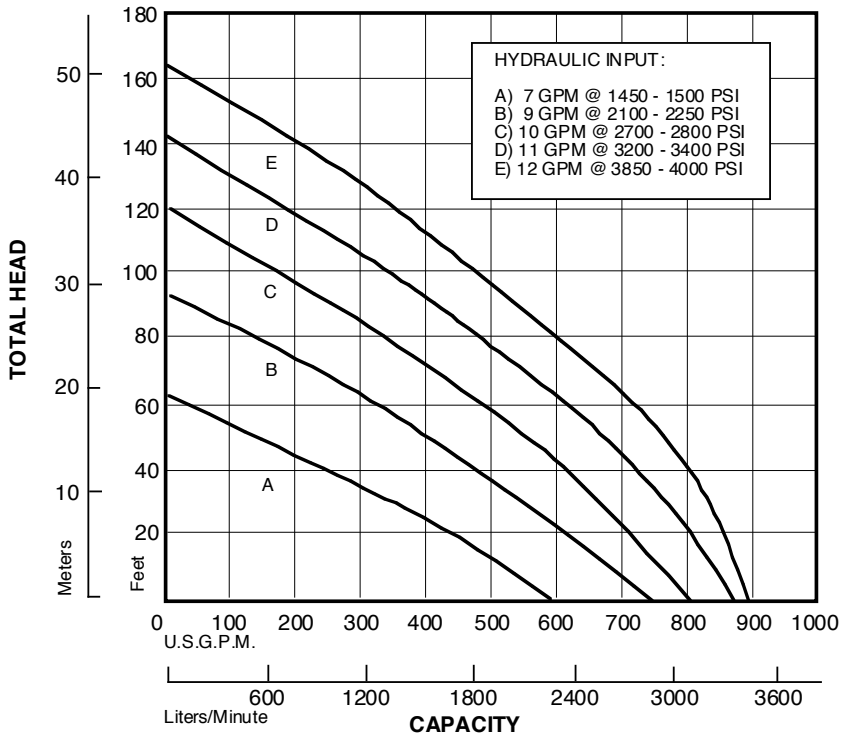
Model S4SCR Overall Dimensions



S4SCR Typical Performance



Curves are based on pumping water at 60°F. For performance curves other than shown above, consult factory.

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4” HYDRAULIC SUBMERSIBLE SLUDGE / SLURRY PUMP

MODEL S4VHL (Aluminum Body)
MODEL S4VHLDI (Ductile Iron Body)
4” (100 mm) Discharge

The S4VHL is designed to handle wastewater and sewage and will fit through a 20" diameter manhole . Primary uses for this pump are: Sewer by-pass into force mains and general transfer of solids laden fluids. This versatile pump is offered in aluminum or ductile iron construction.

FEATURES

- Small Overall Size allows pump to fit through a 20" diameter opening
- Oil Lubricated Seals (can run dry)
- Variable Speed hydraulic drive
- Fully Recessed Vortex Impeller (will pass 3" semi-solids)
- Can be bolted directly into a pipeline or fitted with a suction hose for underwater dredging
- Safe Hydraulic Drive can be used where electric power is hazardous or impractical
- Dependable gear type hydraulic motor
- Operates with our HT25 to HT60 power units or other hydraulic power sources capable of flows of 14 - 26 GPM

SPECIFICATIONS

WEIGHT: (Aluminum)	160 lbs. (72 kg)
(Ductile Iron)	295 lbs. (134 kg)
HEIGHT:	33" (84 cm)
WIDTH(@ widest point):	19 3/4" (50 cm)
DISCHARGE:	4", NPT(F)
INLET FLANGE:	4", 125# ASA
SOLIDS HANDLING:	3" (8 cm)
HOSE PORTS:	1" (-16) SAE
PUMP BODY: (S4VHL)	Heat Treated Aluminum
(S4VHLDI)	Ductile Iron
IMPELLER:	Stainless Steel
WEAR RING and WEAR PLATE	Stainless Steel
SHAFT:	Stainless Steel
SHAFT SEAL:	Carbon/Ceramic (Std)
	Silicon Carbide (Optional)
ELASTOMERS:	Buna N (Std)
HYDRAULIC OIL:	214-320 s.s.u. @ 100°F (64°C)
INPUT FLOW:	Max 26 GPM (98 LPM)
OPERATING PRESSURE:	Max 3000 PSI (204 Bar)
POWER SOURCE:	Any Open Center Hydraulic System

B0109

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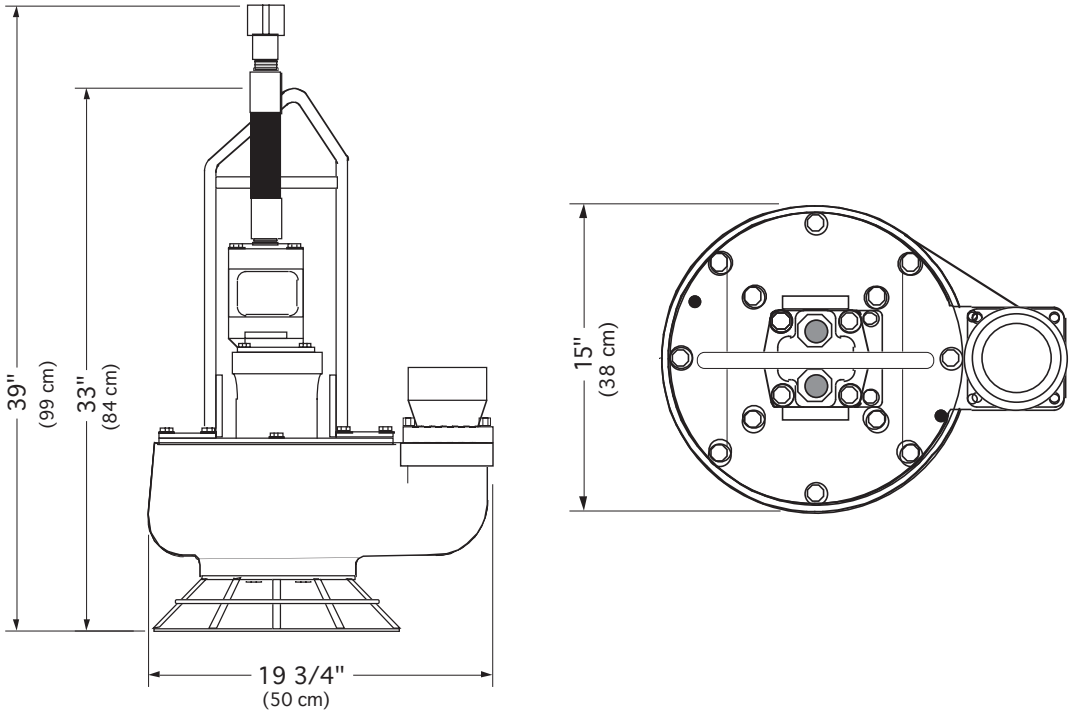
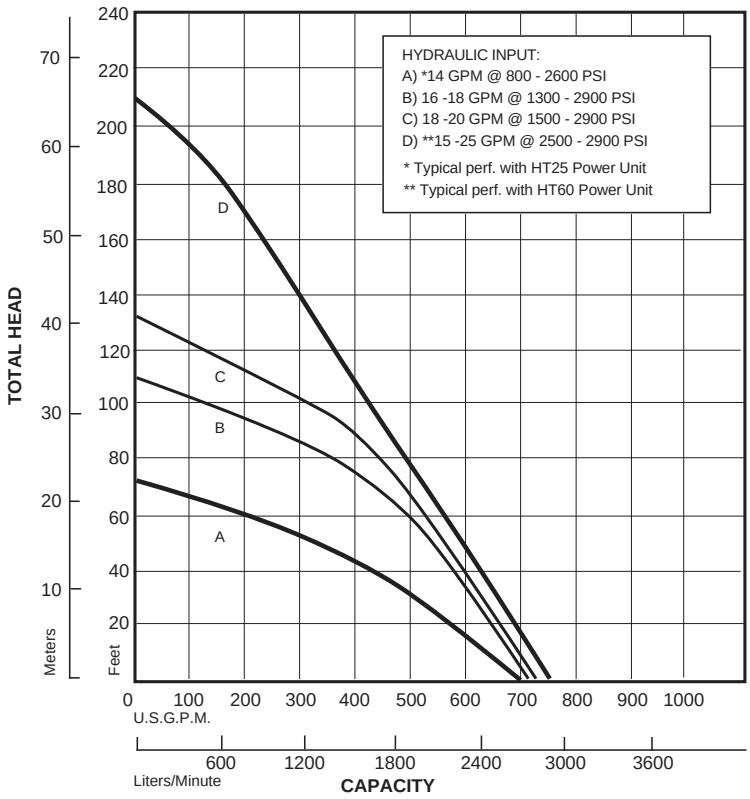
Model S4VHL Overall Dimensions



S4VHL Typical Performance



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7521334 Waukeshaw Sanitary Pump Cart

Features

- Eight Models with Flows from 0-500 gpm
- Variable Speed Control
- Pressures up to 125 psi
- Available from 3 hp through 30 hp
- Auto Cavitation Correction
- Two-Year Warranty

Construction & Design

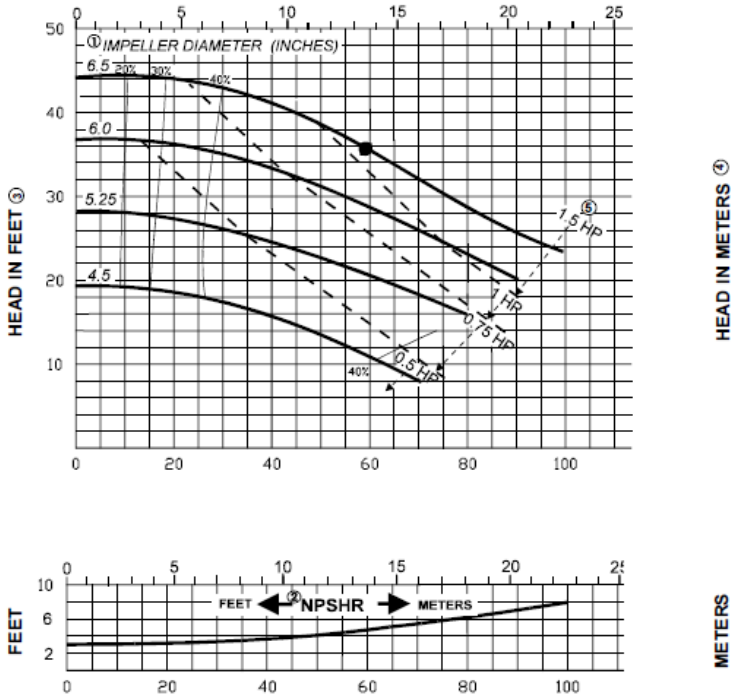
- Stainless Steel Housing and Impeller
- AC Frequency Drive
- Single Phase or Three Phase Power
- 50’ Remote Speed Control
- Nema 4X Electrical Enclosure
- Cast Iron Motor
- Stainless Steel Cart and Poly-Filled Tires

Applications

- Pump Overs
- Juice Transfer
- Blending Barrel
- Racking
- Tank Cleaning

Options

- Float Control
- Timer Control
- Fitting Basket



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PSV Solids Separation System

Solids separations system 2596 is specifically designed for Platform Supply Vessels (PSV) for the purpose of removing solids on a closed loop recirculation system when cleaning the mud tanks of oil based muds, synthetics, and water based muds. System 2596 also serves as a chemical mixing tank in association with the PSV Tank Cleaning System . Solids are accumulated in the center weir and the cleaning solution overflows in to the solution chamber then returns to the tank to be cleaned and via the tank cleaning machine then back to the center weir again creating the closed loop recirculation. This continues until all solids in the tank to be cleaned have been removed... then the process is repeated per tank to be cleaning on the PSV until the entire boat is rendered cleaned and ready for the next transport of drilling muds. This system is most effective when using Orbijet MicroEmulsion solutions such as ORB116B or ORB102SC as these solutions render the muds in the tank to be cleaning water wet as opposed to oil wet allowing the muds to free flow out of the tank being cleaned and flocculate quickly in the weir tank. The 2596 Solids Separation System is typically deployed on the deck of the PSV and flexible hoses used as the utility connections from System 2596 to the Tank Cleaning System as designed by Orbijet, Inc. System 2596 can be connected in series or independent of each other and controlled by manual valving. Automation is available for those customers that prefer actuated valves from the main control system typically located in or near the engine room. Removal of the solids is accomplished by detaching System 2596 from the deck of the PSV when dock side... then lifting System 2596 via it's lifting lugs to the dock. Discharge of the liquids in the liquid phase of System 2596 is accomplished via valves on the side of the structure and the solids are removed by pivoting System 2596 using the 4 trunnions located on each corner of the structure and dumping the solids into an appropriate receptacle. The lids are made of aluminum for ease of handling.

PSV Solids Separation System 2596®

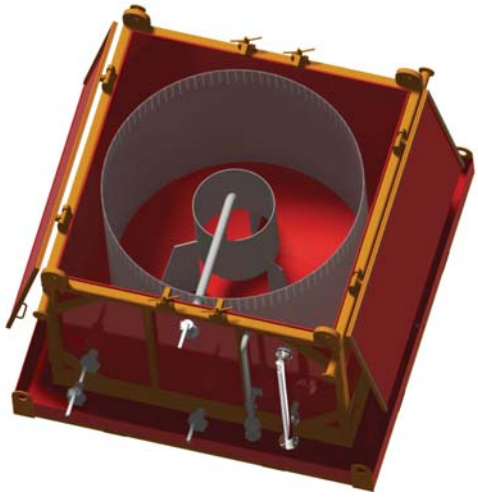
Features

- **Rugged Design**
- **Stress Tested**
- **No Moving Parts**
- **Portable**

Industries

- **Offshore Drilling**
- **Oilfield Services**
- **Platform Supply Vessels**
- **Frac Tank Cleaning**

Approvals Pending



ORB102C and ORB116B
MicroEmulsion Chemistries

General Specifications	
Parameter	**Specification**
Capacities Solids Side Weir (Maximum) Solids Side Weir (Operational) Liquid Side Weir (Maximum)	 1814 Gallons 1360.5 Gallons 954 Gallons
Weights Empty Full (20# mud)	 16,633 lbs. 60,860 lbs.
Spill Containment with 1/2" Drain	Yes
Latch down for heavy seas	Yes
Sight Glass for Level Indication	Yes
Fill Port	3.00" ANSI 150# Carbon Steel
Discharge Port	3.00" ANSI 150# Carbon Steel
Drain Ports (Inner and Outer)	2.00" ANSI 150# Carbon Steel
Exclusive center distribution ring	Yes

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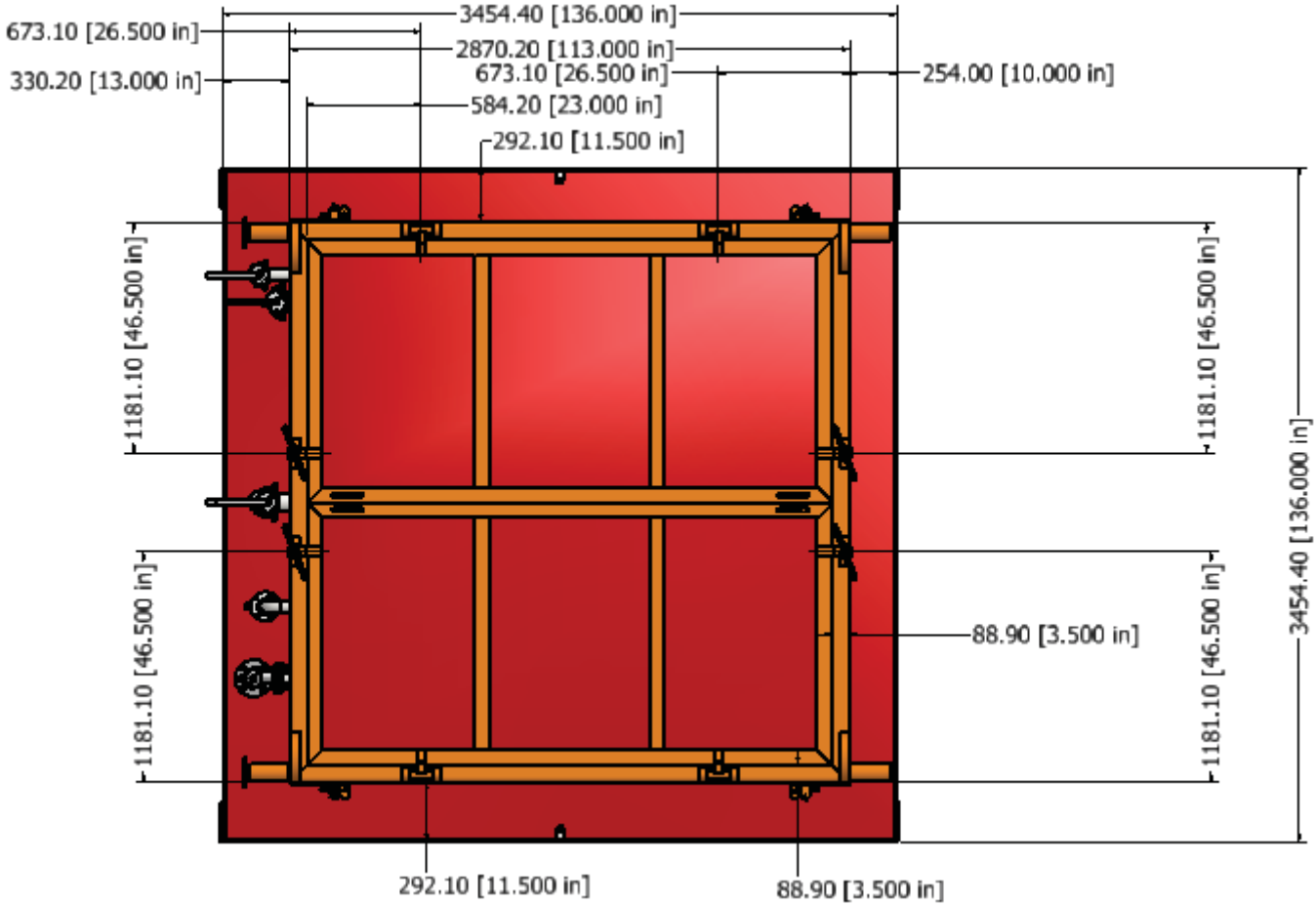
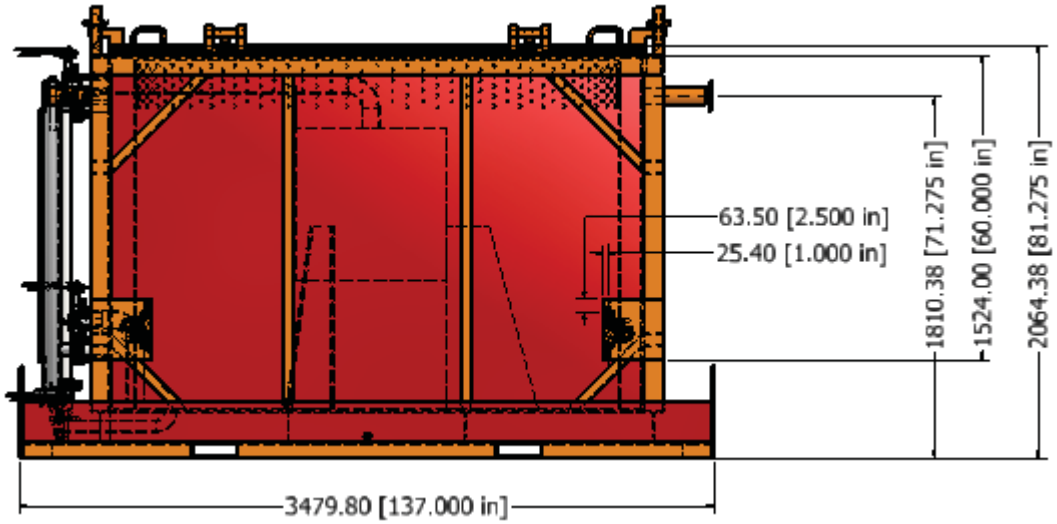
General Dimensions





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SC 360APR

Scanjet Marine Protection System

Scanjet SC 360APR is a high capacity Anti-pirate water cannon for boarding denial. The fixed installed or removable, self operating, multi nozzle machine is driven by the water flow. The Anti-pirate water cannons consist of three main parts; an Anti-pirate water cannon gun unit, a turbine powered drive unit and a mounting rail bracket.

The pump capacity, construction and requirements of the vessel are the design criteria, which have to be evaluated prior to installation. The SC 360APR can be powered by existing pumps on board the vessel. It can be installed either as permanent or as portable units to give the vessel the opportunity to optimise its system and budget.

The horizontal position of the nozzles can when installed be adjusted for each machine. It is possible to optimise the angle to the hull as needs may vary at different positions along the vessels length and due to shape of the hull. The SC 360APR requires no chemicals or steam additives - it has no environmental impact.

By starting the pumps, the SC 360APR starts automatically. The nozzles rotate 360° in a continuous movement. To optimise the downward pressure of the water, the SC 360APR restricts the water from being projected upwards. This is clearly marked for easy installation.
The SC 360APR is developed to protect crew, vessel and cargo. It is a non lethal, passive way of protecting the ship without provoking the attacker.

KEY FEATURES

SC 360APR

- Protect your crew and ship
- No need for manual operation
- Easy mounting without hot work
- Individually adjusted machine length and horizontal position
- Removable after use
- Grease lubricated drive unit
- Adjustable rotating speed
- 180° optimised down operation

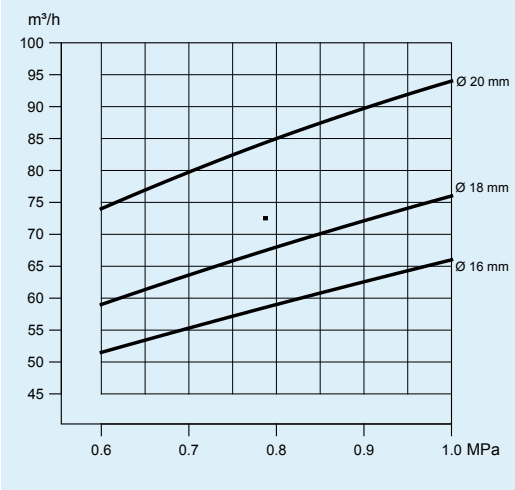
SC 360APR

Scanjet SC 360APR
Based on existing and well proven Scanjet tank cleaning machine technology.

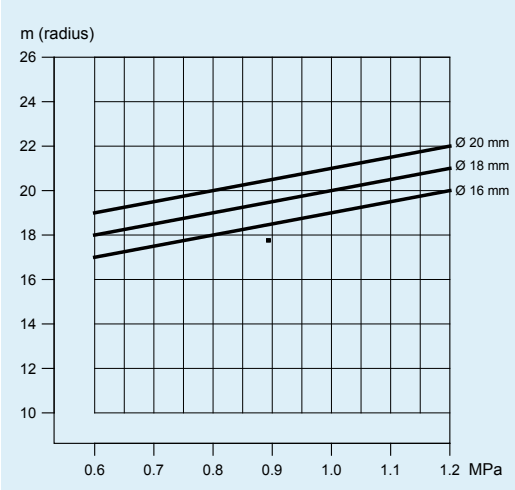
Patent pending
PCT/SE2010/050370
Priority date 2009-04-08
Patent pending 1050695-4
Priority date 2010-06-24

scanjet marine

Technical performance



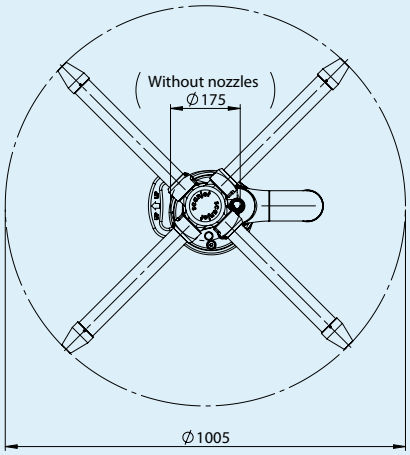
Water flow for selection of different nozzles sizes at specific inlet pressure.

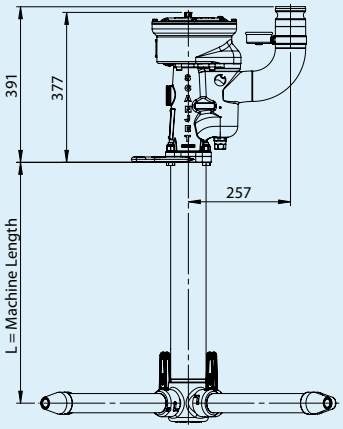


Jet length for selection of different nozzles sizes at specific inlet pressure.

SC 360APR mounted on handrail.

Dimensions



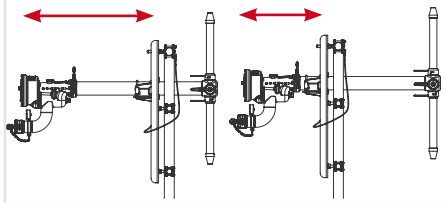


Specifications

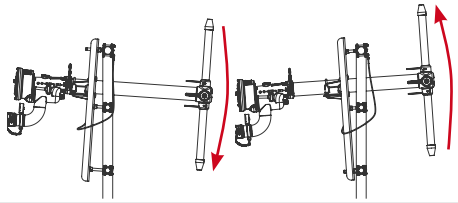
Flow	50-100 m3/h
Inlet pressure	0,3-1,2 MPa
Recommended pressure	0,5-0,8 MPa
Max temperature	95°C
Rotation speed	3-6 rpm
Material	
Inlet housing and main pipe	AISI 316 / SS2348 / WST 1.4404
Weight (approx)	
Machine, L=0,9 m	31 kg
Bracket	14 kg
Packing box size and weight	
1,6x0,4,0,5 m	7 kg
Total gross weight	62 kg
Other part	Makers' standard
Service space	Min 500 mm radius from centre of machine (at rail bracket) for handling and service.

Adjustable positions

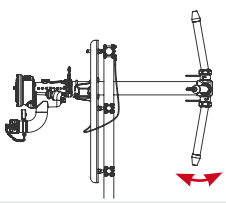
Horizontal adjustment



Tilting adjustment



Retractable nozzles



scanjet marine

We reserve the right to changes without prior notice. Issue 07-10.11

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Stocking Locations in USA, Canada and Mexico

Liquid-Activated Retractable CIP Spray Nozzle

Flush mount nozzle in open position.

Double-wall flush mount nozzle in open position.

Our liquid-activated retractable CIP Spray Nozzles are superior components designed specifically to remain in place during production in sanitary food processing applications.

The CIP spray nozzles feature a liquid-activated spray head that fully extends under liquid pressure during CIP and fully retracts after CIP. Large rotating spray jets provide a high impact scrubbing action that ensures complete cleaning of the equipment.

The nozzle is USDA Accepted for sanitary operations and can be easily removed for inspection.

Features and Benefits

- Liquid-activated design uses less utilities and hookups for operation. No airlines required.
- Fully retractable spray head.
  Allows nozzle to remain in place during production without causing process disturbance.
- USDA accepted for sanitary process applications.
  Can be completely removed for inspection.
- Large spray range cleans hard to reach areas.
  Configurations: forward spray, back spray, lowflow
- Complete stainless steel construction.
- Designed with minimal number of components compared to other type nozzles.
  No breakable or leaking parts.
- Easy to assemble. No tools required.
- Available with 1 ” or 2 ” liquid connection.
- Ferrule mount or flush mount for uncladded, cladded and cladded/insulated vessels.
- Retrofits existing spray devices with EDT mounting ferrule.

Tank Cleaning Technologies provides custom design services, engineering, and supply of evaporators, spray dryer systems and components with an innovative approach that will modernize and improve plant performance and operational safety.

Ver. 1069.2014.05.28

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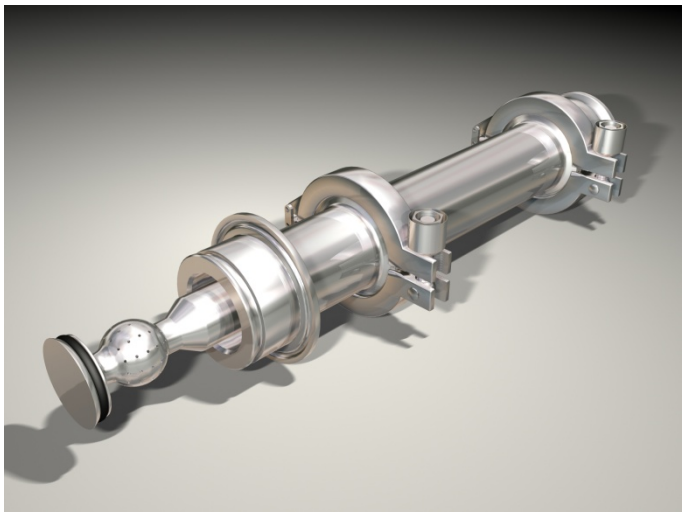
Product Data Sheet

Product : Retractable Spray Ball
Model : RSB-100A

The Scanjet RSB-100A is a Retractable Spray Ball that is Pneumatically driven for actuation to a prescribed location within a structure for cleaning.



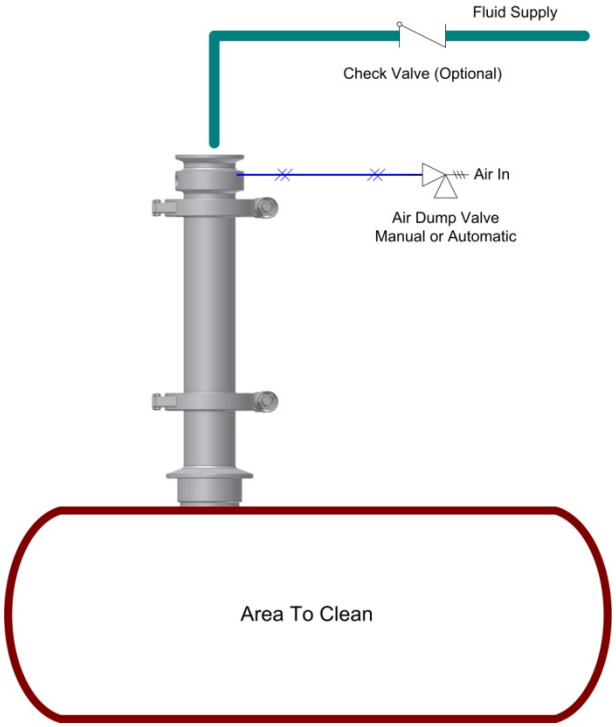
Applications:

- Ventilation Ducting
- Ribbon Blenders
- Tablet Making Equipment
- Air Drying Equipment
- Ducting & Vent Lines
- Powder Handling Systems
- Dryers & Cyclones
- Reactors

Benefits:

- Self-draining
- Targeted Spray Patterns
- Custom lengths available for position optimization
- Out of process way
- 100% CIP design (self-cleaning)
- Pneumatic actuation with mechanical closure

Installation Requirements:



GENERAL SPECIFICATIONS (Standard):

Pressure Range (Fluid):
- 30-60 PSIG (2-4 Bar)

Flow Range (Fluid):
- 10-20 GPM (2.3 - 4.5 m^3/hr)

Pressure Range (Pneumatic/Air):
- 60-80 PSIG (4.1-5.5 Bar)

Air Consumption Range:
- 60mm: 2.9 in^3
- 120mm: 5.8 in^3

Materials Of Construction:
-
- Wetted:
  - 316L SS; EPDM; Carbon Filled PTFE
- Non-Wetted:
  - 301S81 SS; 316SS

Temperature Range:
- 34°-284°F (1°-140°C)

Finish
- ≥ 16 Raμ Inch (0.4 Raμ Meter) As Standard
- Electropolished Finish As Required

Connections:
- Inlet: See standard product program
- Mount: See standard product program
- Air: 0.125" NPT(M) or 0.125" BSP(F)
- Others on request (specials)

Standard Product Program

Part Number	Inlet Conn. Fluid	Mount Conn.	Travel mm	Air Inlet	Spray Pattern	Drilling
RSB100A-60-01	1.50" Tri-Clamp	2.00" Tri-Clamp	60	.125" NPT(M)	216°	64 x 0.80 mm
RSB100A-60-02	1.50" Tri-Clamp	2.00" Tri-Clamp	60	.125" BSP(F)	216°	64 x 0.80 mm
RSB100A-60-03	1.50" Tri-Clamp	2.00" Tri-Clamp	60	.125" NPT(M)	360°	74 x 0.80 mm
RSB100A-60-04	1.50" Tri-Clamp	2.00" Tri-Clamp	60	.125" BSP(F)	360°	74 x 0.80 mm
RSB100A-120-01	1.50" Tri-Clamp	2.00" Tri-Clamp	120	.125" NPT(M)	216°	64 x 0.80 mm
RSB100A-120-02	1.50" Tri-Clamp	2.00" Tri-Clamp	120	.125" BSP(F)	216°	64 x 0.80 mm
RSB100A-120-03	1.50" Tri-Clamp	2.00" Tri-Clamp	120	.125" NPT(M)	360°	74 x 0.80 mm
RSB100A-120-04	1.50" Tri-Clamp	2.00" Tri-Clamp	120	.125" BSP(F)	360°	74 x 0.80 mm

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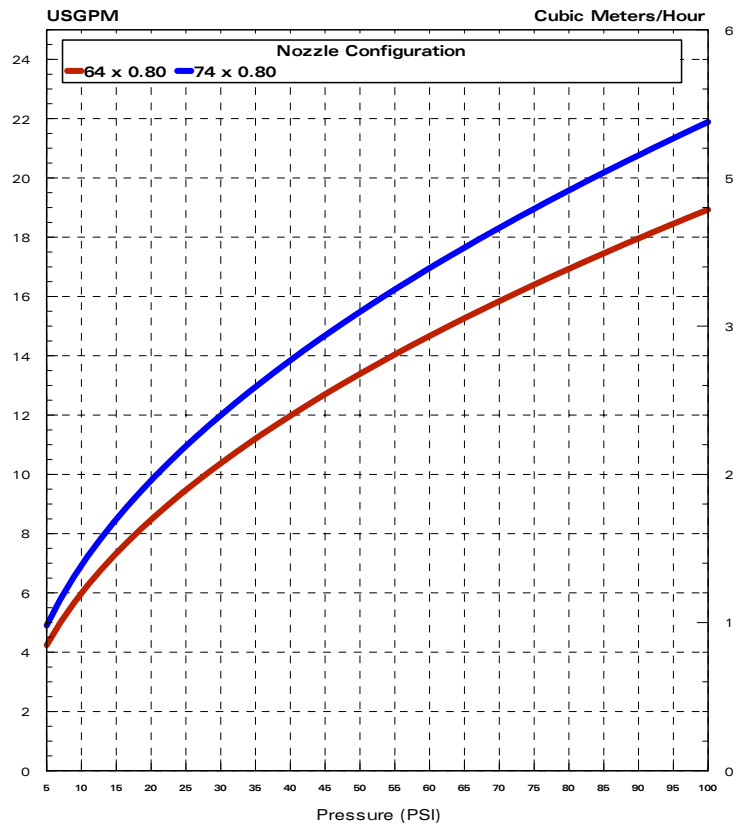
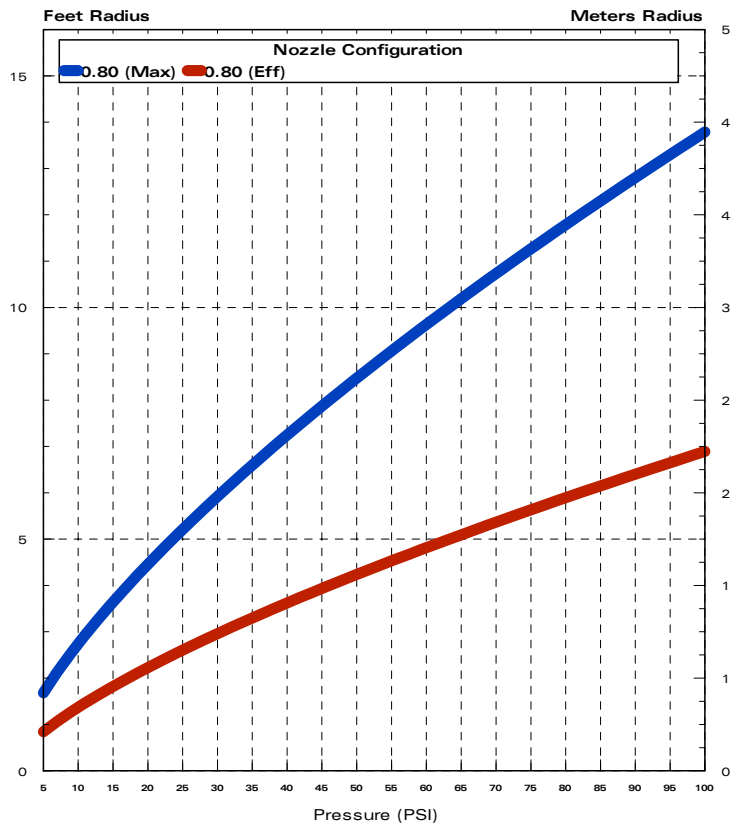
Product Data Sheet

Product : Retractable Spray Ball
Model : RSB-100A

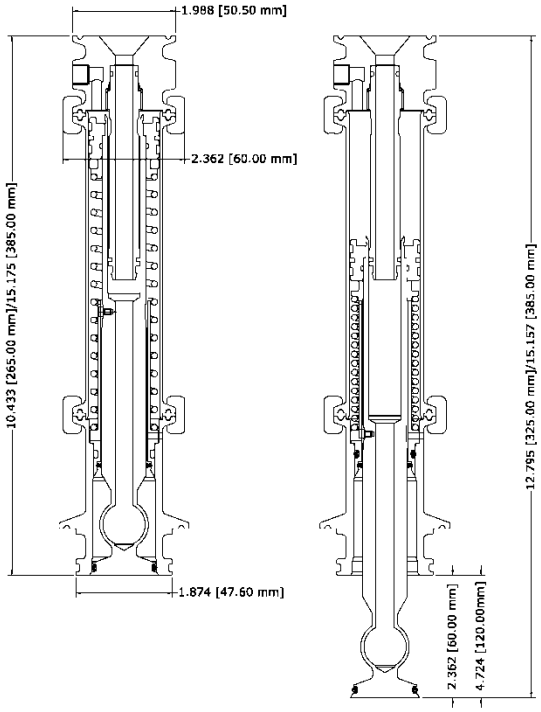
Pressure/Flow Curve



Pressure/Distance Curve



Dimensional Information - "Sealed Unit Shown"



Cut-A-Way View

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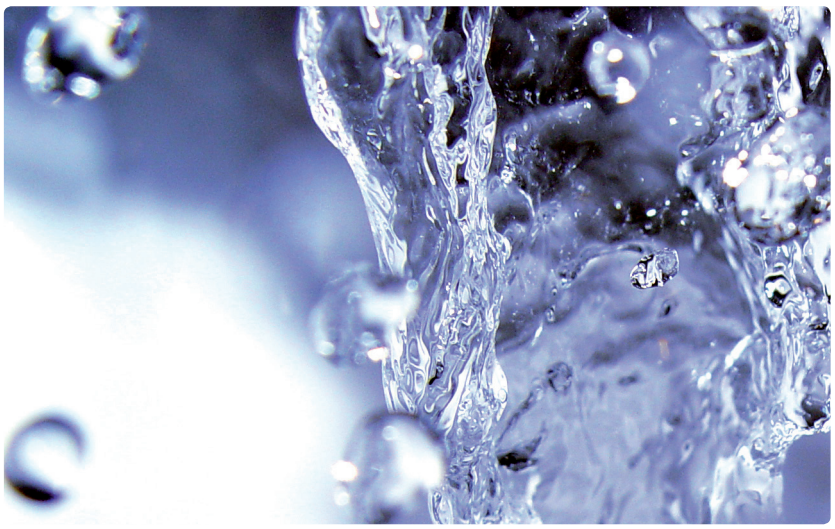
Bio 20

Scanjet tank cleaning equipment



KEY FEATURES

Bio 20 is an advanced external geared tank cleaning machine specially designed for:

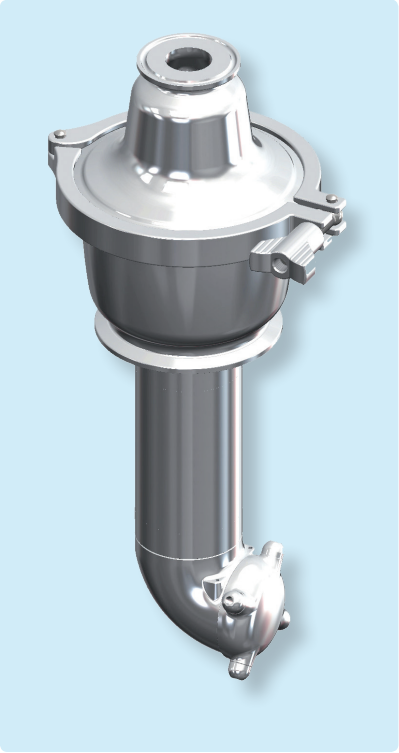
+ Food and Dairy
+ Pharmaceutical
+ Chemical Processing
+ Transportation
+ Beverage

WHERE

+ Self-washing required
+ Low fluid consumption
+ Hygienic design

The Bio 20 rotary jet head is a hygienic tank cleaning machine that provides 360° coverage within a given tank or process vessel. The Bio 20 is an advanced external gear self-powered tank cleaning machine. The external gear box allows for complete sealed tank operation, reduced the number of parts submerged in the product and boasts easy maintenance features.

An increase in water pressure through the turbine increases the jet length and impact on the side of the tank or vessel. The Bio 20 employs market leading self-washing technology that allows itself to be completely covered and has been certified in validations protocols such a riboflavin rinse validation and yogurt washing trials.



BIO20_TCT_2015_01_20

Quality Standards

The Bio 20 is produced in accordance to stringent quality standards and meets or exceeds ISO 9001 International Quality Standards as well as conforming to the cGMP as detailed by the United States FDA (Food and Drug Administration and EHEDG (European Hygienic Equipment Design Group)

Typical Cleaning Methods

+ Fixed installed CIP Systems
+ Multi- Tank Solution Recovery
+ Single Use/Single Pass
+ Single Use/ Recovery

Typical Applications

+ Process vessels and reactors
+ Storage tanks
+ Fermenters
+ Yeast Production

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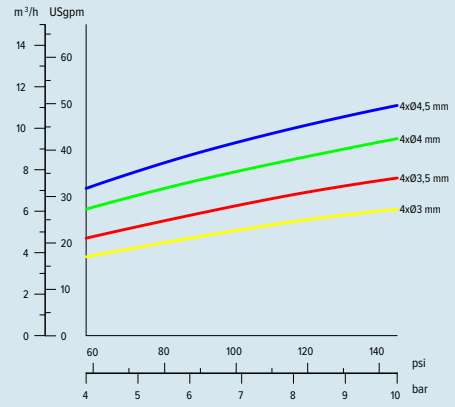
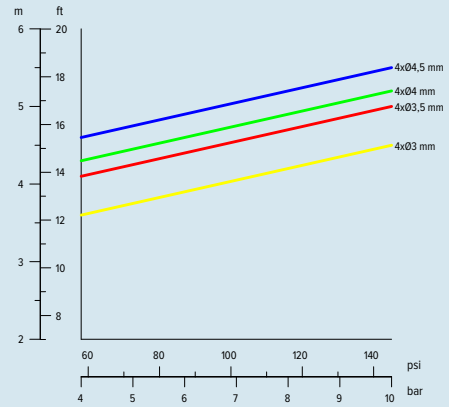
Stocking Locations in USA, Canada and Mexico

Technical performance

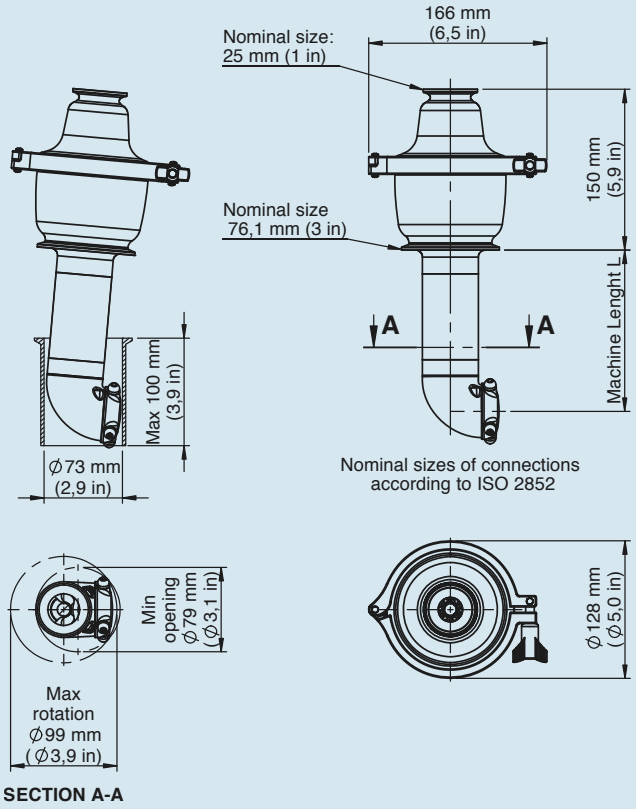


Pressure/Flow



Jet length

Dimensions



SECTION A-A

Specifications

Flow	5-12 m³/h
Inlet pressure	3-14 bar
Max pressure	14 bar
Recommended pressure	6 bar
Max temperature	95°C
Max ambient temperature	140°C
Weight	4.3 kg
Connections standards	Tri clamp
Material	AISI 316L, PVDF, PEEK-TX
Lubrication	Cleaning media

BIO20_TCT_2015_01_20

scanjet

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Stocking Locations in USA, Canada and Mexico

SC 20E-LP

Scanjet tank cleaning equipment

KEY FEATURES

+ Electrical external drive
+ Fixed or portable
+ Bayonet coupling
+ High impact
+ Low volume

The SC 20E-LP is a tank cleaning machine specially developed for the cleaning of small industrial tanks where product residues are hard to remove and cleaning volumes need to be kept to a minimum. The device can either be used on a fixed installed or portable basis and is available in two, three or four nozzle configurations. The external drive is an electrical motor being 230V(AC) although other alternatives are available on request.

Tank connection is as standard a universal flange making it easy to remove the machine from the tank without the need for tools.

SC_20E-LP_TCT_2016_01_14

Quality Control, Compliances & Certifications

The SC 20E-LP is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Additionally, the SC 20E-LP conforms to United States ASME standards for construction and others are available upon request.

Typical applications

+ Paints and coatings process vessels
+ Solvent tanks
+ Totes and IBC's
+ Heavy duty process vessels

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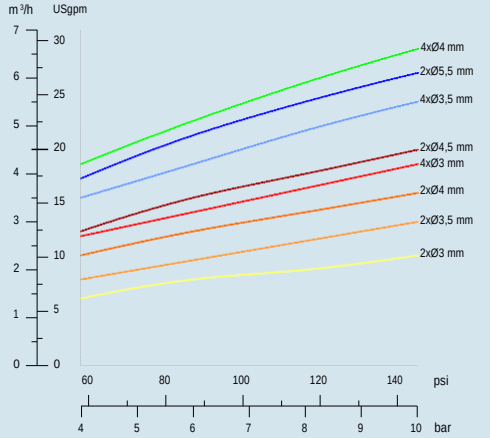
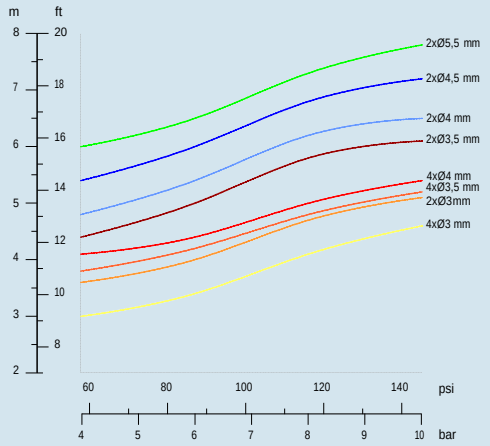
Stocking Locations in USA, Canada and Mexico

Technical performance



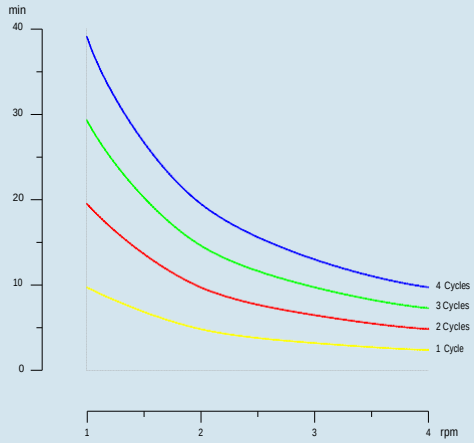
Pressure/Flow

Various nozzle configurations are available.
Contact your local distributor for details



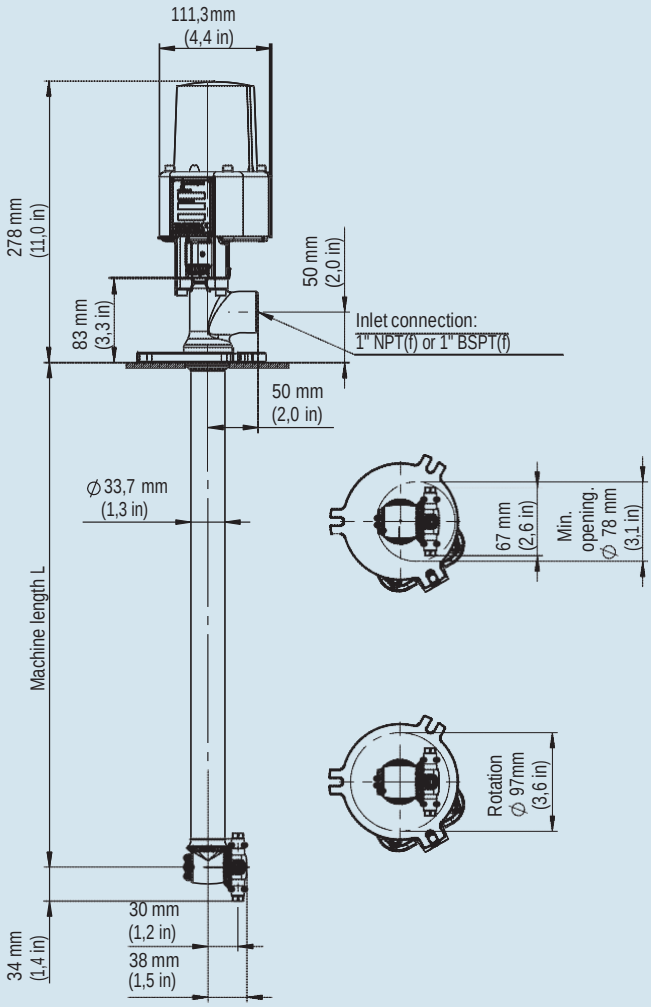
Jet length

Various nozzle configurations are available.
Contact your local distributor for details



Pattern time

Dimensions



Specifications (Low Pressure)

Flow	1,1 -6,5 m³/h
Inlet pressure	4-10 bar
Max pressure	12 bar
Recommended pressure	5–6 bar
Max temperature	95°C
Rotation speed	1-4 rpm
Full cleaning cycle	12 min
Standard length	0,5 or 1m
Weight	6,2kg
Inlet connection	1" BSP/NPT
Tank connection	Universal coupling
Materials	AISI 316, PTFE, PEEK
Lubrication	Cleaning Media

SC_20E-LP_TCT_2016_01_14

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Stocking Locations in USA, Canada and Mexico

Product Data Sheet

Product : SC 20A - HP
Type : Tank Cleaning Machine
Maker : Scanjet

The Type SC 20RAHP (0-2,000 PSIG) automated tank cleaning machine provides 360° impact indexed coverage for the cleaning of the inside of tanks and process vessels.

Industries

The Type SC 20RAHP is a highly versatile high pressure tank cleaning machine and is applicable in most all small type of tanks for process, storage, and transportation.

- Totes and IBC's
- Wine, Beer, and Whiskey Barrels
- Underground Storage Tanks
- Paint Mixing Tanks

Operational

The Type SC 20RAHP machine creates a pattern matrix similar to a ball of twine (see cleaning pattern simulation in the lower left hand corner of this page). A complete pattern is established when 49 axial revolutions of the body have been completed. During the process of this pattern build out, 4 cycles are established with each cycle increasing the density of the pattern matrix.

User Benefits

- High Jet-Stream Impact
- Reduced Cleaning Times
- Reduced Effluent Generation
- Reduced Energy Costs
- Controllable Axial Rotation

DRIVE UNIT

NOZZLE HEAD
2 & 4 NOZZLE
CONFIGURATIONS

COMPLETE ASSEMBLY

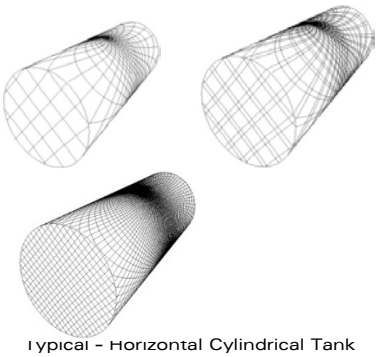
Type SC20RA – Part Number Designations

Model	Qty. Nozzles	Nozzle Type	Nozzle Size	Flange Type	Tube Length
SC20RAHP	2	1	C10	1	36
Part Number = SC20RAHP-2-1-C10-1-36					
SC20RAHP	4	1	C10	1	48
Part Number = SC20RAHP-4-1-C10-1-48					

Nozzle Designations	
Nozzle Type	**Nozzle Size**
1	C10; C15; C20; C25; C30; C35; C40; C50; C60; C70; C80
Mounting Flange Arrangements	
Flange Type	**Description**
1	Standard; 3 prong; 316LSS
2	3.00" 150# ANSI RF; 316LSS
2a	4.00" 150# ANSI RF; 316LSS
3	3.00" Tri-Clamp; 316LSS
3a	4.00" Tri-Clamp; 316LSS
3b	6.00" Tri-Clamp; 316LSS
Tube Length Designations	
Tube Type	**Description**
36	36.00 inches (914.40mm) – Nominal
48	48.00 inches (1219.20mm) – Nominal
72	72.00 inches (1829.00mm) – Nominal

Custom lengths are available by contacting engineering with your request.

Cleaning Pattern Simulation



Typical – Horizontal Cylindrical Tank

Specifications - Summary

Materials of Construction (As Standard):

- Wetted Parts
  - o 316LSS
  - o PTFE
- Other Parts
  - o See manual for parts detail

Weights & Packaged Dimensions

		Packaged Dim. & Wt.
• Tube Type 36		
Flange Type 1&3	: 14 lbs. (6.4 kg)	7"Ø x 40" (24.00 lbs.)
Flange Type 2	: 24.50 lbs. (11.1 kg)	7"Ø x 40" (34.50 lbs.)
Flange Type 2a	: 29.50 lbs. (13.4 kg)	8"Ø x 40" (39.50 lbs.)
Flange Type 3a	: 14.25 lbs. (6.5 kg)	8"Ø x 40" (24.25 lbs.)
Flange Type 3b	: 17.00 lbs. (7.7 kg)	8"Ø x 40" (27.00 lbs.)
• Tube Type 48		
Flange Type 1&3	: 15.5 lbs. (7.0 kg)	7"Ø x 52" (25.50 lbs.)
Flange Type 2	: 26.00 lbs. (11.8 kg)	7"Ø x 52" (36.00 lbs.)
Flange Type 2a	: 31.00 lbs. (14.1 kg)	8"Ø x 52" (41.00 lbs.)
Flange Type 3a	: 15.50 lbs. 7.0kg)	8"Ø x 52" (25.50
Flange Type 3b	: 18.50 lbs. (8.4 kg)	8"Ø x 52" (28.50 lbs.)
• Tube Type 72		
Flange Type 1&3	: 18.50 lbs. (8.4 kg)	7"Ø x 96" (46.00 lbs.)
Flange Type 2	: 29.00 lbs. (13.2 kg)	7"Ø x 96" (46.00 lbs.)
Flange Type 2a	: 34.00 lbs. (15.4 kg)	8"Ø x 96" (48.00 lbs.)
Flange Type 3a	: 18.75 lbs. (8.5 kg)	8"Ø x 96" (48.75 lbs.)
Flange Type 3b	: 21.50 lbs. (9.8 kg)	8"Ø x 96" (54.50 lbs.)

Lubrication:

- Flow-Through (Media Lubricated)

Pressure Range - Fluid:

- 0-2,300 PSI (158.62 Bar)

Pressure Range – Air:

- 0-10 PSIG (0-0.68 Bar)
- Consumption
  - o 1.4 – 3.1 SCFM (40-88 l/min.)

Temperature Range:

- Static : 300°F (148.89°C)
- Operational : 200°F (93.33°C)

Inlet Connection Type:

- 1.00" NPT(F) and 1.00" BSP(F) as Standard
- Others On Request

Minimum Tank Opening Requirement & Turn Radius

- Tank Opening : 2.76" (70mm)
- Turning Radius : 3.82" (97mm)

Surface Finish:

- ≥ 25 Ra μ (Micro Inch) – External as standard
- ≤ 25 Ra μ (Micro Inch) – Optional

Connections:

- See dimensional diagram for standards

Gear Ratio (Fixed to Moving Gear):

- 47/49 as standard (47 on hub with 49 on shaft)

1077.2016.01.20

15200 Middlebrook Drive; Suite E • Houston, Texas 77058 USA
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Email: scanjetsales@tankcleantech.com / sales @tankcleantech.com
Website: www.tankcleantech.com / www.orbijet.com

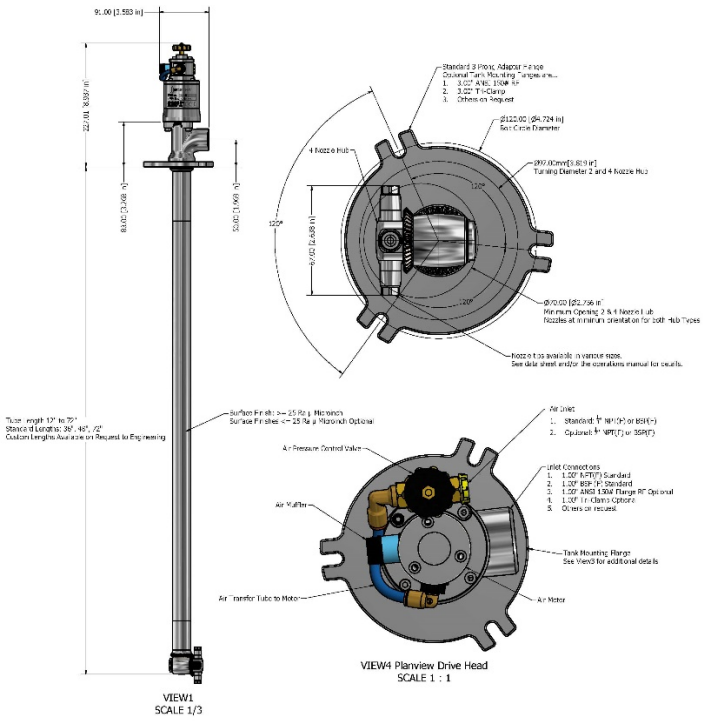
Product Data Sheet

Product : SC 20A-HP

Type : Tank Cleaning Machine

Maker : Scanjet

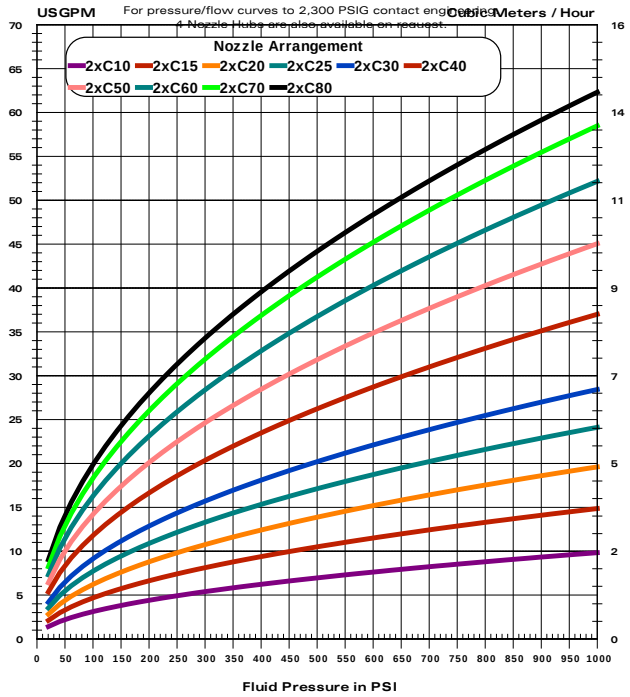
Dimensional Information



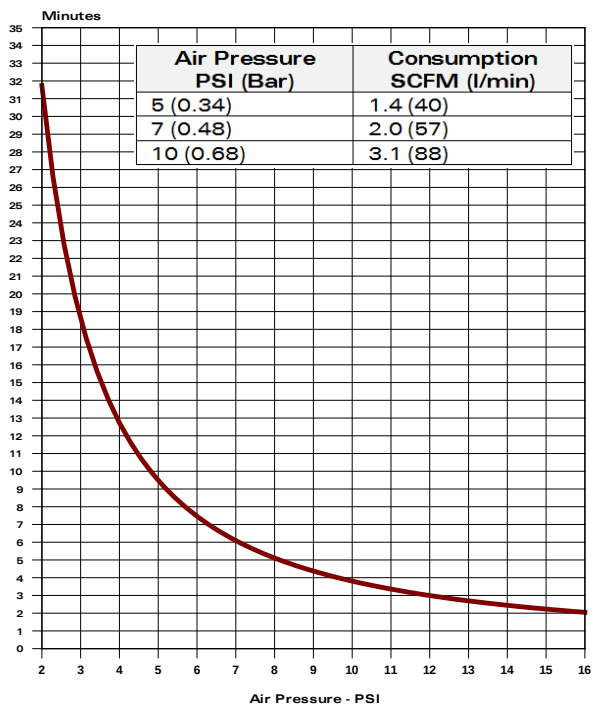
Flange dimensions shown here are for the Standard 3 Prong Flange Only.
For other dimensions, contact Engineering.

Pressure/Flow Curve (0-1000 PSI)

(for pressures to 3000 PSI and 4 nozzle configurations... contact us)

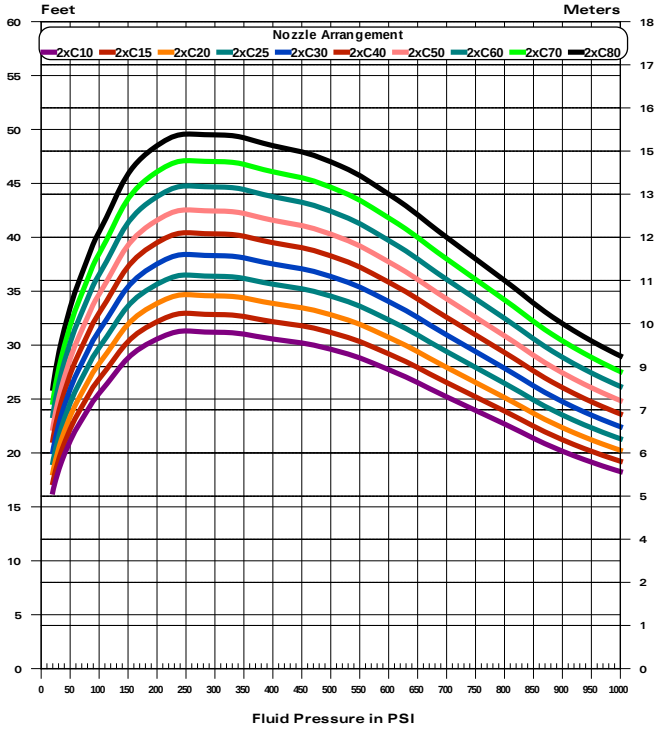


Time to Establish One Pattern



Air Pressure PSI (Bar)	Consumption SCFM (l/min)
5 (0.34)	1.4 (40)
7 (0.48)	2.0 (57)
10 (0.68)	3.1 (88)

Jet-Length



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SC 30A

Scanjet tank cleaning equipment

Product summary

The SC 30A is a single nozzle tank cleaning machine especially developed for sector cleaning tanks/cisterns/vessels in hazardous ATEX classified areas.

SC 30A gives the user a possibility to optimize the cleaning, with minimal use of time, energy and cleaning media.

SC 30A consists of two main parts; one washing unit that is fixed installed in the tank and one portable air driven drive unit SC 100, SC 100 PW or SC 180 for operation. The drive unit can be exchanged or removed without exposing the tank to the outside atmosphere.
As option the SC 30A can be provided with a free selection of single nozzle levels giving a tailor-made installation for each specific need.

Quality Control, Compliances & Certifications

SC 30A is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.
Additionally, the SC 30A conforms to United States ASME standards for construction and European, CE and ATEX standards for design, construction and safety.

Typical applications for the SC 30A:

- Crude oil storage tanks
- Large process vessels and fermenters
- Large silos and dryers
- Large reactors
- Large Uni-Tanks

	SC 100 	SC 100PW 	SC 180 
Air pressure	0,5 - 0,7 MPa	0,5 - 0,7 MPa	0,5 - 0,7 MPa
Air consumption	250 l/min	250 l/min	450 l/min
RPM	0,5 - 2,0	1,0 - 5,0	0,5 - 5,0
Elevation	3°	7,2°	1,5°, 3°, 4,5°, 30° PW
Vertical sector clean	0 - 180°	0 - 180°	0 - 200°
Horizontal sector clean	-	-	0 - 400°

KEY FEATURES

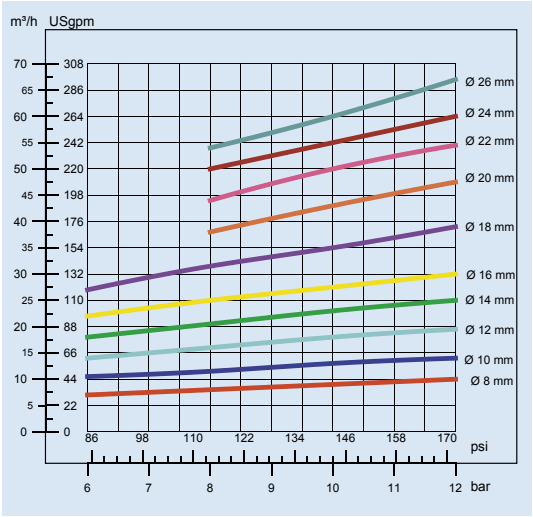
SC 30A

- ATEX
- Programmable sector cleaning
- Rugged construction
- External drive
- High jet impact
- High capacity

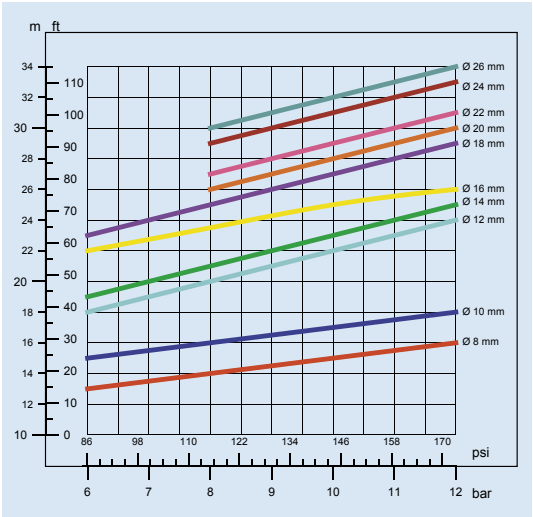
SC 30A

scanjet
www.scanjet.se

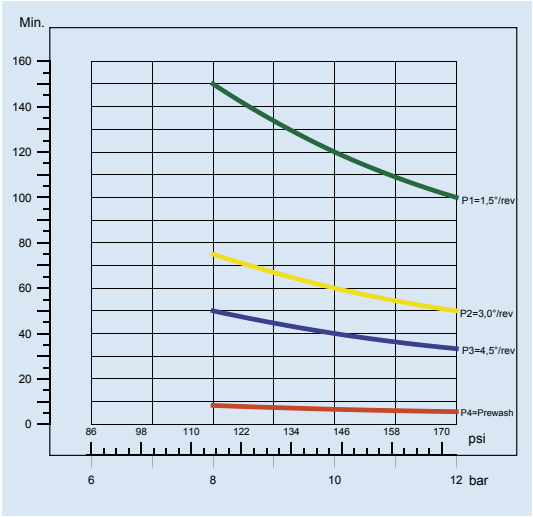
Technical performance



Pressure/Flow

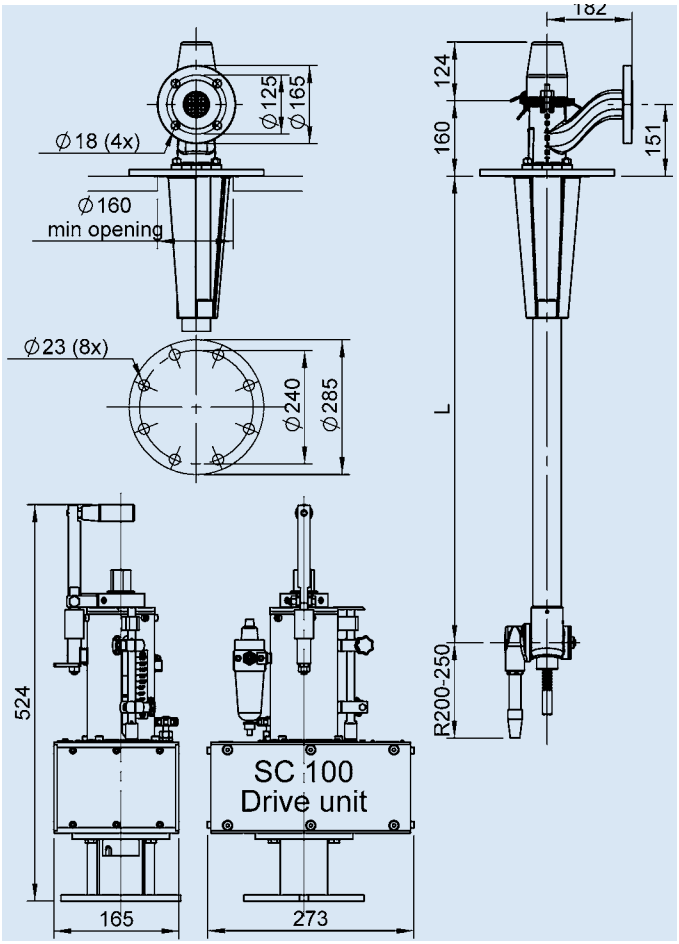


Jet length



Pattern time

Dimensions



Specifications

Flow	5-65 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Standard length	1500 mm
Weight	44 kg
Per additional meter of main pipe	10 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN50
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning Media

scanjet

We reserve the right to changes without prior notice.

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Stocking Locations in USA, Canada and Mexico

1034.2013.12.19

SC 30T

Scanjet tank cleaning equipment

KEY FEATURES

+ Programmable
+ Magnetic drive
+ Section cleaning
+ Rugged construction
+ External drive
+ Easy maintenance
+ High jet impact
+ Easy installation
+ Adjustable speed

The SC 30T is a single nozzle mechanically programmable automated tank cleaning machine constructed of 316 stainless steel and other highly corrosion resistant materials.

The SC 30T allows the operator to wash the tank in a full 360° mode or to set the nozzle angle to wash the tank within a particular section. The SC 30T also employs a patented magnetic drive transmission thus reducing the need for costly seal replacements and potential failures when used in hazardous environments. As the drive mechanism and other major components are external to the tank, this results in easy maintenance and a high level of safety when the cleaning of hazardous products are required.

The SC 30T is the product of choice when long jet-lenghts and/or a high level of jet impact is required.

SC30T_TCT_2015_01_29

Quality Standards

The SC 30T is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request. Additionally, the SC 30T conforms to United States ASME standards for construction and others... available upon request.

Typical applications for the SC 30T:

+ Ethanol fermenters
+ Crude oil storage tanks
+ High density stock chest
+ Large silos and dryers
+ Road tankers and railcars
+ Reactors
+ Large Uni-Tanks

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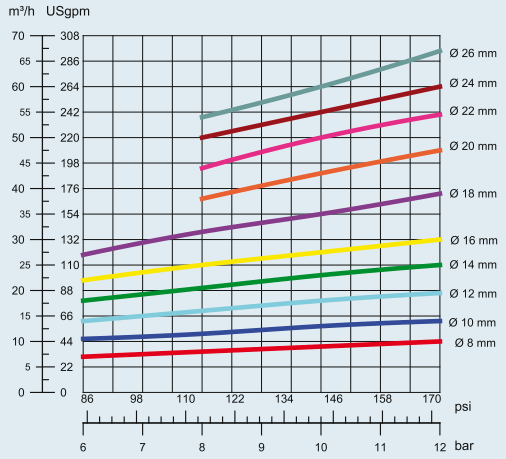
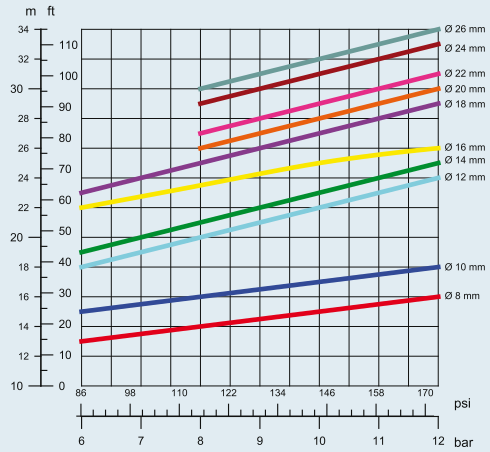
Stocking Locations in USA, Canada and Mexico

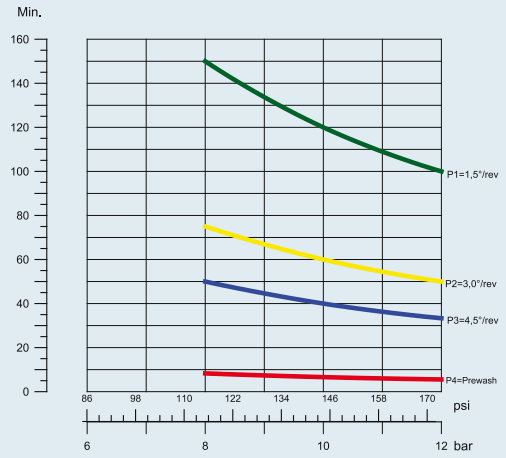
Technical performance



Pressure/Flow

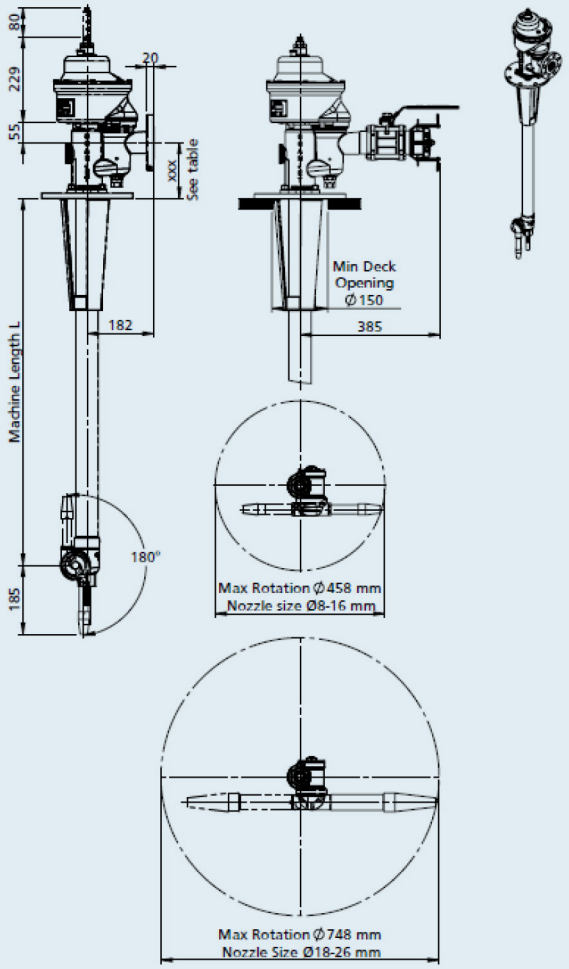


Jet length



Pattern time

Dimensions



Specifications

Flow	5-70 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Rotation speed	1-1,6 rpm
Standard length	1500 mm
Weight	43 kg
Per additional meter of main pipe	10 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN50
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning Media

SC30T_TCT_2015_01_29

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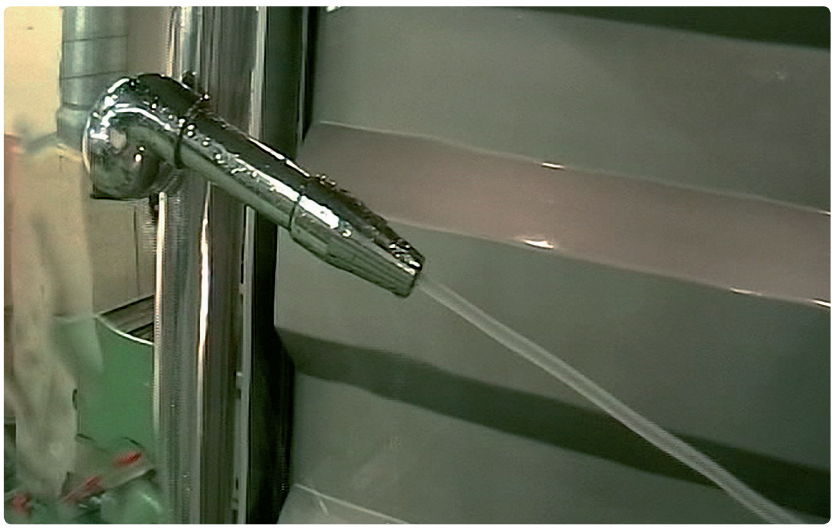
Stocking Locations in USA, Canada and Mexico

SC 30TA

Scanjet tank cleaning equipment

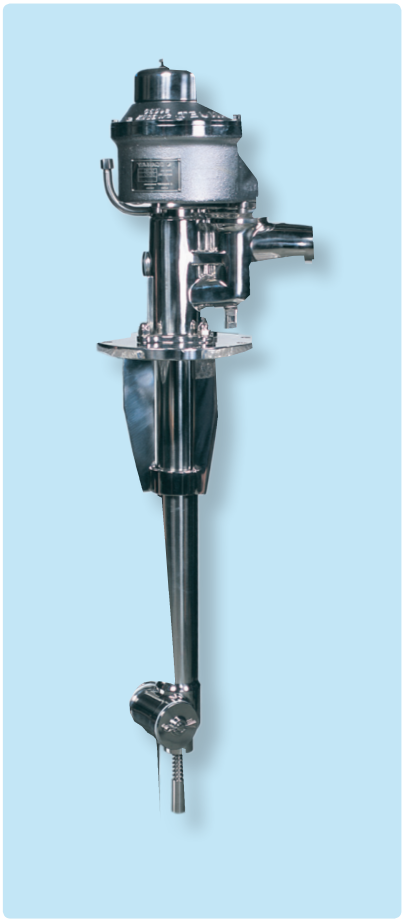


KEY FEATURES

- Aseptic
- Internally and externally polished to 0,8 micron
- Alcohol filled cofferdam available

SC 30TA is the first single nozzle aseptically designed programmable tank cleaning machine suited to large tank installations. The unit is internally and externally polished to end user specification and can also be delivered with alcohol cofferdams between the drive unit and tank atmosphere.

The single nozzle design delivers a solid and powerful jet with an optimized cleaning result on all tank surfaces. It comprises a unique separated turning and lifting moment with a rapid manual overdrive for sector cleaning setting.



SC30TA_TCT_2015_01_21

Quality Control, Compliances & Certifications

The SC 30TA is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request. Additionally, the SC 30TA conforms to United States ASME standards for construction and others... available upon request.

Typical applications for the SC 30TA:

- Large process vessels and reactors
- Large storage tanks
- Large transportations tanks
- Juice tanks
- Beverage tanks

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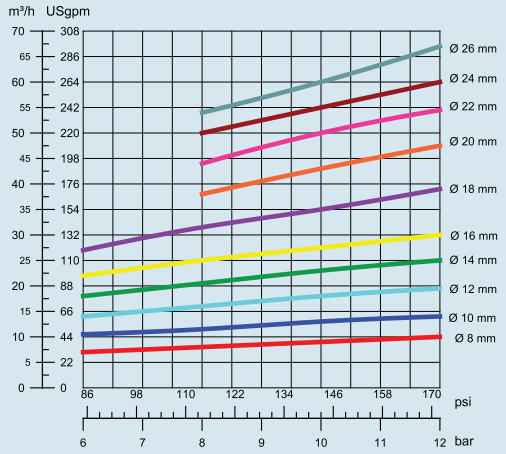
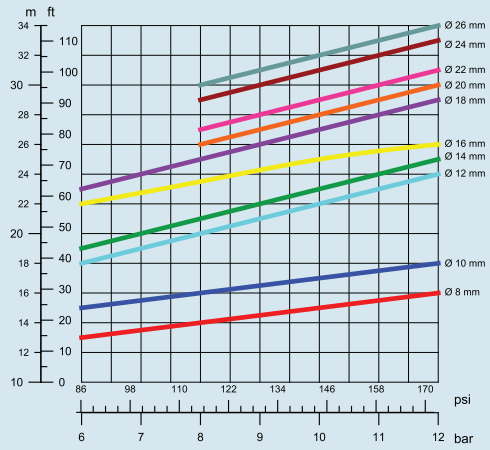
Stocking Locations in USA, Canada and Mexico

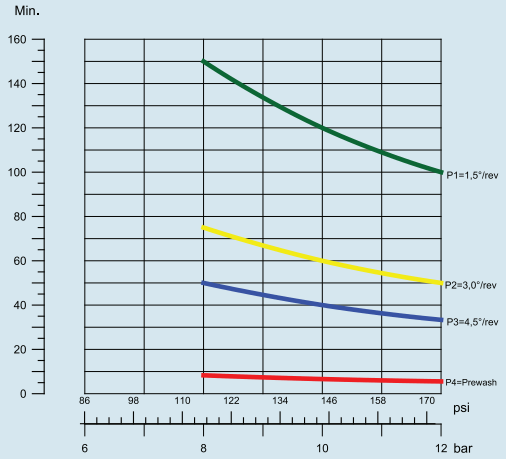
Technical performance



Pressure/Flow

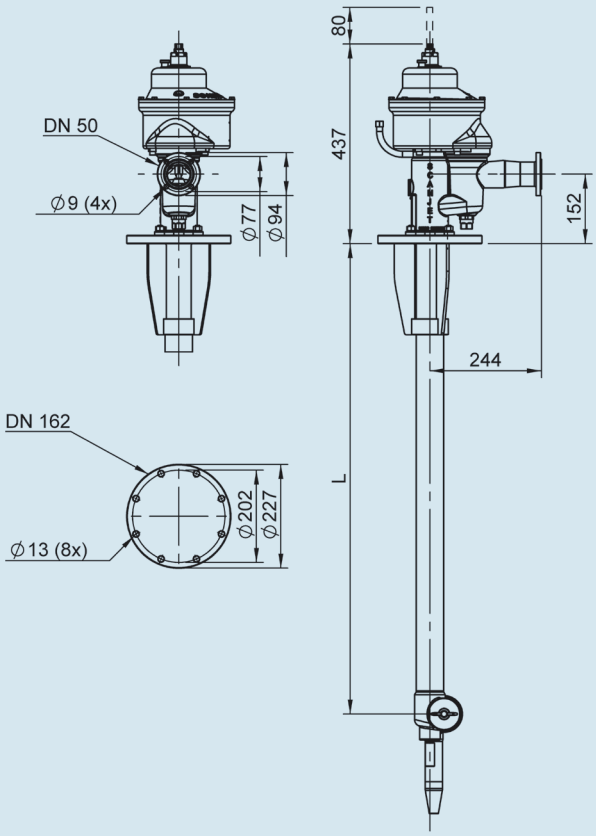


Jet length



Pattern time

Dimensions



Specifications

Flow	5-65 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Rotation speed	1-1,6 rpm
Standard length	1000 mm
Weight	43 kg
Per additional meter of main pipe	10 kg
Tank connection	DN 162, DIN-11864-BF-A41*1,5-N-1,4404
Inlet connection	DN 50, DIN-11864-BF-A41*1,5-N-1,4404
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning Media

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Stocking Locations in USA, Canada and Mexico

SC 30TH

Scanjet tank cleaning equipment

Scanjet Model SC 30TH is driven by the cleaning media by means of a fixed installed turbine with an integrated programmable drive unit. The permanent lubrication means an oil-free drive unit and the patented magnetic transmission allow an exchange of the drive unit without exposing the tank to the outside atmosphere.

Powerful single nozzle tank cleaning machine

The single nozzle concept gives a very solid and powerful jet with an optimized cleaning result on all tank surfaces. It has the unique separated turning and lifting movements and a rapid manual overdrive for sector cleaning setting.

Self draining nozzle

The nozzle assembly is self draining and the machine has a full 0-180 degrees cleaning range.
The patented design is in accordance with IMO-Marpol requirements.

Fully programmable

The SC 30TH is fully programmable to meet multiple cleaning needs. Various cleaning programs, including prewash, can be chosen during or before the cleaning operation.

Integration with WashTrac™

Fully prepared for integration with WashTrac™ tank cleaning monitoring system.

Typical applications for SC 30TH:

- Chemical carriers
- Product carriers
- Crude oil tankers
- Offshore applications

KEY FEATURES

SC 30TH

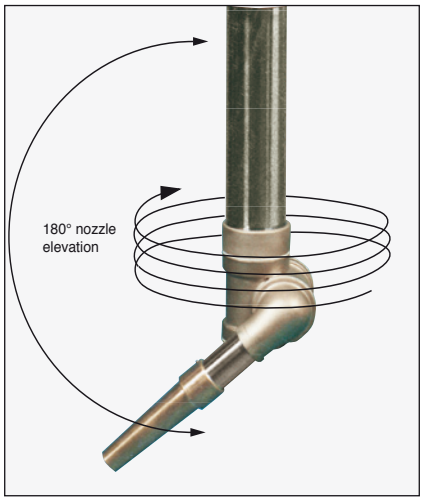
- Magnetic Transmission
- Fully programmable
- Minimized cleaning time
- Separated turning and lifting movements
- Strainer standard
- WashTrac™ (option)
- Drive unit can be removed without exposing tank to atmosphere
- No gearbox inside tank
- AISI 316 and PTFE
- Prewash program
- Grease lubricated drive unit

SC 30TH

scanjet marine

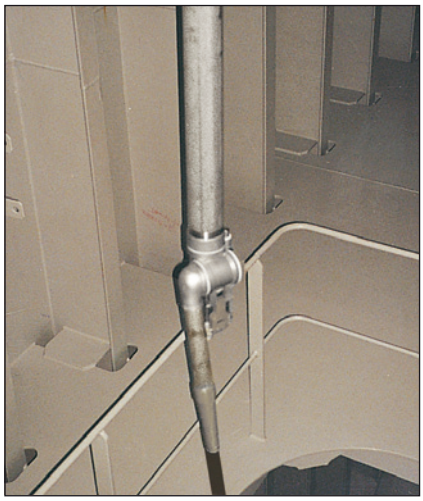
SC 30TH Scanjet tank cleaning equipment

Nozzle spiral motion

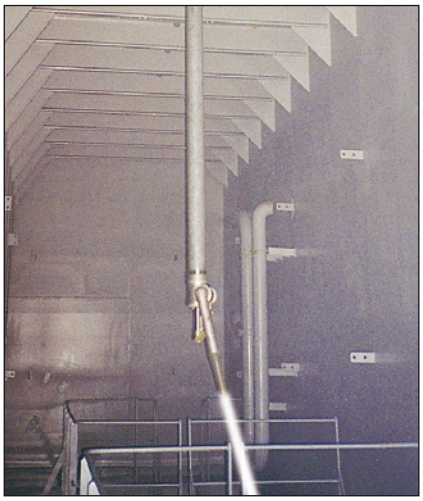


180° nozzle elevation for complete cleaning range coverage and the unique separated lifting and turning movements.

Single nozzle – optimal impact



Crude oil washing certified.



Water washing.

Easy program selection including pre-wash.

The drive unit can be removed without oil spill or exposing tank to atmosphere.

Connection to WashTrac™ as option.

GENERAL ADVANTAGES

- Maintenance free system below deck
- Fully programmable machines
- Cleaning with closed hatch conditions
- Minimized cleaning time
- Minimized cleaning media consumption
- Dry (oil-free) drive unit
- Filter in front of turbine
- Portable cleaning machines, long hoses etc. minimized
- Production, design and spares direct from factory
- Optimal tankcleaning economy
- Drive unit may be replaced or serviced without exposing tank to atmosphere
- Free design service
- Computerized shadow diagram calculation
- Passivation of stainless steel tanks allowed for

SC 30TH

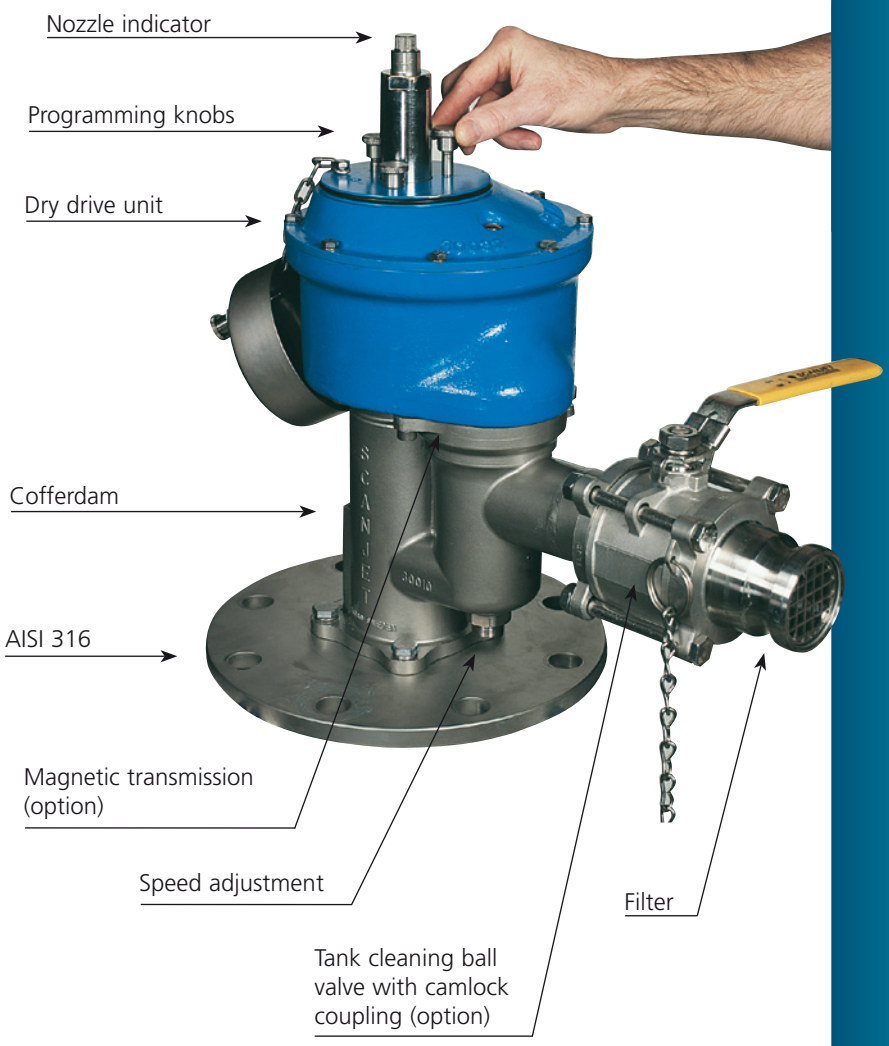
Developed for the third millenium the Scanjet Model SC 30TH offers the latest technology in tank cleaning.

The machine is produced in AISI 316 meeting all standard specifications.

Any desired starting position of the nozzle will be reached in just a few seconds, and the design allows for a manual overdrive at any time during the tank cleaning operation.

The machine has very few moving parts requiring a minimum of service and is maintenance free below deck.

The drive unit can be removed without exposing the tank to atmosphere. Thanks to the magnetic transmission, there is no penetration between the drive unit and the turbine which means that any accidental leakage is eliminated.



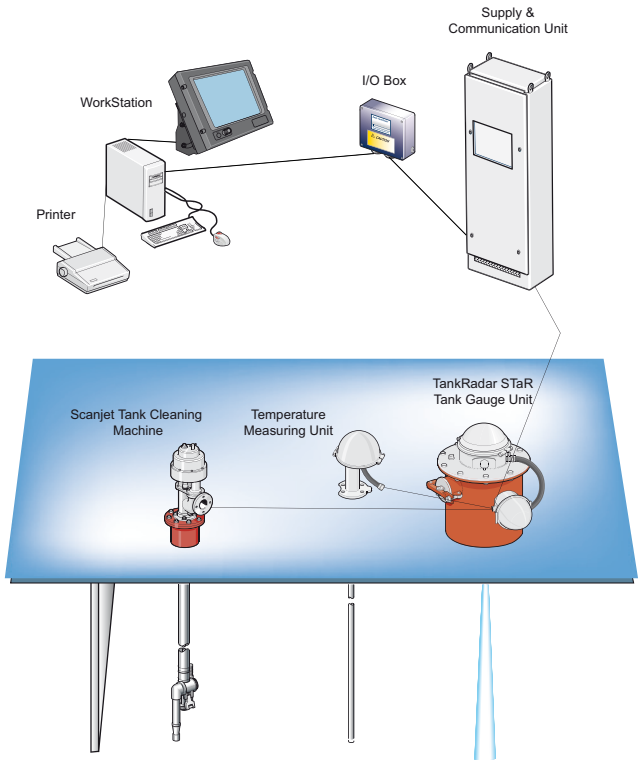
WashTrac™ Tank Cleaning Monitoring System

The innovative tank cleaning monitoring system is jointly developed by Saab Rosemount Marine and Scanjet Marine. By using already installed hardware, WashTrac™ monitors the tank cleaning operation onboard any tanker.

The WashTrac™ systems offers following features and advantages to operators.

- Operating status of tank cleaning machines
- Start/Stop alarm of tank cleaning machines
- Operation and prewash data logging on printer

Various options available



(Tank cleaning monitoring system recommended by Intertanko)

SC 30TP

Scanjet tank cleaning equipment

KEY FEATURES

SC 30TP

- Magnetic Transmission
- Separated turning movements
- Strainer standard
- Portable drive unit
- Integration with WashTrac™
- Arctic version

Scanjet Model SC 30TP is a modern tank cleaning machine especially developed for use in arctic conditions.
The machine is media driven by means of a fixed installed turbine with a portable programmable drive unit, to ensure rapid and safe operation also in arctic conditions

Powerful single or twin nozzle tank cleaning machine

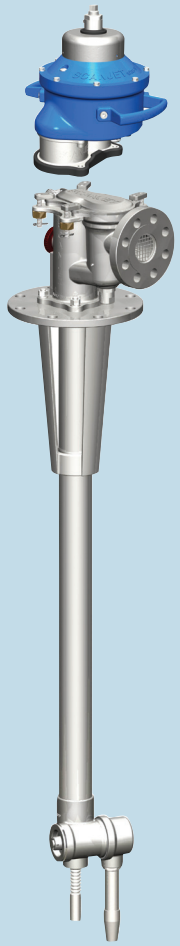
Full versatility is provided by free selection of single nozzle or twin nozzle type of system and multistage nozzle levels give a customised installation for each specific vessel.

The nozzle(s) directing the cleaning media perform a horizontal spiral motion giving a single or crossing helical pattern with a perfect cleaning result even in areas below horizontal stringers, longitudinals and corrugated bulkheads.

Typical application for SC 30TP:

- Chemical carriers
- Product carriers
- Small and medium size crude oil carriers
- Offshore

SC 30TP



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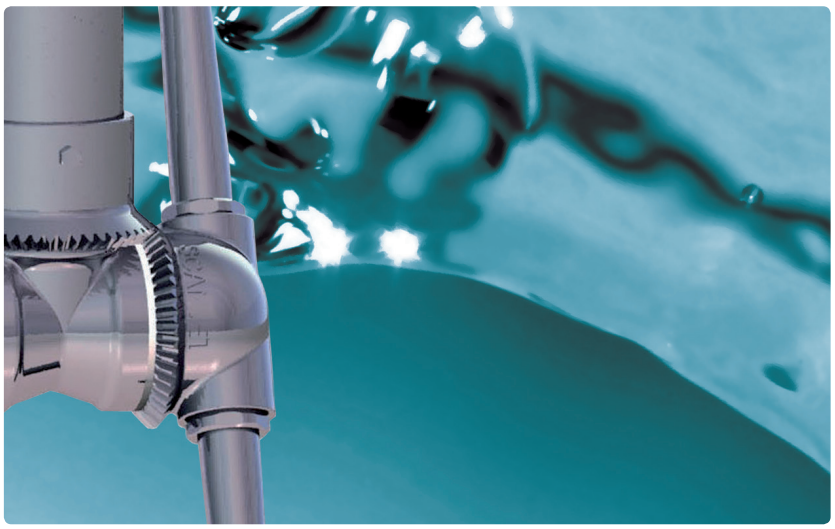
Stocking Locations in USA, Canada and Mexico

www.scanjet.se

SC 40RA

Scanjet tank cleaning equipment



KEY FEATURES

+ Removable drive
+ Easy installation
+ Controllable rotation
+ 2 & 4 nozzle design
+ Very low pressure drop
+ Quiet operation
+ CE rated
+ Self draining

The SC 40RA is an air driven externally powered automated tank cleaning machine. Both 2 nozzle and 4 nozzle versions are available with all wetted parts constructed of 316 stainless steel and other highly corrosion resistant materials.

As none of the cleaning fluid is used to power the SC 40RA, the pressure drop across the machine is very minimal. As a result, the fluid energy from the cleaning supply pump is maximized.

The SC 40RA is a very rugged and durable tank cleaning machine; designed for demanding cleaning applications where reliability and long service intervals are required.

Quality Standards

The SC 40RA is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Additionally, the SC 40RA conforms to United States ASME standards for construction and others are available upon request.

Typical applications for the SC 40RA:

+ Ethanol storage and process tanks
+ Paints and coatings process vessels
+ Over-the-road tankers and railcars
+ Totes and IBC's
+ Batch blending tanks

SC40RA_TCT_2015_01_21

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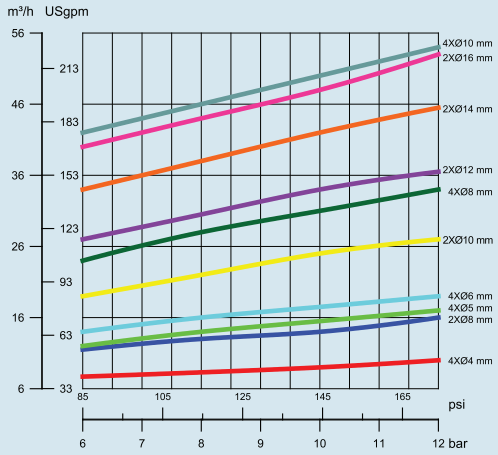
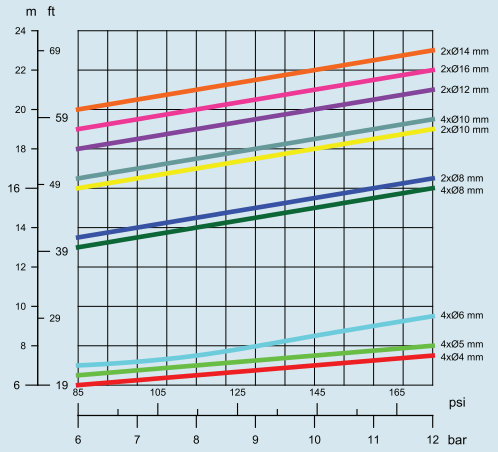
Stocking Locations in USA, Canada and Mexico

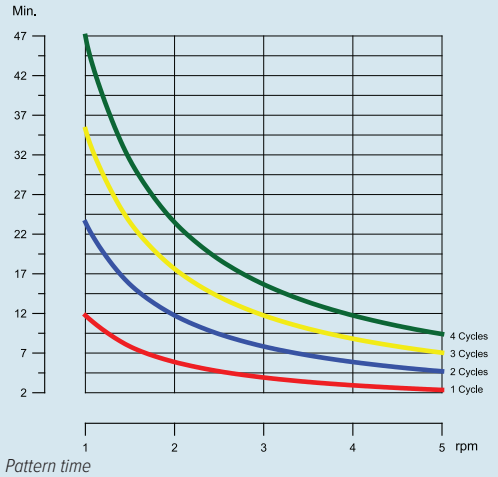
Technical performance



Pressure/Flow

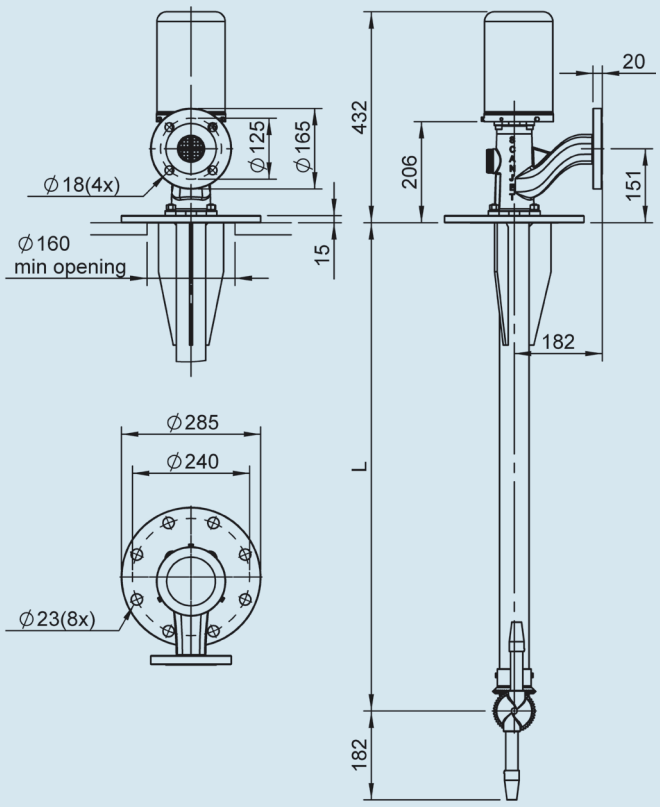


Jet length



Pattern time

Dimensions



Specifications

Flow	5-55 m³/h
Inlet pressure	0,6-1,2 MPa
Max pressure	1,4 MPa
Recommended pressure	0,8 MPa
Max temperature	95°C
Rotation speed	1-5 rpm
Standard length	1500 mm
Weight	38 kg
Per additional meter of main pipe	10 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN50
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning Media
Drive unit	Air motor

SC40RA_TCT_2015_01_21

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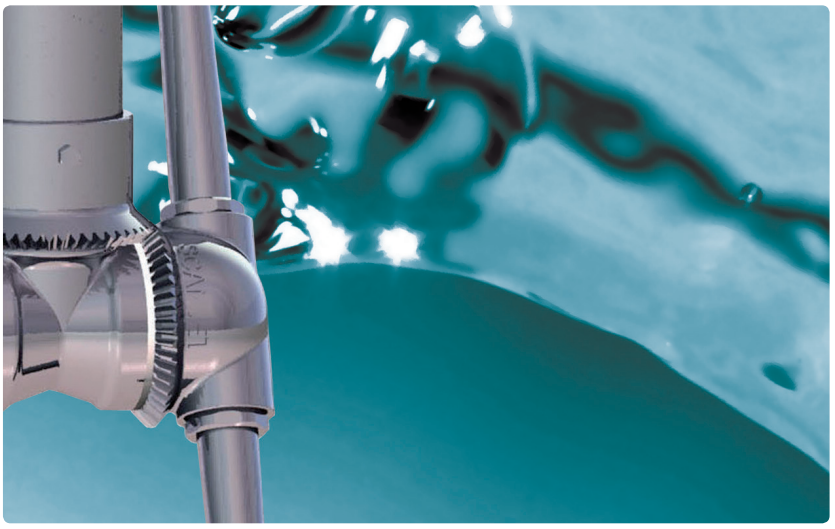
Stocking Locations in USA, Canada and Mexico

SC 40RE

Scanjet tank cleaning equipment



KEY FEATURES

+ Removable drive
+ Easy installation
+ Controllable rotation
+ 2 & 4 nozzle design
+ Very low pressure drop
+ Quiet operation
+ CE rated
+ Self draining

The SC 40RE is an electric driven externally powered automated tank cleaning machine. Both 2 nozzle and 4 nozzle versions are available with all wetted parts constructed of 316 stainless steel and other highly corrosion resistant materials.

As none of the cleaning fluid is used to power the SC 40RE, the pressure drop across the machine is very minimal. As a result, the fluid energy from the cleaning supply pump is maximized.

The SC 40RE is a very rugged and durable tank cleaning machine; designed for demanding cleaning applications where reliability and long service intervals are required.

Quality Standards

The SC 40RE is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Additionally, the SC 40RE conforms to United States ASME standards for construction and others are available upon request.

Typical applications for the SC 40RE:

+ Ethanol storage and process tanks
+ Paints and coatings process vessels
+ Over-the-road tankers and railcars
+ Totes and IBC's
+ Batch blending tanks

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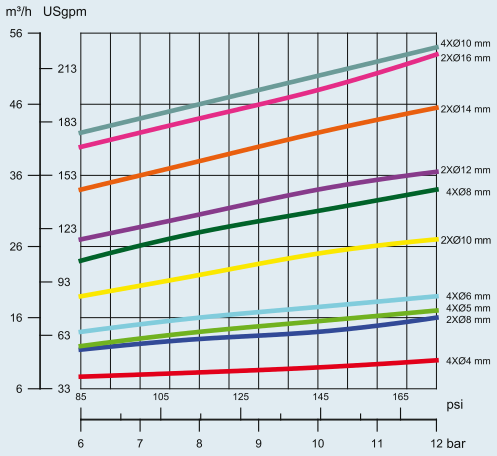
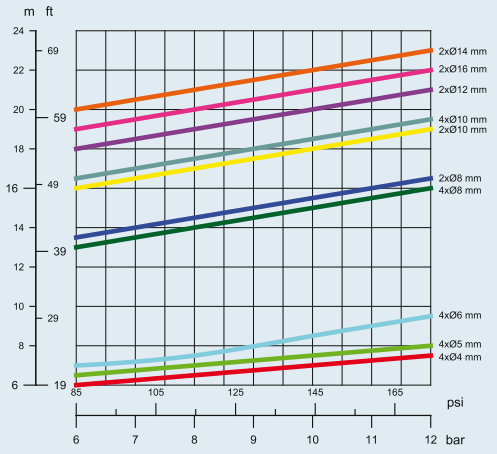
Stocking Locations in USA, Canada and Mexico

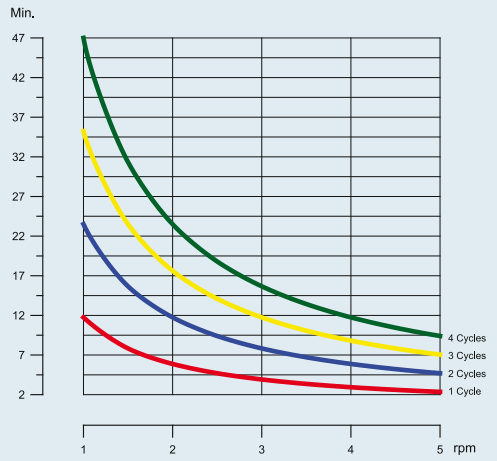
Technical performance



Pressure/Flow

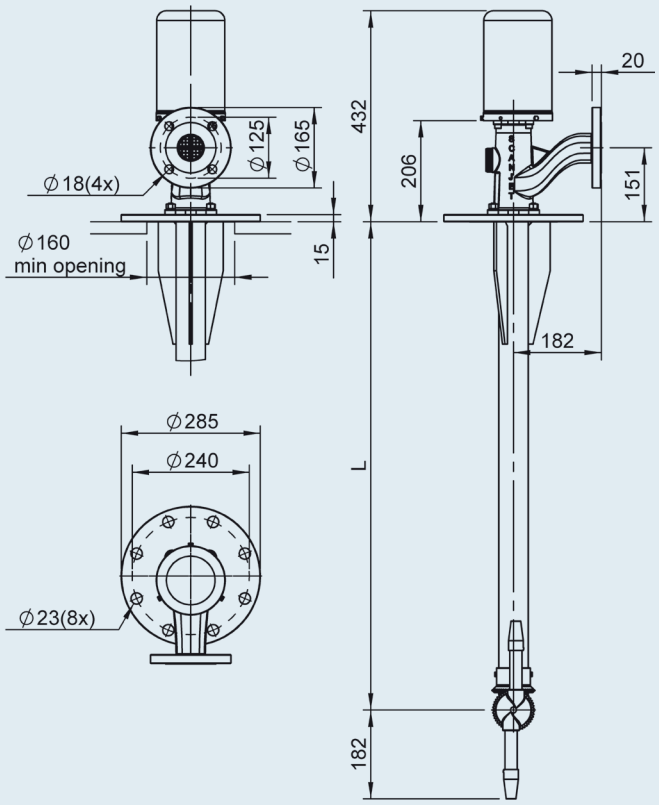


Jet length



Pattern time

Dimensions



Specifications

Flow	5-55 m³/h
Inlet pressure	0,6-1,2 MPa
Max pressure	1,4 MPa
Recommended pressure	0,8 MPa
Max temperature	95°C
Rotation speed	1-5 rpm
Standard length	1500 mm
Weight	38 kg
Per additional meter of main pipe	10 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN50
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning Media
Drive unit	Electric engine

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Stocking Locations in USA, Canada and Mexico

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SC 40RH

Scanjet tank cleaning equipment

KEY FEATURES

SC 40RH

- Strainer standard
- Integration with WashTrac™ (option)
- Drive unit can be removed without exposing tank to atmosphere
- No gearbox inside tank
- AISI 316 and PTFE
- Grease lubricated

Scanjet Model SC 40RH is a robust and very flexible type of tank cleaning machine specially designed for marine and off-shore applications. Scanjet Model SC 40RH is hydralic driven with an intergrated drive unit.

Twin nozzle tank cleaning machine

The SC 40RH gives the user the possibility to optimise the cleaning operation and is preprogammed to minimize the use of time, energy and cleaning media.

SC 40RH has very few moving parts requiring a minimum of service and is maintenance free inside tank.

Adjustable rotation speed

The rotation speed can easily be adjusted on the driving unit.

Typical applications for SC 40RH

- Chemical carriers
- Product carriers
- Offshore applications
- River barges
- Deck tanks
- Recidual tanks

SC 40RH

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SC 40RT

Scanjet tank cleaning equipment

KEY FEATURES

+ Magnetic drive
+ Rugged construction
+ External drive
+ Easy maintenance
+ High jet impact
+ Easy installation
+ Adjustable speed

The SC 40RT is a dual or four nozzle externally driven automated tank cleaning machine constructed of 316 stainless steel and other highly corrosion resistant materials. It employs a patented magnetic drive transmission thus reducing the need for costly seal replacements and potential failures when used in hazardous environments. The drive mechanism and other major components are external to the tank, this results in easy maintenance and a high level of safety when the cleaning of hazadous products are required.

The SC 40RT is a very rugged and durable tank cleaning machine; designed for demanding cleaning applications where reliability and long service intervals are required.

SC40RT_TCT_2015_01_21

Quality Standards

The SC 40RT is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Typical applications for the SC 40RT:

+ Ethanol fermenters, storage and process tanks
+ Crude oil storage tanks
+ High density stock chest
+ Large silos and dryers
+ Road tankers and railcars
+ Reactors
+ Large Uni-Tanks
+ Pulp storage tanks

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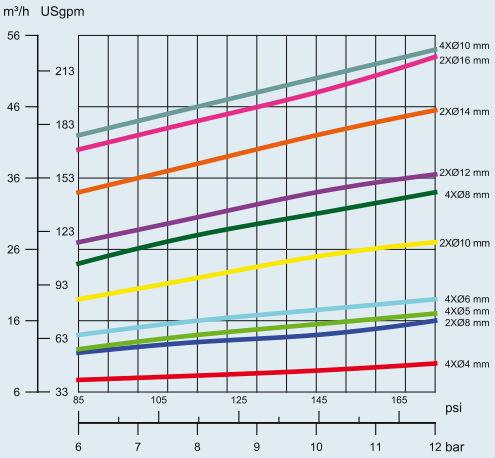
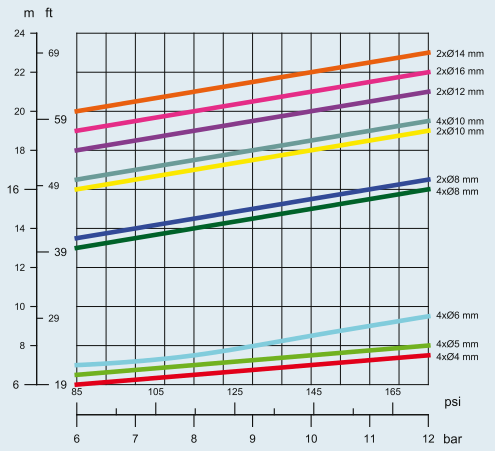
Stocking Locations in USA, Canada and Mexico

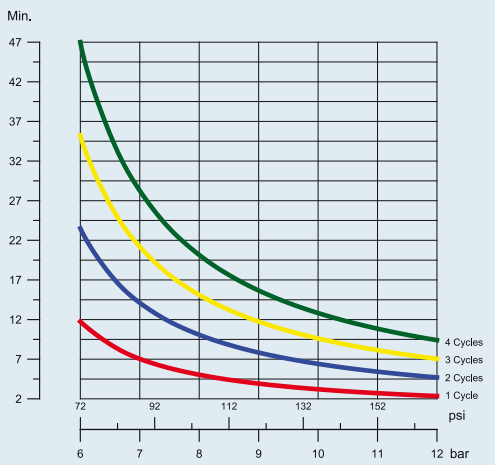
Technical performance



Pressure/Flow

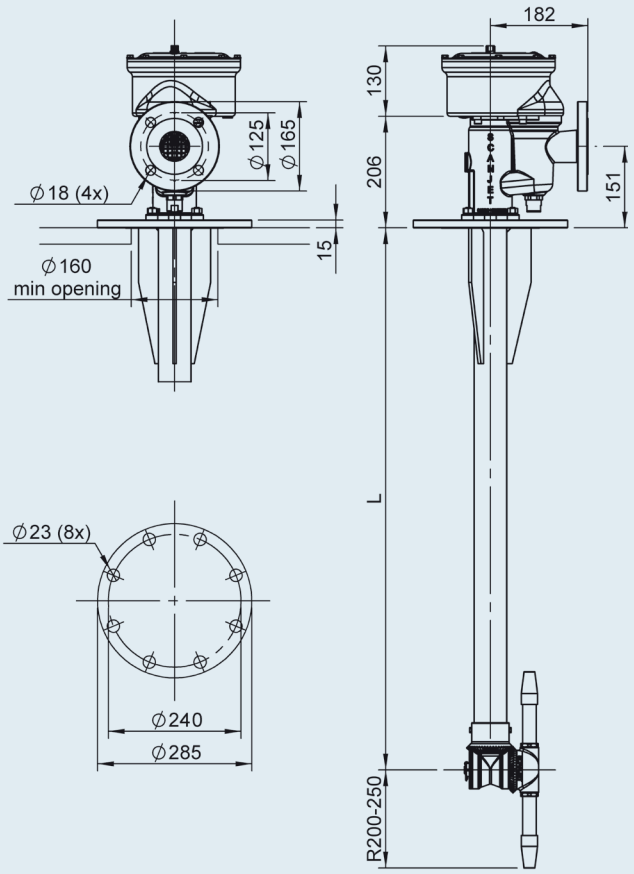


Jet length



Pattern time

Dimensions



Specifications

Flow	5-55 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Rotation speed	1-2 rpm
Standard length	1500 mm
Weight	43 kg
Per additional meter of main pipe	10 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN50
Materials	AISI 316, PTFE, Viton
Lubrication	Cleaning media

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Stocking Locations in USA, Canada and Mexico

SC 50/75T

Scanjet Model SC 50/75T is a modern tank cleaning machine specially developed for:

- Chemical carriers
- Product carriers
- Industrial applications
- Offshore supply vessels
- Small and medium size crude oil carrier

Scanjet Model SC 50/75T is driven by the cleaning media by means of a fixed installed turbine with an integrated programmable drive unit. Full versatility is provided by free selection of single nozzle or twin nozzle type of system and multistage nozzle levels give a tailor-made installation for each specific vessel.

The nozzle (s) directing the cleaing media perform a horizontal spiral motion giving a single or crossing helical pattern with a perfect cleaning result even in areas below horizontal stringers, longitudinals, corrugated bulkheads etc. The patented design is in accordance with IMO-Marpol requirements.

Fully prepared for integration with WashTrac™, our tank cleaning monitoring system.

Working Principle

The cleaning media comes from the supply line onboard the vessel and enter into the inlet housing and passes the vertical turbine, which drives the driving unit.

The cleaning media continues through the main pipe to the nozzles and then out in the tank. The driving unit will rotate the main pipe and elevate the nozzle(s) and will hereby clean the tank in a spherical pattern.

The rotation speed is controlled by the rotation speed of the turbine and could easily be set to desired speed.
The rotation of the main pipe and the elevation of nozzle(s) are indicated on the scale on the lifting rod.

The elevation per revolution (Pitch) for the nozzle(s) can be set to different pre-programmed values by means of lifting and turning the program knob.

Specifications

Flow	5-60 m^3/h
Inlet pressure	0,6-1,2 MPa
Recommended pressure	0,8-1,0 MPa
Max temperature	95^o
Rotation speed	1-1,6 rpm
Length	1,0-17,5 m
Weight	50-215 kg
Tank connection	PN16 DN150
Inlet connection	PN16-DN65
JIS 16K-65A	
Material in contact with cargo	AISI 316
Lubrication	Grease

Options

As per shipyard/shipowner specification

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Stocking Locations in USA, Canada and Mexico

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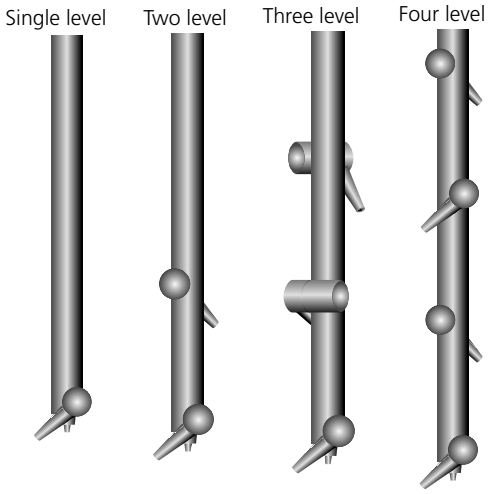
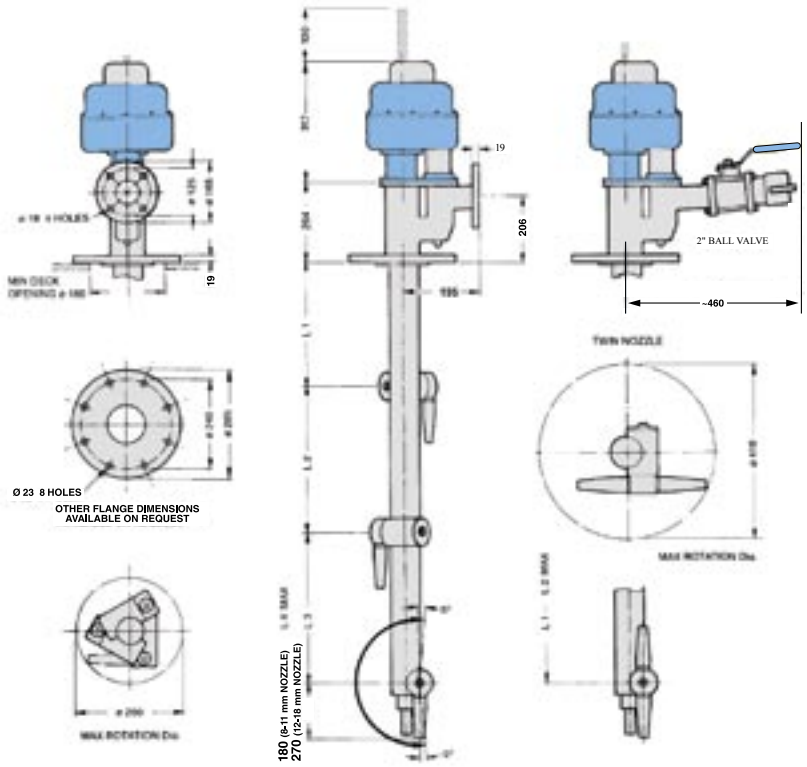
Single or multistage cleaning levels

One single nozzle cannot always give an acceptable cleaning result.

Corrugated bulkheads, longitudinals or horizontal stringers can create shadow areas and should also be cleaned underneath.

Each cleaning machine can therefore be individually designed to optimize the cleaning result.

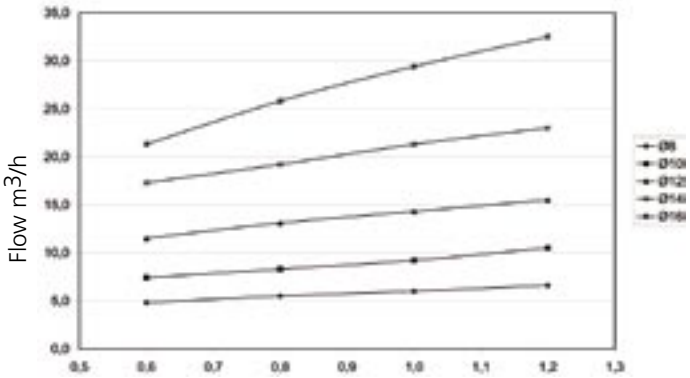




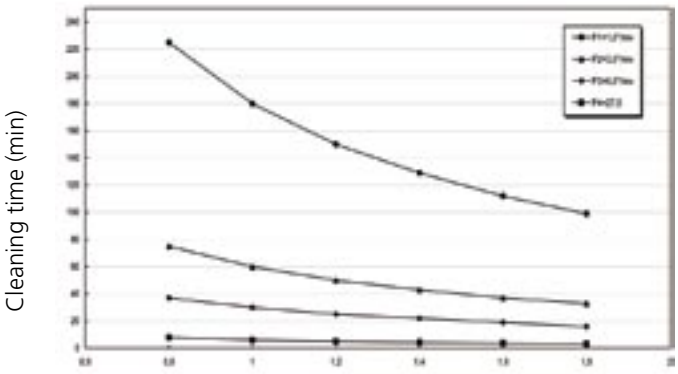
Technical performance SC 50/75T

Supply pressure MPa	Nozzle dia ø 8 mm		Nozzle dia ø 10 mm		Nozzle dia ø 12 mm		Nozzle dia ø 14 mm		Nozzle dia ø 16 mm	
	Flow m³/h	Jet length m	Flow m³/h	Jet length m	Flow m³/h	Jet length m	Flow m³/h	Jet length m	Flow m³/h	Jet length m
0,6	4,8	9	7,4	10	11,5	12	17,3	14	21,3	17
0,8	5,5	12	8,3	14	13,1	16	19,2	18	25,8	22
1,0	6,0	13	9,2	15	14,3	17	21,3	19	29,4	25

Waterflow for different nozzles sizes at specific inlet pressure



Cleaning time for different no of cycles depending on the rotation speed



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1007.2013.12.19

SC 60A

Crude Oil Storage Tank Cleaning Machine

KEY FEATURES

- ATEX certified
- Sector Cleaning
- Support Leg Entry
- Highly Durable
- Pneumatic Drive
- High Solids Loading
- Stainless Steel Const.
- Pitch Control
- Custom Lengths

Scanjet SC 60A is an advanced tank cleaning nozzle system specifically designed for Crude Oil Storage Tanks where tank entry is limited.

The SC 60A has the ability to make entry into the tank via the support legs on floating roof tanks, as well as other openings that may be available on the tank to be cleaned. It can also be programmed for a specific cleaning pattern.

Sector Cleaning

The SC 60A is pneumatically driven and can be programmed for sector cleaning. If the job requires that the cleaning pattern should only be focused on the tank bottom and 1 meter of the side wall, the SC 60A can perform this function.

Tank Entry

The SC 60A is designed to make tank entry for Crude Oil Storage Tanks as easy as possible. To this purpose, the SC 60A can enter a floating roof storage tank via the support legs affixed to the roof of the tank. Just advise us of the mounting flange type (dimensions) and we will fit the SC 60A to your requirements.

Solids Handling

The SC 60A is a master at handling solids. Crude Oil Tank Cleaning is a dirty and arduous task. Designed to use Crude Oil as the cleaning media. The SC 60A handles solids several times that of conventional machines.

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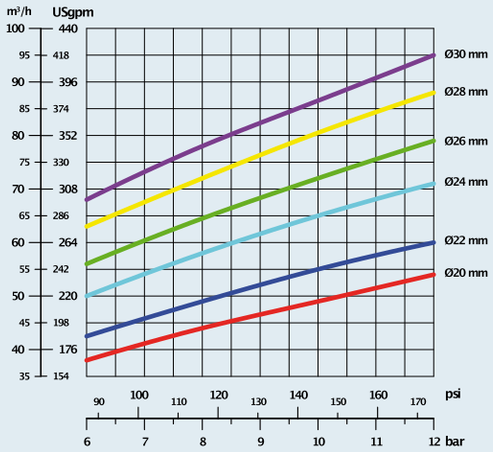
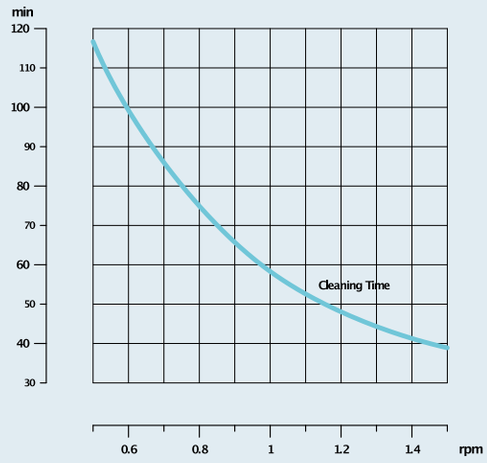
Stocking Locations in USA, Canada and Mexico

Technical performance



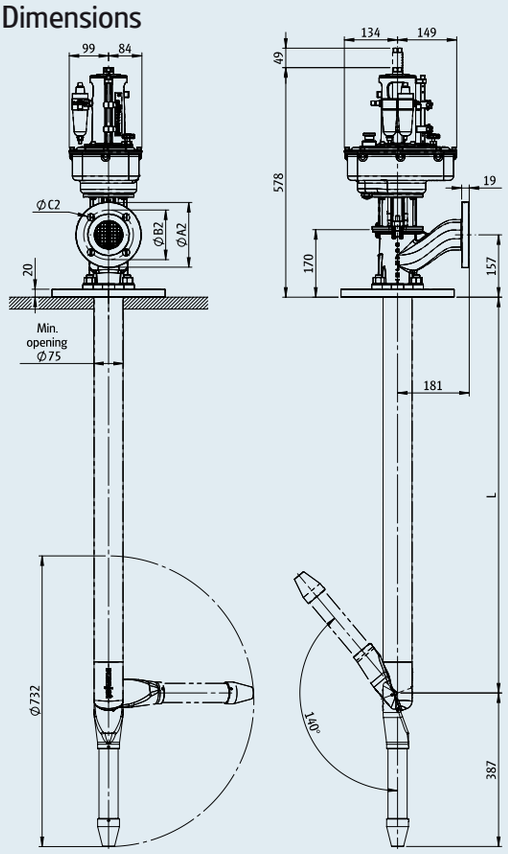
Pressure/Flow

	Supply pressure MPa (Bar)			
	0,6 (6)	**0,8 (8)**	**1,0 (10)**	**1,2 (12)**
Nozzle size	Jet length [m]	Jet length [m]	Jet length [m]	Jet length [m]
Ø 20mm	21	24	25	26
Ø 22mm	21	24	25	25
Ø 24mm	23	23	24	25
Ø 26mm	23	26	28	30
Ø 28mm	25	26	28	30
Ø 30mm	25	26	28	30



Cleaning time

Dimensions



Specifications

Flow	0-96 m³/h
Operating pressure range	0-14 BAR
Max pressure	17 BAR
Recommended pressure	12 BAR
Max temperature	95°C
Standard length	1500 mm
Weight	53 kg
Per additional meter of main pipe	12 kg
Material in contact with cleaning media	AISI 316, PTFE

Drive Unit SC160

Drive Type	Pneumatic
Air Pressure	4-8 BAR
Max Air Consumption	300 liter/minute
Max Cleaning Pattern	140°
Elevation	2.4°
Rotation speed	0.5-1.5 RPM

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Stocking Locations in USA, Canada and Mexico

SC 90A

Scanjet tank cleaning equipment

KEY FEATURES

- ATEX
- Programmable sector cleaning
- Rugged construction
- External drive
- High jet impact
- High capacity

The SC 90A is a single nozzle tank cleaning machine especially developed for sector cleaning tanks/cisterns/vessels in hazardous ATEX classified areas. It gives the user a possibility to optimize the cleaning, with minimal use of time, energy and cleaning media.

SC 90A consists of two main parts; one washing unit that is fixed installed in the tank and one portable air driven drive unit SC 150 for operation. The drive units can be exchanged or removed without exposing the tank to the outside atmosphere. It is the product of choice when long jet-lenghts and/or a high level of jet impact is required.

SC90A_TCT_2015_01_21

Quality Control, Compliances & Certifications

The SC 90A is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request. Additionally, the SC 90A conforms to United States ASME standards for construction and European, CE and ATEX standards for design, construction and safety.

Typical applications for the SC 90A:

- Crude oil storage tanks
- Large process vessels and fermenters
- Large silos and dryers
- Large reactors
- Large Uni-Tanks

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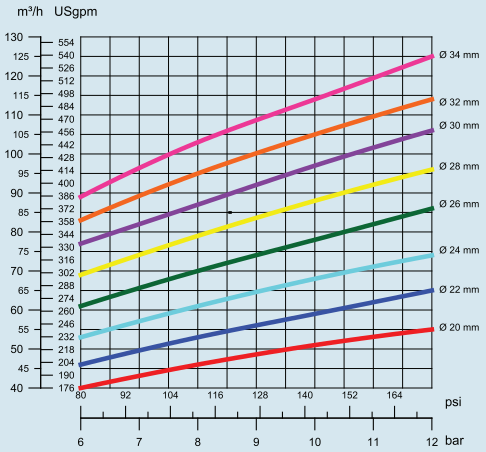
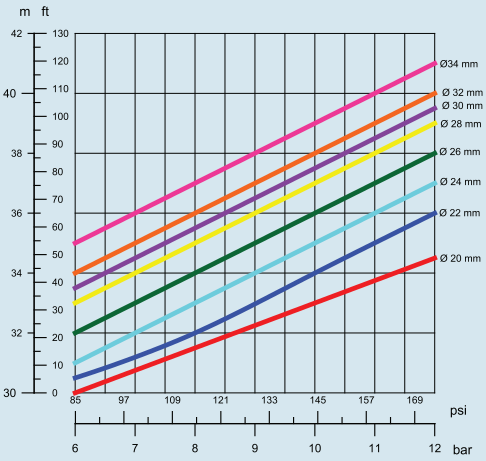
Stocking Locations in USA, Canada and Mexico

Technical performance

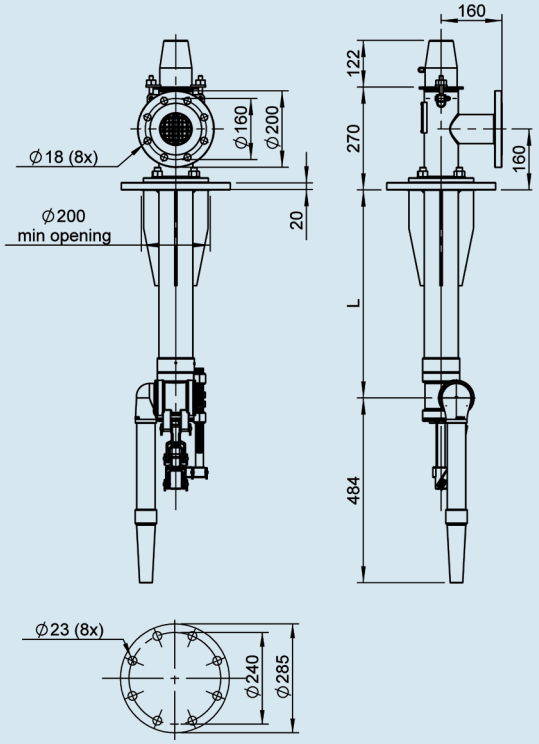


Pressure/Flow



Jet length

Dimensions



	SC 150	SC 150PW
Air pressure	0,5 - 0,7 MPa	0,5 - 0,7 MPa
Air consumption	250 l/min	250 l/min
RPM	0,5 - 2,0	1,0 - 5,0
Elevation per rotation	2°	5°
Sector clean	0 - 180°	0 - 180°

Specifications

Flow	40-106 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Rotation speed	0,5-5 rpm
Standard length	1500 mm
Weight	75 kg
Per additional meter of main pipe	15 kg
Tank connection	PN16 DN150
Inlet connection	PN16 DN80
Materials	AISI 316, PTFE/Viton
Lubrication	Cleaning Media

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Stocking Locations in USA, Canada and Mexico

SC 90T2

Scanjet tank cleaning equipment

Scanjet Model SC 90T2 is driven by the cleaning media by means of a fixed installed turbine with an integrated programmable drive unit. The permanent lubrication means an oil-free drive unit and the patented magnetic transmission allow an exchange of the drive unit without exposing the tank to the outside atmosphere.

Powerful single nozzle tank cleaning machine

The single nozzle concept gives a very solid and powerful jet with an optimized cleaning result on all tank surfaces. It has the unique separated turning and lifting movements and a rapid manual overdrive for sector cleaning setting.

Self draining nozzle

The nozzle assembly is self draining and the machine has a full 0-180 degrees cleaning range.
The patented design is in accordance with IMO-Marpol requirements.

Fully programmable

The SC 90T2 is fully programmable to meet multiple cleaning needs. Various cleaning programs can be chosen during or before the cleaning operation.

Integration with WashTrac™

Fully prepared for integration with WashTrac™ tank cleaning monitoring system.

Typical applications for SC 90T2:

- Crude oil tankers
- Product carriers
- Bulk carriers

KEY FEATURES

SC 90T2

- Magnetic transmission
- Fully programmable
- Minimized cleaning time
- Separated turning and lifting movements
- Strainer standard
- WashTrac™ (option)
- Drive unit can be removed without exposing tank to atmosphere
- Grease lubricated drive unit

SC 90T2

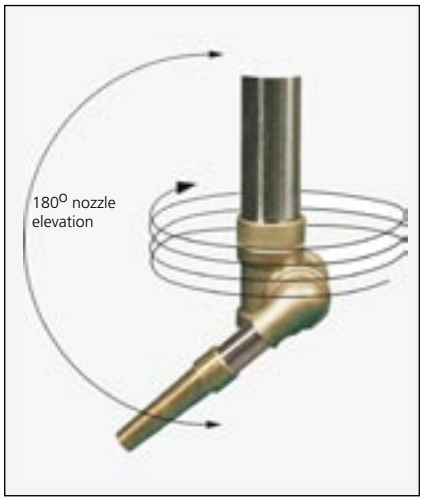
www.scanjet.se

SC 90T2

Scanjet tank cleaning equipment

...an orbijet company

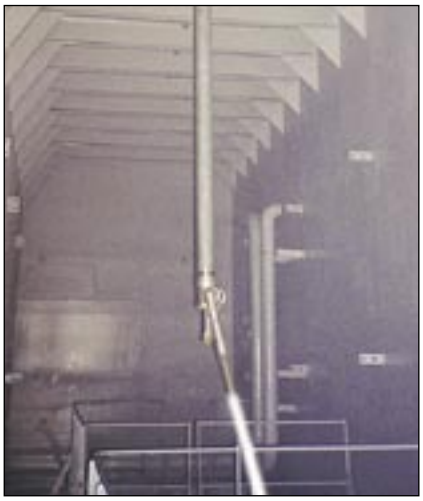
Nozzle spiral motion



180° nozzle elevation for complete cleaning range coverage the unique separated lifting and turning movements.

Single nozzle – optimal impact

Crude oil washing certified.



Water washing.

Easy program selection.

The drive unit can be removed without oil spill or exposing tank to atmosphere.

Fully prepared for connection to WashTrac™ (option).

GENERAL ADVANTAGES

- Maintenance free system below deck
- Fully programmable machines
- Cleaning with closed hatch conditions
- Minimized cleaning time
- Minimized cleaning media consumption
- Dry (oil-free) drive unit
- Filter in front of turbine
- Production, design and spares direct from factory
- Optimal tankcleaning economy
- Drive unit may be replaced or serviced without exposing tank to atmosphere
- Free design service
- Computerized shadow diagram calculation
- AISI 316 material available as option

SC 90T2

Developed for the third millenium the Scanjet Model SC 90T2 offers the latest technology in tank cleaning.

The machine is produced in materials according to shipyard requirements, meeting all standard specifications.

Any desired starting position of the nozzle will be reached in just a few seconds, and the design allows for a manual overdrive at any time during the tank cleaning operation.

The machine has very few moving parts requiring a minimum of service and is maintenance free below deck.

The drive unit can be removed without exposing the tank to atmosphere. Thanks to the magnetic transmission, there is no penetration between the drive unit and the turbine which means that any accidental leakage is eliminated.

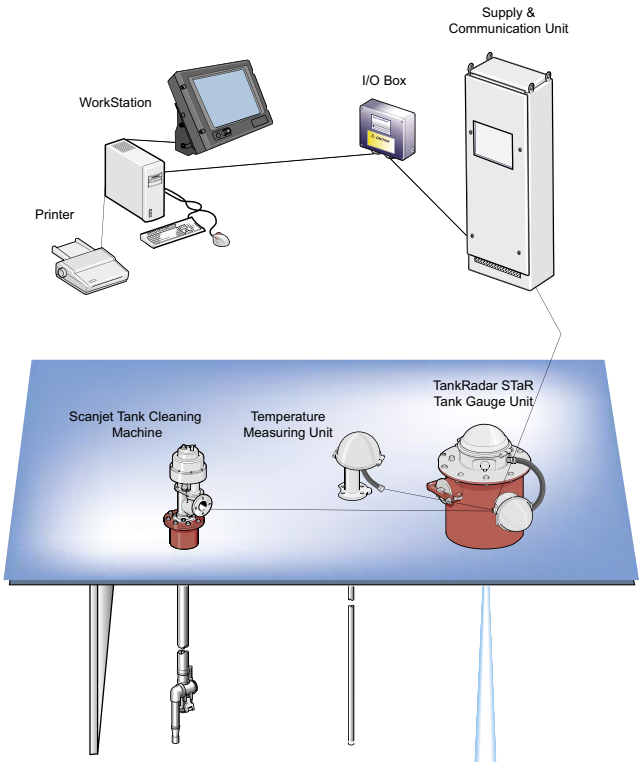
WashTrac™ Tank Cleaning Monitoring System

The innovative tank cleaning monitoring system is jointly developed by Saab Rosemount Marine and Scanjet Marine. By using already installed hardware, WashTrac™ monitors the tank cleaning operation onboard any tanker.

The WashTrac™ systems offers following features and advantages to operators.

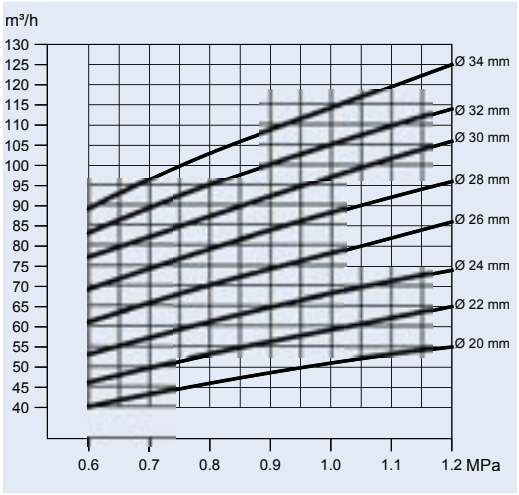
- Operating status of tank cleaning machines
- Start/Stop alarm of tank cleaning machines
- Operation and prewash data logging on printer

Various options available

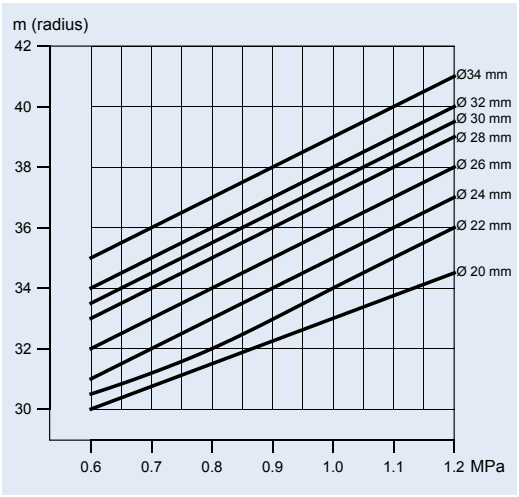


(Tank cleaning monitoring system recommended by Intertanko)

Technical performance

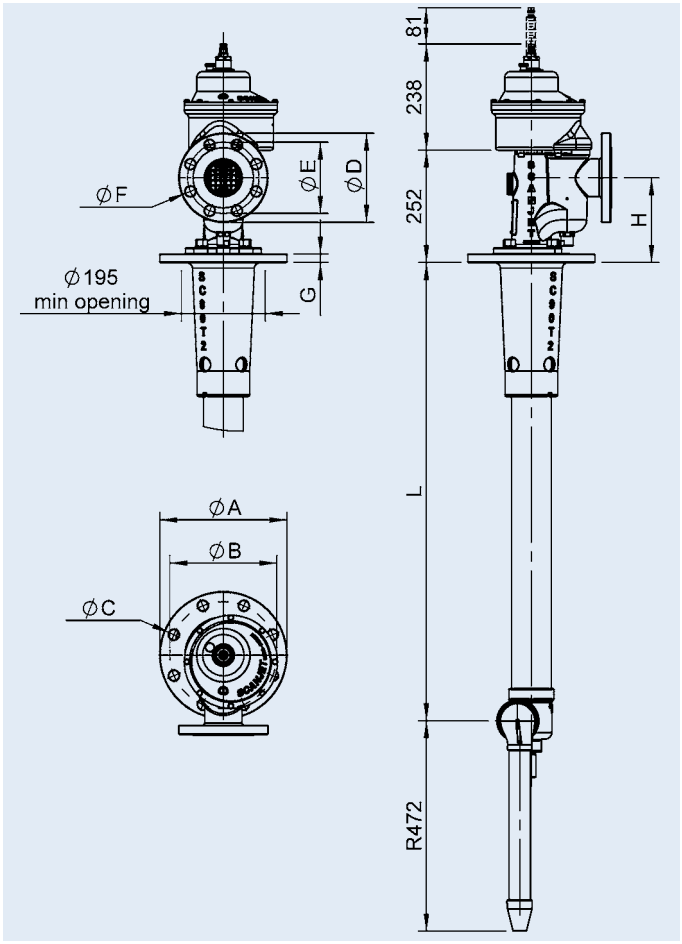


Water flow for selection of different nozzles sizes at specific inlet pressure.



Effective jet length for selection of different nozzles sizes at specifi c inlet pressure.
(Performance data according to DNV type approval certificate) Impact of 700mm wc or greater. Maximum jet length is approximately double the values stated in this graph.

Dimensions



Deck flange:

	O.D (A)	P.C.D (B)	Holes (C)	Thickness (G)
JIS5K-200A	Ø320	Ø280	Ø23 (8x)	20
PN16-DN150	Ø285	Ø240	Ø23 (8x)	20

Other connections on request.

Inlet flange:

	O.D (D)	P.C.D (E)	Holes (F)	Height (H)
JIS16K-80A	Ø200	Ø160	Ø23 (8x)	190
PN16-DN80	Ø200	Ø160	Ø18 (8x)	190

Specifications

Flow	40-125 m³/h
Inlet pressure	0,6-1,2 MPa
Recommended pressure	0,8 MPa
Max temperature	95°C
Rotation speed	0,5-1,5 rpm
Approx weight (L=3500mm)	100 kg
Per additional meter of main pipe	15 kg
Material in contact with cargo	as per specification
Lubrication	Grease

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Stocking Locations in USA, Canada and Mexico

Bio 10

Scanjet tank cleaning equipment

KEY FEATURES

Bio 10 is an advanced tank cleaning machine specially developed for:

+ Food & Dairy
+ Pharmaceutical
+ Chemical Processing
+ Transportation
+ Beverage

Where

+ Self-washing required
+ Low fluid consumption
+ Hygienic design

The Bio 10 rotary jet head is a hygienic tank cleaning machine that provides 360deg coverage within a given tank or process vessel. The Bio 10 is self powered by the flow of the fluid through the inlet cone of the machine. An increase in pressure and flow will correspondingly increase the length of the jet and impact upon the tank or vessel surfaces. The Bio 10 employs exclusive self-washing features that allows itself to be completely covered and has been certified in rinse validation protocols such a riboflavin rinse validation and yogurt washing trials.

BIO10_TCT_2015_01_20

Quality Standards

The Bio 10 is produced in accordance to stringent quality standards and meets or exceeds ISO 9001 International Quality Standards as well as conforming to the cGMP as detailed by the United States FDA (Food and Drug Administration and EHEDG (European Hygienic Equipment Design Group).

Typical Cleaning Methods:

+ Fixed Installed CIP Systems
+ Multi-Tank Solution Recovery
+ Single Use/Single Pass
+ Single Use/Recirculatory

Typical application for the Bio 10:

+ Process vessels and reactors
+ Storage tanks
+ Transportations tanks
+ Fermenters
+ Yeast propagation

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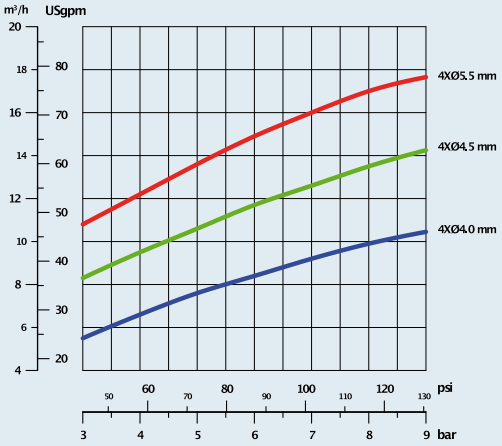
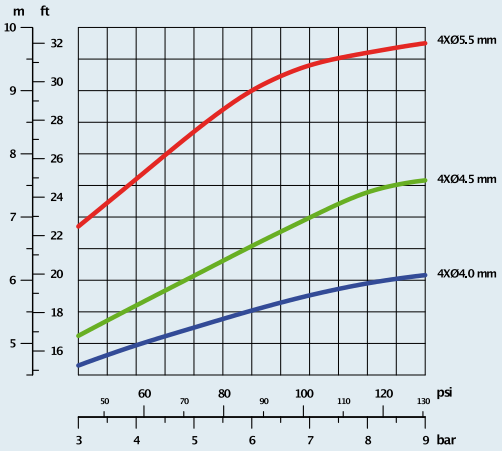
Stocking Locations in USA, Canada and Mexico

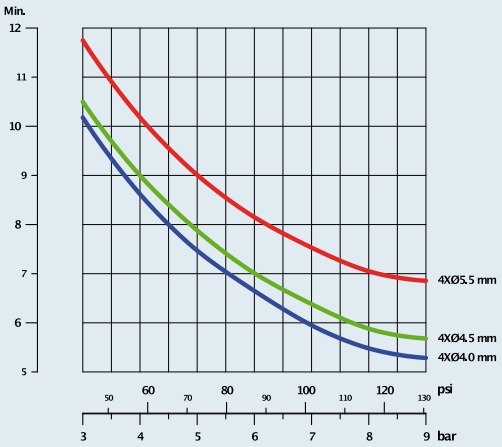
Technical performance



Pressure/Flow

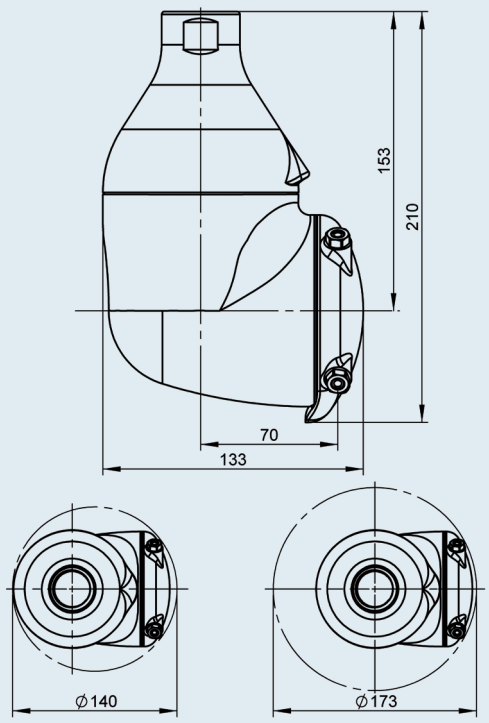


Jet length



Pattern time

Dimensions



Specifications

Flow	5-16 m³/h
Inlet pressure	3-10 bar
Max pressure	12 bar
Recommended pressure	6 bar
Max temperature	95°C
Max ambient temperature	140°C
Weight	5,1 kg
Connections standards	See model # table
Material	AISI 316, PTFE, PEEK
Lubrication	Cleaning media

Standard product program model # table

	Nozzles	Connection
B 10-4x4.0-104	4x4.0 mm	
B 10-4x4.5-104	4x4.5 mm	1" NPT (F)
B 10-4x5.5-104	4x5.5 mm	
B 10-4x4.0-064	4x4.0 mm	
B 10-4x4.5-064	4x4.5 mm	1" BSP (F)
B 10-4x5.5-064	4x5.5 mm	
B 10-4x4.0-824	4x4.0 mm	
B 10-4x4.5-824	4x4.5 mm	1" Clip-On
B 10-4x5.5-824	4x5.5 mm	
B 10-4x4.0-844	4x4.0 mm	
B 10-4x4.5-844	4x4.5 mm	1" Weld-On
B 10-4x5.5-844	4x5.5 mm	
B 10-4x4.0-846	4x4.0 mm	
B 10-4x4.5-846	4x4.5 mm	1.5" Weld-On
B 10-4x5.5-846	4x5.5 mm	

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scanjet systems

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Stocking Locations in USA, Canada and Mexico

Bio 25

Scanjet tank cleaning equipment

KEY FEATURES

Bio 25 is an advanced tank cleaning machine specially developed for:
+ Food & Dairy
+ Pharmaceutical
+ Chemical Processing
+ Transportation
+ Beverage

Where
+ Self-washing required
+ Low fluid consumption
+ Hygienic design

The Bio 25 rotary jet head is a hygienic tank cleaning machine that provides 360° coverage within a given tank or process vessel. The Bio 25 is self powered by the flow of the fluid through the inlet cone of the machine. An increase in pressure and flow will correspondingly increase the length of the jet and impact upon the tank or vessel surfaces. The Bio 25 employs exclusive self-washing features that allows itself to be completely covered and has been certified in rinse validation protocols such a riboflavin rinse validation and yogurt washing trials.

BIO25_TCT_2015_01_20

Quality Standards

The Bio 25 is produced in accordance to stringent quality standards and meets or exceeds ISO 9001 International Quality Standards as well as conforming to the cGMP as detailed by the United States FDA (Food and Drug Administration and EHEDG (European Hygienic Equipment Design Group).

Typical Cleaning Methods:

+ Fixed Installed CIP Systems
+ Multi-Tank Solution Recovery
+ Single Use/Single Pass
+ Single Use/Recirculatory

Typical application for the Bio 25:

+ Process vessels and reactors
+ Storage tanks
+ Transportations tanks
+ Fermenters
+ Yeast propagation

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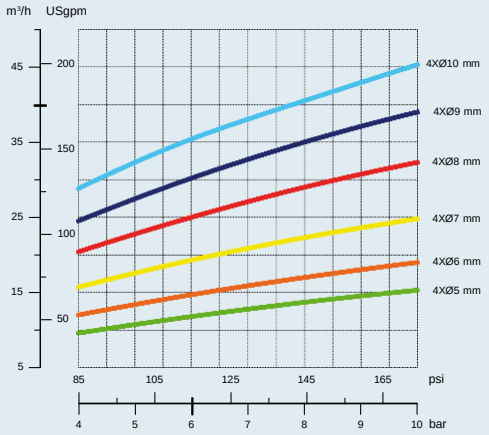
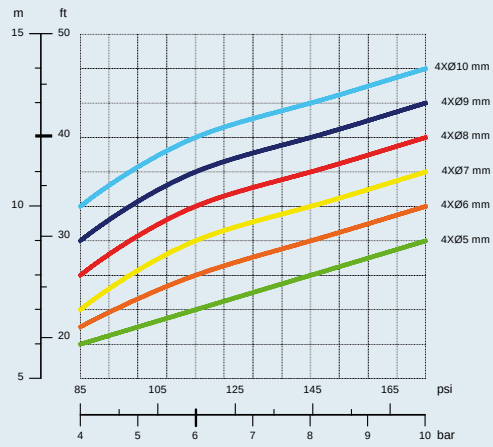
Stocking Locations in USA, Canada and Mexico

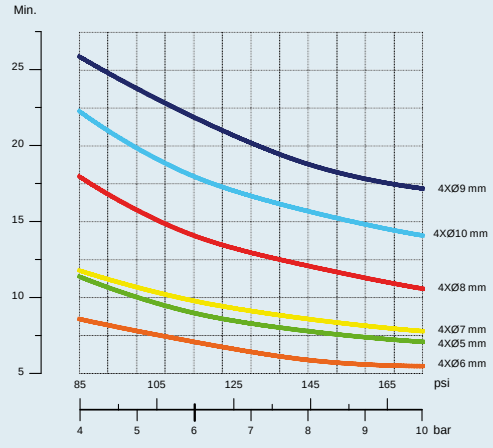
Technical performance



Pressure/Flow

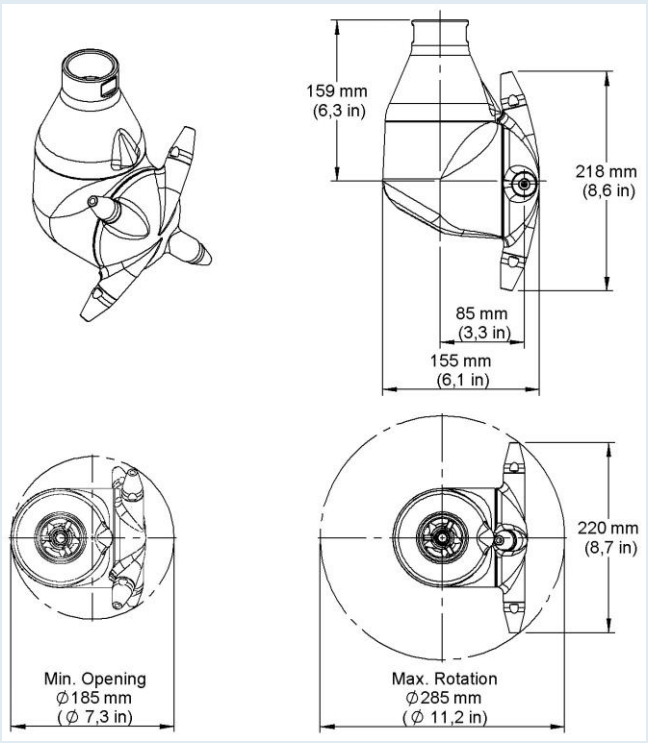


Jet length



Pattern time

Dimensions



Specifications

Flow	6-45 m³/h
Inlet pressure	4-10 bar
Max pressure	12 bar
Recommended pressure	6 bar
Max temperature	95°C
Max ambient temperature	140°C
Weight	7 kg
Connections standards	1,5" BSP, NPT
Material	AISI 316, PTFE, PEEK, Tungsten, Al2O3
Lubrication	Cleaning media

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Stocking Locations in USA, Canada and Mexico

Bio 50 - 2 Nozzle

Hygienic Tank Cleaning Machine...for large tanks

The Bio 50 rotary jet head is a hygienic tank cleaning machine that provides 360° coverage within a given tank or process vessel. The Bio 50 is self powered by the flow of the fluid through the inlet cone of the machine. An increase in pressure and flow will correspondingly increase the length of the jet and impact upon the tank or vessel surfaces. The Bio 50 employs exclusive self-washing features that allows itself to be completely washed and has been certified in rinse validation protocols such as riboflavin validation and yogurt washing tests. The Bio 50 is designed for larger more difficult tanks to clean where longer jet-lenths and greater wetting intensities are required with controlled rotation values for ulitmate cleaning results.

Quality Standards...

The Bio 50 is produced in accordance to stringent quality standards and meets or exceeds ISO 9001 International Quality Standards as well as conforming to the cGMP as detailed by the United States FDA (Food and Drug Administration) and EHEDG (European Hygienic Equipment Design Group).

Typical CIP Cleaning Methods...

- Fixed Installed CIP Systems
  - Multi-Tank Solution Recovery
  - Single Use/Single Pass
  - Single Use/Recirculatory

Typical Applications...

- Process Vessels and Reactors
- Large Air Dryers
- Large Juice Storage Tanks
- Large Fermenters
- Large Sugar Tanks

Specifications...

Flow	0-98 m3/hr (0-431 USGPM)
Inlet Pressure Range	2-20 BAR (30-300 PSI)
Maximum Temperature (Operating)	95°C (203°F)
Maximum Temperature (Static)	140°C (284°F)
Weight	6.8 kg (14.96 lbs)
Connection Standards	2.00" NPT(F) and 2.00" BSP(F); others on request
Material	AISI 316,PTFE,PEEK,Tungsten, AI2O2
Lubrication	Cleaning Media
Surface Finish	<= 20 Ra Microinch

Key Features Bio 50 2N

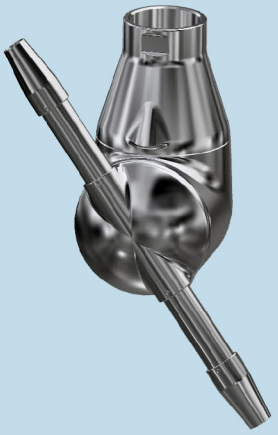
Bio 50 is an advanced tank cleaning machine specifically developed for very large tanks in...

- Food & Dairy
- Pharmaceutical
- Chemical Processing
- Transportation & Storage
- Beverage

Where...

- Self-washing is required
- High impact values needed
- Hygienic design required
- Long jet lengths required

Bio 50 2N



Nozzle extensions for long jet-lengths

Patented Flush Drive Technology
Patent No. SE534034C2

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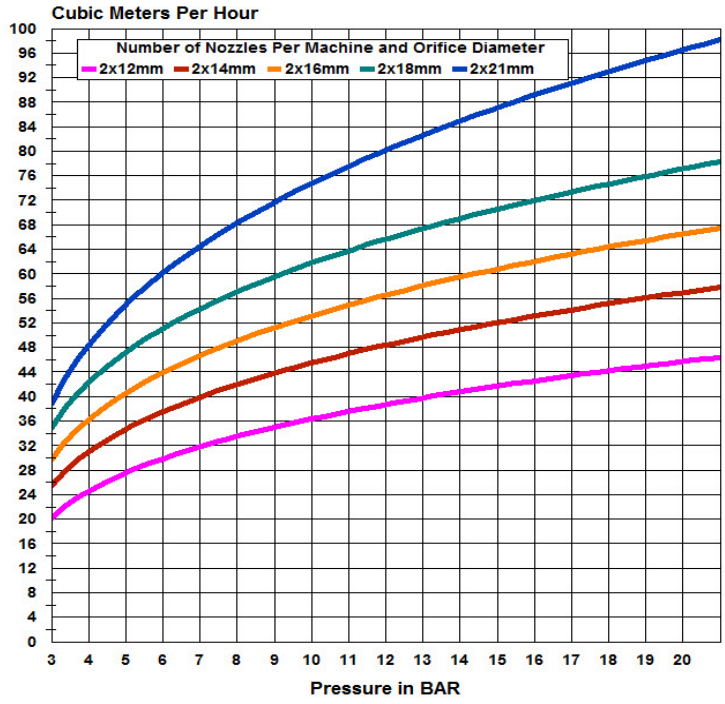
Stocking Locations in USA, Canada and Mexico

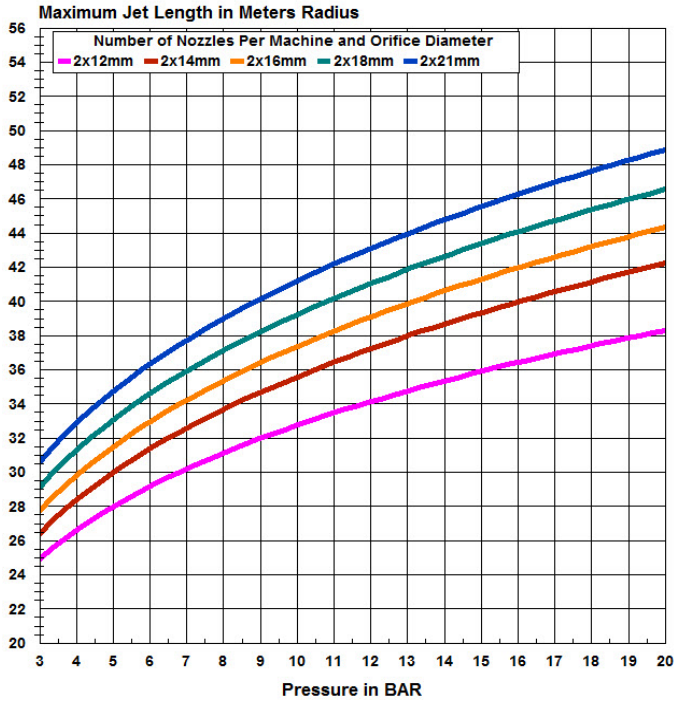
BIO502N_TCT_2015_01_20

Technical Performance

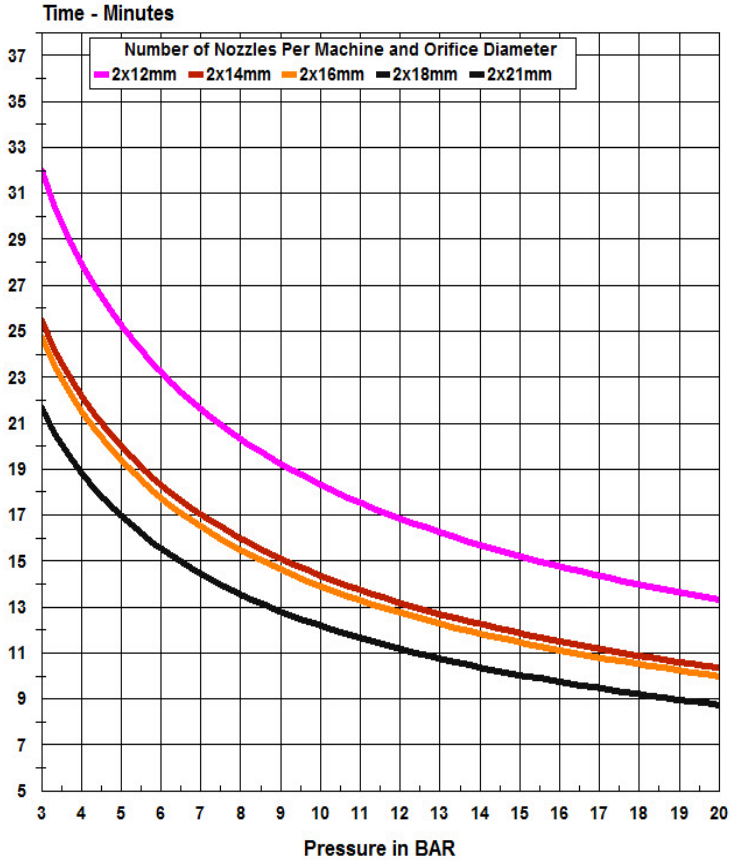
Pressure/Flow



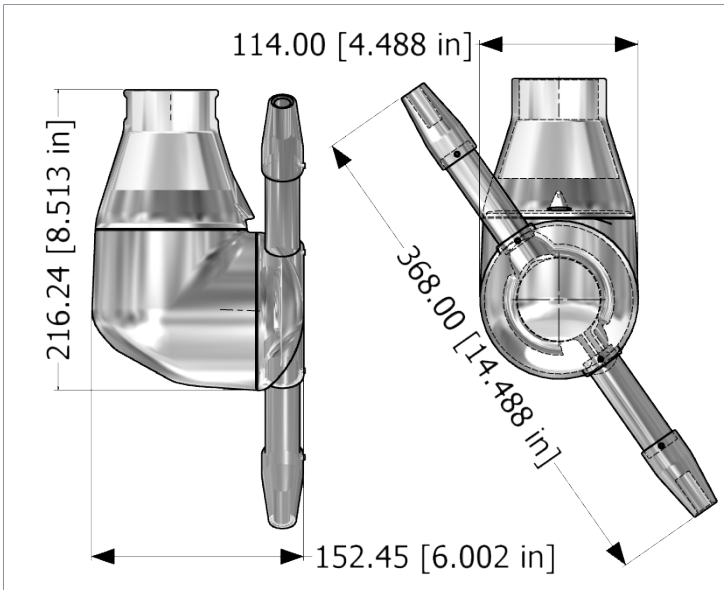
Jet-Length



Pattern Time



Dimensions (mm/in)



Dimensions are in mm and inches

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Stocking Locations in USA, Canada and Mexico

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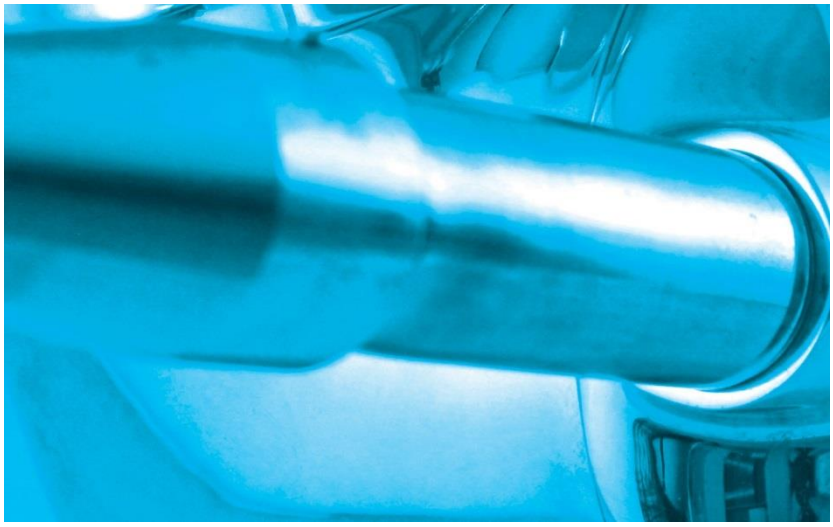
Bio 50

Scanjet tank cleaning equipment



KEY FEATURES

Bio 50 is an advanced tank cleaning machine specially developed for:
+ Sanitary design
+ Long Service Intervals
+ High Capacity
+ Long jet length

The Bio 50 has the highest capacity of all the machines in the Bio range. This twin nozzle, highly polished tank cleaning machines is designed for the largest vessel the food and beverage industry applications can throw at it. The Bio 50 is self- powered by the flow of the fluid through the inlet cone of the machine. An increase in the flow and pressure will correspondingly increase the length of jet and impact on the side of the tank or vessel. The bio 50 employs exclusive self-washing features that allows itself to be completely covered and has been certified in validation protocols such as riboflavin rinse validation and yoghurt washing trials.

BIO50_TCT_2015_01_21

Quality Standards

The Bio 50 is produced in accordance to the stringent quality standards and meets or exceeds ISO 9001 international Quality Standards as well as conforming to the cGMP as detailed by the United Sates FDA (Food and Drug Administration) and EHEDG (European Hygienic Equipment Design Group)

Typical Cleaning Methods

+ Fixed Installed CIP Systems
+ Multi-Tank Solution Recovery
+ Single Use / Single Pass
+ Single Use / Re-circulatory

Typical applications

+ Large Process Vessels and reactors
+ Large Storage tanks
+ Large Fermenters

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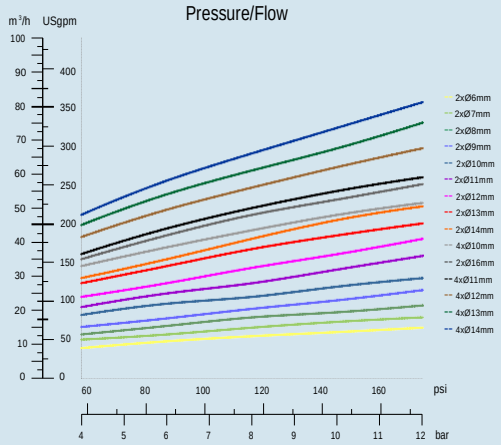
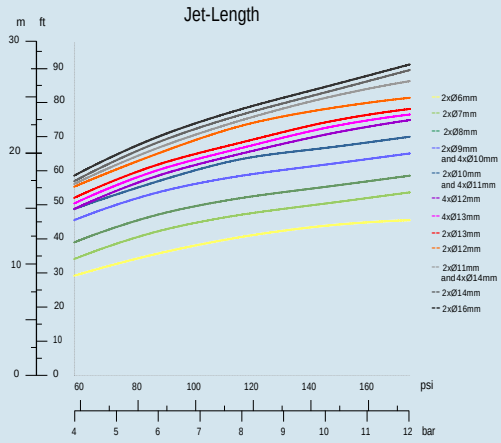
Stocking Locations in USA, Canada and Mexico

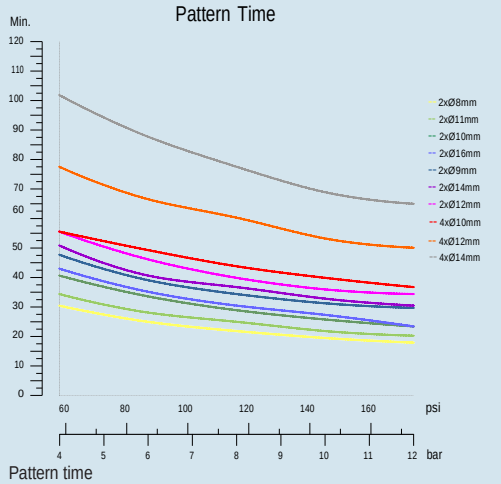
Technical performance



Pressure/Flow

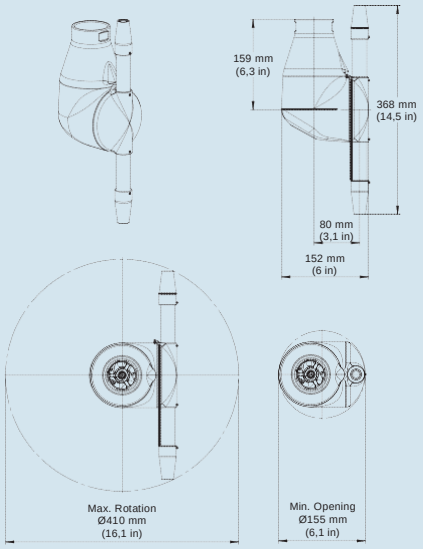


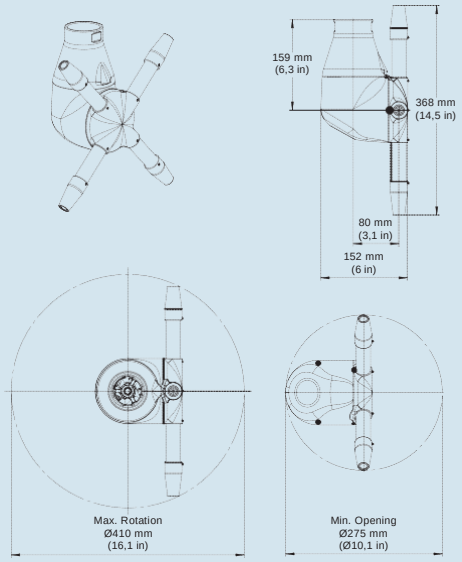
Jet length



Pattern time

Dimensions





Specifications

Flow	(see graph) m³/h
Inlet pressure	4-12 bar
Max pressure	12 bar
Recommended pressure	6 bar
Max temperature	95°C
Max ambient temperature	140°C
Weight	2N: 6,6kg /4N: 7,3 kg
Connections standards	See model # table
Material	AISI 316, PTFE, PEEK
Lubrication	Cleaning media

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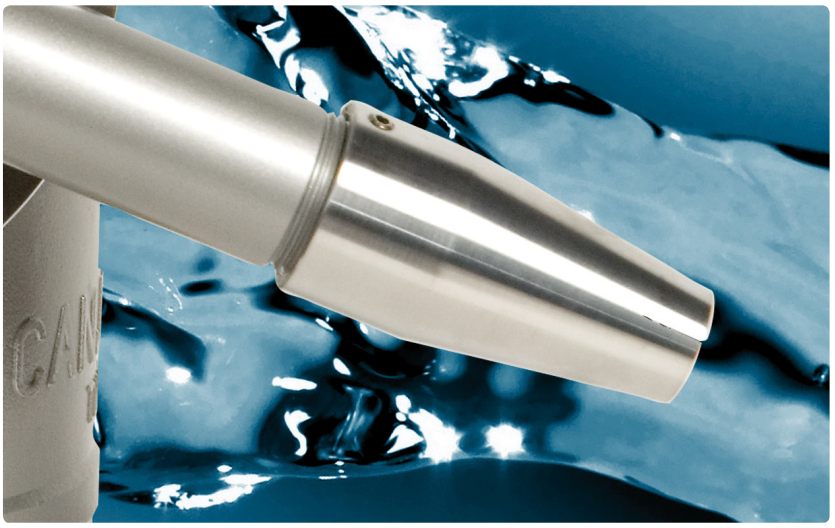
Stocking Locations in USA, Canada and Mexico

SC 15TW

Scanjet tank cleaning equipment



KEY FEATURES

+ Rugged construction
+ Adjustable turbine
+ ISO 9001 Quality
+ Exceptional jet lengths
+ Easy maintenance
+ 316 SS construction
+ Optimized cycle times
+ Flow through gearbox

The SC 15TW is a 1.5" dual or four nozzle automated tank cleaning machine constructed of 316 stainless steel and other highly corrosion resistant materials. It has a fixed to moving gear ratio of 47 to 49 allowing it to produce a homogenous 360° pattern that is superior to that of any other rotating jet head in it's class.

The SC 15TW is an integrated turbine class type of tank cleaning machine and employs an adjustable turbine and flow through gearbox. The adjustable turbine allows the rotation speed of the SC 15TW to be adjusted without the need of changing costly stators and/or gearing found in other similar cleaning devices.

SC15TW_TCT_2015_01_21

Quality Standards

The SC 15TW is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request.

Additionally, the SC15TW conforms to United States ASME standards for construction and others are available upon request.

Typical applications for the SC 15TW:

+ Road and Rail tanker cleaning
+ Portable cleaning for contractors
+ Fermenter tank cleaning
+ Storage tank cleaning
+ Wine storage tanks and fermenters
+ Brewery storage tanks and fermenter

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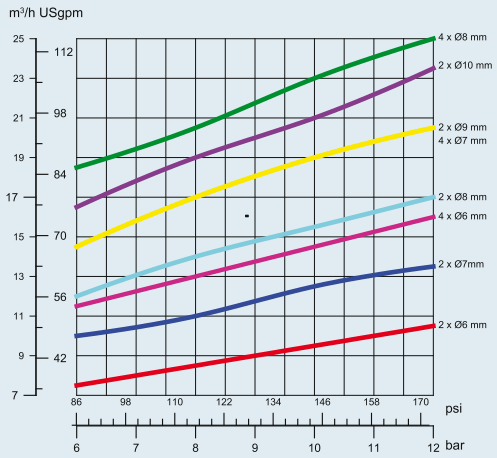
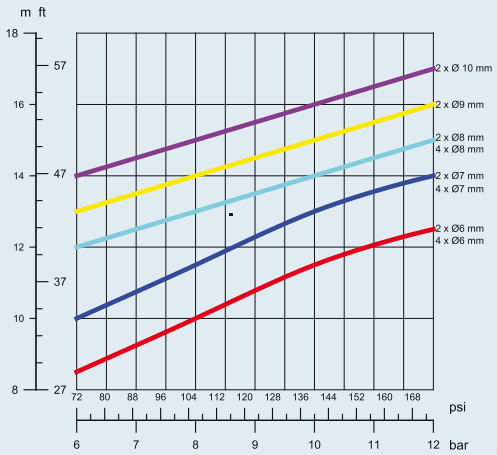
Stocking Locations in USA, Canada and Mexico

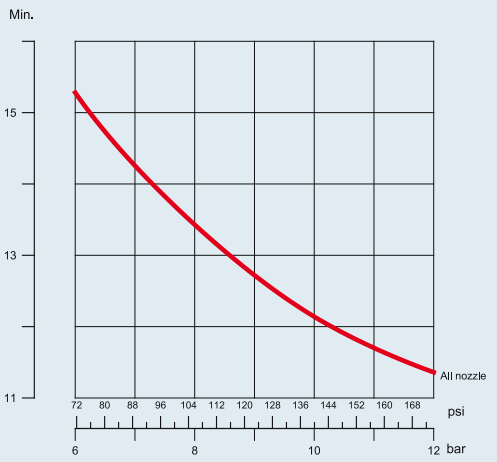
Technical performance



Pressure/Flow

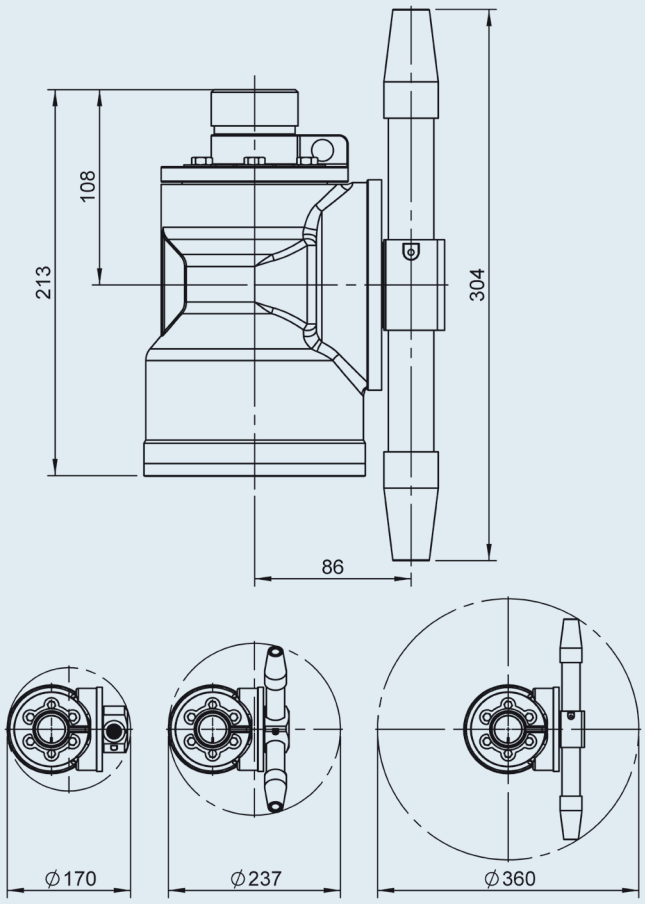


Jet length



Pattern time

Dimensions



Specifications

Flow	7-25 m³/h
Inlet pressure	6-12 bar
Max pressure	14 bar
Recommended pressure	8 bar
Max temperature	95°C
Rotation speed	1,5-4 rpm
Weight	9,2 kg
Inlet connection	11/2" BSP or NPT
	Flanges as option
Materials	AISI 316, PTFE, PEEK
Lubrication	Cleaning Media

SC15TW_TCT_2015_01_21

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www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

www.scanjet.se

Product Data Sheet
Type: SC15TW4/SCG15TW4 180

The ScanJet SC15TW4 rotary jet head provides 180° indexed impact cleaning over a defined time period. It is automatic, pre-programmed and produces a set cleaning pattern based on the location within a given tank.

APPLICATIONS

Tanks and production vessels used in storage, process and transportation ranging in size from 70 to 700 m^3 (18,500 and 184,920 US gallons) for a single machine.

INDUSTRIES

- Offshore Drilling
- Oil & Gas
- Contractors
- Chemical Processing
- Transportation/Logistics
- ...and more

OPERATION

The flow of the cleaning fluid makes the nozzles perform a geared rotation around the vertical and horizontal axis. In the first cycle, the nozzles lay out a coarse pattern on the tank surface. The following cycles make the pattern gradually denser until a full 180° pattern is obtained. This time will vary depending upon the configuration of the machine and the pressure/flow in which the machine is operated.

OPTIONS

The choice of nozzle diameters can optimize jet impact length and flow rate at the desired pressure. Alternative thread connections available on request.

QUALITY SYSTEM

ISO 9001 International Quality Standards.

SPECIFICATIONS

Materials
AISI 316L, PTFE, PEEK, Tefzel
Weight
9.2 kg (20.28 lbs)
Lubricant
Self-lubricating with the cleaning fluid
Pressure Range
1 – 21 bar (15 – 300 psi)
Nominal Operating Pressure
6.89 – 13.79 bar (100 to 200 psi)
Maximum Working Temperature
95° C (203° F)
Maximum Throw Length - Radius (Static)
10 – 21m (33 - 68 ft.)
Minimum Opening Requirement
172.78mm (6.8020 inches)
Turning Radius in Operation
193.83mm (7.6312 inches)
Installation
Portable or Fixed
Standard Connection
1 ½" NPT and BSP; others on request.
Other Dimensions
See dimension drawings on second page of this data sheet.

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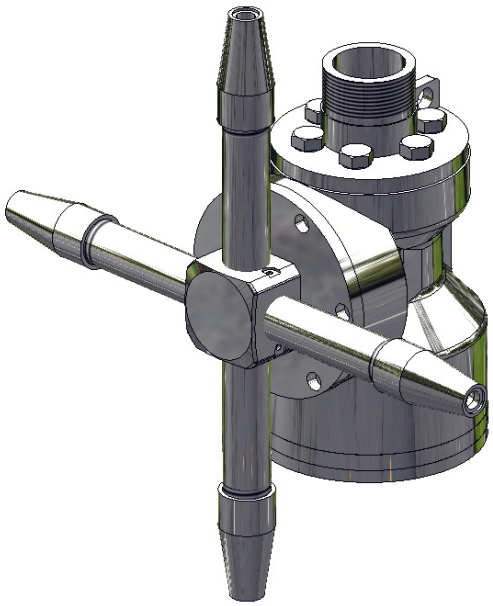
With exclusive adjustable turbine!!



ORDERING INFORMATION – STANDARD PROGRAM

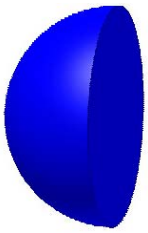
See model table below for your specification part number.

Part Number	Inlet Connection	Nozzles
SC15414082010-00	1.50" NPT(M)	4x8mm
SC15414102010-00	1.50" NPT(M)	4x10mm
SC15414112010-00	1.50" NPT(M)	4x11mm
SC15424082010-00	1.50" BSP(M)	4x8mm
SC15424102010-00	1.50" BSP(M)	4x10mm
SC15424112010-00	1.50" BSP(M)	4x11mm

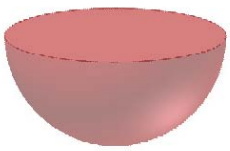
Note: If sealed gearbox part number prefix is SCG

Pattern Development

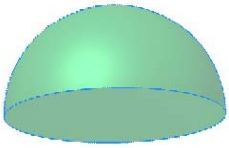
The cleaning pattern is projected 180° in any direction by the placement of a baffle insert kit in the nozzle hub. The cleaning pattern will appear similar to the images below. The direction of the baffle relative to the machine axis must be known at the time of order. The most common is 180° up or down.



180° Side



180° Down



180° Up

Specification and product offerings are subject to change without notice

501.2013.12.19

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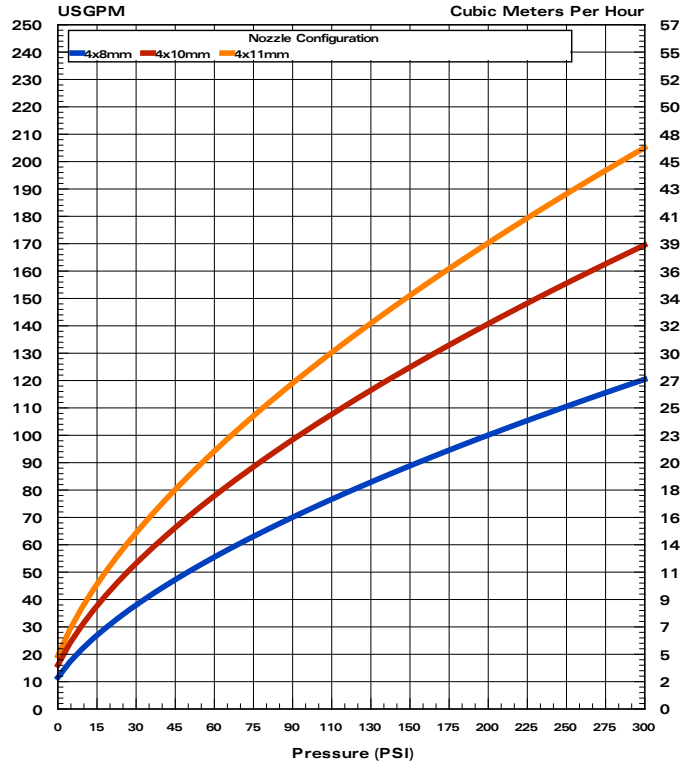
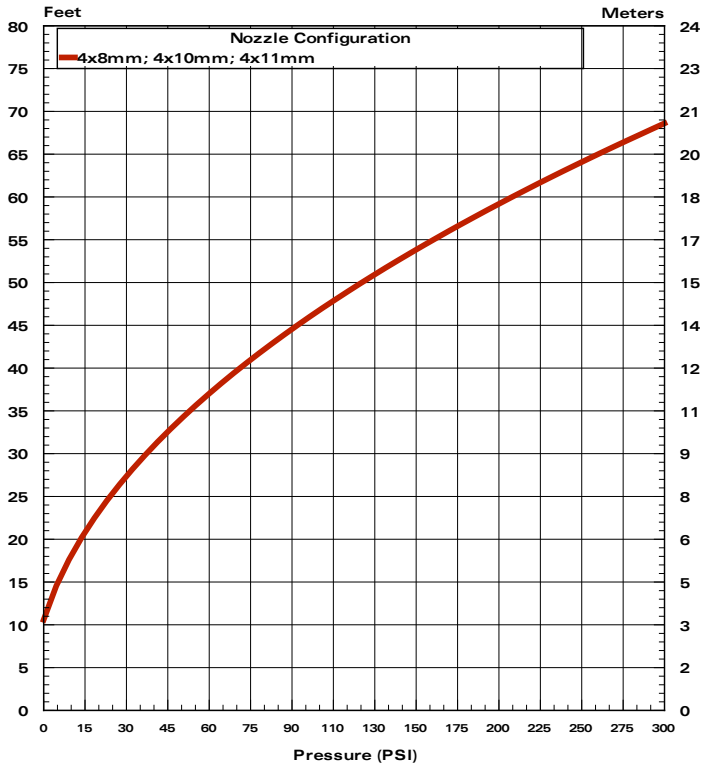
Product Data Sheet
Type: SC15TW4/ SCG15TW4 180

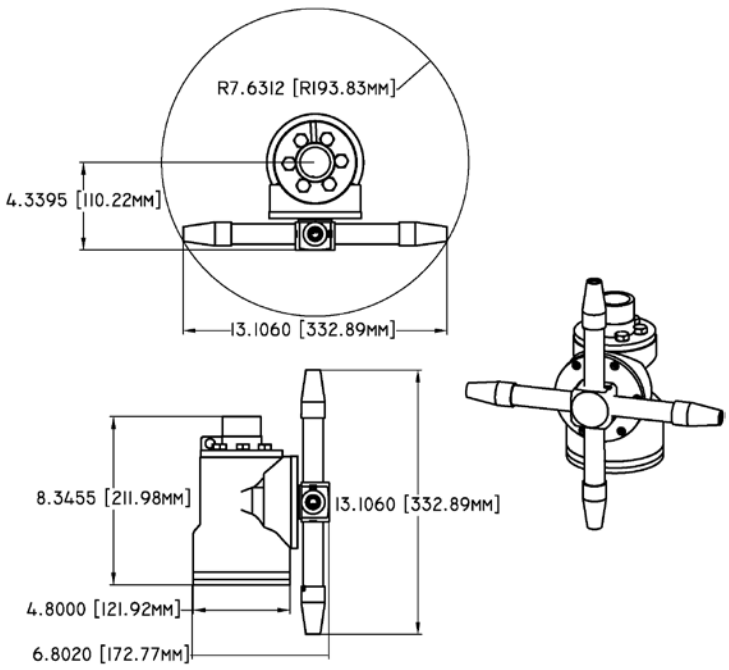
FLOW RATE



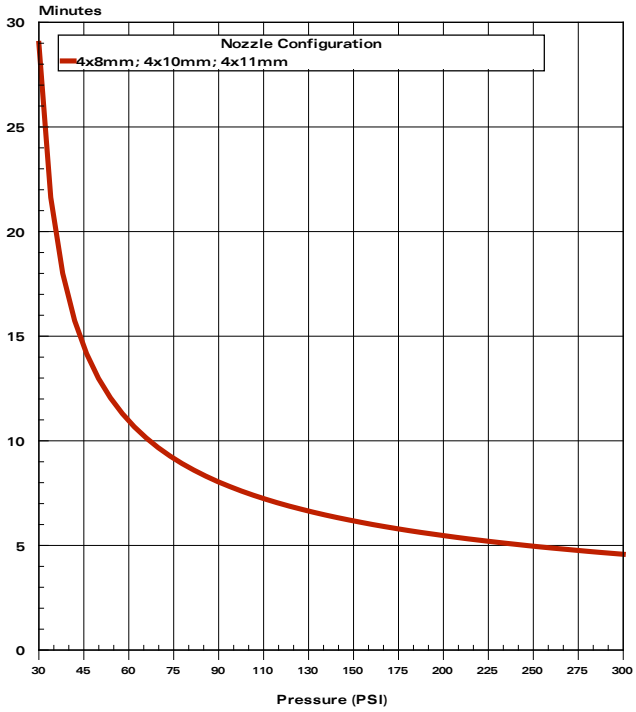
HORIZONTAL THROW LENGTH AT STATIC CONDITION



DIMENSIONS (mm and inches)



CLEANING TIME, COMPLETE PATTERN



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SC 15TW-GL

Scanjet tank cleaning equipment

Scanjet Model SC 15TW-GL is a tank cleaning machine specially developed for cleaning of tanks in harsh environments. Tanks with volumes up to 5000 m³ can be cleaned by one single unit.

Typical installations are onboard offshore supply vessels, drilling rigs, barges, chemical carriers, product carriers or industrial processes – all types of installations where solid particles are or can be in the cleaning media.

The size, construction and cleaning requirements of these tanks are our design criteria, which will be evaluated prior to installation and operation.

The SC 15TW-GL can be used either as a fixed installed machine, installed on a down pipe, or as a portable system to be used in different tanks/vessels, mounted on a hose with a supporting hose saddle.

Working Principle

The cleaning media flows through the machine to the nozzles and out in the tank, cleaning all surfaces with powerful high impact jets. The flow will pass the turbine which will start the rotary motion of the gearbox. This movement will create a criss-cross pattern on the tank walls, covering 360° of the tank.

The first cycle will create a wide pattern, Pre Wash, on the tank walls, the following cycles will dense the pattern until a full program is reached after 4 cycles.

The gearbox is oil lubricated and sealed of from the cleaning media.

Refer to the SC15TW2 data sheet for performance data on this model.

KEY FEATURES

SC 15TW-GL

- Optimised cleaning effect
- Easy handling
- Safe operation
- Designed for long lifetime
- Media lubricated
- Oli lubricated
- 180° down (option)

SC 15TW-GL

SC 15TW-GL

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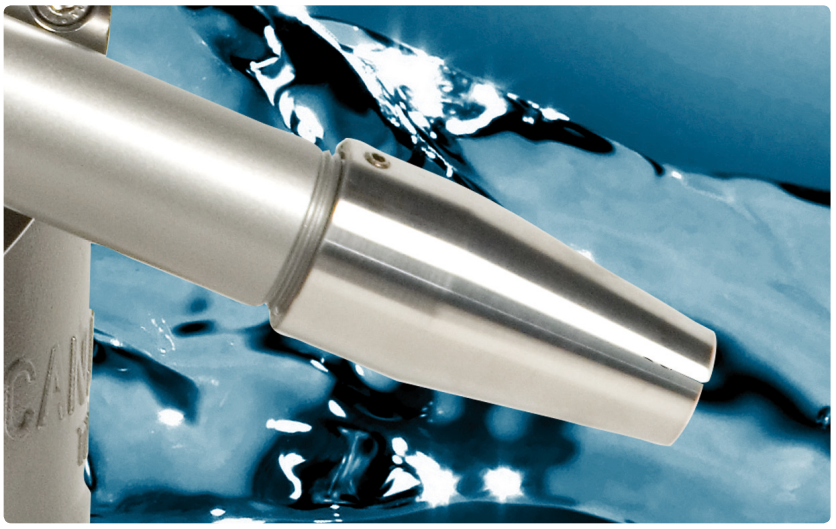
Stocking Locations in USA, Canada and Mexico

SC 45TW

Scanjet tank cleaning equipment



KEY FEATURES

+ Rugged construction
+ Adjustable turbine
+ ISO 9001 Quality
+ Exceptional jet lengths
+ Easy maintenance
+ 316 SS construction
+ Optimized cycle times
+ Flow through gearbox
+ Designed for large tanks

The SC 45TW is a 2” dual nozzle automated tank cleaning machine constructed of 316 stainless steel and other highly corrosion resistant materials. It has a fixed to moving gear ratio of 47 to 49 allowing it to produce a homogenous 360deg pattern that is superior to that of any other rotating jet head in it’s class.

The SC 45TW is an integrated turbine class type of tank cleaning machine and employs an adjustable turbine and flow through gearbox. The adjustable turbine allows the rotation speed of the SC 45TW to be adjusted without the need of changing costly stators and/or gearing found in other similar cleaning devices.

SC45TW_TCT_2015_01_21

Quality Control, Compliances & Certifications

The SC 45TW is produced in accordance with ISO 9001 Quality Standards and our certificate of conformity and accreditation is available on request. Additionally, the SC 45TW conforms to United States ASME standards for construction and others... available upon request.

Typical applications for the SC 45TW:

+ Crude oil storage tanks
+ Large process vessels and fermenters
+ Large silos and dryers
+ Large reactors
+ Large Uni-Tanks

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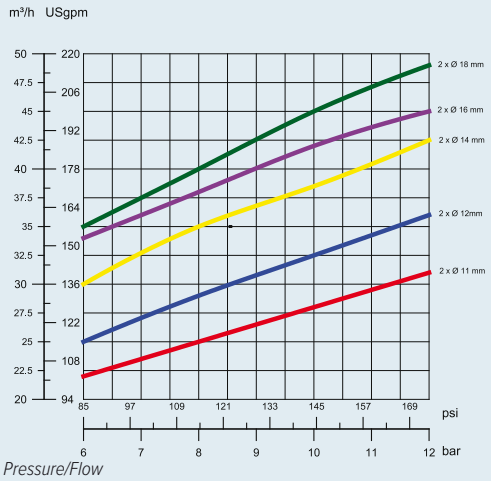
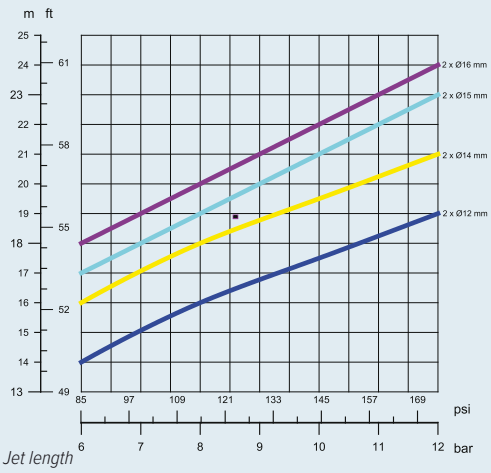
Stocking Locations in USA, Canada and Mexico

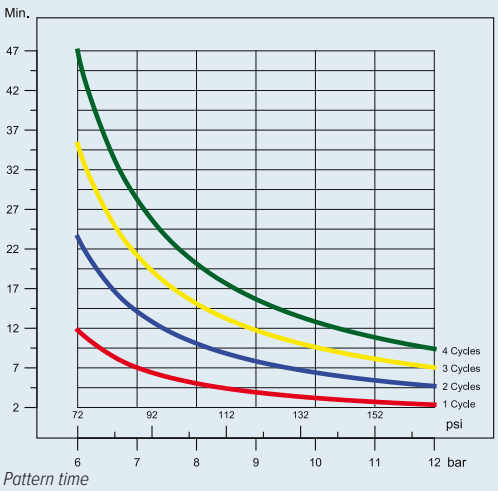
Technical performance



Pressure/Flow

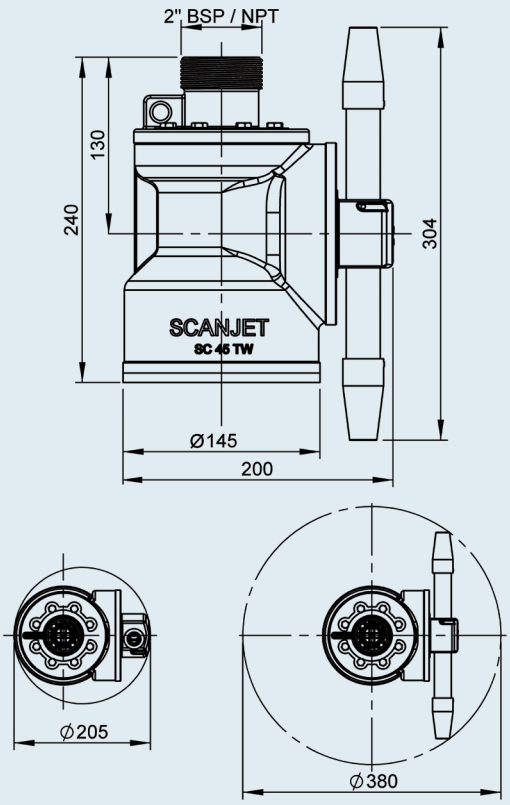


Jet length



Pattern time

Dimensions



Specifications

Flow	5-16 m³/h
Inlet pressure	3-10 bar
Max pressure	12 bar
Recommended pressure	6 bar
Max temperature	95°C
Max ambient temperature	140°C
Weight	5,1 kg
Connections standards	See model # table
Material	AISI 316, PTFE, PEEK
Lubrication	Cleaning media

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Stocking Locations in USA, Canada and Mexico

SC 45TW

Scanjet tank cleaning equipment

Scanjet Model SC 45TW can be used for fixed installation on down pipe or for portable cleaning on a flexible hose.

SC 45TW is available in bronze or stainless steel versions and is therefore suitable for any type of tank cleaning operation. Our range of accessories, such as hoses, hose saddles, hose connectors or adapters, y-pieces and valves also covers any type of operation.

Typical applications for SC 45TW:

- Crude oil carriers
- Product carriers
- Offshore
- Bulk carriers
- OBO carriers
- FPSO & FSU

Accessories:

Connections

To suit any type of connection, various types of adapters and connectors are available in suitable materials for the marine environment.

Hoses

The standard hose comes with two stainless steel bonded wires for electrostatic protection.

KEY FEATURES

SC 45TW

- Optimised cleaning effect
- Easy handling
- Safe operation
- Designed for long lifetime
- Media lubricated

SC 45TW

Portable tank cleaning set including SC 45TW, flexible hose and hose saddle.

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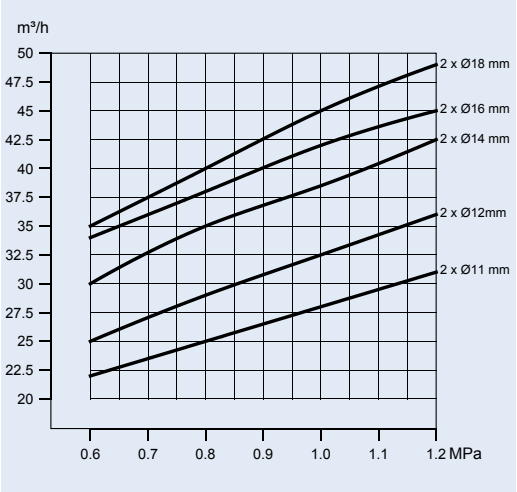
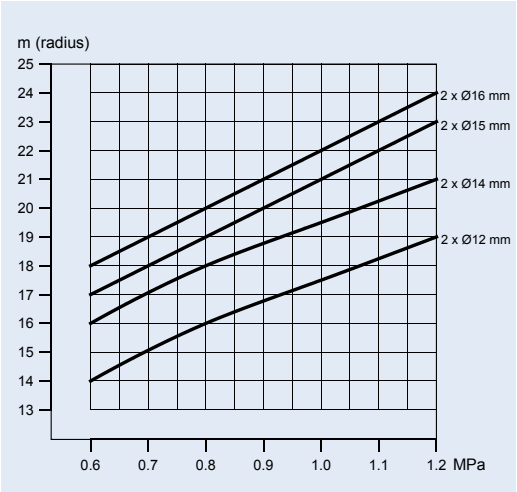
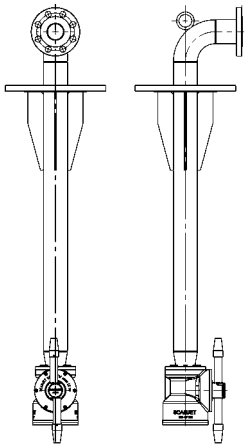
Technical performance



Water flow for selection of different nozzles sizes at specific inlet pressure.

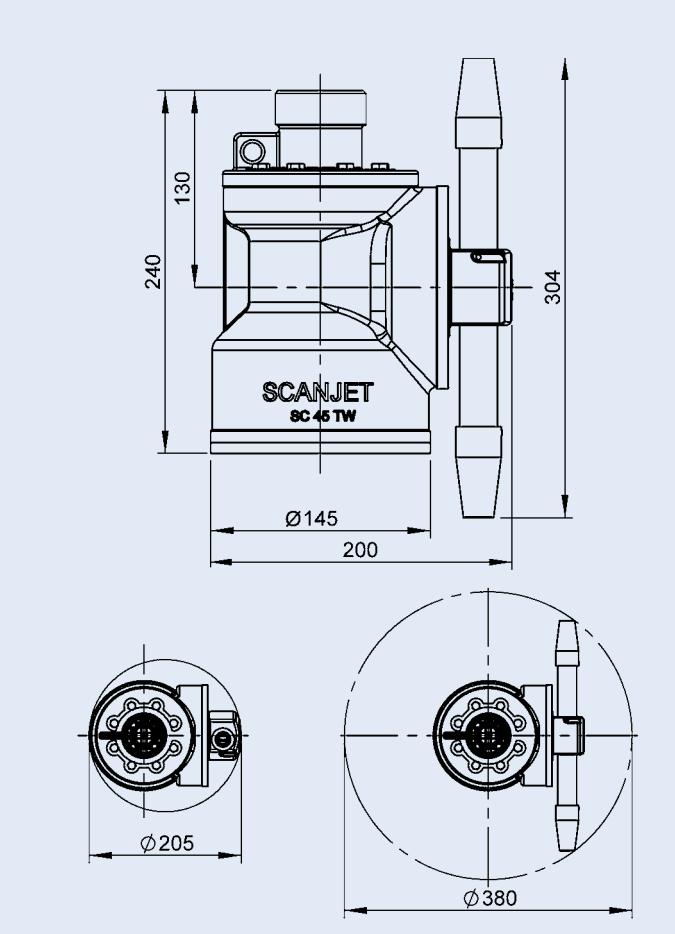


Effective jet length for selection of different nozzles sizes at specific inlet pressure.
(Performance data according to DNV type approval certificate)



SC 45 TW mounted on Twinfix downpipe.

Dimensions



Specifications

Flow	14 - 60 m³/h
Inlet pressure	0,6 - 1,2 MPa
Recommended pressure	0,8 MPa
Max temperature	95°C
Rotation speed	1 - 3 rpm
Approx weight	14 kg
Standard connection	2" BSP male
	Flanges as option
Material in contact with cargo	AISI 316 or bronze
Bearing and sealings	PTFE/Peek
Lubrication	Cleaning media

Manufactured by...
Scanjet AB
P. O. Box 9316
Sodra Langebergsgatan 36
Goteborg, Sweden SE-400 97

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Stocking Locations in USA, Canada and Mexico

We reserve the right to changes without prior notice.

Bio 2

Scanjet tank cleaning equipment

KEY FEATURES

+ Rotating spray
+ 360° spiral cleaning
+ Suited for small tanks
+ Low pressure
+ Low volume

Bio 2 is a rotating spray nozzle/head that is driven by the cleaning fluid and is a very effective CIP alternative compared to traditional static spray balls.

The fan like cleaning action provides improved coverage at low pressure whilst reducing the usage of cleaning media to a minimum. Each unit has a double ball bearing design that allows installation and operation in any position.

Quality Control, Compliances & Certifications

Bio 2 is manufactured in AISI 316/316L and can be polished according to specification. 3.1.B certificates can be quoted on request.

Typical applications for the Bio 2

+ IBC's
+ Small yeast tanks
+ Milk transportation
+ Large barrels
+ Large ducting
+ Small beverage tanks
+ Headboxes
+ Mixing vessels

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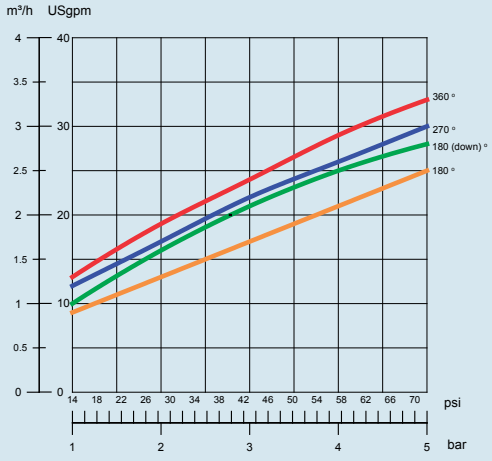
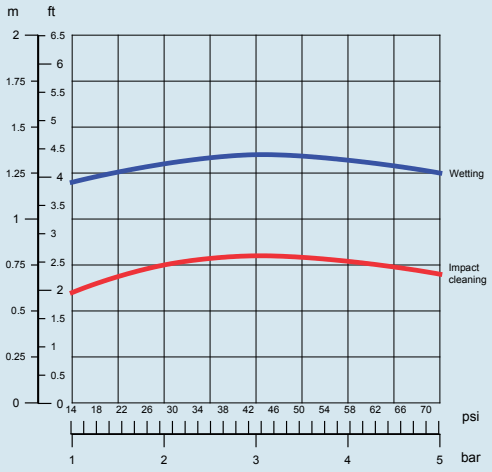
Technical performance

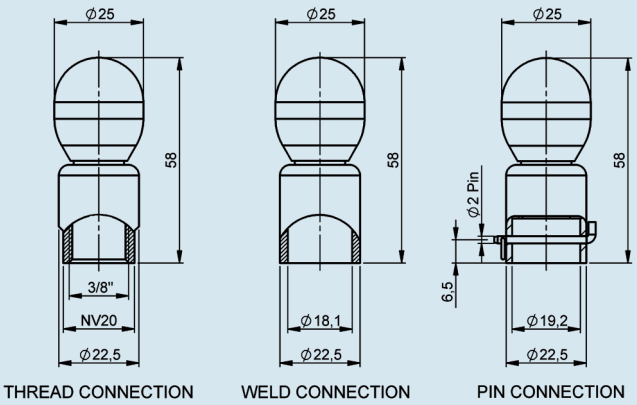


Pressure/Flow

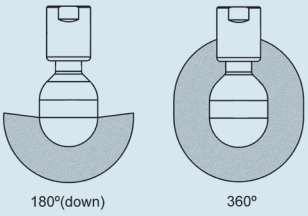


Cleaning radius

Dimensions



Spray Pattern



Other spray patterns are available on request

Specifications

Flow	0,9-3,3 m^3/h
Inlet pressure	1-5 bar
Max pressure	5 bar
Recommended pressure	3 bar
Max working temperature	95°C
Max ambient temperature	140°C
Weight	100 g
Connection	3/8" BSP or NPT, weld-on or pin
Material	Balls in AISI 316, all other parts in AISI 316L
Lubrication	Cleaning media

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Stocking Locations in USA, Canada and Mexico

Bio 5

Scanjet tank cleaning equipment

KEY FEATURES

+ Rotating spray
+ 360 degree spiral cleaning
+ Ideal for small tanks
+ Low pressure
+ Low volume

Bio 5 is a rotating spray nozzle/head that is driven by the cleaning fluid and is a very effective CIP alternative compared to traditional static spray balls. The fan like cleaning action provides improved coverage at low pressure whilst reducing the usage of cleaning media to a minimum.

BIO5_TCT_2015_01_20

Quality Control, Compliances & Certifications

Bio 5 is manufactured in AISI 316/316L and can be polished according to specification. 3.1.B certificates can be quoted on request.

Typical applications for the Bio 5

+ IBC's
+ Small yeast tanks
+ Milk transportation
+ Large barrels
+ Large ducting
+ Small beverage tanks
+ Headboxes
+ Mixing vessels

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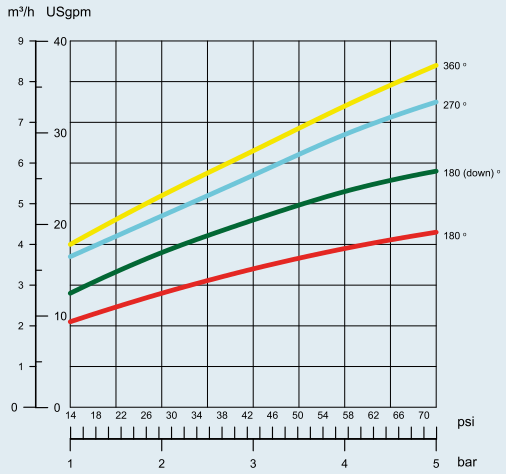
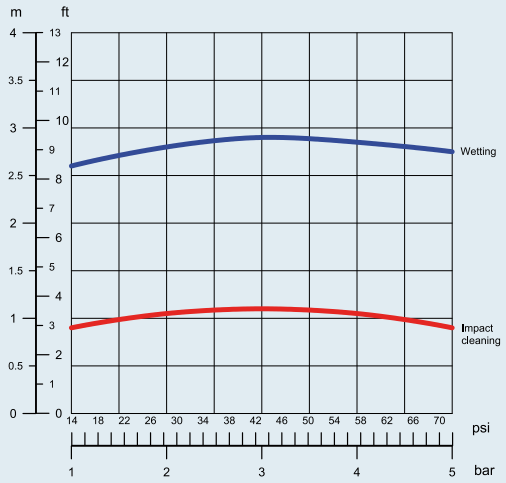
Stocking Locations in USA, Canada and Mexico

Technical performance

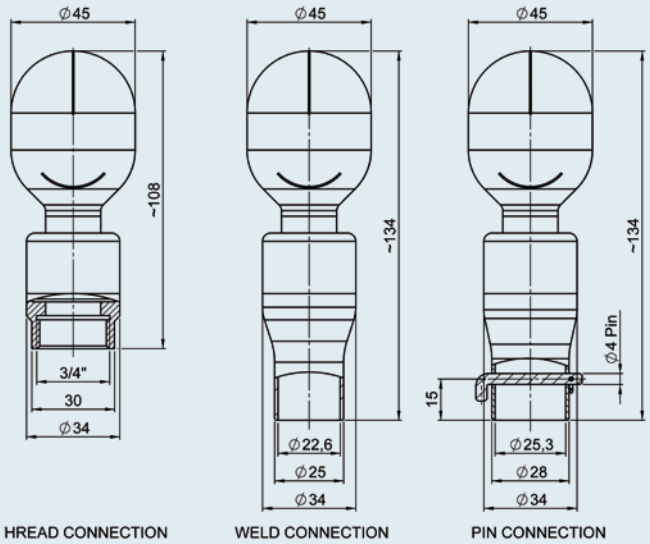


Pressure/Flow

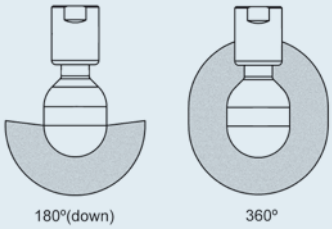


Cleaning radius

Dimensions



Spray pattern



Other spray patterns
are available on request

Specifications

Flow	2,1-8,4 m^3/h
Inlet pressure	1-5 bar
Max pressure	5 bar
Recommended pressure	3 bar
Max working temperature	95°C
Max ambient temperature	140°C
Weight	280 g
Connections	3/4" BSP or NPT, weld-on or pin
Material	Balls in AISI 316, all other parts in AISI 316L
Lubrication	Cleaning media

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www.tankcleantech.com

Stocking Locations in USA, Canada and Mexico

Bio 5A

Scanjet tank cleaning equipment

NEW PRODUCT
Unique Design

KEY FEATURES

+ Rotating spray
+ 360 degree spiral cleaning
+ Ideal for small tanks
+ Low pressure
+ Low volume

The Scanjet Bio 5A is a very efficient replacement to traditional static cleaning devices, it offers 360° impact coverage, self-cleaning and self-draining. The patent pending Bio 5A design follow EHEDG and GMP guidelines, it can be supplied with EN10204-2.1, 2.2 or 3.1 material and FDA 21CFR compliance certificates.

This new type of fluid bearing Rotary Spray Head is becoming the first choice for customers looking to improve their CIP tank cleaning systems, saving water and at the same time increase the cleaning efficiency. The Bio 5A is easy to install and comes with either a pin, weld-on or threaded connection, the life time of fluid bearing cleaning devices is two to three times compared to what traditional ball bearing cleaning devices offer.

The Scanjet Bio 5A can be used in a wide range of applications such as;

+ Mixing vessels
+ Reactors
+ Yeast tanks
+ IBC's
+ Barrel cleaning
+ Smaller beverage tanks
+ Paint manufacturing
+ Headboxes

BIO5A_TCT_2015_01_20

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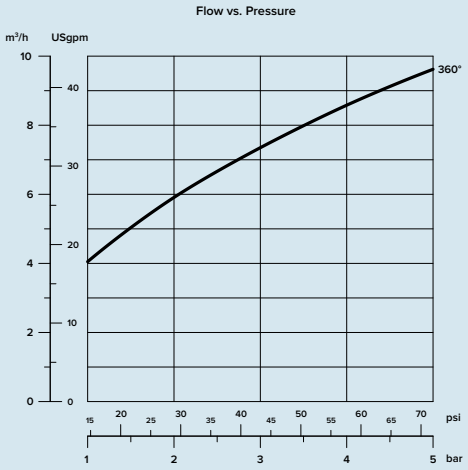
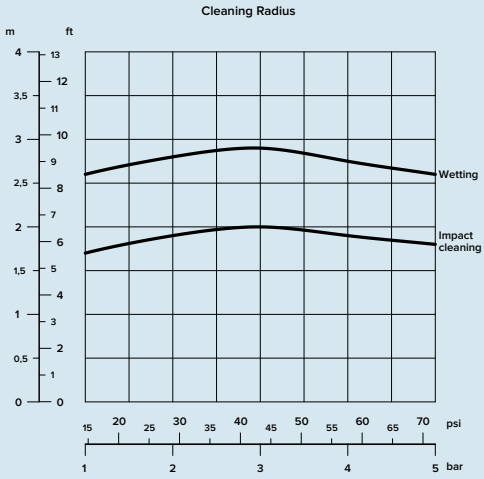
Technical performance

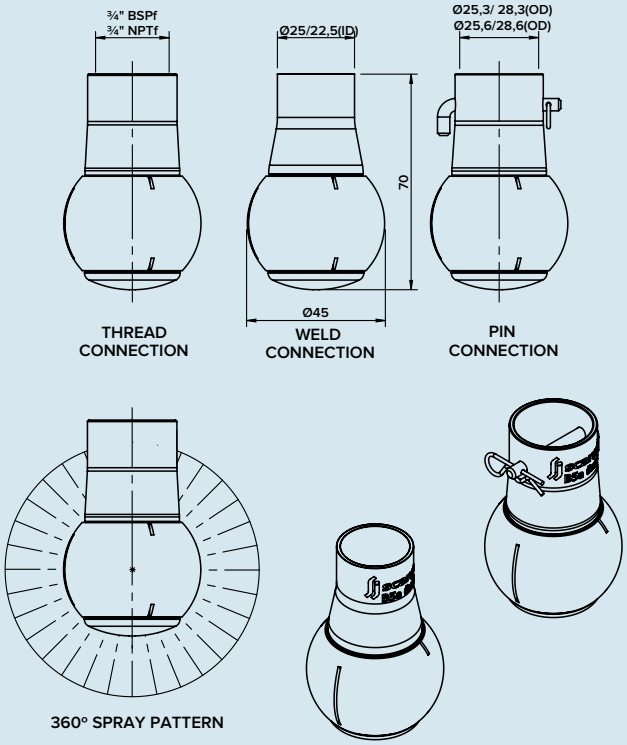


Pressure/Flow



Cleaning radius

Dimensions



Specifications

Flow	4,1 - 9,8 m³/h
Inlet pressure	1-5 bar
Max pressure	5 bar
Recommended pressure	3 bar
Max working temperature	95°C
Max ambient temperature	150°C
Weight	137 – 175 g
Connections	¾" NPT or BSP
	Weld connection
	Pin connection
Material	EN1.4404/PEEK
Lubrication	Self lubricated by media
Surface finish	Ra 0,8 µm

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Bio 5SB

Scanjet Rotary Spray Head

Bio 5SB is a slim rotary spray head suitable for medium sized process vessels. The Bio 5SB has a unique hygienic design following stringent EHEDG guidelines. The machine is completely self-draining and its simple design ensures zero maintenance and maximal running life. The rotary spray head is a low pressure device, where rotation is powered by the eccentric flow of the cleaning liquid through the spray head. Through multiple spray patterns, residue is removed efficiently using a limited amount of cleaning fluid. Thanks to its simplified and effective design, it can be used in a wide range of applications and can be installed in any position or angle.

Typical Applications:

- Mixing vessels
- Reactors
- Yeast tanks
- Intermediate Bulk Containers (IBC)
- Beverage tanks
- Paint manufacturing tanks
- Glue production tanks

Features & Benefits:

- Hygienic design
- Rotating spray
- Self-cleaning & self-draining
- Sanitary design
- Long life time
- Low operating pressure
- Highly efficient cleaning
- Minimised fluid consumption & usage of cleaning chemicals

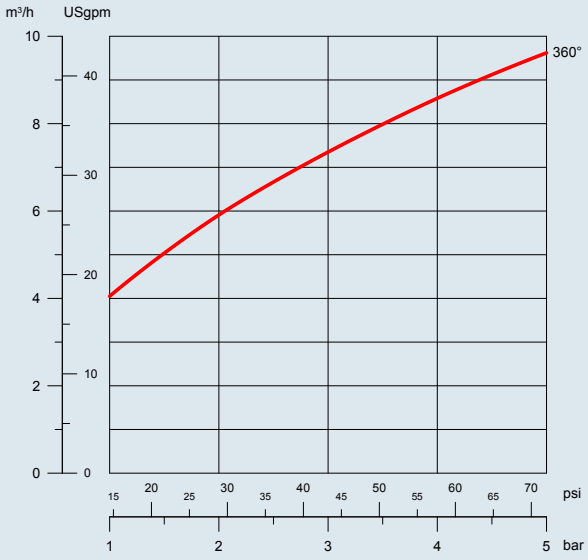
TCT
Tank Cleaning Technologies

...an orbijet company

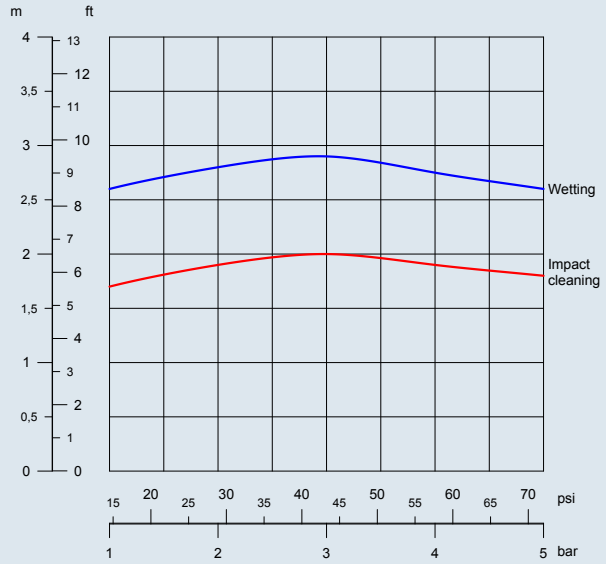
scanjet

Technical Performance

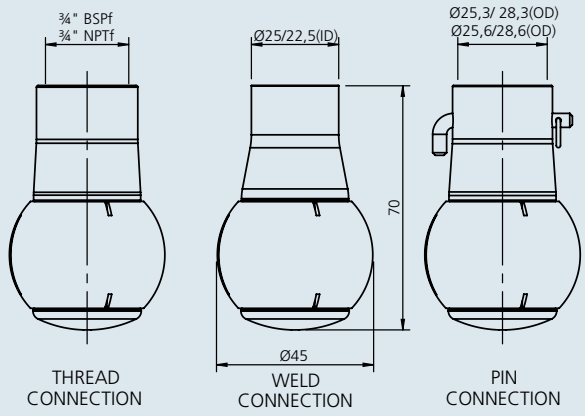
Pressure/Flow



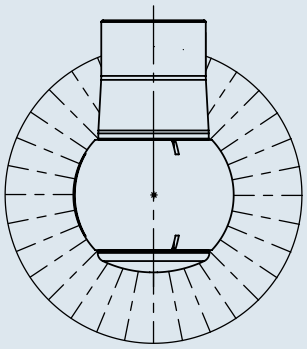
Cleaning Radius



Dimensions



Spray Pattern



360° SPRAY PATTERN

Specifications

Flow:	4-9.6 m³/hour
Inlet pressure:	1-5 bar
Max pressure:	5 bar
Recommended pressure:	3 bar
Max temperature:	95°C
Max ambient temperature:	140°C
Weight:	280 g
Connections standards:	¾" NPT/BSP, weld-on or PIN
Material:	AISI 316L, PEEK
Lubrication:	Cleaning media
Surface finish:	0.8 µm
Certificates:	EN10204-2.1, 2.2 and 3.1

scanjet

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Stocking Locations in USA, Canada and Mexico

Bio 7

Scanjet tank cleaning equipment

KEY FEATURES

– Rotating spray
– 360 degree spiral cleaning
– Ideal for medium and large tanks
– Low pressure
– Low volume

Bio 7 is a rotating spray nozzle/head that is driven by the cleaning fluid and is a very effective CIP alternative compared to traditional static spray balls. The fan like cleaning action provides improved coverage at low pressure whilst reducing the usage of cleaning media to a minimum.

BIO7_TCT_2015_01_20

Quality Control, Compliances & Certifications

Bio 7 is manufactured in AISI 316/316L and can be polished according to specification. 3.1 certificates can be quoted on request.

Typical applications for the Bio 7

– Medium yeast tanks
– Dairy and beverage transportation
– Large barrels
– Large ducting
– Large beverage tanks
– Mixing vessels
– Dairy processes

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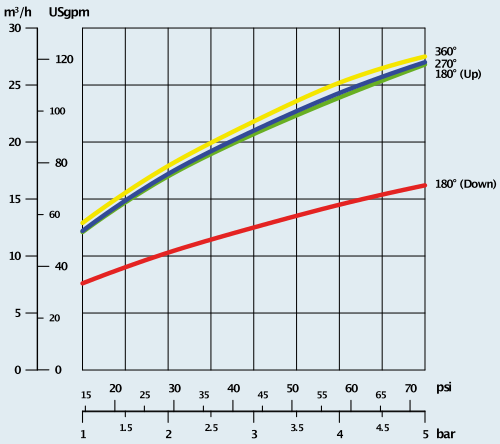
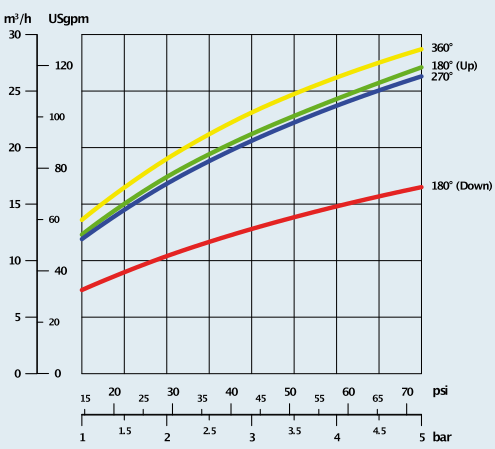
Stocking Locations in USA, Canada and Mexico

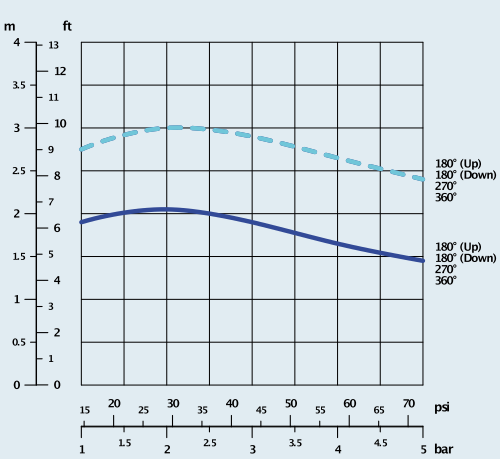
Technical performance



Pressure/Flow (BSP)

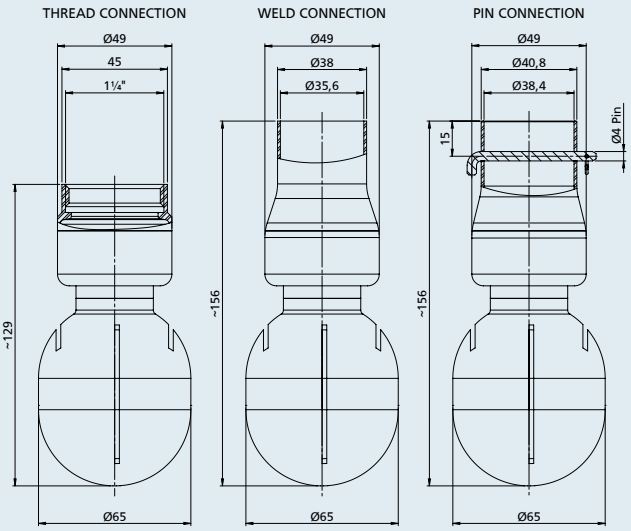


Pressure/Flow (Clip)

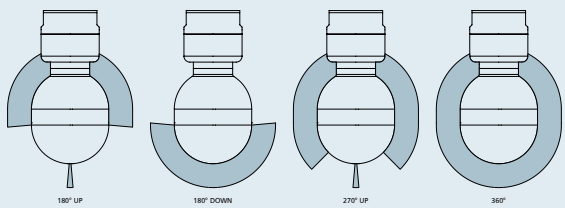


Cleaning radius

Dimensions



Spray pattern



Specifications

Flow	7,5-29,5 m^3/h
Inlet pressure	1–5 bar
Max pressure	5 bar
Recommended pressure	2–3 bar
Max working temperature	95°C
Max ambient temperature	140°C
Weight	500 g
Connections	11/4" BSP or NPT, weld-on or pin
Material	Balls in AISI 316 and PTFE, all other parts in AISI 316L
Lubrication	Cleaning media

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Stocking Locations in USA, Canada and Mexico

MicroSpinner

…rotating spray head

MicroSpinner

- Very low flow
- Cleaning of small areas
- Hygienic design

Ordering…
Please specify desired spray pattern, required connections, material selection, and type of certification required.

Options…
Downpipe assemblies with tri-clamp fittings and flange connections in 1.4401 (316) or Hastelloy C4
Spray patter of 180° and 90° can be quoted on request.

Application
The Tank Cleaning Technologies (TCT) MicroSpinner is a rotary spray head that uses cleaning media to provide coverage and impact. The device represents an effective alternative to traditional static spray balls because it uses low volumes of cleaning fluid at low pressure. The double ball bearing in the TCT MicroSpinner's rotating head makes the device suitable for all industrial cleaning applications, including tanks, reactors, vessels and other containers ranging from 0.05 to 1 m3 (10-250 US gallons), depending on dimensions and cleaning task. Assistance with optimal application positioning and other technical recommendations are avail-able in CAD format.

Working Principle
The flow of the cleaning media causes the head of the TCT MicroSpinner to rotate, and the fan-shaped jets lay out a swirling pattern throughout the tank or reactor. This generates the impact needed for the efficient removal of residual product; the cascading flow covers all internal surfaces of the vessel.

Standard Design
The TCT MicroSpinner is available in Hastelloy C4, Both 1.4401 (316) and Hastelloy C4 are available in polished versions. As standard documentation, the TCT MicroSpinner can be supplied with a "Declaration of Conformity" for material specifications and 3.1.B certifications can be quoted on request.

Materials
Housing, inlet connection, Head; 1.4404 (316L), Balls: 1.4401(316)

Technical Data

Weight	: 75 grams (0.2 lbs)
Lubricant	: Self-lubricating with the cleaning fluid
Working Pressure	: 1-10 BAR (14.5-145 PSI)
Recommended Pressure	: 1-5 BAR (14.5-73 PSI)
Maximum Working Temperature	: 100°C (230°F)
Maximum Static Temperature	: 180°C(356°F)
Spray Pattern	: 360°
Spray Radius	: 1 meter (3.2808 feet) maximum
Minimum Tank Opening	: 25mm (0.98 inches)
Connections	: 3/8" BSP(F)/NPT(F); ¼" BSP(F); ¾" Clip-on and Weld

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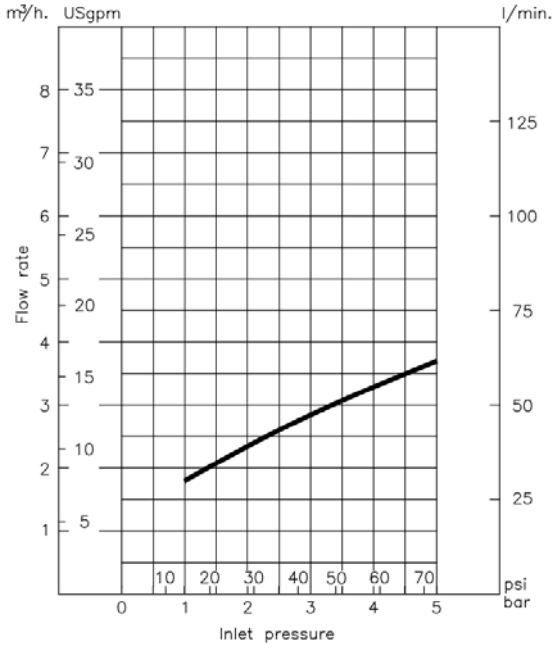
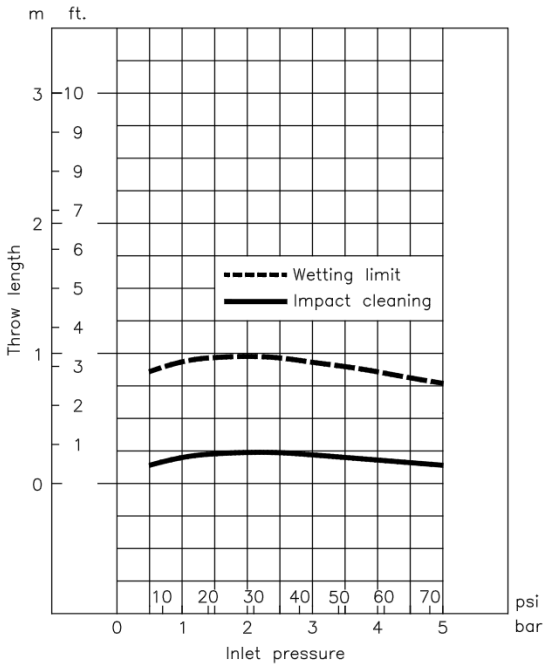
Stocking Locations in USA, Canada and Mexico

1065.2013.12.19

Flow Rate

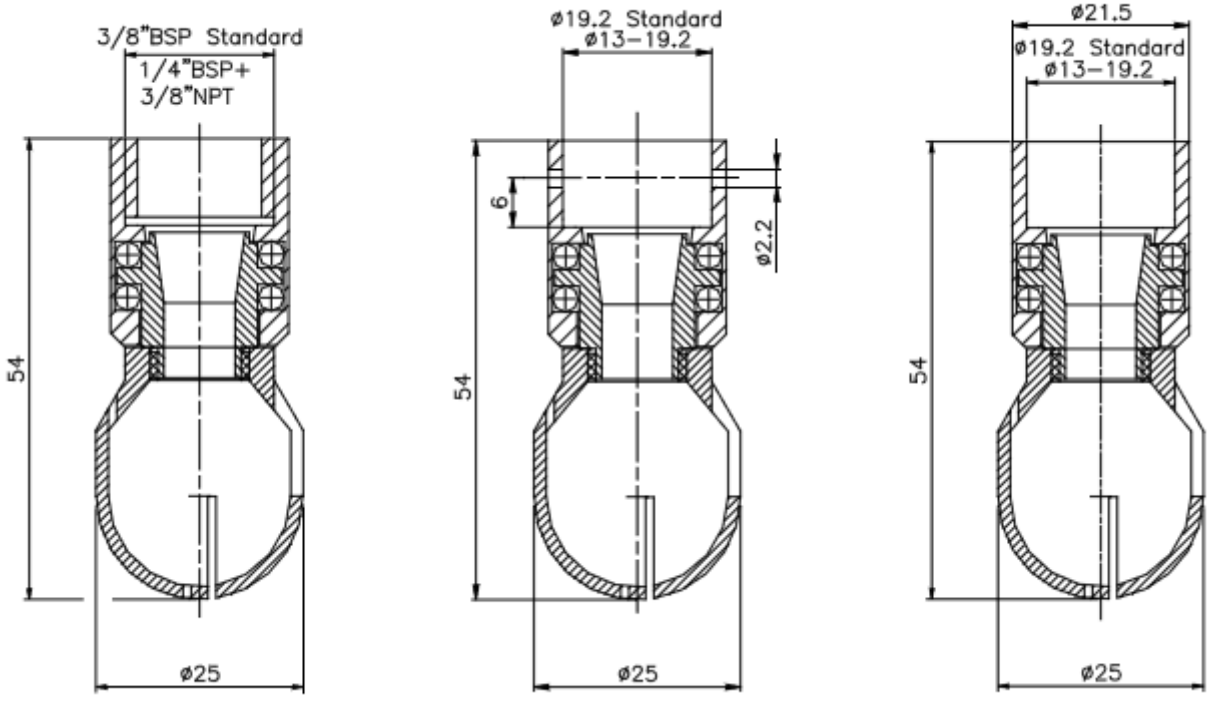


Cleaning Radius



For clip-on models, the flow rate is increased by approx 0.5 m³/h.

Dimensions (mm)



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Product Data Sheet

Product : Type UBA

Type: Single-Axis Rotating Spray Head

The UBA Machine is designed to distribute cleaning media in tanks ranging in size from 24 to 32 feet in diameter/width (7.3 to 9.8 meters). The UBA is a single axis rotary spray ball that projects a predetermined spray pattern within a given tank geometry. The rotation of the spray ball is controlled mechanically to avoid over rotation... which would result in reduction of spray radius and impact values of the media. The required wetting intensity should be properly reviewed before final selection of the device.

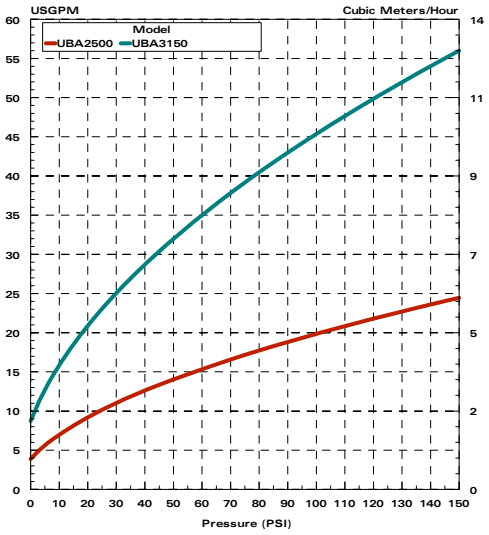
Model No.	Inlet Connection	Spray Pattern
UBA2500B31SN	.750" NPT(F)	360°
UBA2500B31GN	.750" NPT(F)	270° Down
UBA3150B31SN	1.50" NPT(F)	360°

Application benefits

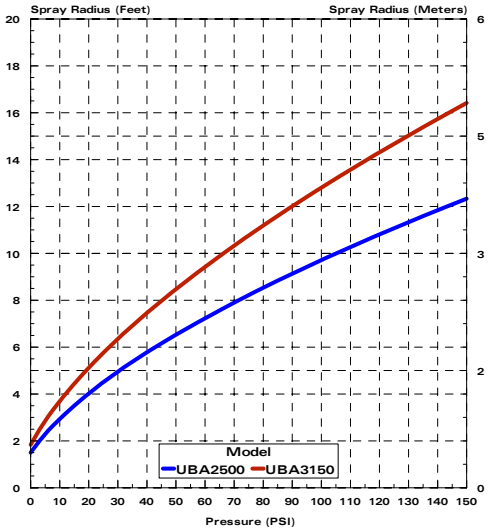
- Increased cleaning radius over non-controllable rotating spray balls
- Lower cost compared to RJH (Rotating Jet-Head cleaning devices)
- Minimal maintenance requirements

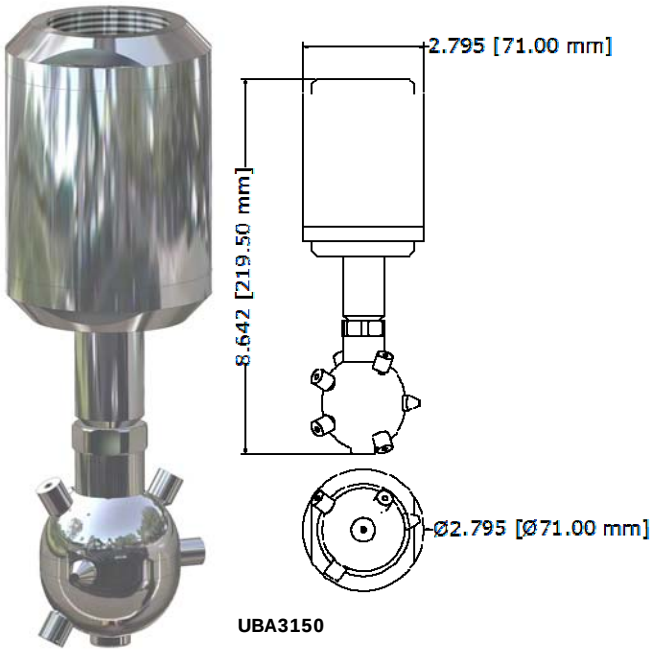
Performance Curves

Pressure/Flow

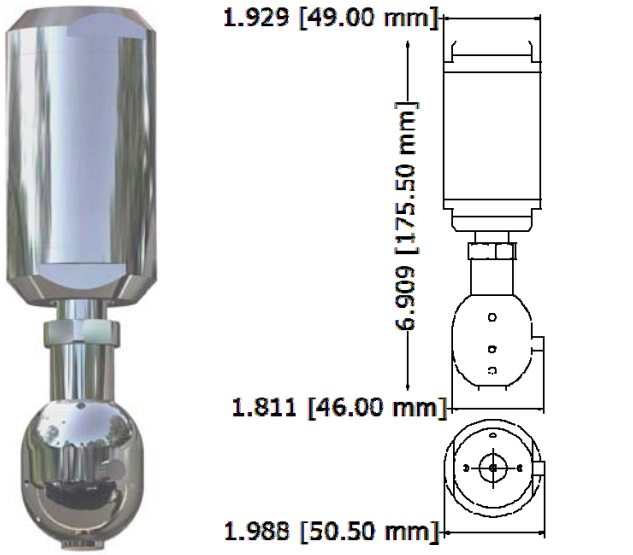


Spray Radius





UBA3150



UBA2500

General Specifications:

- Materials of Construction:
  - 316L Stainless Steel
  - PTFE

  Other materials on request.
- Temperature:
  - 300°F(149°C) Static and Operational
- Maximum Pressure
  - 300 PSIG (20.7 Bar)
- Weight
  - UBA2500 : 2.1lbs (.95 kg)
  - UBA3150 : 5.3 lbs (2.5 kg)

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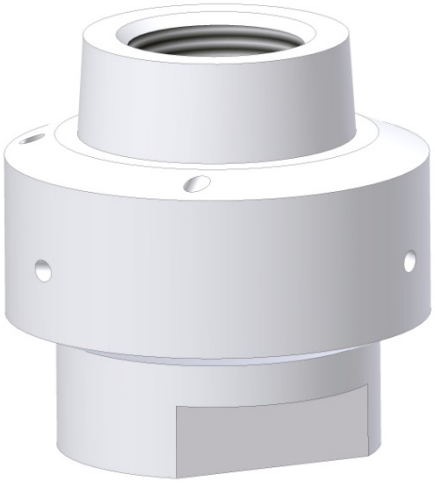
157.2013.12.06

Product Data Sheet

Product : Rotating Spray Head
Model : **UBB**

The Scanjet UBB rotating spray head offers 360° and 180° down (certain models) coverage for the cleaning of the inside of small tanks, process vessels, pipes, and other small containers.



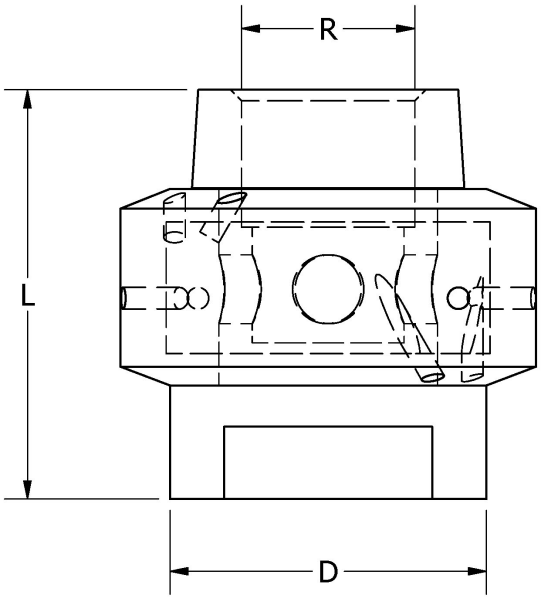
Industries

The Scanjet UBB is designed to disperse fluid and/or chemicals in small vessels and tanks. As standard, made completely of high quality PTFE (Teflon). Typical industries are Food, Beverage, Fine Chemicals, Pharmaceutical, Paints and Coatings... as well as other applications where the stated output parameters are applicable.

Operational

The Scanjet UBB is a Rotating Spray Head (RSH) and completes a full pattern in one rotation of the head. The higher the inlet pressure, the faster the rotation of the head itself. The amount of run time and pressure will vary... depending on the cleaning requirement.

Dimensional Information:



Specifications - Summary

Materials
All : PTFE (Teflon)

Weight
See reference table below

Lubrication
Lubricated by the fluid flowing through the device.

Pressure
Range : 0-100 PSIG (0-13.79 bar)
Optimal : 60 PSIG (4.13 bar)

Temperature
Maximum Working : 205°F (96°C)
Maximum Static : 300°F (149°C)

Connection Types
See reference table below

Nominal Wetting Radius
UBB2319 : 10.00 feet (3.04 meters)
UBB2320 : 10.00 feet (3.04 meters)
UBB3198 : 10.00 feet (3.04 meters)

Type UBB - Standard Model Reference Table

P/N	Spray Pattern	Connection	M.O.C.	Weight Lbs/(kg)	DIMENSIONS (Refer to drawing)			
					H		D	
					Inches	*mm*	*Inches*	*mm*
UBB2319E1BN	180° Down	0.500" NPT(F)	PTFE	0.24/(0.1088)	2.375	60.325	2.375	60.325
UBB2319E1EN	360°	0.500" NPT(F)	PTFE	0.24/(0.1088)	2.375	60.325	2.375	60.325
UBB2320E1EN	360°	0.750" NPT(F)	PTFE	0.35/(0.1587)	2.375	60.325	2.375	60.325
UBB3198E1EN	360°	1.000" NPT(F)	PTFE	0.53/(0.2404)	2.500	63.500	2.750	69.850
UBB2319E1BB	180° Down	0.500" BSP(F)	PTFE	0.24/(0.1088)	2.375	60.325	2.375	60.325
UBB2319E1EB	360°	0.500" BSP(F)	PTFE	0.24/(0.1088)	2.375	60.325	2.375	60.325
UBB2320E1EB	360°	0.750" BSP(F)	PTFE	0.35/(0.1587)	2.375	60.325	2.375	60.325
UBB3198E1BB	360°	1.000" BSP(F)	PTFE	0.53/(0.2404)	2.500	63.500	2.750	69.850

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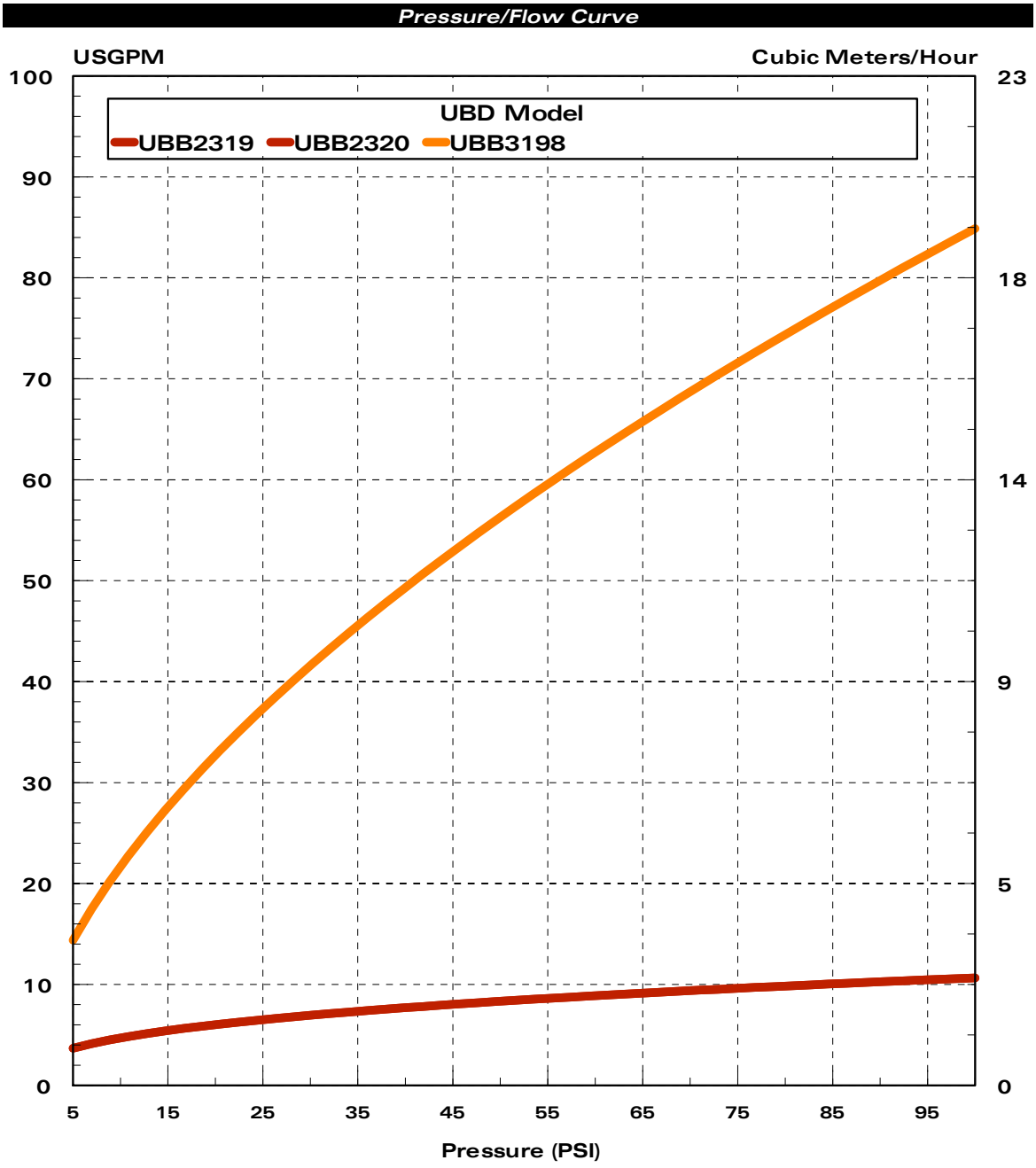
Stocking Locations in USA, Canada and Mexico

Product Data Sheet

Product : Rotating Spray Head
Model : **UBB**



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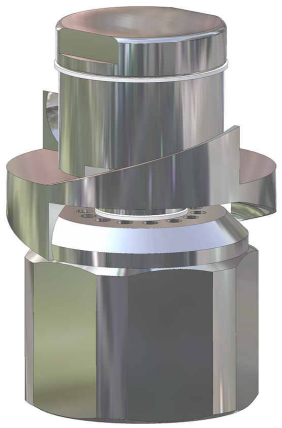
Stocking Locations in USA, Canada and Mexico

Product Data Sheet

Product : Rotating Spray Head
Model : **UBD**

The Scanjet UBD rotating spray head offers 360° and 180° (Up and Down) coverage for the cleaning of the inside of small tanks, process vessels, pipes, and other small containers.



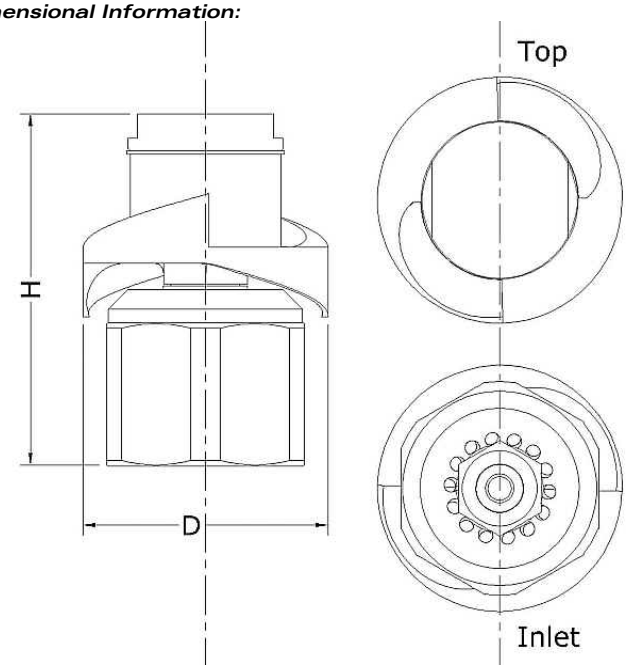
Industries

The Scanjet UBD is designed to clean vessels and tanks where a larger throw radius and flow rates are required... as compared to our other device offerings. As standard, made completely of high quality 316L stainless steel with a high polished finish. Typical industries are Food, Beverage, Fine Chemicals, Pharmaceutical, Paints and Coatings... as well as other applications where the stated output parameters are applicable

Operational

The Scanjet UBD is a Rotating Spray Head (RSH) and completes a full pattern in one rotation of the head. The higher the inlet pressure, the faster the rotation of the head itself. The amount of run time and pressure will vary... depending on the cleaning requirement.

Dimensional Information:



Specifications - Summary

Materials
All : 316L Stainless Steel
PTFE
Hastelloy C22 (Special Order)
(Others on Request)

Weight
See reference table below

Lubrication
Lubricated by the fluid flowing through the device.

Pressure
Range : 0-100 PSIG (0-13.79 bar)
Optimal : 60 PSIG (4.13 bar)
(Optimal will vary on the application)

Temperature
Maximum Working : 205°F (96°C)
Maximum Static : 300°F (149°C)

Connection Types
See reference table below

Surface Finish
Standard : 25-35 Raμ
Electropolished : $\leq$ 20 Raμ

Nominal Wetting Radius
UBD2530 : 8.20 feet (2.59 meters)
UBD2780 : 8.20 feet (2.59 meters)
UBD2870 : 8.20 feet (2.59 meters)
UBD3125 : 9.40 feet (2.87 meters)
UBD3140 : 11.50 feet (3.50 meters)
UBD3210 : 11.50 feet (3.50 meters)

Type UBD - Standard Model Reference Table
(Custom configurations and other materials on request.)

P/N	Spray Pattern	Connection	M.O.C.	Weight Lbs/(kg)	DIMENSIONS (Refer to drawing)			
					H		D	
					Inches	*mm*	*Inches*	*mm*
UBD2530B31AN	360°	0.750" NPT(F)	316L SS	1.0/(.45)	2.250	57.150	1.500	38.100
UBD2870B31AN	360°	0.750" NPT(F)	316L SS	1.0/(.45)	2.250	57.150	1.500	38.100
UBD2780B31AN	360°	1.000" NPT(F)	316L SS	1.0/(.45)	3.000	76.200	2.000	50.800
UBD3125B31AN	360°	1.000" NPT(F)	316L SS	1.5/(.68)	3.000	76.200	2.000	50.800
UBD3140B31AN	360°	1.500" NPT(F)	316L SS	2.0/(.90)	4.125	104.775	2.688	68.263
UBD3210B31AN	360°	1.500" NPT(F)	316L SS	2.0/(.90)	4.125	104.775	2.688	68.263
UBD2780B31BN	180° Up	1.000" NPT(F)	316L SS	1.0/(.45)	3.000	76.200	2.000	50.800
UBD3140B31BN	180° Up	1.500" NPT(F)	316L SS	2.0/(.90)	4.125	104.775	2.688	68.263
UBD2530B31CK	180° Down	0.750" NPT(F)	316L SS	1.0/(.45)	2.250	57.150	1.500	38.100
UBD2780B31CN	180° Down	1.000" NPT(F)	316L SS	1.0/(.45)	3.000	76.200	2.000	50.800

Tank Cleaning Technologies, Inc.
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Web: www.tankcleantech.com

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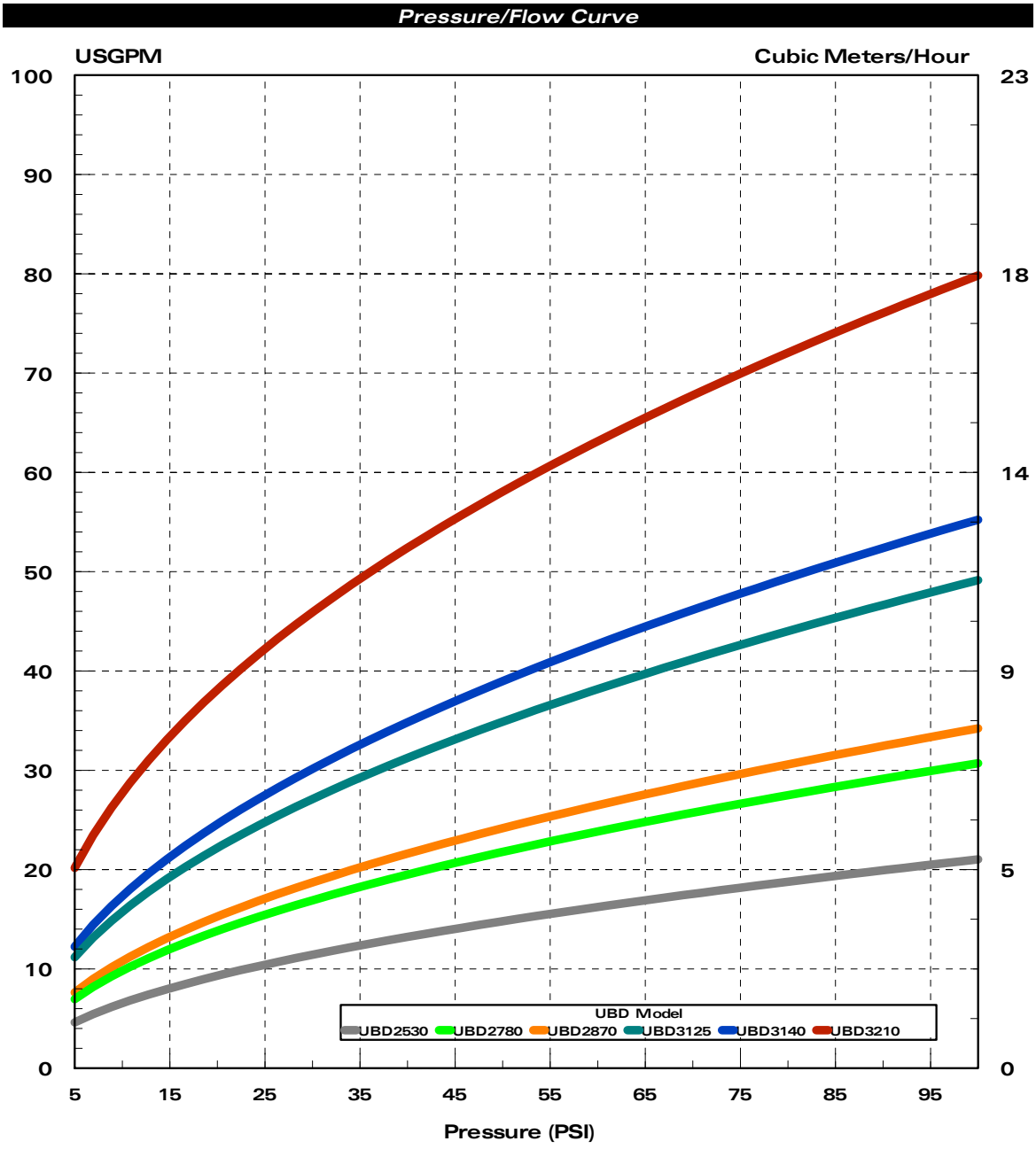
Product Data Sheet

Product : Rotating Spray Head
Model : **UBD**



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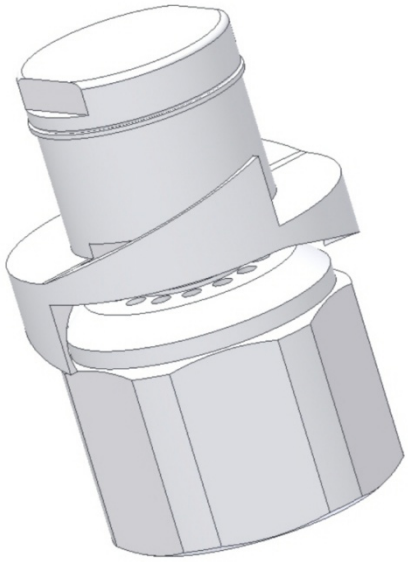
Product Data Sheet

Product : Rotating Spray Head
Model : **UBE**

The Scanjet UBE rotating spray head offers 360° coverage for the cleaning of the inside of small tanks, process vessels, pipes, and other small containers.



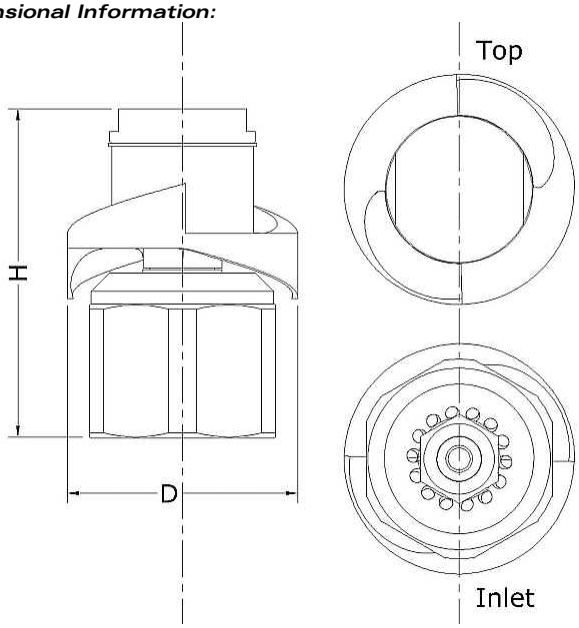
Industries

The Scanjet UBE is designed to clean vessels and tanks where a larger throw radius and flow rates are required... as compared to our other device offerings. As standard, made completely of Virgin Grade PTFE. Typical industries are Food, Beverage, Fine Chemicals, and Pharmaceutical... as well as other applications where the stated output parameters are applicable

Operational

The Scanjet UBE is a Rotating Spray Head (RSH) and completes a full pattern in one rotation of the head. The higher the inlet pressure, the faster the rotation of the head itself. The amount of run time and pressure will vary... depending on the cleaning requirement.

Dimensional Information:



Specifications - Summary

Materials
All : PTFE (Teflon)

Weight
See reference table below

Lubrication
Lubricated by the fluid flowing through the device.

Pressure
Range : 0-100 PSIG (0-13.79 bar)
Optimal : 60 PSIG (4.13 bar)

Temperature
Maximum Working : 205°F (96°C)
Maximum Static : 300°F (149°C)

Connection Types
See reference table below

Type UBE - Standard Model Reference Table
(Custom configurations and other materials on request.)

P/N	Spray Pattern	Spray Radius		Connection	M.O.C.	DIMENSIONS (Refer to drawing)			
						H		D	
		In	mm			*Inches*	*mm*	*Inches*	*mm*
UBEA087E1AK	360°	108	2743	0.750" NPT(F)	PTFE	2.250	55.125	1.500	38.100
UBEA087E1BK	180° Up	108	2743	0.750" NPT(F)	PTFE	2.250	55.125	1.500	38.100
UBEA087E1CK	180° Down	108	2743	0.750" NPT(F)	PFTE	2.250	55.125	1.500	38.100
UBEA052E1AK	360°	108	2743	0.750" NPT(F)	PFTE	2.250	55.125	1.500	38.100
UBEA125E1AK	360°	108	2743	1.000" NPT(F)	PTFE	3.000	76.200	2.000	50.800
UBEA078E1AK	360°	108	2743	1.000" NPT(F)	PTFE	3.000	76.200	2.000	50.800
UBEA078E1BK	180° Up	108	2743	1.000" NPT(F)	PTFE	3.000	76.200	2.000	50.800
UBEA078E1CK	180° Down	108	2743	1.000" NPT(F)	PTFE	3.000	76.200	2.000	50.800
UBEA210E1AK	360°	120	3048	1.500" NPT(F)	PTFE	4.000	101.600	2.750	69.850
UBEA140E1AK	360°	120	3048	1.500" NPT(F)	PTFE	4.000	101.600	2.750	69.850
UBEA140E1BK	180° Up	120	3048	1.500" NPT(F)	PTFE	4.000	101.600	2.750	69.850
UBEA140E1CK	180° Down	120	3048	1.500" NPT(F)	PTFE	4.000	101.600	2.750	69.850

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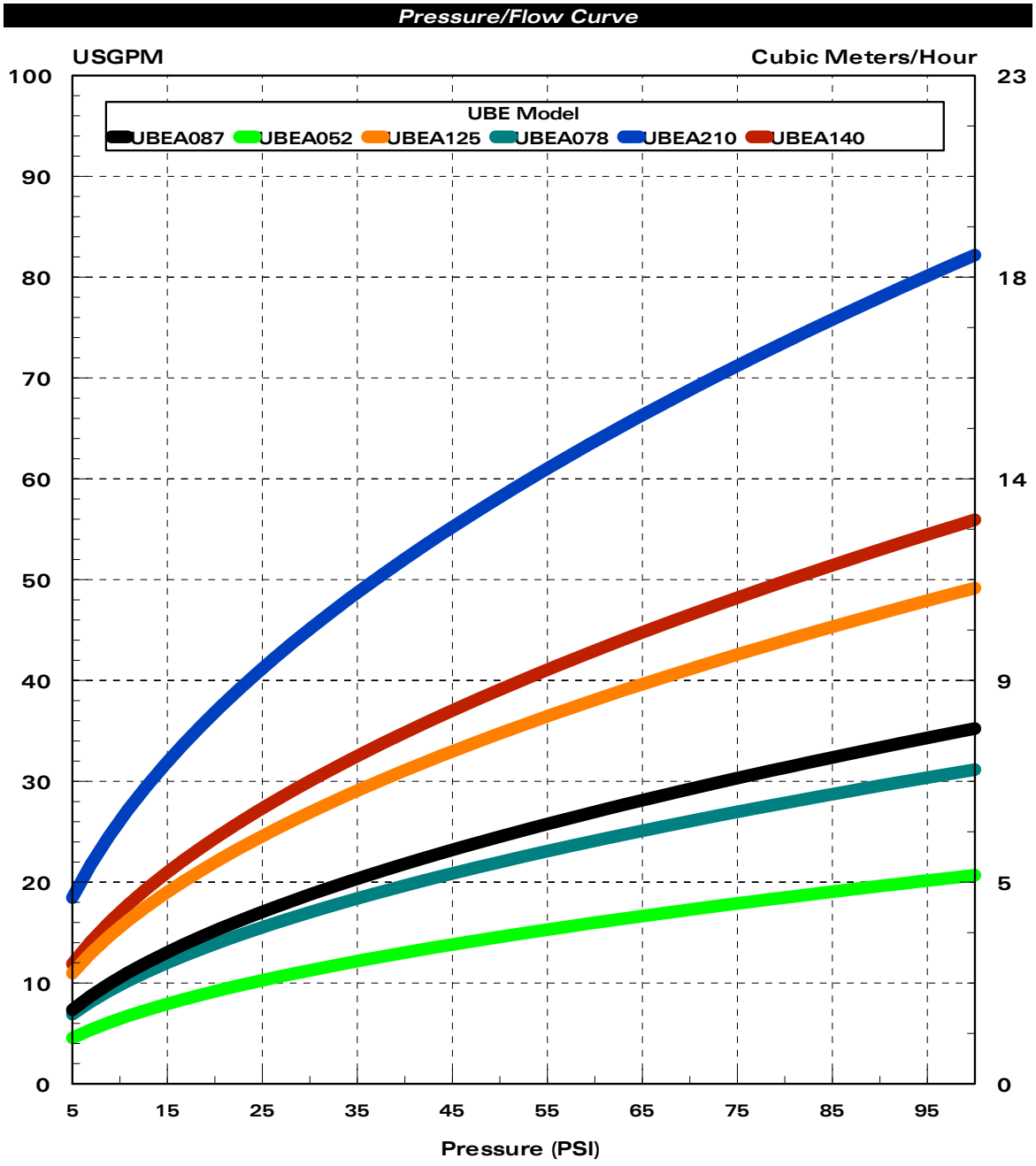
Product Data Sheet

Product : Rotating Spray Head
Model : **UBE**



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Product Data Sheet

Product : Rotating Spray Head

The Orbijet UBF rotating spray head offers 270° coverage for the cleaning of the inside of small tanks, process vessels, pipes, and other small containers.

Industries

The Orbijet UBF has been designed to fit through an opening as small as 1.00" in diameter. As standard, made completely of high quality 316L stainless steel with a high polished finish. Typical uses are small containers used within the beverage industry; small bore pipes, and as augmentation to larger CIP installations.

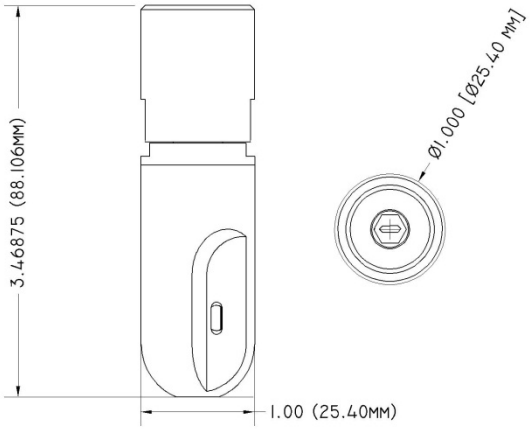
Operational

The Orbijet UBF is a Rotating Spray Head (RSH) and completes a full pattern in one rotation of the head. The higher the inlet pressure, the faster the rotation of the head itself. The amount of run time and pressure will vary... depending on the cleaning requirement.

User Benefits

- Reduced Cleaning Times
- Reduced Effluent Generation
- Reduced Energy Costs

Dimensional Information:



Specifications - Summary

Materials
All : 316L Stainless Steel (Others on Request)

Weight
316L Stainless Steel : 0.545 lbs (.247 kg)

Lubrication
Lubricated by the fluid flowing through the device.

Pressure
Range : 0-200 PSIG (0-13.79 bar)
Optimal : 100 PSIG (6.89 bar)
(Optimal will vary on the application)

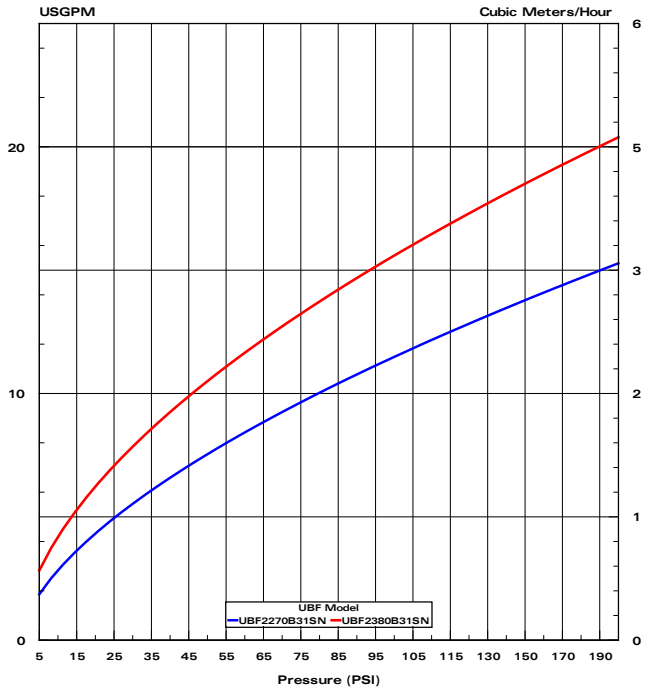
Temperature
Maximum Working : 205°F (96°C)
Maximum Static : 300°F (149°C)

Connection Types
.50" NPT(F) threads as standard; others on request

Surface Finish
Standard : 25-35 Raμ
Electropolished : $\leq$ 20 Raμ

Nominal Wetting Radius
4.9 Feet (1.49 meters)

Pressure/Flow Curve



Type UBF - Standard Model Reference Table

Model #	Inlet Connection	M.O.C.	Spray Pattern
UBF2270B3SN	0.50" NPT(F)	316	270°
UBF2380B3SN	0.50" NPT(F)	316	270°

Custom configurations on request.
(Subject to Engineering Charges)

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Product Data Sheet

Product : Static Spray Balls

Type : UAA

Static Spray Balls are simple, fast, and efficient devices for the cleaning of the inside of tanks in a variety of industries. All units are self cleaning and available in a variety of spray patterns and surface finishes.

In Application:

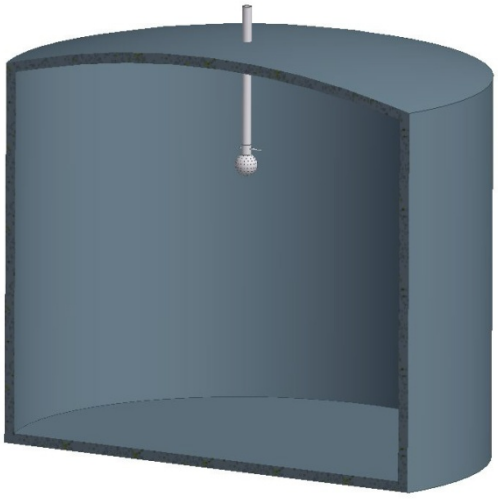
Static Spray Balls can be used in hygienic and non-hygienic applications.

Typical Industries Served:

- Food
- Dairy
- Pharmaceutical
- Cosmetic
- Biotech
- Chemical
- Beverage

In Operation:

Static Spray Balls project a predetermined spray pattern based on the drilling arrangement of the holes within the ball. Typically, cleaning is accomplished by creating the desired coverage and cascading effect required for the relative cleaning task.



Typical Installation

General Specifications

Materials Of Construction

- 316L Stainless Steel as Standard
- Teflon and Hastelloy on Request

Pressure/Flow Range

- 0 – 100 PSIG (7 Bar)
- 0 – 500 GPM (113 M^3/Hr)

Inlet Connections:

- Threaded (NPT, BSP and Others)
- Clip-On
- Weld Joint

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Scanjet application solutions

Innovative Tank Management

Distributed and Serviced by...
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15200 Middlebrook Drive; Suite E
Houston, Texas 77058 - USA
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Fax: +1 713 516.5883
Email: sales@tankcleantech.com

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Stocking Locations in USA, Canada and Mexico

Scanjet high quality products and solutions

Crude oil carriers require our larger machines with high capacity for sediment control to meet Marpol regulations.

For bulk carriers Scanjet provides solutions for the cleaning of holds and water ingress alarm systems.

River tankers and barges are using Scanjet following an in increased demand for an environmentally firendly and safe tank cleaning operation with closed hatches.

For chemical and product carriers the Scanjet installation is of utmost importance for the safety and economical performance of the vessel.

For FPSO vessels there are Scanjet installations available meeting all operational requirements.

Offshore supply vessels and plattforms are using our low capacity machines for cleaning of drilling mud and brine tanks.

Scanjet is committed to meet the highest standards of quality and performance. We continuously develop and improve our product range to meet the market demand for optimal technical performance.

Specifications and details are subject to change and are given herewith for information only.
19/8/2014

Dear Customer

Scanjet is dedicated to develop and manufacture Tank Management equipment for marine Industry. We focus entirely on the cargo tanks where most of the revenue is generated for the operators. We are confident that by supplying high quality solutions we will support our clients in their work to optimize the operation onboard the vessels for many years to come.

Being the market leader for marine tank cleaning installation and level gauging equipment for the cruise vessels worldwide, we have a long reputation within the marine industry and numerous of sailing references. The knowledge gained the years has resulted in a product portfolio where we can offer:

- Tank cleaning solutions that will support quick turnaround for the vessels.
- Integrated monitoring, alarm and control system that will safeguard that all tanks are managed safely onboard the vessels.

Our worldwide service net-work and 24/7 spare part support will support you in the operation for the coming years. Going direct from producer to the user will make sure that operational costs are attractive for the lifetime of the vessels.
The Scandinavian product is made to highest quality standards and fully approved by all classification societies. Our experienced personnel will also support you with designing the installation to give an optimized solution where the most valuable items onboard is kept-THE TANKS.

Scanjet Innovative Tank Management concept has been developed to support all type of vessels in a flexible and customer focused approach. Being totally dedicated to the tanks onboard the vessels Scanjet will be your best partner for tank management!

Niklas Falkmer
MD Scanjet Marine

Tankers

Temperature compensated hydrostatic pressure sensor

Tank pressure
Line pressure
Pump pressure
Sensor with enclosure

Electropneumatic gauging

Portable tank cleaning

Draft gauging

FO / DO / FW tanks

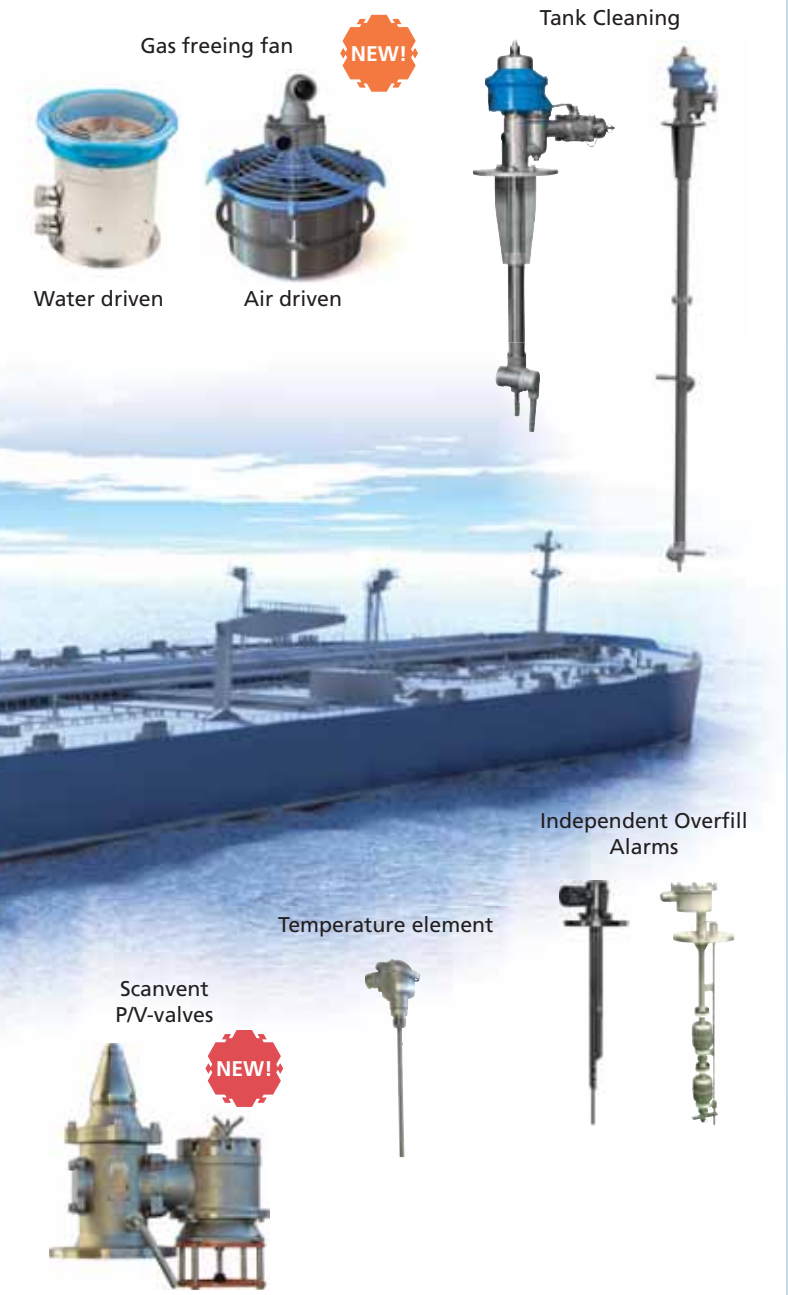
Electric pressure sensors

Microwave radar level gauging

Vapor emission control

Scanjet Tank Management Systems
Scanjet is the experienced supplier of tank management equipment including tank level gauging and well known for being the world´s leading producer of tank cleaning equipment and anti-pirate water cannons.
With Scanjet Tank Management operators will be able to integrate tank operations with loading/unloading and the cleaning process.

Scanjet Tank Cleaning Equipment
Scanjet Tank Cleaning Machines for both fixed installations and portable use have been well known to the marine industry since 1994. A wide range of machines are being produced in the Swedish factory and is available for all types and sizes of installations from small chemical carriers and product tankers to large VLCC and ULCC crude oil tankers. To date more than 100.000 machines have been installed on more than 4000 vessels.
The product range includes high performance programmable single nozzle machines for fixed installations as well as twin nozzle machines to be fixed installed in deck or submerged mounted, or used as portable units on flexible rubber hoses. The machines are driven with integrated turbines by the cleaning media or by portable air driven drive units. With the unique magnetic transmission the drive unit can easily be removed if needed without exposing the tank to atmosphere which is both convenient and cost saving.
The programmable machines have a selection of different cleaning programmes and features for prewash procedures and can be equipped with remote indication sensors giving signals to displays or systems on the bridge or in the cargo control room.
Long multi-level machines are available for cargo tank installations requiring full cleaning coverage or for slop tanks when submerged installations are not preferred. In addition to the operational benefits with everything accessible on deck considerable cost savings are achieved thanks to less piping.



In the portable range Scanjet also offers a range of modern gas freeing fans suitable for various sizes of ships.

Scanjet Tank Level Gauging Equipment

With the joining of the Ariston technology in 2012 Scanjet is now able to offer a full range of level gauging equipment for all types of vessels and tanks using a selection of different technologies. More than 550 systems have been installed worldwide. For cargo tanks we offer our own developed systems using either advanced microwave radar sensors or pressure sensors. A combination of both enables very accurate density calculations. For service or ballast tanks we offer systems with either electro-pneumatic "bubble system" or pressure sensors. Independent High Level & Overfill Alarm Systems are available with two different well proven technologies, floats or acoustic wave. Scanjet Tank & Line Pressure Monitoring offers compact units with excellent integration possibilities and replaces the need for a second p/v valve at lower cost.

Non-contact Microwave Radar

One of the few marine microwave ullage gauges featuring a power and 4-20 mA signal on a two core cable, providing a simple, fast and cost effective installation for both new buildings and retrofit projects. Its unique design and technology eliminates the need for large and tall adapter trunks to fit radar to the deck. The system provides for automatic trim and list correction and allows exporting of level either at the flotation centre of the tank, at the sensor location or at the sounding pipe.

Independent High Level & Overfill (95%-98%) Alarm Systems For Cargo Tanks

Scanjet Independent High Level & Overfill Alarm Systems are high quality products based on acoustic wave technology or well proven floats for marine applications. A complete system can be delivered either as a single or dual point system for high level and overfill (high-high) level alarm detection for any kind of liquid, including any hydrocarbons and chemicals.
The system is fully compliant with the requirement from IMO resolutions for high level alarms and overflow control and rules from all classification societies. Visual and audible alarms will display on the alarm panel as well as on deck with external alarm lights) and sirens.
The high level (95% and overfill 98%) alarms are totally electrically independent from each other. The system sensor test for verification of alarm function is performed on deck and features a built-in function for preventing false alarms.

Scanjet Vapor Emission Control System – VECS

The Scanjet Macron Vapor Emission Control System has been developed for safe return of volatile organic compounds to shore when loading. The system monitors the vapor emission and oxygen content in main vapor collection lines during operation.

Bulk carriers

FO / DO / FW tanks

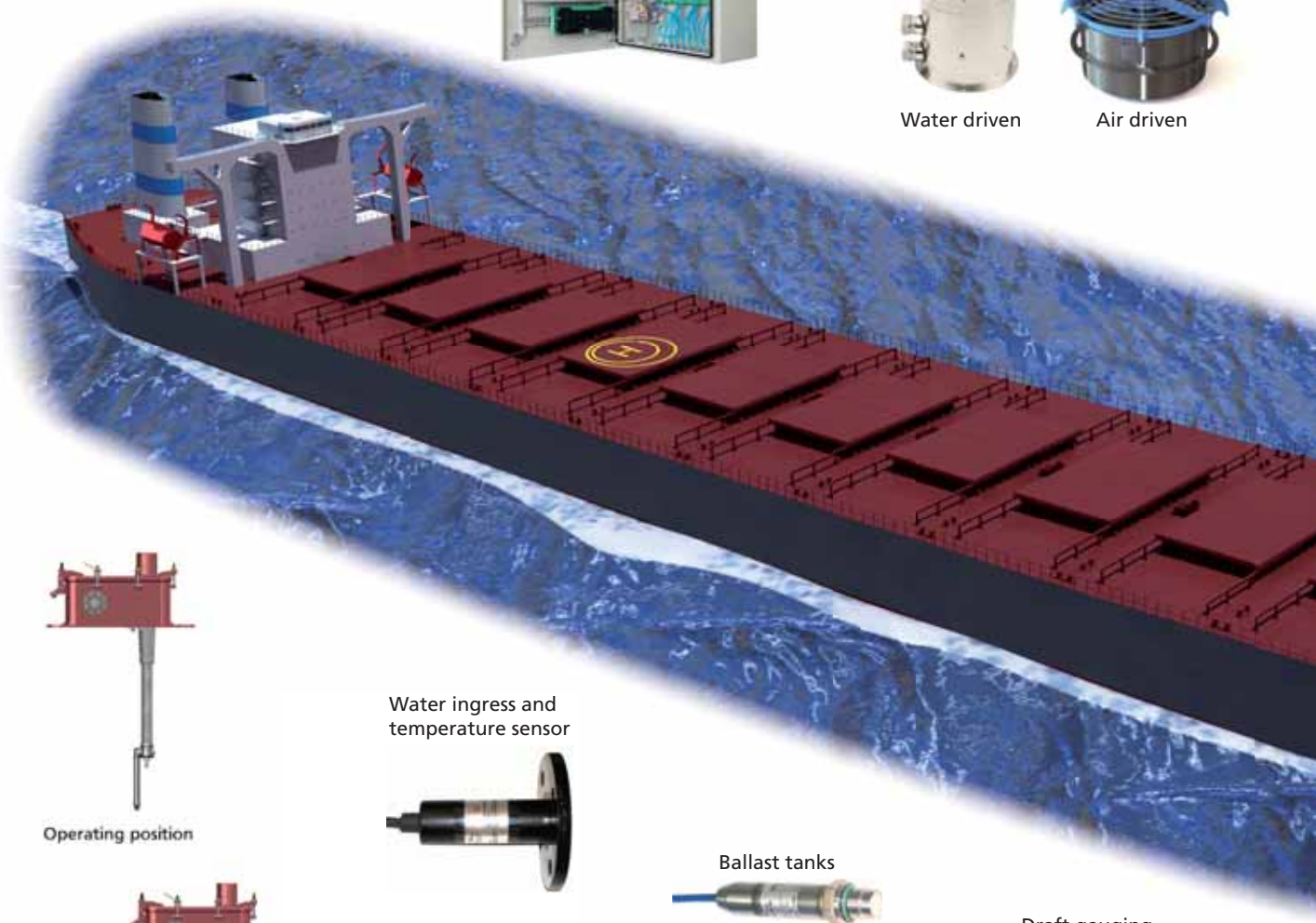
Electropneumatic gauging

Gas freeing fan

NEW!

Water driven

Air driven



Operating position

Water ingress and temperature sensor

Ballast tanks

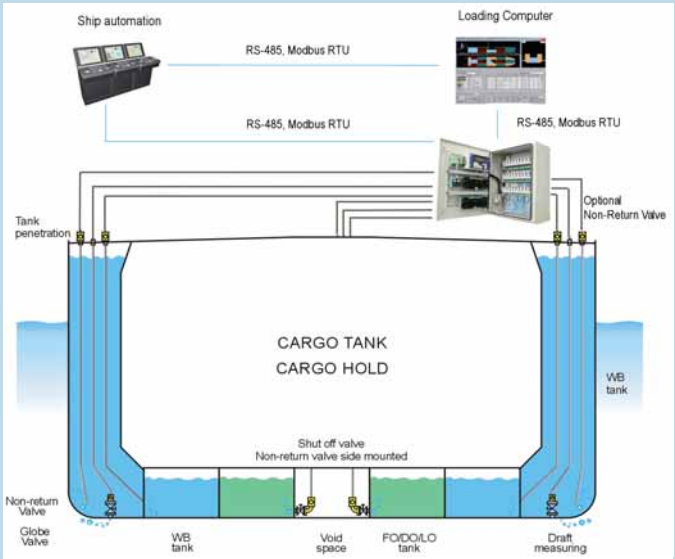
Draft gauging

Parked position

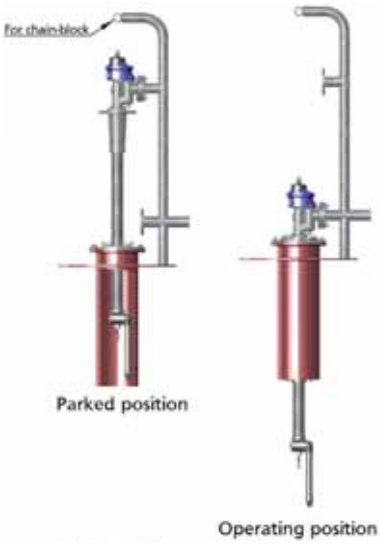
Scanjet Level Gauging Equipment

For level gauging in ballast tanks Scanjet offers a selection of electro-pneumatic systems ("bubble systems") and pressure sensors. The electro-pneumatic Macron SML-1000 system measures the level of water in ballast tanks, fuel oil tanks, water ingress and draft by reliable high quality pressure sensors located in easily accessible IP44 system cabinets. Operating principle is based upon the measurement of hydrostatic pressure at the bottom of the tank by modulated air through a bubbling probe. The system can be supplied either with standard DC 4-20 mA signals with two wires to SURVEYOR, ship automation or cargo monitoring system or as fully digital system with Modbus serial line. The robust sensors are very stable in the long term, highly repeatable and are temperature compensated.

For the alternative with pressure sensor level gauging, the highly accurate pressure sensors measure absolute pressure. The sensors are hermetically sealed without any ventilation to the atmosphere with a patented water tight con-



Portable cleaning



Scanjet Hold Cleaning Equipment

Bulk carriers often make quick changes from one type of cargo to another. Many times this has to be done in a matter of hours and the time saved in just one quick change can pay for the cost of a complete Scanjet hold cleaning installation. The washing process makes use of sea water and the cargo holds are then rinsed with fresh water to minimize the effects of corrosion and prevent salt from contaminating the next cargoes.

For the best and most economical solution standard Scanjet machines are used, with different mounting arrangements designed to fit the ship´s structure and to prevent damage to equipment during cargo operations. The standard machines can either be arranged in a foldable installation where they are hand cranked from the parking position to operation position or mounted in a vertically retractable installation where machines can be lifted from the operation position to the safe parking position.

There is a need of cleaning the holds even if the vessel is carrying the same cargo time after time. Regardless the previous cargo carried, all cargo holds should be thoroughly cleaned prior to loading the next cargo. If a vessel is carrying cargoes where residues will solidify on the surfaces, they may be next to impossible to remove if the vessel is not cleaned immediately after discharge. Remaining residues may damage not only the next cargo, but also cause damage to painted surfaces and increase corrosion.

nection between body and the signal cable. The sensor can be installed from the top or the side of the tank and are connected to the TCU through I/O cards with integrated zener barriers (ATEX), as required. Reference is made through an additional sensor, which reads the atmospheric pressure on a continuous basis.

Scanjet Water Ingress Detection System

The SURVEYOR WIAS microwave radar sensor with integrated temperature monitoring.

The SURVEYOR Water Ingress Detection & Alarm System is designed to detect the presence of water in the cargo holds of bulk carriers. The system is in full compliance with regulations, following the International Association of Classification Societies' adoption of a unified interpretation of the International Maritime Organization's (IMO) Performance Standards for Water Level detectors on Bulk and single hold General Cargo Carriers. Regulation requires bulkers to be fitted with water ingress detection equipment that will provide audible and visual alarms on the bridge in the event of water levels being detected in cargo holds (at two levels) and other spaces forward of the first collision bulkhead.

The microwave water ingress detection system is based on the di-electric properties of water molecules. The sensor constantly checks the di-electric constant of the cargo present at the microwave antenna. Reflection is processed based on the medium´s di-electric properties. Water ingress in the cargo hold leads to a substantial change of the reflection coefficient and thus is detected by the microwave sensor. Presence of water will switch the sensor to an alarm state – in both empty and loaded cargo compartment, regardless of the type of cargo carried.

Cruise vessels

Electropneumatic system

SML-1000A internals

Scanjet Level Gauging Equipment
Scanjet has extensive experience of level gauging installations onboard a large number of cruise vessels worldwide and is today the undisputable market leader in this segment. Distinguished owners like TUI Cruises, AIDA, RCCL, NCL have all chosen the Scanjet systems for the proven reliability and performance for any size of system. For cruise vessels carrying up to 5000 passengers safety can not be jeopardized. Correct and fast information from the level gauging system must be secured at all times. The Scanjet Macron SML-1000 electro pneumatic system offers continuous measurement giving signal to needed systems with DC 4-20 mA or digital Modbus serial line. The largest systems delivered so far have been with more than 250 measuring points connected to more than 20 cabinets.

Car Carriers

Scanjet Level Gauging Equipment
For car carriers Scanjet has an extensive experience of level gauging installations including references for well-known operators like Swedish Wallenius Lines and Norweigan Hoegh Autoliners. Car carriers carrying up to 8000 cars are depending on fast and accurate level gauging information from the systems using either electro-pneumatic or pressure sensor technology.

Electropneumatic system

SML-1000A internals

Offshore vessels

Scanjet Tank Cleaning Equipment
For offshore vessels, all types of supply vessels,rigs and FPSOs, Scanjet has a wide range of various tank cleaning machines available meeting all cleaning needs including the special requirements for cleaning of mud tanks. Machines with either single nozzle or twin nozzle, internal or external drive and even bended machines are available for those installations not allowing mounting on deck but with the need for external drive and optimal cleaning pattern. The fixed installed tank cleaning machines can also be delivered in split version for easy handling e.g. below process deck of FPSOs.

SC 15TW

SC 90 T2

SC 30T

SC 40RT

Scanjet Level Gauging Equipment
For level gauging in ballast and service tanks Scanjet offers a selection of electro-pneumatic systems ("bubble systems") and pressure sensors. The electro-pneumatic Macron SML-1000 system measures the level of water in ballast tanks, fuel oil tanks, water ingress and draft by reliable high quality pressure sensors located in easily accessible IP44 system cabinets.
For the alternative with pressure sensor level gauging, the highly accurate pressure sensors measure absolute pressure. The sensors are hermetically sealed without any ventilation to the atmosphere with a patented water tight connection between body and the signal cable. The sensor can be installed from the top or side of the tank and are connected to the TCU through I/O cards with integrated zener barriers (ATEX), as required. Reference is made through an additional sensor, which reads the atmospheric pressure on a continuous basis.

Multipurpose monitoring & control system

The Multipurpose Monitoring & Control System -
The Heart Of All SURVEYOR™ Systems.

Being mindful of the need to offer the so desired universal and flexible solution for monitoring of tank levels (cargo, ballast, service), tank and manifold pressures, temperatures, draft, etc. and deliver the information to ship's automation systems, we developed and launched our advanced Multipurpose Monitoring & Control System.

The System features a tank display unit (TDU) with colour touch screen and configurable software via a Windows based configuration program. Local setup of display functions and measurement units makes the interface user friendly and easy to operate. The unit's sleek design, size and easy installation contribute to creating more userfriendly and ergonomic environment solutions. Through virtually unlimited expansion possibilities the system can handle an unlimited number of sensors, allowing the addition or removal of monitoring points.

Configuration of a new monitoring point or updating of the existing configuration can be performed on site by connecting the tank control unit (TCU) to a PC. The TCU performs all the processing of the signals from the I/O cards and supplies power to the I/O cards and the display unit.
The control unit supports communication protocols to the majority of makers' automation systems - for example digital I/O, thermocouples, anti-healing systems, mainframe computers, etc. Customized software, friendly interface and expansion possibilities make the Ariston Multipurpose Monitoring and Control System a cost effective and efficient solution.

The SURVEYOR™ systems are based on proven pressure sensor and radar technology, giving accurate information through direct measuring of cargo level, temperature, vapour pressure and cargo density. The pressure sensors and radar gauges have a track record of long time stability and accuracy. The system is recommended for installation in cargo tanks, ballast tanks, fuel oil tanks and for draft measurement. The sophisticated and user friendly on/offline loading calculator is capable of presenting hull stress and stability calculations, allowing printouts of cargo transfer reports, and is an integral part of the system.

The tailor made high quality pressure sensors measure absolute pressure. Sensors are hermetically sealed without any ventilation to the atmosphere. Reference is made through an additional sensor, which reads the atmospheric pressure on a continuous basis. Temperature measurement is integrated in the sensors for correction of the pressure reading accuracy well as a separate temperature monitoring feature. The system is applied on board tankers, dry cargo vessels, offshore vessels, coast guard and land based facilities.

Multipurpose monitoring & control system

PC Windows Workstation and Loading Calculator

Multiple PC Workstation Support

TDU Touch Screen System Monitor

Multiple TDU Support

RS232

RS232 RS485

Handheld Wireless (WLAN) Tank Monitoring and Alarm Unit

NEW!

tPC 196 Local Indicator

With Eex enclosure on deck

tPC 140 Local Indicator

RS485

TCU Control Unit

Main and redundancy power (2x24VDC)

Sensor for system atmospheric pressure compensation

Input from the inclinometers for trim and list correction

To serial line logging printer (memory)

RS232 / RS485 / MODBUS to AMS (third party automation)

Signal to Valve & Pump Control System

Programmable alarm outputs

System Cabinet

RS485

RS485

To more I/O Cards

RS485

I/O Cards

SAFE AREA

HAZARDOUS AREA

Non-contact Microwave radar

4-20 mA or digital

4-20 mA

Independent 95%-98% Alarm

4-20 mA

Tank Pressure
Line Pressure
Pump Pressure
Sensor with enclosure

From On/Off switch

AN-SCCNV
AD Conversion Card

WashTrac

Temperature compensated hydrostatic pressure sensor

Temperature Element Pt 100

Water Ingress and Temperature Sensor

Gas freeing fan Water driven

Ballast tanks

FO / DO / FW tanks

Draft gauging

VECS

Scanvent P/V-valves

Portable

Gas freeing fan Air driven

Multipurpose monitoring and control system

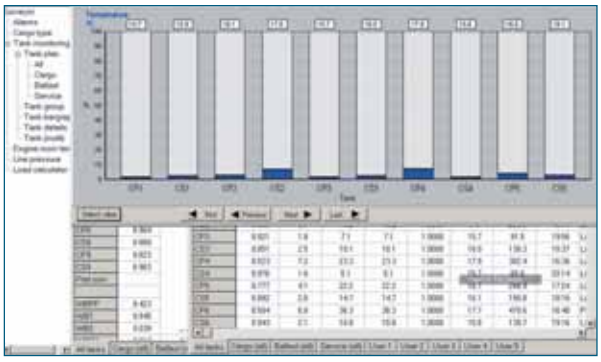
Data presentation on a WinXP PC Workstation:
SURVEYOR™ is one of the most comprehensive and versatile multipurpose platform for automatic tank monitoring offering possibilities that have previously not been available. Along with the standard presentation on the TDU, the system can be configured to acquire all tank related data from the TCU and will display the same graphics on a dedicated workstation running the SURVEYOR ™ for Windows™ software.
This software features a user friendly graphical interface for display of tank plan, bar graphs, charts and curves together with advanced functions and individual configuration possibilities.

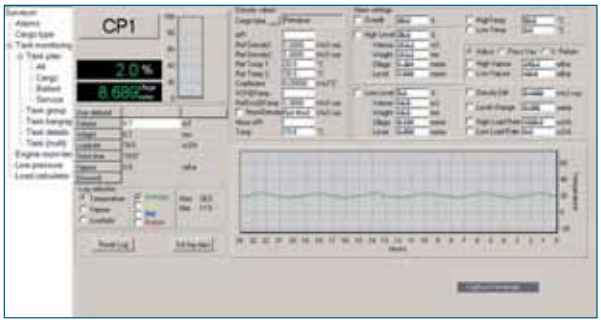
Loading calculator:
Simulation of loading plan.
Simultaneous indication of results of calculations.
Input and storage of cargo data.
Input and storage of ballast tank data.
Input and storage of service tank data.
Input/output of cargo data in:
- Cubic metres.
- Metric tonnes.
- US barrels.
- Long tonnes.
- Ullage -Sounding - Percentage of tank filling.

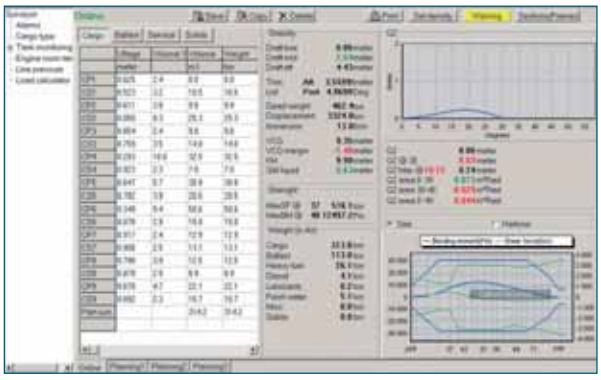
Input of cargo temperatures, each tank.
Off-line calculation for cargo planning.
Temperature expansion calculations.
ASTM tables calculation (API) for different ASTM-tables.
Draft survey.
Load and condition report.
Graphic presentation of ship conditions.
Reports - different cargo and presentation reports.
On-line connection to Surveyor level gauging system.

Calculations:
Calculation of intact stability for GM, KG, GZ, FSM.
Display and print out of GZ-curve and relevant areas.
Control of intact stability against actual stability requirements.
VCG and free surface effect of tanks are automatically calculated fordifferent loadings.
Calculation of DW total, displacement, trim, list, draft (dF, dM, dA).
Longitudinal strength calculations.
Damage stability by means of predetermined limiting Min GM or Max
KG-curves.

The SURVEYOR™ loading calculator features simultaneous ON- and OFF-line calculations with alarm display in case a current loading condition is different to the pre-planned one(s).







High velocity pressure /vacuum valve type MARK IV SuperGreen

The Mark IV SuperGreen high velocity valve is the result of dedicated research into creating the ideal compromise between loss of tank vapour and non-oscillating behaviour, all in a simple package that appeals to low maintenance. It features a combination of magnet power and air breaks, which are unique and patent applied for. It is truly non-oscillating as it complies with the two second no-metal-to-metal contact definition from ISO 15364:2007. At the same time, and this is the real accomplishment, it does not emit tank vapour to atmosphere unless the set-pressure is reached, at which point it will only emit excess pressure, unless a true emergency is happening when the primary full capacity unit will open.

INTERTANKO and others have estimated the VOC loss on the crude carrier to equal 0.25% of the cargo. The Mark IV SuperGreen can reduce VOC loss for all practical purposes to nil during voyage.

The vent features two discs: a small weight loaded one for thermal variations during voyage and a full flow valve for use during loading and special occasions.

Tank cleaning monitoring

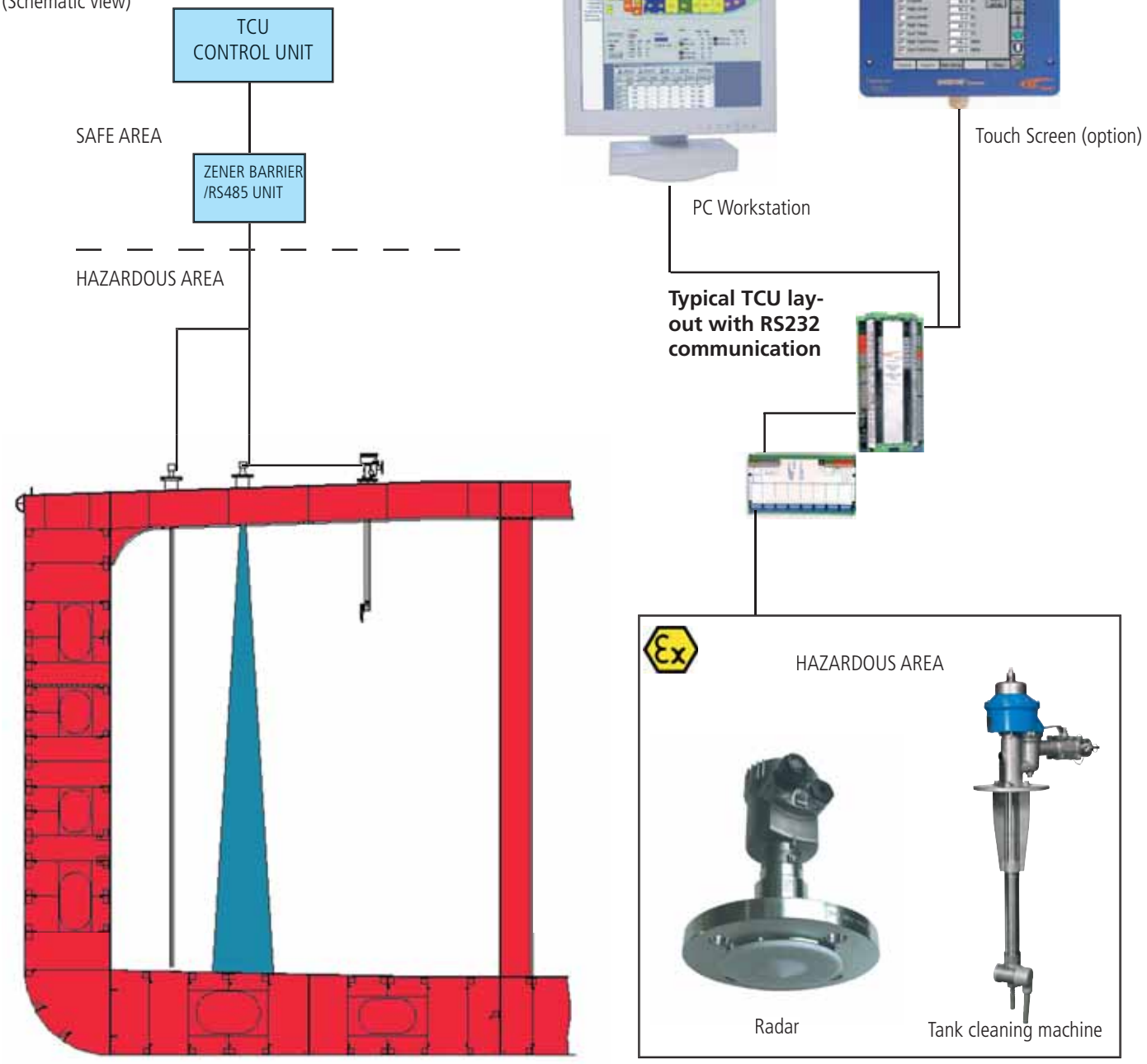
WashTrac™ Tank Cleaning Monitoring System
The innovative tank cleaning monitoring system WashTrac™ improves the efficiency and control of the tank cleaning procedure. Shorter turn around time in port, increases the profitability. Overview in real time gives the operator full control of the tank cleaning procedure.

With WashTrac™ there will be no downtime and no missed charters.

WashTrac™ Tank Cleaning monitoring system
Each Scanjet Tank Cleaning machine is equipped with a sensor that indicates when the machine is running. The sensor is connected to our Tank Radar gauge on deck.
There is no need for extra cabling in order to present the information on the Work Station.

Our Tank Radar gauge processes the sensors' signals and the status is transferred to the Work Station via the Supply and Communication Unit (SCU).

WashTrac™ Tank Cleaning monitoring system
(Schematic view)



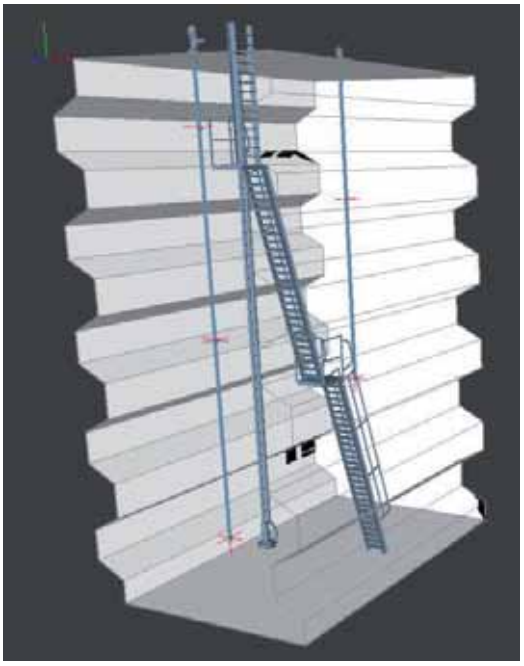
Engineering and aftersale service

Engineering
Our Project Department is able to assist you with installation proposals for all our products. For a Scanjet tank cleaning system we are able to assist with detailed system proposals including making of shadow diagrams ensuring that you will get an installation meeting your cleaning requirements. We deliver engineering consultancy services for large scale offshore projects and have solutions for clients across the globe. No matter if you need assistance in making a 3D model for your fabrication, complex and advanced piping systems with integrated automation and monitoring needs, valve, pump and heat exchanger systems we can be your reliable project partner.

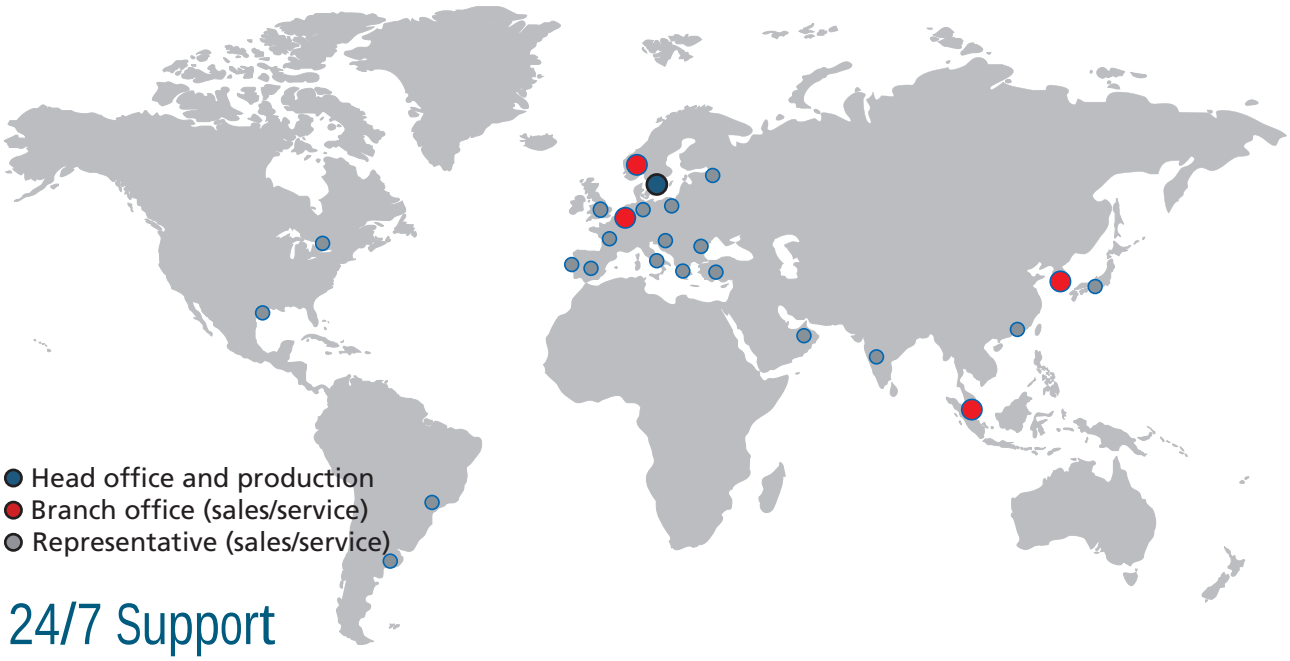
Aftersale service
Our experienced After Sales team is available to assist you with technical support, spare parts or service worldwide. With our network of Scanjet offices and Scanjet representatives we are able to quickly respond and assist you.

Tank cleaning machines are installed and operated in extremely harsh marine conditions.
In order to ensure continued safe operation of the Scanjet tank cleaning machines it is advised to follow given service instructions.

A Scanjet Service Kit supplies the operator with the essential parts that prolong the life of your tank cleaning machine and ensures safe, smooth trouble free operation.



Sales and Service



- Head office and production
- Branch office (sales/service)
- Representative (sales/service)

24/7 Support

For any installation there is an optimized Scanjet product.

Distributed and Serviced by...
Tank Cleaning Technologies, Inc.
15200 Middlebrook Drive; Suite E
Houston, Texas 77058 - USA
Phone: +1 281.480.4041
Fax: +1 713 516.5883
Email: sales@tankcleantech.com

www.tankcleantech.com

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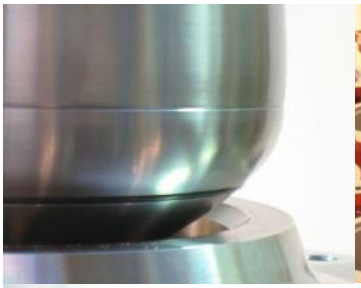
SCAN VENT




High velocity pressure/vacuum valve:

Type MARK IV SuperGreen

- No VOC/IG loss during voyage
- No seat and disc wear during voyage
- Approved for long small diameter vent line

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www.tankcleantech.com

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Scanjet / Scanvent

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V. 5.5 (08-14)

Contents

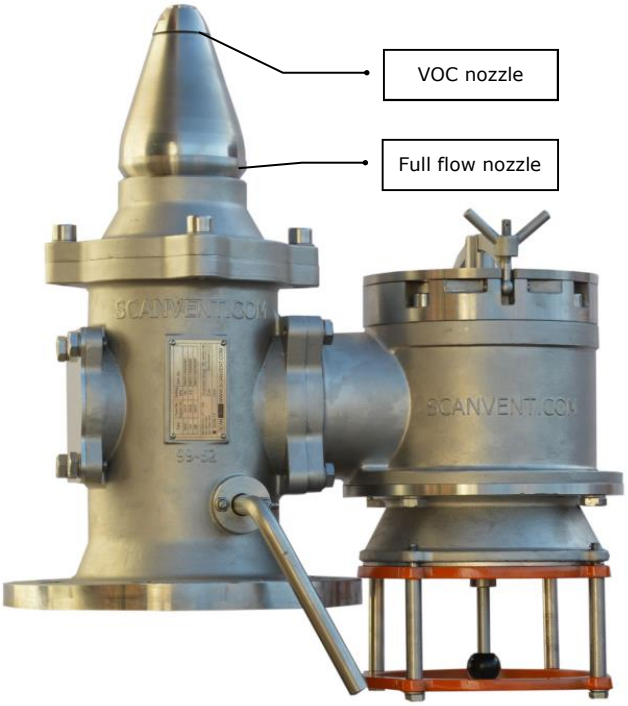

Dänemark - Deutschland - Dänemark

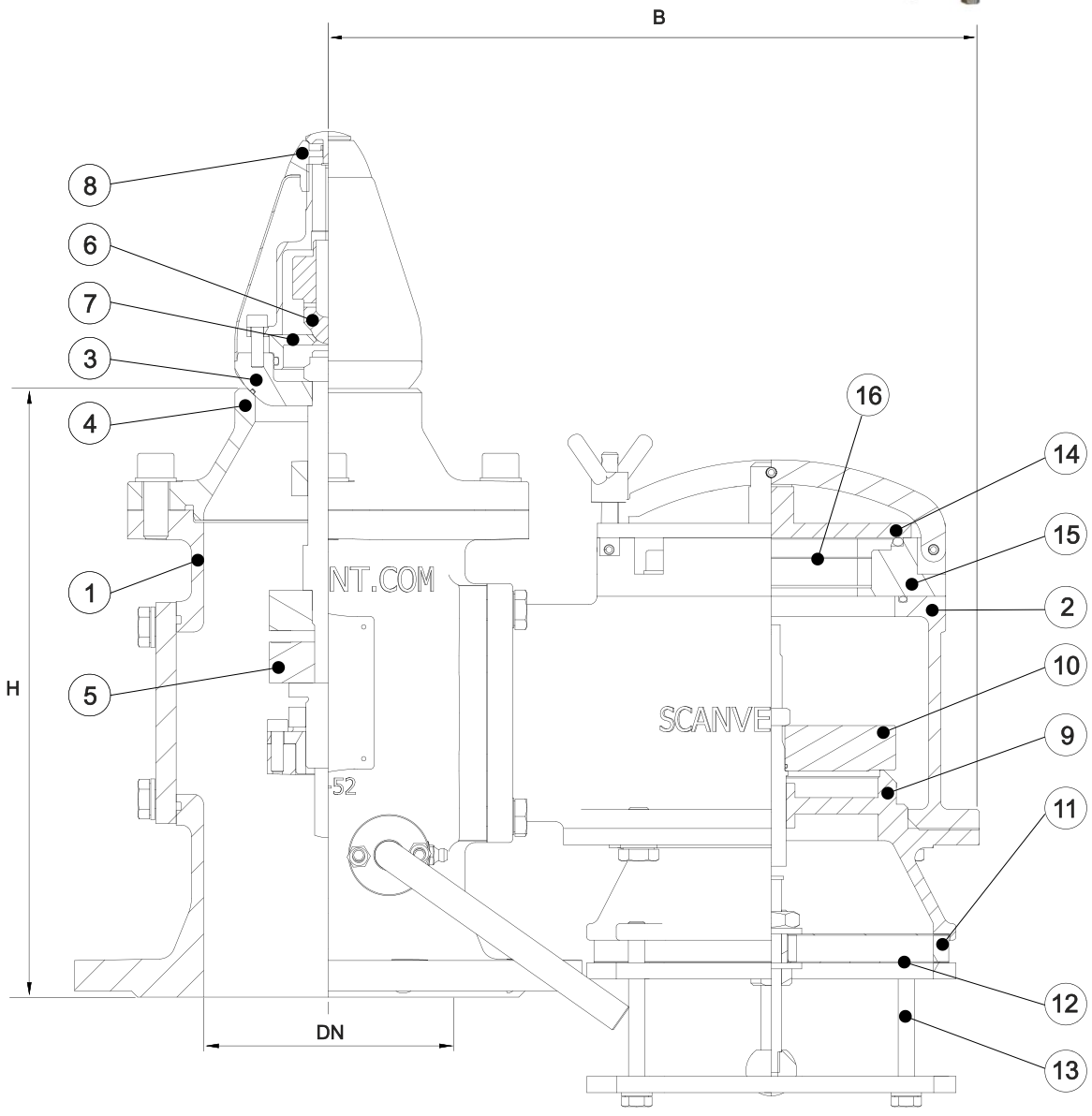
MARK IV SuperGreen

How it works

During voyage the VOC dedicated nozzle handles the small thermal venting volumes necessary for the integrity of the tanks. This valve re-seats at its opening setting and ullage space pressure, be it VOC or inert gas, is never lost below the VOC valve's opening pressure. This will be the Target Pressure according to IMO MSC/Circ. 680. During loading, the main valve opens to provide full capacity. Like any other valve.

The result of this simple but efficient design is optimum VOC handling and minimum use of the inert gas plant. See more info under *Nitrogen Savings*.





Bill of Materials

Item	Description	Spec 1	Spec 2	Spec 3
1	Valve house	Stainless steel	Bronze	Cast iron
2	Vacuum house	Stainless steel	Bronze	Cast iron
3	Primary pressure disc	Stainless steel	Stainless steel	Stainless steel
4	Primary pressure seat	Stainless steel	Stainless steel	Stainless steel
5	Magnet system	Encapsulated	Encapsulated	Encapsulated
6	Secondary pressure disc	Stainless steel	Stainless steel	Stainless steel
7	Secondary pressure seat	Stainless steel	Stainless steel	Stainless steel
8	Secondary nozzle	Stainless steel	Stainless steel	Stainless steel
9	Vacuum seat	Stainless steel	Stainless steel	Stainless steel
10	Vacuum disc	Stainless steel	Stainless steel	Stainless steel
11	Net ring	Stainless steel	Stainless steel	Stainless steel
12	Flame screen	Stainless steel	Stainless steel	Stainless steel
13	Optional cover	Stainless steel	Stainless steel	Stainless steel
14	Cover	Stainless steel	Stainless steel	Stainless steel
15	Gas-freeing cover (optional)	Stainless steel	Stainless steel	Stainless steel
16	Flame screen (optional)	Stainless steel	Stainless steel	Stainless steel

FACTBOX

Body material: Select on basis of corrosion properties of cargo. Advise: Stainless steel body is necessary only when the tanks are in stainless steel.

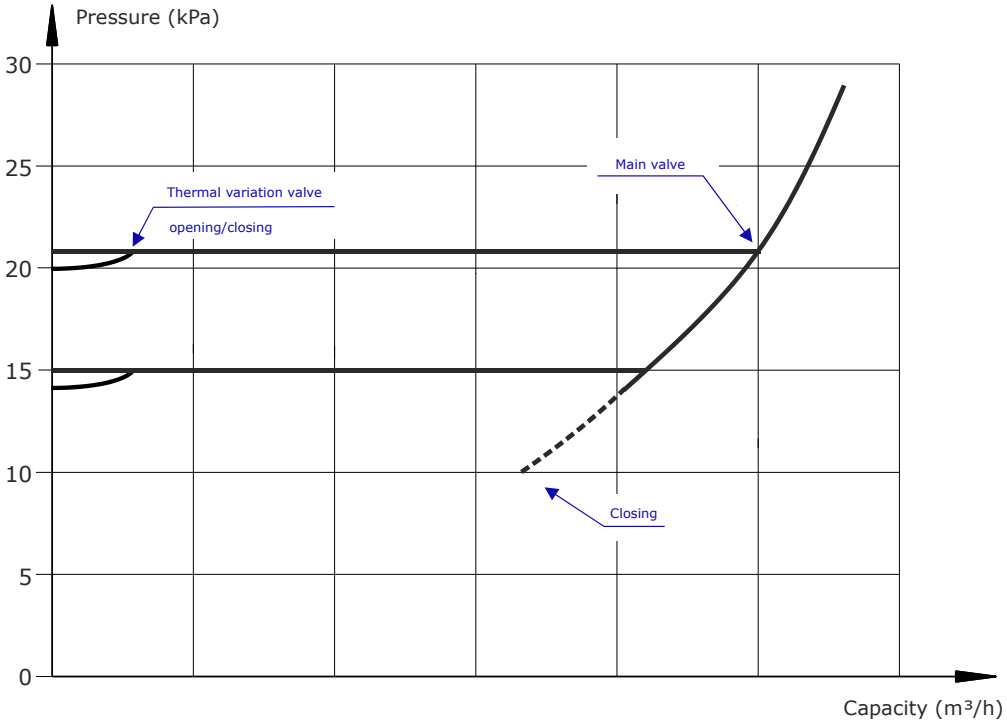
Trim material: Generally, regular stainless steel AISI 316 is sufficient. Wear on the pressure-seat/disc is concentrated on the small thermal variation valve.

Seat/disc material: Chlorides, sulphuric and carbonic acids are generally best served with seats and discs in a non-standard stainless steel, for instance a duplex quality or an off-shore spec SMO stainless steel. Resilient seat are not suitable for magnet—operated valves. As any wear will cause a smaller magnet gap, which results in a significant increase of the set-pressure.

Dimensions

Model	DN mm	DN inch	H (mm)	B (mm)
MARK IV HPHVV-1	65 - 80 - 100	2½ - 3 - 4	54	365
MARK IV HPHVV-2	65 - 80 - 100	2½ - 3 - 4	58	365
MARK IV HPHVV-3	65 - 80 - 100 - 125	2½ - 3 - 4 - 5	66	410
MARK IV-1	65 - 80 - 100	2½ - 3 - 4	360	360
MARK IV-1L	65 - 80 - 100	2½ - 3 - 4	376	365
MARK IV-1.5	80 - 100 - 125	3 - 4 - 5	430	360
MARK IV-2	100 - 125 - 150	4 - 5 - 6	520	440
MARK IV-2.5	100 - 125 - 150	4 - 5 - 6	575	440
MARK IV-3	125 - 150	5 - 6	600	490
MARK IV-3.5	150 - 200	6 - 8	625	525
MARK IV-4	200 - 250	8 - 10	775	660
MARK IV-5	200 - 250 - 300	8 - 10 - 12	890	775
MARK IV-6	300 - 350	12 - 14	950	880
MARK IV-7	300 - 350	12 - 14	1025	940

Pressure flow chart

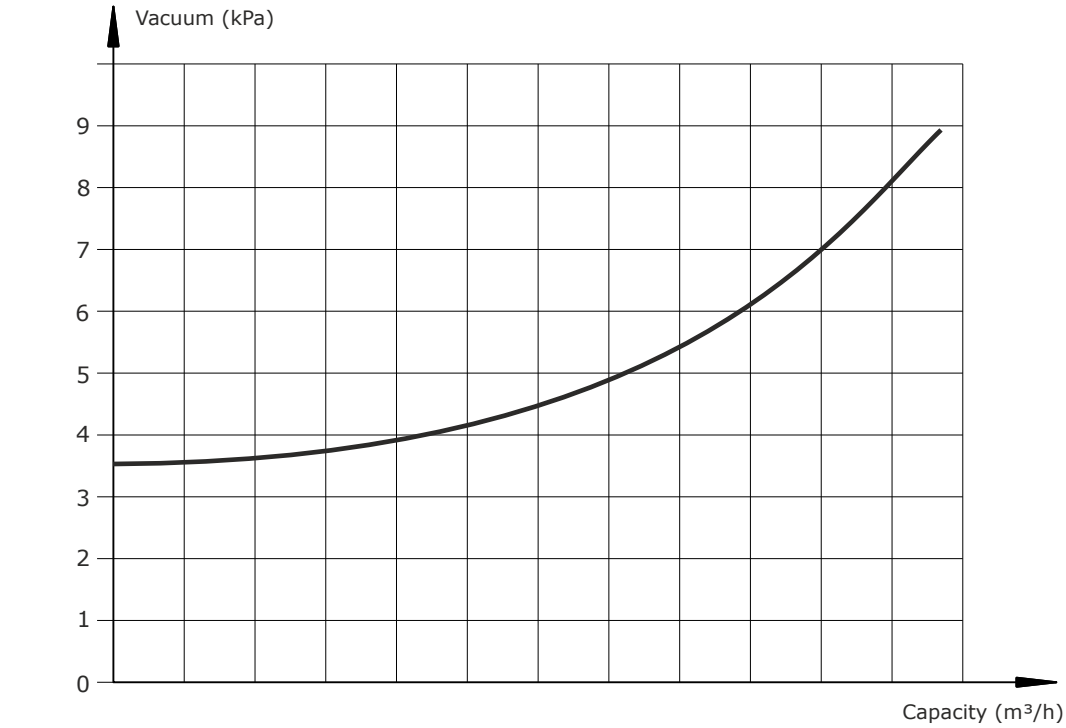


HVV-1L	0	80	160	240	320	400	480	IIB
HVV-1	0	170	340	510	680	850	1020	IIB
HVV-1.5	0	220	440	660	880	1100	1320	IIB
HVV-2	0	360	720	1080	1440	1800	2160	IIB
HVV-2.5	0	480	960	1440	1920	2400	2880	IIB
HVV-3	0	560	1120	1680	2240	2800	3360	IIB
HVV-3.5	0	700	1400	2100	2800	3500	4200	IIB
HVV-4	0	900	1800	2700	3600	4500	5400	IIA
HVV-5	0	1060	2120	3180	4240	5300	6360	IIA
HVV-6	0	1300	2600	3900	5200	6500	7800	IIA
HVV-7	0	1800	3600	5400	7200	9000	10800	IIA
HVV-8	0	2300	4600	6900	9200	11500	13800	IIA
HVV-9	0	2700	5400	8100	10800	13500	16200	IIA

Note: Interpolate for other settings

Chart is for standard air according to ISO 15364:2007. IIA and IIB as appropriate

Vacuum flow chart



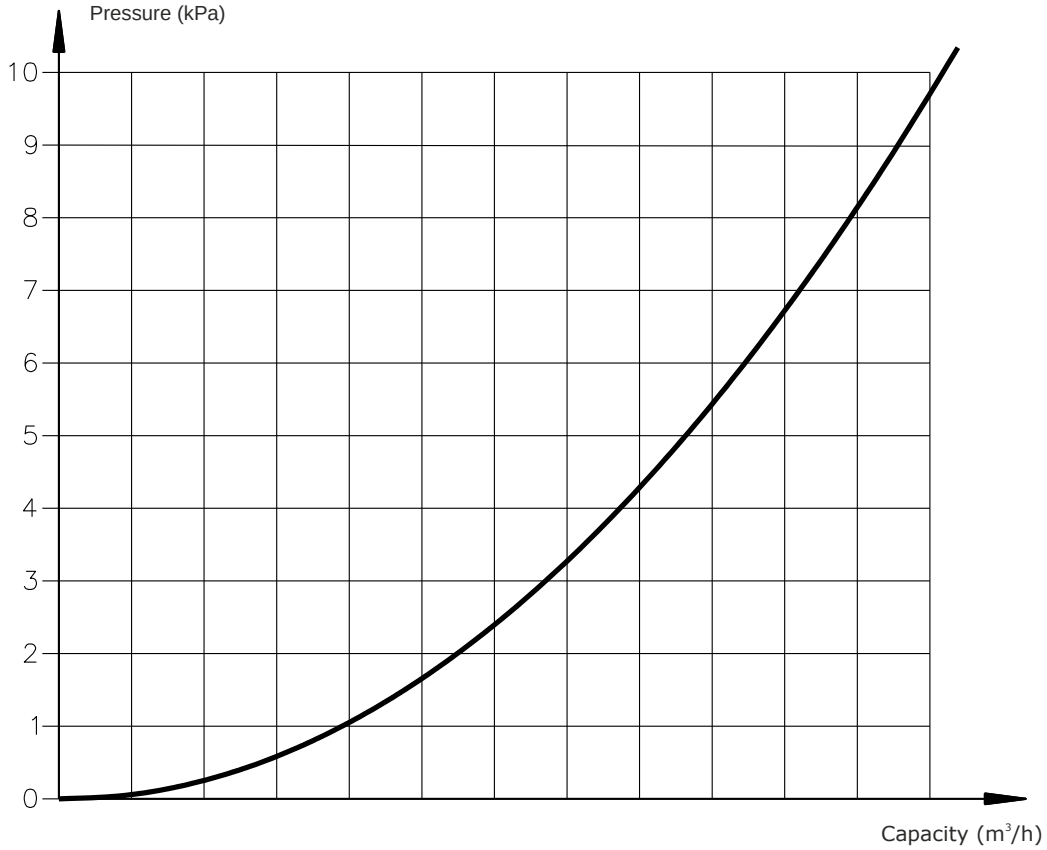
VV-1	0	100	200	300	400	500	600	IIB
VV-1.5	0	160	320	480	640	800	960	IIB
VV-2	0	200	400	600	800	1000	1200	IIB
VV-2.5	0	245	490	735	980	1225	1470	IIB
VV-3	0	420	840	1260	1680	2100	2520	IIB
VV-4	0	550	1100	1650	2200	2750	3300	IIA
VV-5	0	640	1280	1920	2560	3200	3840	IIA
VV-6	0	1000	2000	3000	4000	5000	6000	IIA

Note: Pressure valves can be fitted with two vacuum valves for added capacity.

Interpolate for other settings. Chart is valid for IIA and IIB.

Chart is for standard air according to ISO 15364:2007

Gas-freeing flow chart



GF 1	0	120	240	360	480	600	720
GF 1.5	0	180	360	540	720	900	1080
GF 2	0	220	440	660	880	1100	1320
GF 2.5	0	350	700	1050	1400	1750	2100
GF 3	0	440	880	1320	1760	2200	2640
GF 3.5	0	560	1120	1680	2240	2800	3360
GF 5	0	760	1520	2280	3040	3800	4560
GF 6	0	1000	2000	3000	4000	5000	6000
GF 7	0	1250	2500	3750	5000	6250	7500

Note: Valid for IIA and IIB

Chart is for standard air according to ISO 15364:2007

Valve solutions with heating

Electrical heat tracing

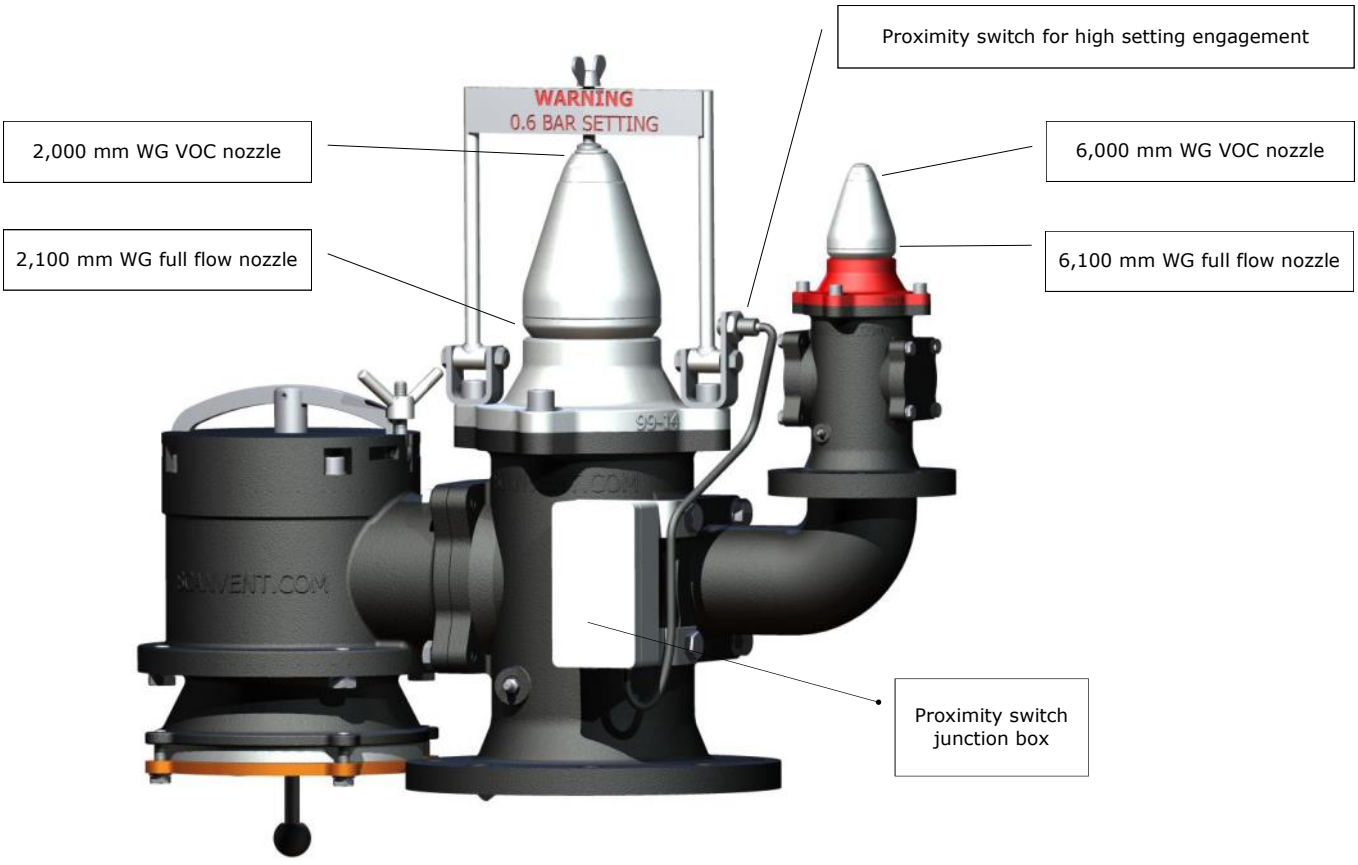
Heating with thermal oil or steam

6,000 mm WG setting for PO

To avoid cooling of PO the set-pressure must be elevated to 0.6 bar. This cannot be the standard set-pressure for all cargoes because the tanks might not withstand the combined stress of increased ullage space pressure and a high SG cargo.

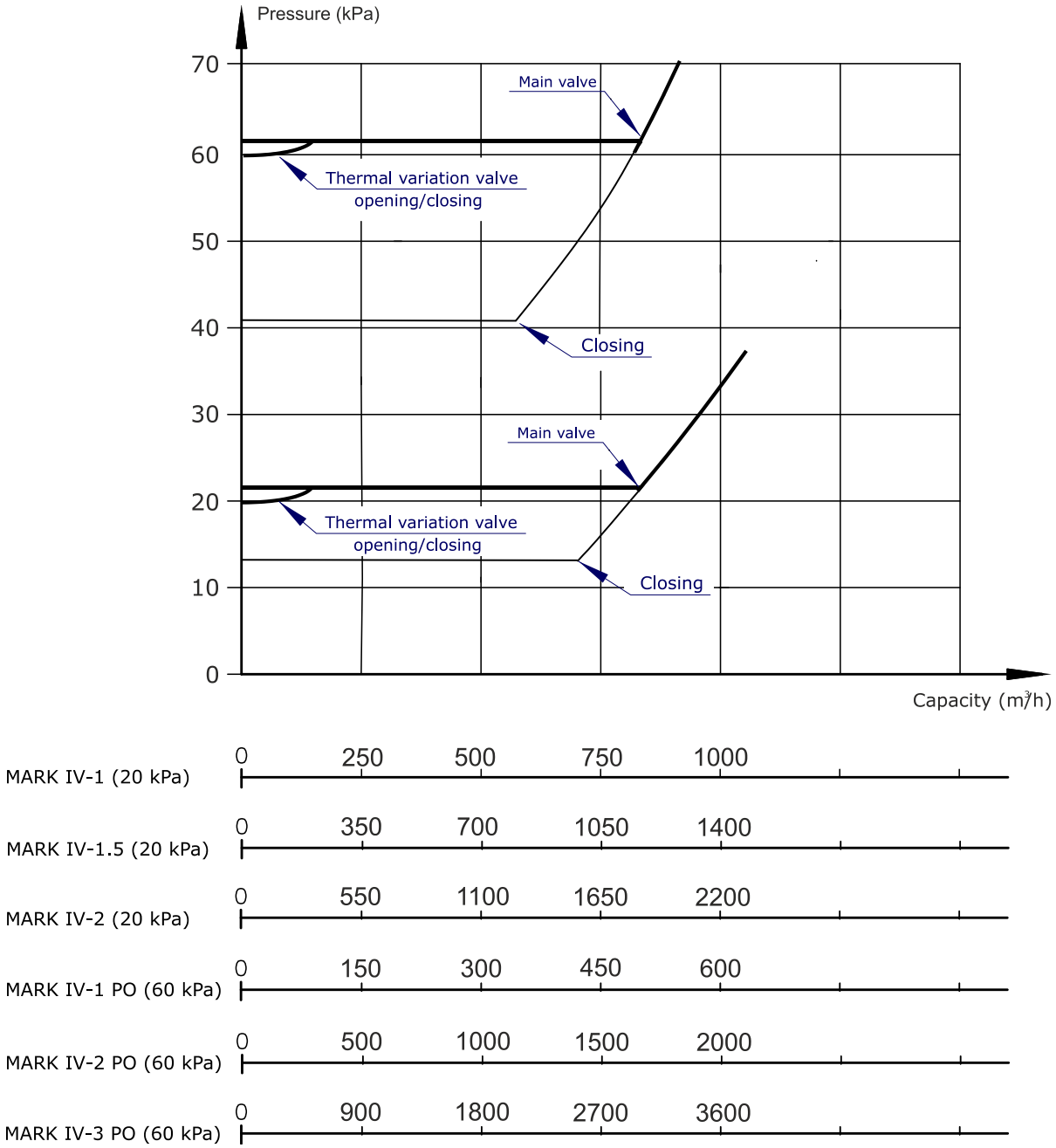
When increasing the set-pressure from 2,000 mm WG to 6,000 mm WG the capacity – in principle – increases 300%. This equals serious over-capacity and therefore risk of oscillation. Hence, the dedicated 0.6 bar valve is the smallest high velocity vent ever made, weighing in at less than 20 kg and therefore lighter than elongated valve housings and special stems, weights, etc. The Mark IV valve in 0.6 bar execution can be installed replacing the 0.2 bar valve or mounted in a combined unit. The latter is the most convenient solution and crew may completely avoid close contact with valve trim with traces of cargo. Moreover, gas-freeing is not necessary as dismantling is not required.

The integrated unit can be furnished a proximity switch to show at the bridge or cargo control room which setting is applied, 0.2 or 0.6 bar.



MARK IV SuperGreen—6,000 mm WG solution for PO

Flow chart for 6,000 mm WG version



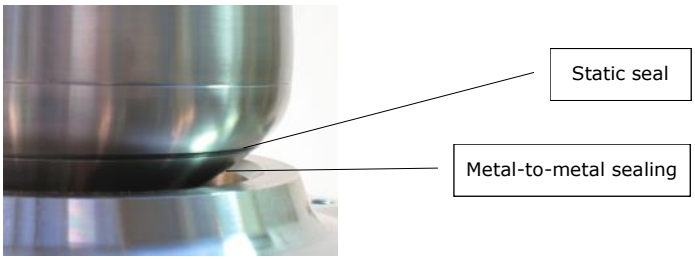
Note: Chart is valid for IIA and IIB.

Chart is for standard air according to ISO 15364:2007

Special features

Bubble-tight performance

A static seal is applied to prevent stray emission. The actual sealing of the valve is the metal-to-metal seat/disc only. According to ISO 15364, the leakage rate to be informed to the user is established at 80% of the set-pressure. The Mark IV valve is bubble tight at this pressure because the leakage would only be possible from the VOC nozzle, which is less than 5% of the full flow seat in terms of size. Applying the static seal renders the valve perfectly bubble-tight at 95% of the set-pressure. See video on our webpage.



FACTBOX

We have maintained metal-to-metal seat/disc arrangements rather than resilient seals for two reasons:

- Valves with resilient seals must be fire tested with the seals partly damaged, which is impossible to manage if administered correctly; flame will circumvent the damaged seal and cause flash-back.
- Resilient seals that yield over time will cause the disc to sink, which again causes an increase of the magnet power, thus an increased setting. When calibrating the magnets, adjustments are made in 1/10 mm steps, so a damaged resilient seal may easily cause the set-pressure to increase to an unacceptable level triggering alarms or worse.

On our webpage you can see two video sequences showing the unavoidable leakage rate from the industry standard spherical seat/disc arrangement and for the same but with a static seal blocking gas from escaping the seating surface. The lifetime of the seal is impressive because the o-ring is a static installation: the weight of the disc is still carried by the metal seat and does not compress the o-ring.

The o-ring is a readily available industry standard in NBR or Viton and is easily replaced when needed, for instance when the valve is cleaned, and a safety pin can be inserted to allow one crew member to perform the replacement while doing the regular cleaning. Kalrez or similar for small bore valves for chemicals is available.

Valve without static seal

See video on www.scanvent.com

Valve with static seal

See video on www.scanvent.com

Samarium Cobalt magnets

Over the years the prevailing magnet material used in p/v valves was cheap, ferrite based compounds. These were prone to extreme corrosion if the epoxy protection failed. Later, for chemical carrier applications, stainless steel encapsulated Neodymium magnets were used, which are vulnerable to low and high temperatures causing permanent damage, i.e., loss of magnet power. This is relevant in arctic conditions or where valves are heated and/or used for heated cargoes.

AISI 316 encapsulated magnets

Currently, the ideal magnet material appears to be Samarium Cobalt, which we are now using exclusively in stainless steel encapsulated units.

For a simple but to-the-point comparison, please refer to: *www.wikipedia.org/wiki/samarium-cobalt_magnet*

The lifetime of the S-C magnets without power loss will surpass that of the tanker.

Minimizing stray emissions

Definition of leakage rate

All seat/disc systems suffer a certain leakage rate. That's the unpleasant reality and why ISO 15364:2007 for marine p/v valves Section 6.1 reads:

> *"The maximum gas leakage rate shall be provided and expressed as the volume in standard air that may leak from the valve at 80% of the nominal setting."*

A seat/disc is so sensitive that a human hair will cause a leakage rate that can be felt at the tip of your finger. Obviously, as hardened sot and other particles pass and with the seat and disc slamming against each other, the leakage rate will gradually increase.

When SCANVENT staff first worked with leakage rates some 20 years ago, this resulted in portable test rigs and test procedures. Resilient seals were brought into the picture to reduce leakage rates, but when spherical seats/discs came 10 years ago, the leakage rates were dramatically reduced and things went back to metal-to-metal arrangements. Resilient seals are simply not suitable for use on sea-going tankers; the environment is harsh, cargoes are corrosive, and the valves are constantly moving with the ship.

The below procedure is applicable for the most used valve type with a spherical arrangement and shows an ISO 15364 Section 6.1 leakage rate of 4 liters/min from a VLCC suitable valve.

Leakage - Pressure drop

tank size 90 liter
temp 20 degrees C

valve size, pressure side	Max allowable leakage, litres	Max allowable pressure drop			
		Mbar	PSI	mmwg	mmHg
1	1	11	0,2	111	8
2	1	11	0,2	111	8
3	1	11	0,2	111	8
4	1,5	17	0,2	167	13
5	2	22	0,3	222	17
6	2,5	28	0,4	278	21
7	4	44	0,6	444	33

Competition's allowed leak rate at 80% of set-pressure.

With a Scanvent static seal the leak rate is zero for all practical purposes.

Definition of VOC loss rate

Industry studies headed by Intertanko suggest a total VOC loss rate during voyage of 0.25% of the cargo. This is not the 4 liters stray emission mentioned above! All full-lifting valves have a blow-down, i.e. the difference between opening and closing pressure. Due to the requirements for non-oscillating performance, the blow-down must be quite large and is often 50-70% or more of the opening setting. Every time such a valve opens, be it because of thermal expansion or sloshing, the ullage space pressure is reduced accordingly, bringing the tank pressure below the vapor pressure of volatile gases such as Methane (a super ozone-depleting gas 16 times worse than CO_2). Then the cycle repeats itself. The same happens when a mast riser valve is opened too early and/or shut too late.

What the SCANVENT design brings

The secondary valve will release over-pressure only; it has no blow-down. Its capacity is relatively small and sized to take care of in-voyage venting needs only. So, put differently, the tank pressure never reach the set-point of the primary valve and therefore de-pressurization of the ullage space does not take place.

The VOC Management Plan can state, "No VOC release below the VOC valve's set-point (= Target Pressure) takes place during voyage and therefore the in-voyage VOC handling cannot be further improved as it equals only what must be released for the integrity and safety of the ship."

VOC efficient operation

How the VOC valve works

Voyage

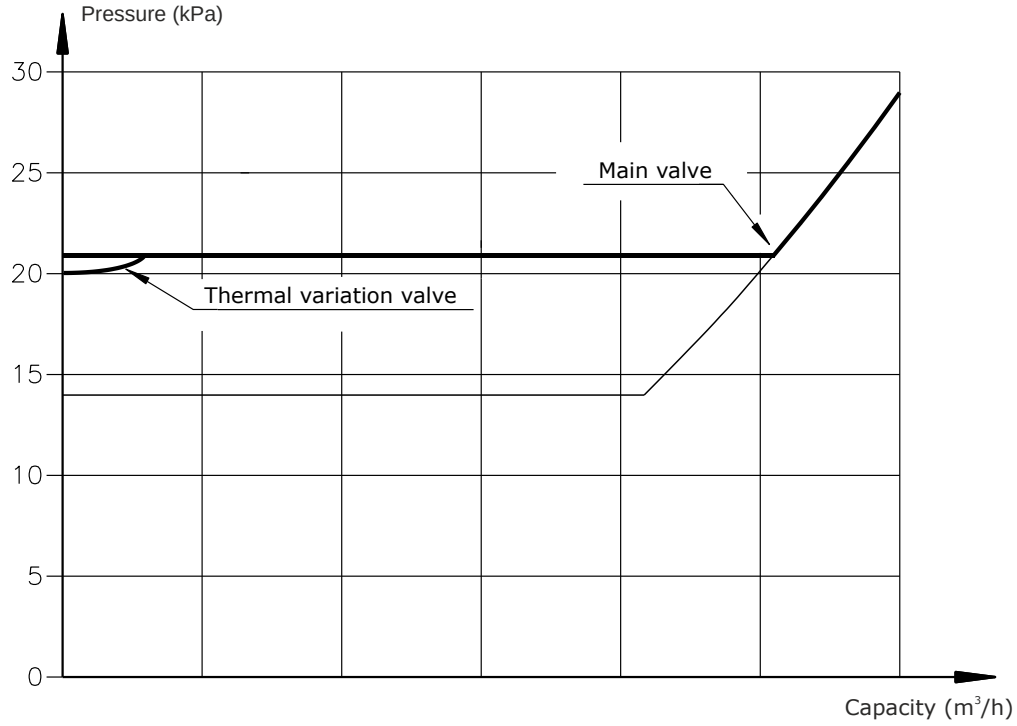
Only the modulating valve operates. VOC or Nitrogen loss is limited to the bare minimum that must be vented to protect the tank.

Loading

Full capacity is available without any pressure increase.

Closed

The net closing pressure is always 10%.



VOC management plan—IMO MSC/Circ. 680

Old pratice

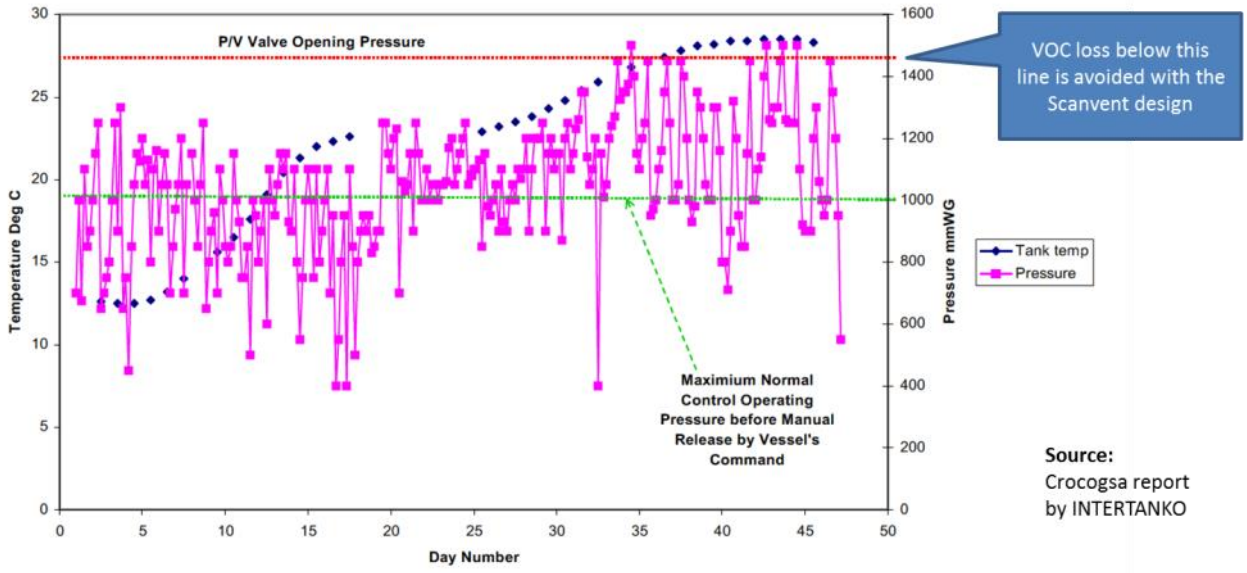
It is established by an industry work group (Crucogso) that traditional **in-voyage** venting procedures involving Mast Riser releases cause loss rates up to 0.25% of the cargo transported because of excessive lowering the ullage space pressure. The study shows that manual releases are made because of crew distrust in venting equipment. The operation typically entails opening the main by-pass at 1,000 mm WG and shutting it at 400 mm WG, just above the low-pressure IG alarm. This creates a vicious circle with never ending vaporization of volatile gases. Methane being the predominant one with Ozone depleting characteristics many-fold that of CO_2.

The loss rate of 0.25% does not sound like an awful lot, but at the end of the day it equals six laden VLCCs and sud-denly the number becomes a lot in terms of invincible pollution and loss of finite resources.

VOC loss **during loading** is more modest. Depending on the pre-loading IG pressure and cargo characteristics, at a certain point of loading (typically 90% full), cargo vapour is vented rather than inert gas, unless of course the ship is attached to a vapour emission control system (VECS). Therefore, the main VOC loss challenge relates to the in-voyage loss.

Maintaining a higher in-voyage tank pressure is described in IMO MSC/Circ. 680 as the way ahead for existing ships. This is precisely what SCANVENT's new valve design is made to do.

The following chart shows the typical VOC loss during voyage caused by manual release or the high blow-down of a conventional valve because venting takes place below the true vapour pressure of volatile gasses. Refer to vapour pressure chart on next page.



VOC regulations

IMO has mandated a VOC Management Plan according to IMO MSC/Circ. 680. It is not laid out to reduce emissions to specific levels, only to make sure that the crew has a way forward to reduce losses and for the cargo owner to be aware of the solutions chosen.

The VOC regulations follow from Regulation 15.6 of the Revised Annex VI of MARPOL 73/78:

> *1.4.2. The ship should define a target operating pressure for the tanks. This pressure should be as high as possible and the ship should aim to maintain tanks at this level during the loading and carriage of relevant cargo.*
>
> *1.4.3. When venting to reduce tank pressure is required, the decrease in the pressure in the tanks should be as small as possible to maintain the tank pressure as high as possible.*

The following chart shows that the "problem area" is below 2,000 mm WG:

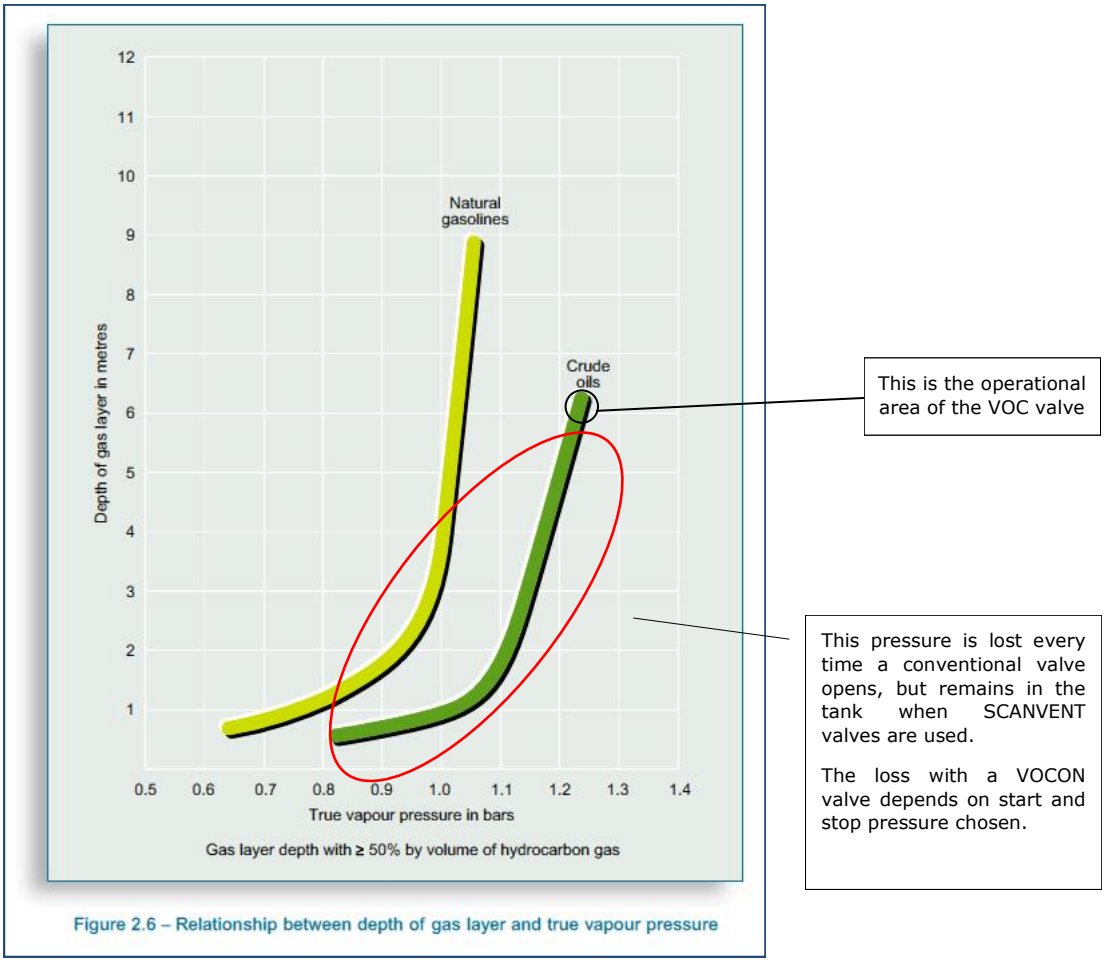


Figure 2.6 – Relationship between depth of gas layer and true vapour pressure

Source: OCIMF—5th edition

Old and new approaches to VOC loss voyage

Alternatives and cost

The only well-functioning alternative to the Scanvent system is a gas-reabsorption system (Venturie, GBA), but the cost is much higher. A controlled venting system via the mast riser has effect but far from the level otherwise achieved.

Issue	New building		Existing ships	
	Cost	VOC saving	Cost	VOC saving
Scanvent	No extra cost: same as conventional valves but less for maintenance	Zero loss below target pressure	Market price for individual p/v valves	Zero loss below target pressure
Remote controlled mast riser valve	USD 50,000 + maintenance	Saves VOC loss from 800 to 400 mm WG ullage space pressure	USD 50,000 + maintenance	Saves VOC loss from 800 to 400 mm WG ullage space pressure
Gas re-absorption system	USD 500,000 + maintenance + operational cost	Zero loss below target pressure	USD 500,000 + maintenance + operational cost	Zero loss below target pressure

Current practice

Involves the VOCON procedure. In short, the principle is to vent only what is deemed necessary and shut down the process earlier than past practice calls for. In real life this is done by halting the release when the rate of pressure reduction flattens, indicating that on-going boil-off is being vented.

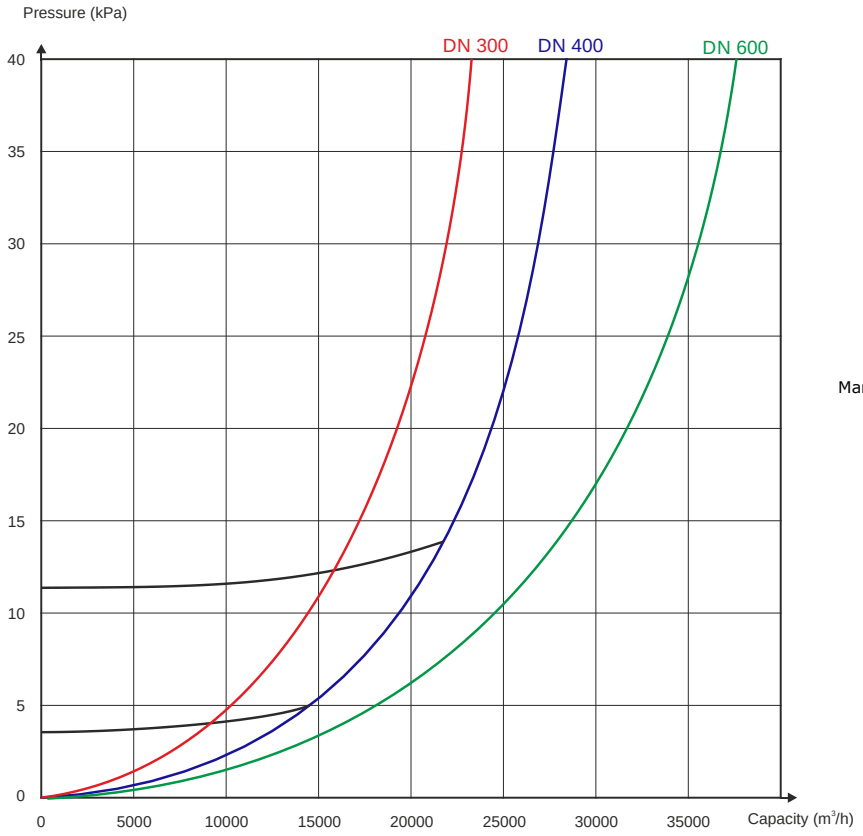
Typically, manual release would then halt at 7-800 mm WG rather than 400 mm WG, and some improvement at no cost is achieved.

An automated version of the VOCON procedure can be fitted by means of an in-line by-pass valve on the mast riser. It should of course open earlier than the individual valves, which are typically set at 1,400 mm WG, and a reasonable opening setting for the by-pass valve would then be 1,200 mm WG. If hydraulically operated, the blow-down is controlled and it can re-seat at a pre-determined tank pressure, say, 800 mm WG. The VOC saving, however, is insignificant compared to the Scanvent system.

Mast riser system

VOCON suitable in-line by-pass valve

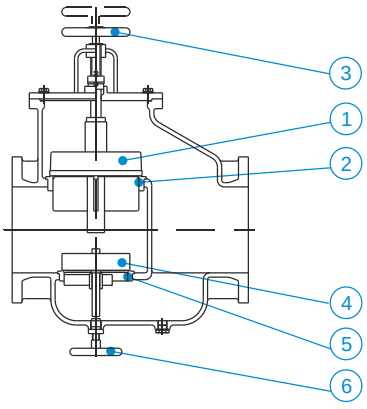
The below system is being fitted by SCANVENT on 8 VLCCs (as per May 2012).



Manual VOCON valve

Mast riser pressure valve type N-VOCON:

- Sizes from DN 250 to DN 500
- Lockable—optimized for use in connection with high velocity vent type MARK IV Super-Green
- Weight loaded/booster plate, magnet-operated or controlled via PLC



Mast riser pressure/ vacuum valve type TG:

1	Pressure disc
2	Pressure seat
3	Checklift (pressure)
4	Vacuum disc
5	Vacuum seat
6	Checklift (vacuum)

Remote controlled VOCON valve

Best practice for VOC handling

During loading

Only a Vapour Emission Control System (VECS) can make a difference. A gas re-entry system (GBA, Venturie et al) may help to control gas evolution and so may other systems, such as increased drop line diameter (KVOC) to minimize splashing, but with the steadily increased used of VECS around the world, losses during loading is not a concern in future.

During voyage

The main contributing factor behind the estimated 0.25% loss of cargo is venting equipment designed to vent as much as possible. In principle, plugged tanks would solve the problem but that is of course out of the question. STENA have tried a virtuel "plug" by increasing the max working pressure from 0.14 bar to 0.60 bar and have no doubt succeeded in eliminating the in-voyage VOC loss, but at the cost of added steel.

Others, such as SAMCO, have carried out tank pressure readings on a number of ships for years to gain representative data on tank pressure figures. It turns out that the tank pressure, when left to its own devices, travels between 500 and 1,800 mm WG. This is key to the approach of SCANVENT: tank test pressure is 2,500 mm WG and the liquid filled breaker is often set at 2,100 mm WG with the high pressure alarm just below that. Some valve types generate 30-40% pressure increase before yielding full capacity, so a standard setting of 1,400 mm WG does not mean that the tank pressure stays that low; it often goes to 1,800 mm WG before the valves start to de-pressurize the tanks. The SCANVENT valve has no pressure increase and therefore the full pressure range is used to conserve vapour.

Conclusion

A valve that opens at 1,800 mm WG and works without the tank pressure reaching 1,900 mm WG and never drops below 1,800 mm WG would solve the industry's VOC challenge. – This is exactly what the new SCANVENT design is all about! As the below OCIMF chart shows, key is to avoid venting below 1,800 mm WG and any VOC loss is eliminated for all practical purposes. Period.

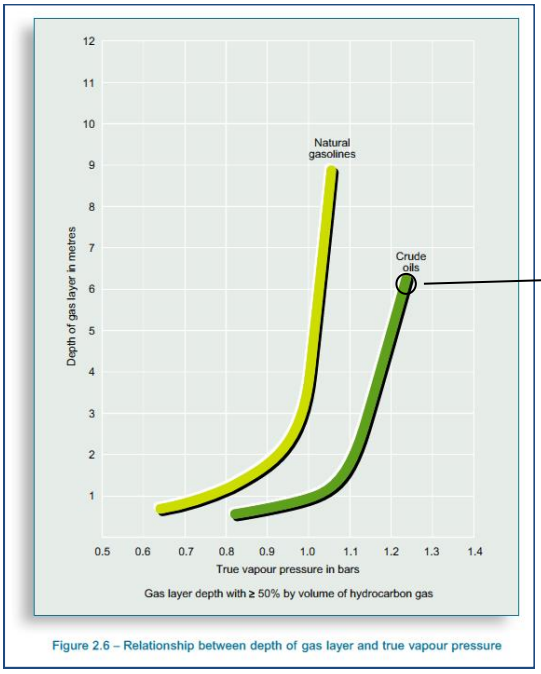
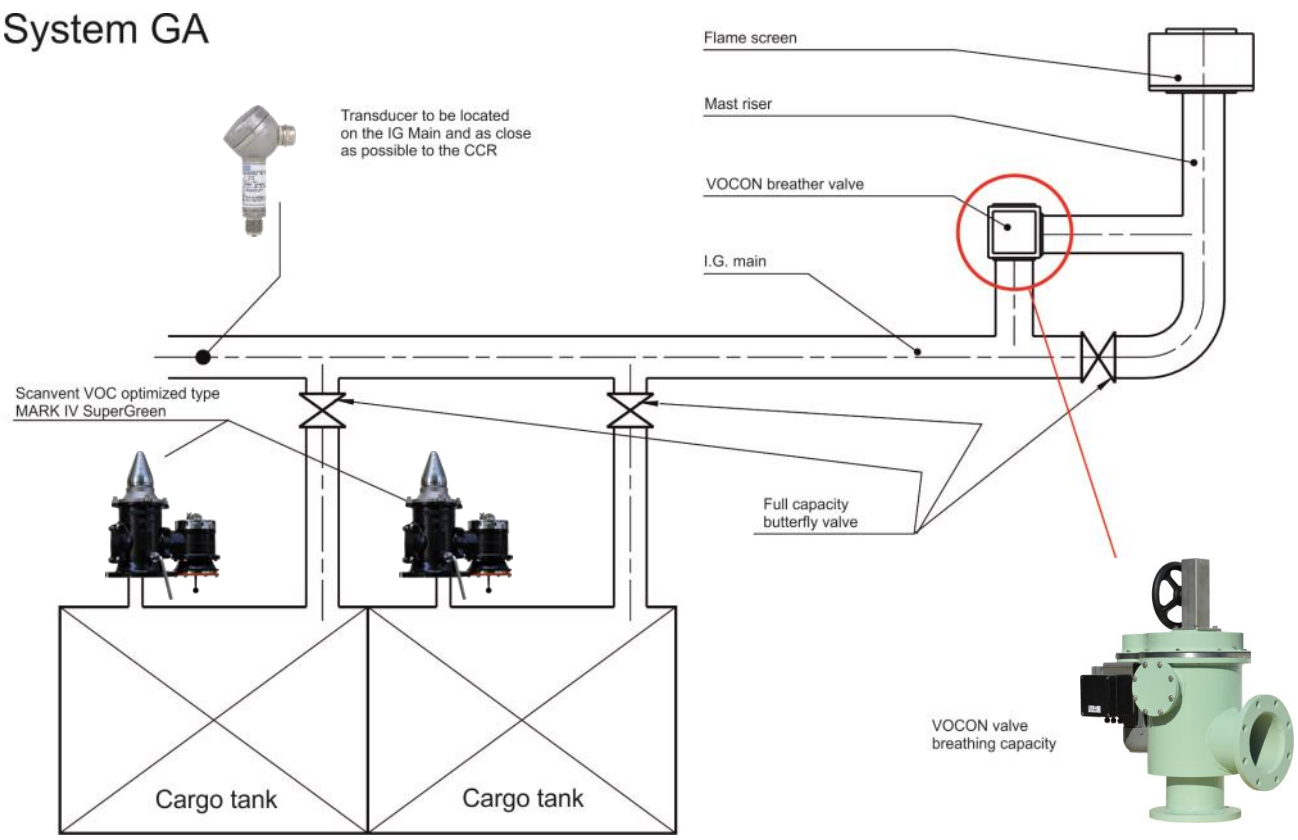


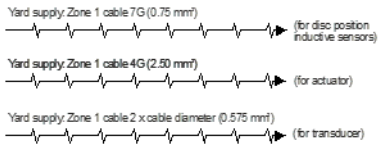
Figure 2.6 – Relationship between depth of gas layer and true vapour pressure

This is the operational area of the VOC valve

Source: OCIMF—5th edition

VOCON breather system



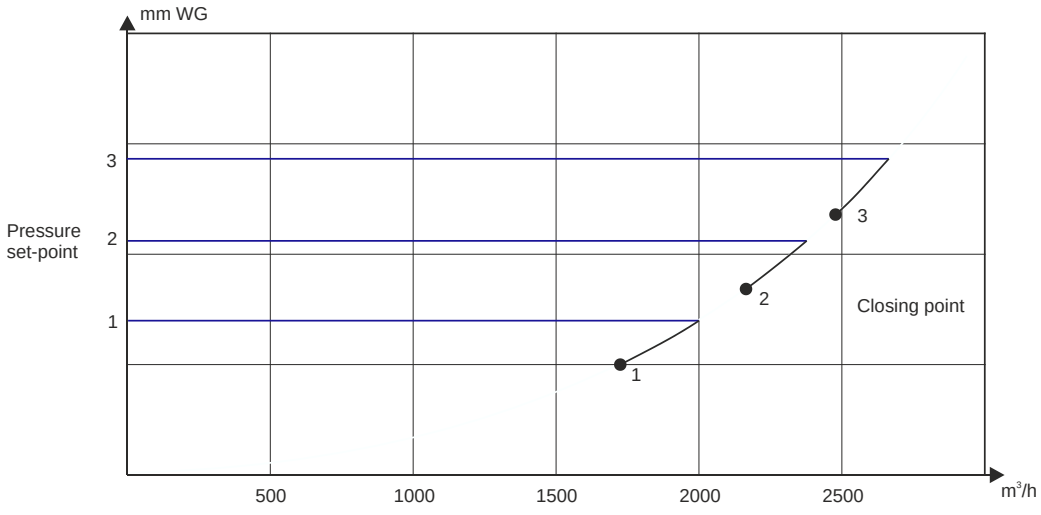


Main specification

VOCON valve DN 150 (breather)

- Pressure transducer EX approved
- Electrical actuator EX approved
- PLC with cabinet and frequency Convertor
- Programmable opening/closing pressure
- Constant electrically locked/standstill heating
- Manual emergency opening and closing
- Programmable opening and closing speeds

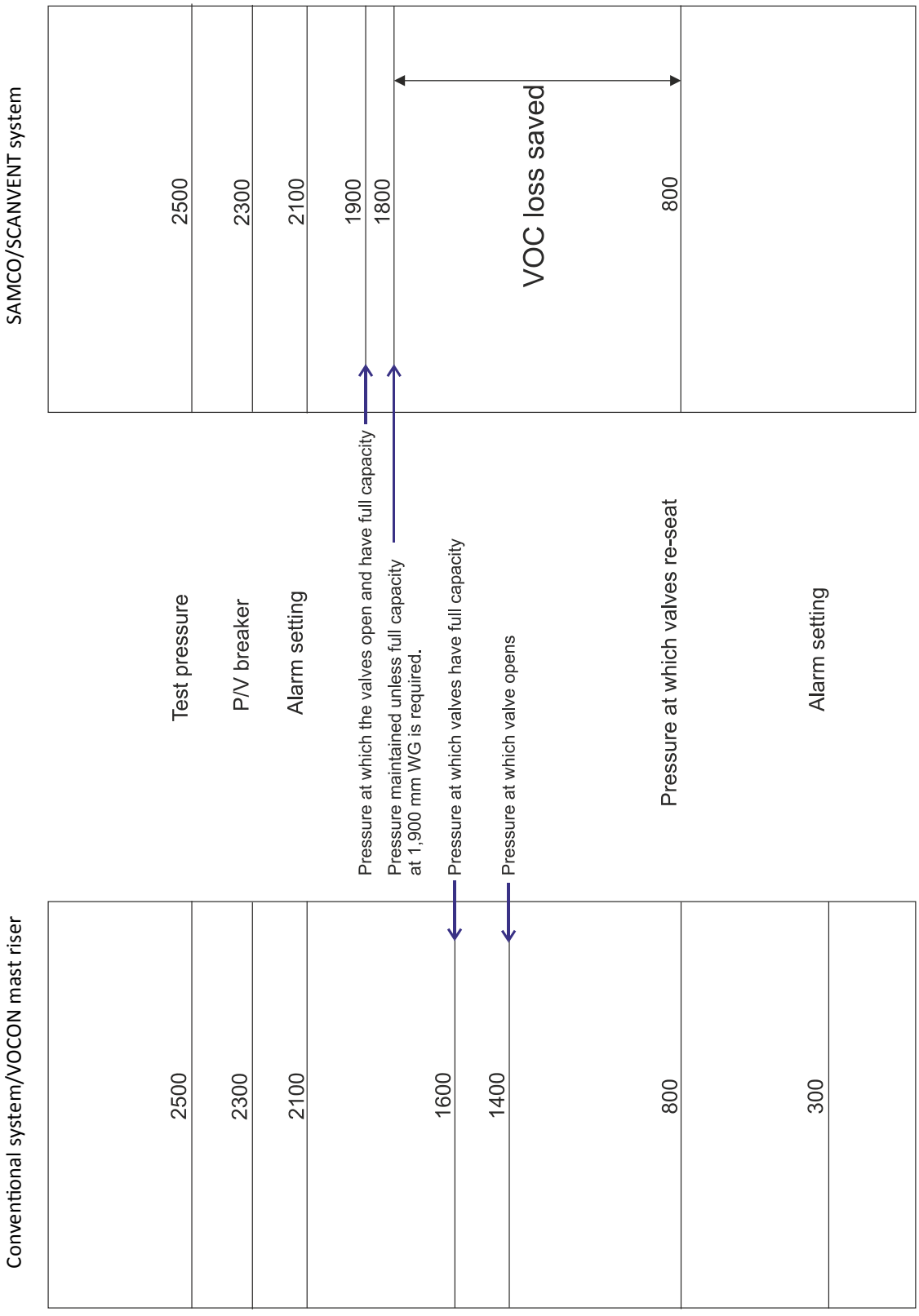
Flow Curve



Scanvent VOCON valve

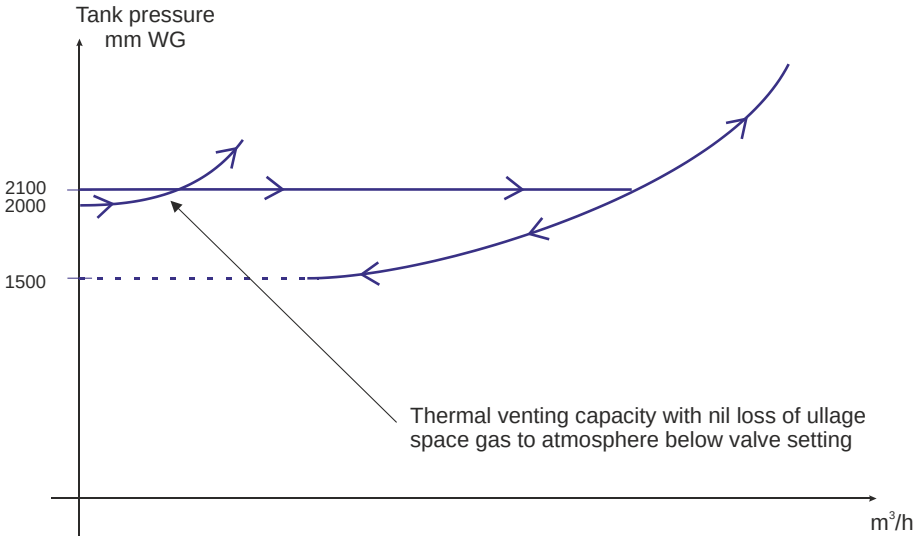
- Ex approved e-actuator solution with frequency converter and PLC in CCR
- Valve disc closing pressure maintained constantly by e-actuator, which also functions as stand-still heating
- Opening setting and closing pressure are programmable
- Disc lift time is programmable to allow a minimum blow-down
- Check-lift function from CCR
- Manual opening and closing
- Self-closing in case of power failure to maintain IG pressure

VOC handling—comparison between systems

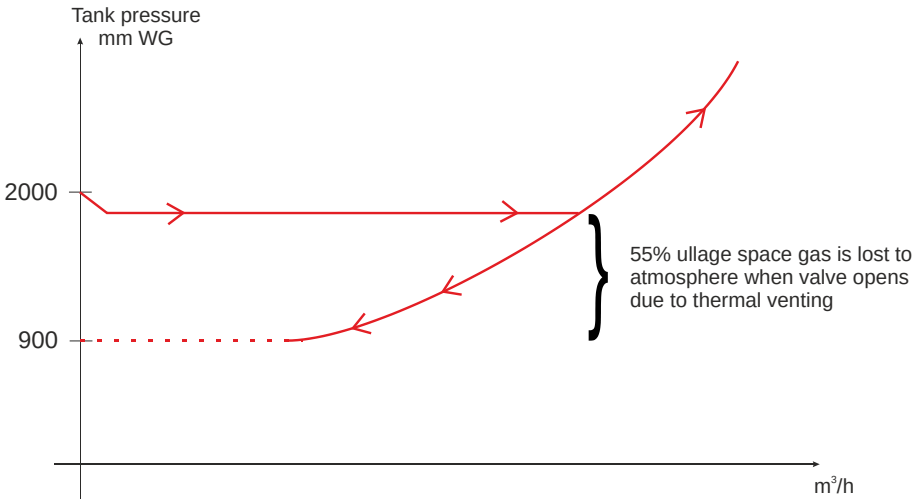


Graphic comparison—import of valves blow-down

SCANVENT type MARK IV SuperGreen



Conventional valve



Reducing VOC loss may conflict with valve design regulations

FACT BOX

New regulations in conflict with VOC concerns

With ISO 15364:2007 came a new definition of non-oscillating, namely minimum 2 seconds between metal-to-metal contact whenever the valve is open for the intended length/ diameter of vent piping. The obvious way to meet the new requirement is to increase the difference between opening setting and closing pressure (blow-down), for instance by employing more magnet power or larger diameter booster plates to keep the valve disc airborne on reduced flow rates. Regardless, this is counter-productive when it comes to saving VOC; the more blow-down the more VOC loss.

Meeting the 2 seconds requirement left conventional designs VOC ineffective. The loss rate is higher now than it used to be, which is not what one would expect.

Put differently, the SCANVENT design is based on the realization that a small blow-down cannot be achieved unless a pilot valve design is used, which is complicated and cost prohibitive. Hence, the SCANVENT design aims for a very high blow-down, which is not a concern since the dedicated VOC valve will release only the gas volume that must be released for safety reasons.

The term non-oscillating is derived and developed from the concept of "non-hammering", which was coined when IMO MSC/Circ. 677 was adopted. In early days, the approval criterion was left with the manufacturer. He had to decide whether the valve could take the chattering, fluttering, hammering that occurs when the feeding rate to the valve through the piping is insufficient to keep the valve open. Not surprisingly, most manufacturers were optimistic and decided that the equipment could take any kind of beating.

The phenomenon of non-oscillating is simple and known for ages. If the pressure drop over the piping exceeds the blow-down of the valve, the discs drops down regardless of the tank pressure. The trick is to keep the valve open without emptying the ullage space more than needed to safeguard the integrity of the tank.

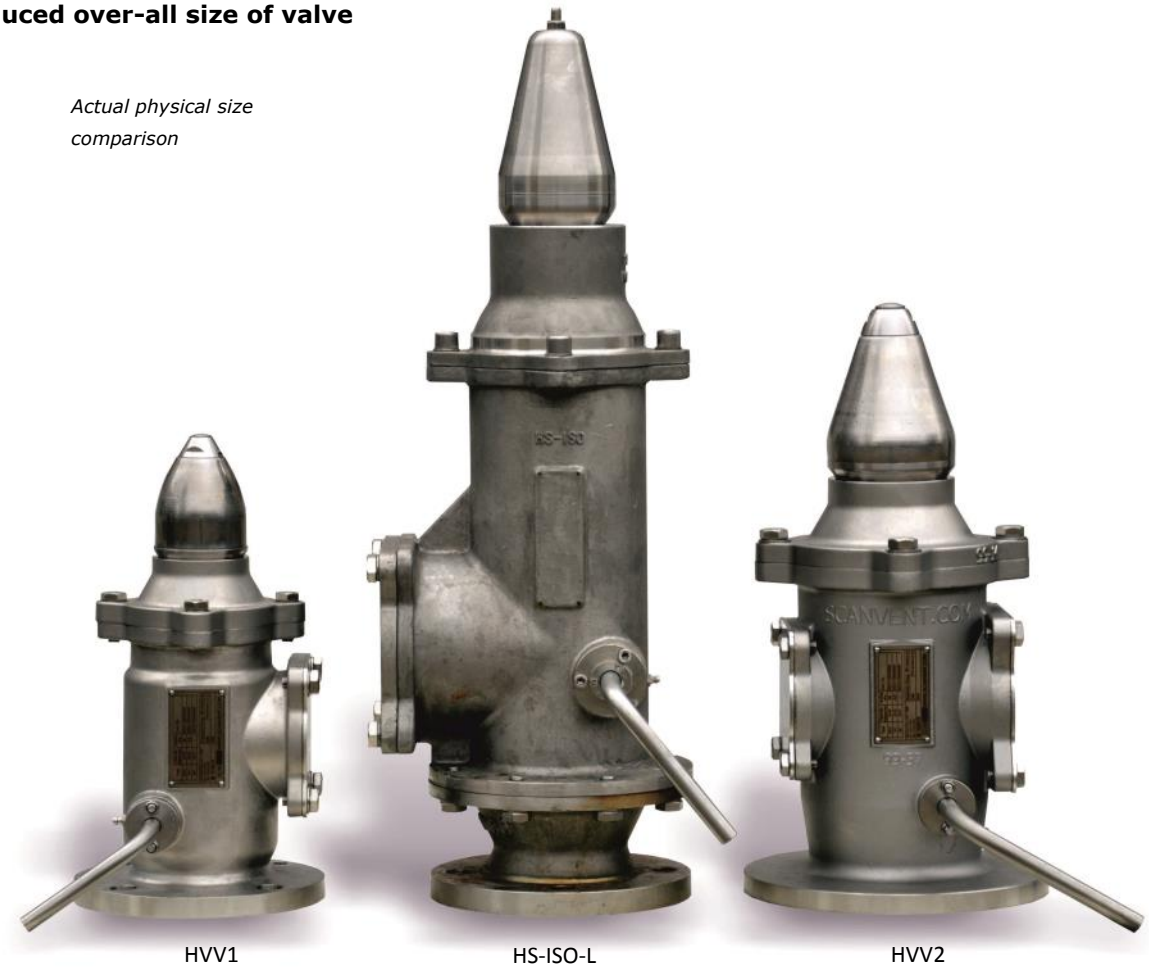
Pipe diameter savings

The huge capacity gained with Mark IV results in dramatic pipe saving for yards:

Issue	Conventional design	SCANVENT type MARK IV
Design year	2001	2010
Design code	Non-hammering	Non-oscillating
Blow-down voyage (mm WG)	2,000 ⇨ 900	2,000 ⇨ 2,000
Blow-down loading (mm WG)	2,000 ⇨ 900	2,100 ⇨ 1,500
Maximum pipe lengths (Source: ABS certificate)	DN 65: 50 m DN 80: 50 m DN 100: 30 m DN 125: 6 m DN 150: 12 m DN 200: 6 m DN 250: 6 m	DN 65: 50 m DN 80: 50 m DN 100: 50 m DN 125: 50 m DN 150: 50 m DN 200: 20 m DN 250: 10 m

Reduced over-all size of valve

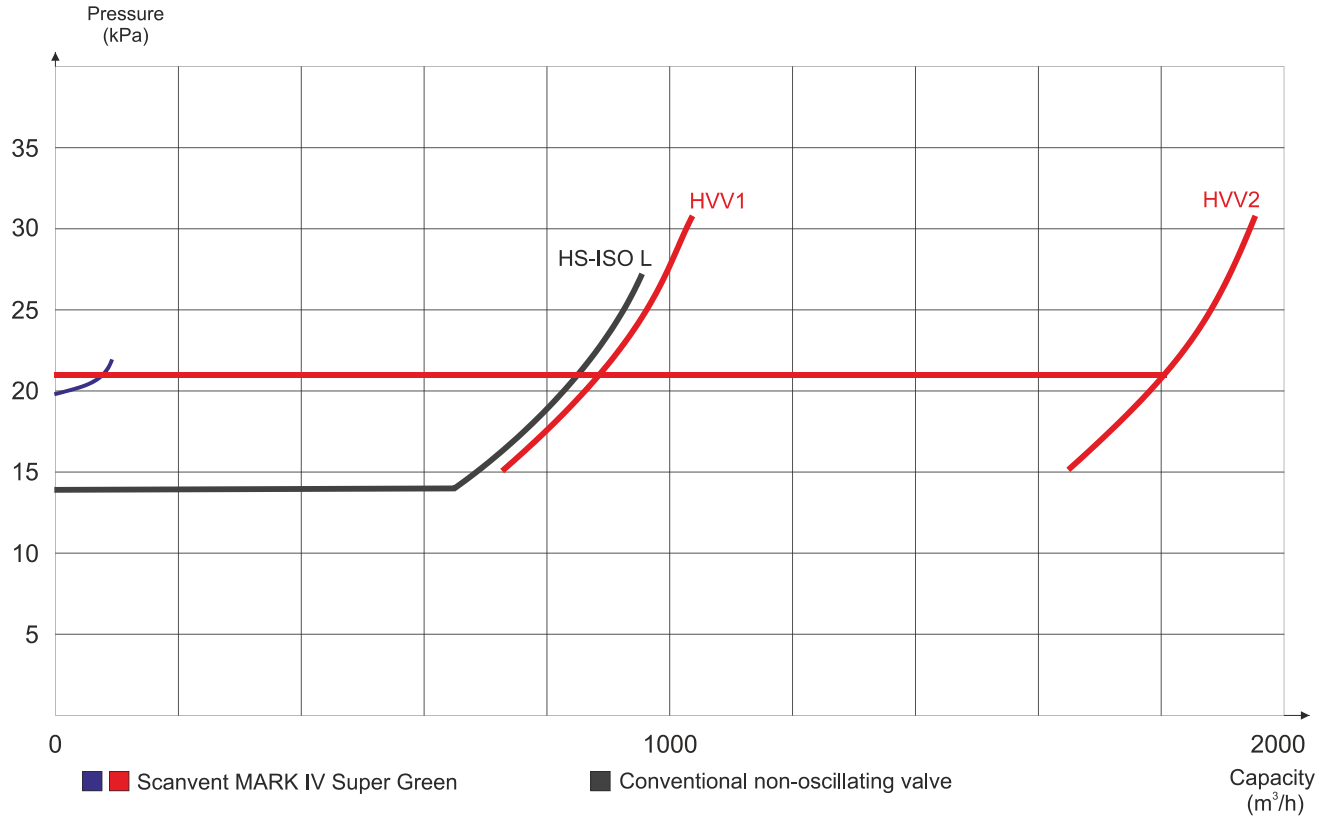
Actual physical size comparison



HVV1
Capacity: 870 m^3/h

HS-ISO-L
Capacity: 840 m^3/h

HVV2
Capacity: 1800 m^3/h



Conclusion

For low loading rates, the SCANVENT design has the ability to perform controlled venting with a decent jet speed, whereas other designs are performing what must be described as leakage. Once the loading rate is sufficient to fully open the valves, the Scanvent valve has nearly double the capacity of other designs of the same size and therefore superior jet speed and dispersion height.

There is no possibility to have a decent jet speed from a valve operating at a few percentage of its full capacity. Hence the dual nozzle system of the Scanvent design is – currently - the only available method to ascertain that low loading rates does not result in heavy leakage close to deck or process units on FPSOs

Reduced nitrogen savings

During voyage, the loss of nitrogen is a function of the valve's opening characteristics and closing pressure.

The best illustration of differences in this regard is between a conventional valve and the new Scanvent design.

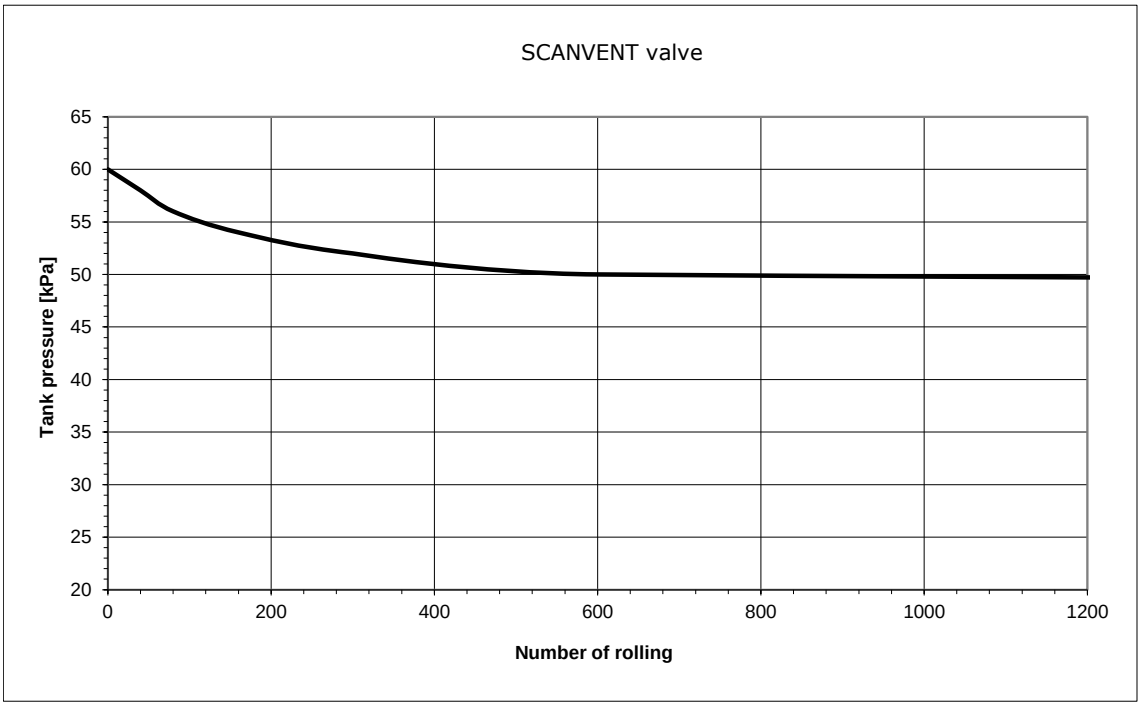
Assumption:

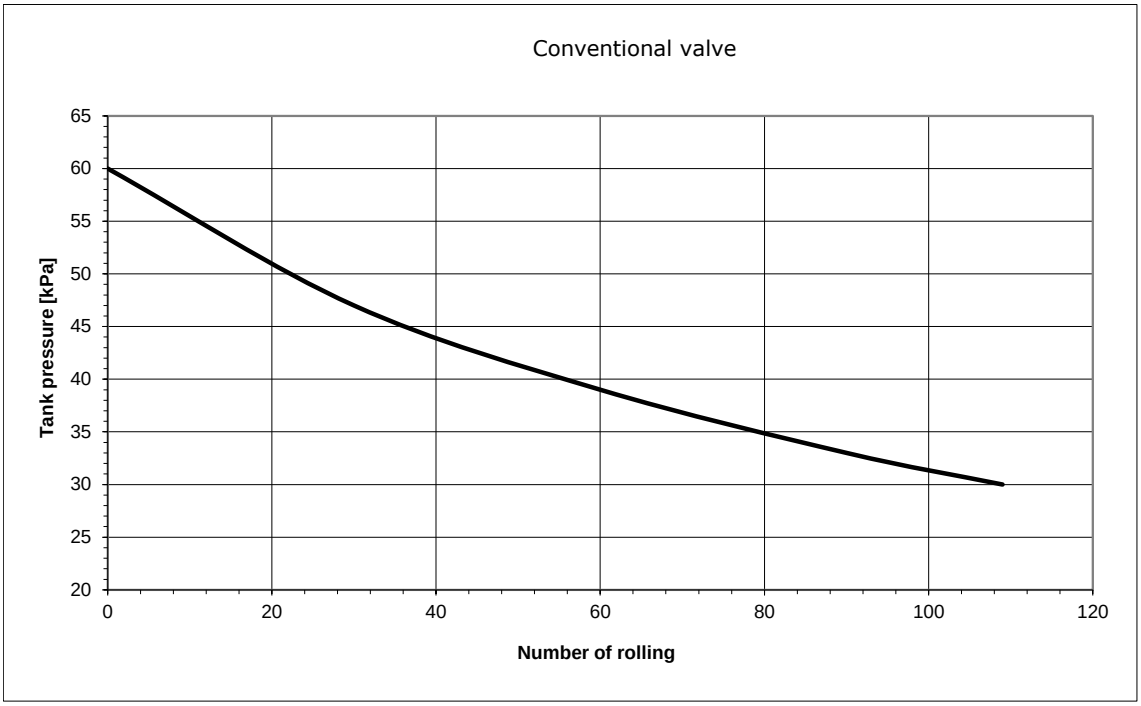
- Tank pressure = 60 kPa
- Nitrogen padding pressure = 50 kPa
- Nitrogen purged immidiately at low pressure alarm = 30 kPa
- Cargo Tank Capacity = 1.000 m3
- Cargo tank is 98% full
- Nitrogen padding volume is 2% = 20 m3
- Venting pipe size = DN 100, length 20 m
- Wave frequency = 20 times per hour
- During sloshing, the cargo will enter the vent pipe in height of 2 meters

SCANVENT (dual nozzle type)	**Conventional type**
Set point = 60 kPa	Set point = 60 kPa
Blow-down pressure = 60 kPa	Blow-down pressure = 30 kPa

Number of rollings per day = 20 x 24 = 480

The below graph shows that the lower point of 50 kPa will not be reached within the first couple of weeks.





4.6.1 Conclusion:

- Scanvent valve (dual nozzle): Refilling every 2 weeks or more
- Conventional valve: Refilling every 5 hours

Reduced maintenance

The SCANVENT design is specifically aimed at reducing maintenance. 90% of maintenance with conventional p/v valves is related to seats and discs. The seats are typically held in place by a thread and must be machined after replacement to achieve gas tight alignment. The consequence is costly repair works involving the manufacturer's assistance. Magnet-operated valves cannot have the seats machined down without corresponding adjustments of the magnet gap, rendering replacement of seats and discs into a full-day job.

VECS sizing rules and yards' desire to reduce pipe diameter is a bad combination creating chattering because of oversizing, thus, increased wear and tear of seats and discs.

By moving 95% of venting operations to the tiny thermal variation valve, which is modulating and therefore perfectly balanced without chattering, wear and tear from mechanical movement is eliminated for all practical purposes. When and if replacement is needed it is a low cost issue done by crew on the spot.

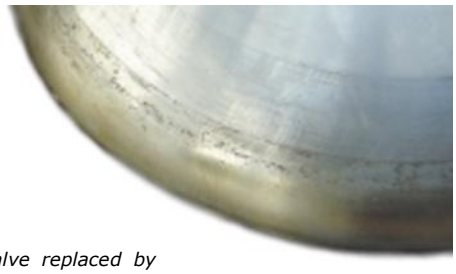
The SCANVENT design is aimed at eliminating what owners do not like: sending equipment back and forth to the manufacturer and arranging service visits to ships. The SCANVENT design is a plug-and-play unit allowing maintenance to be carried out by crew.

Example of parts necessary to overhaul in order to change main wear parts:

Conventional valve *Scanvent design*

Pitting

Tiny indents caused by corrosion or wear are generally described as pitting.



A seat from a conventional non-oscillating valve replaced by SCANVENT for a Danish ship owner. The valve in question is fully approved to all standards per May 1, 2012. This pitting will cause notable leakage that can be felt and smelt.

Corrosion

Corrosion (due to cargo, inert gas or salt) is dealt with by proper material specifications. Materials such as SAF 2507 or even SMO may be recommended. However, in reality, wear is much worse a problem than corrosion for 316 materials.

Wear

Wear is an all-together more complex phenomenon and depends entirely on the valve type, sizing, etc.

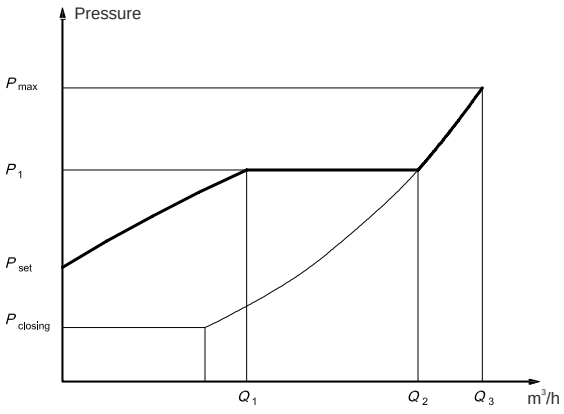
Any valve that is not modulating, i.e., opening in proportion to the over-pressure, is prone to frequent metal-to-metal contact, which in the case of stainless steel parts against each other is toxic for service lifetime. Just imagine what would happen with a stainless steel shaft running in a stainless steel bushing – disaster. The consequence in the case of valve discs and seats can be seen in the above picture. If one part is made in a soft grade, like a wear-ring in a pump, this will cause the magnet gab to decrease and the valve setting will increase. This is not acceptable.

Conclusion

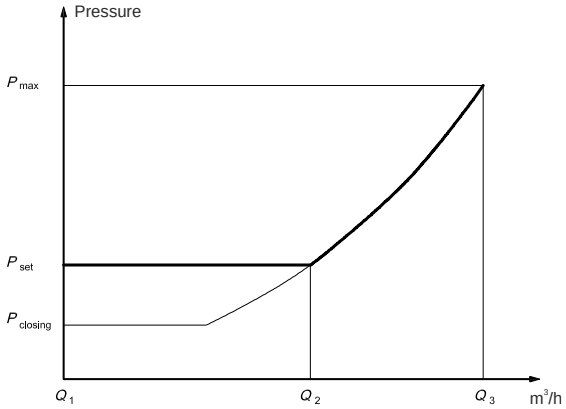
There is only one method available to prevent pitting: the least function of the valve possible, which is exactly what the SCANVENT dual nozzle design achieves.

ISO 15364:2007

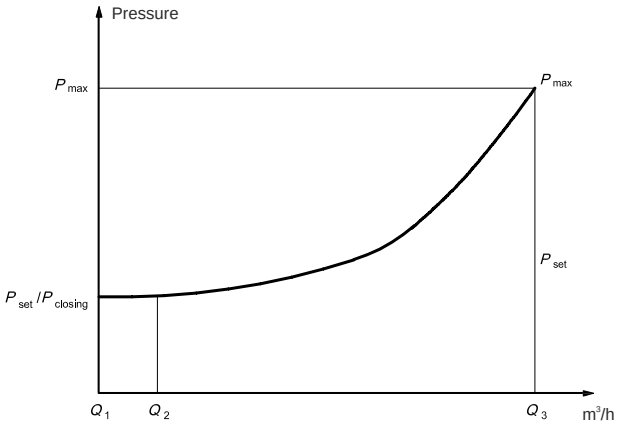
Transition point valves



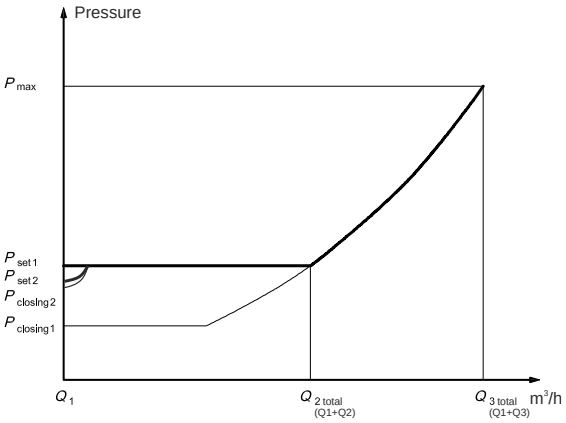
Full lifting valves



Modulating valves

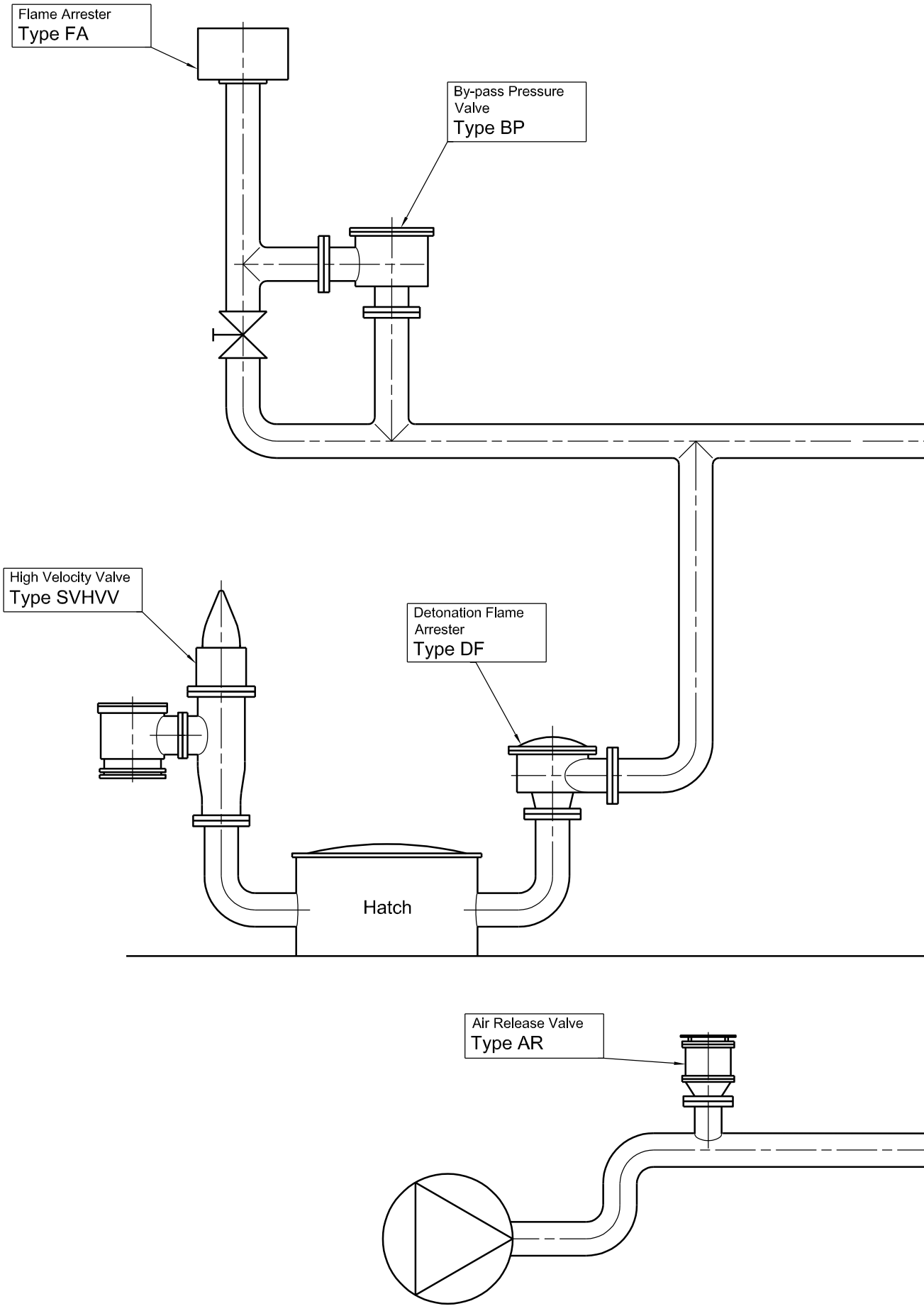


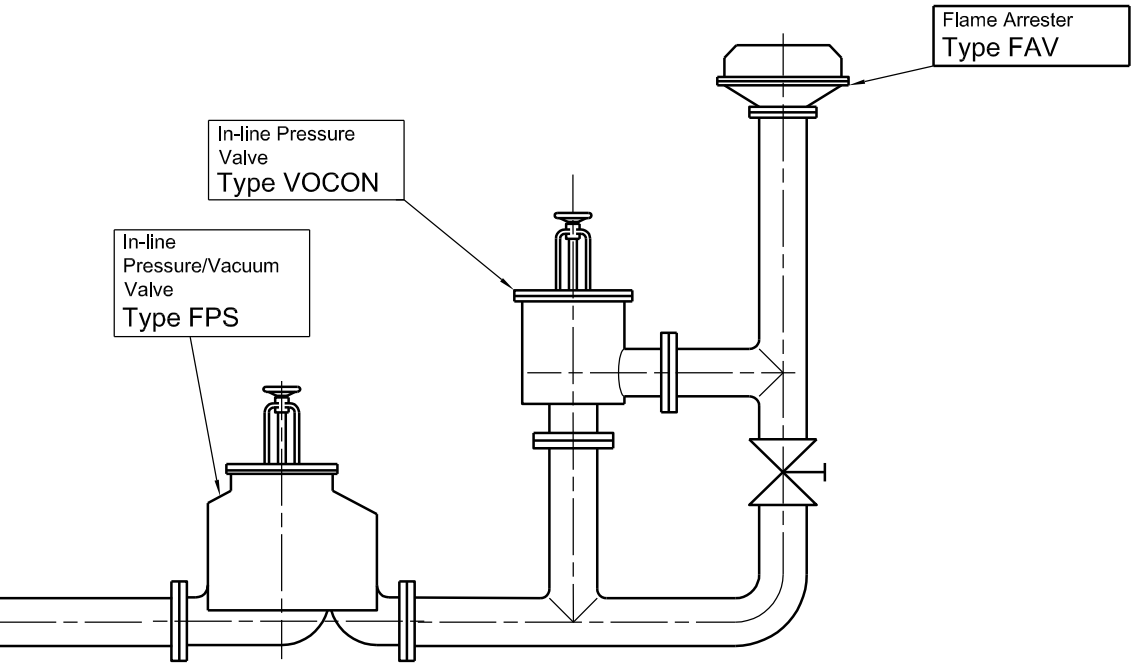
SCANVENT valves

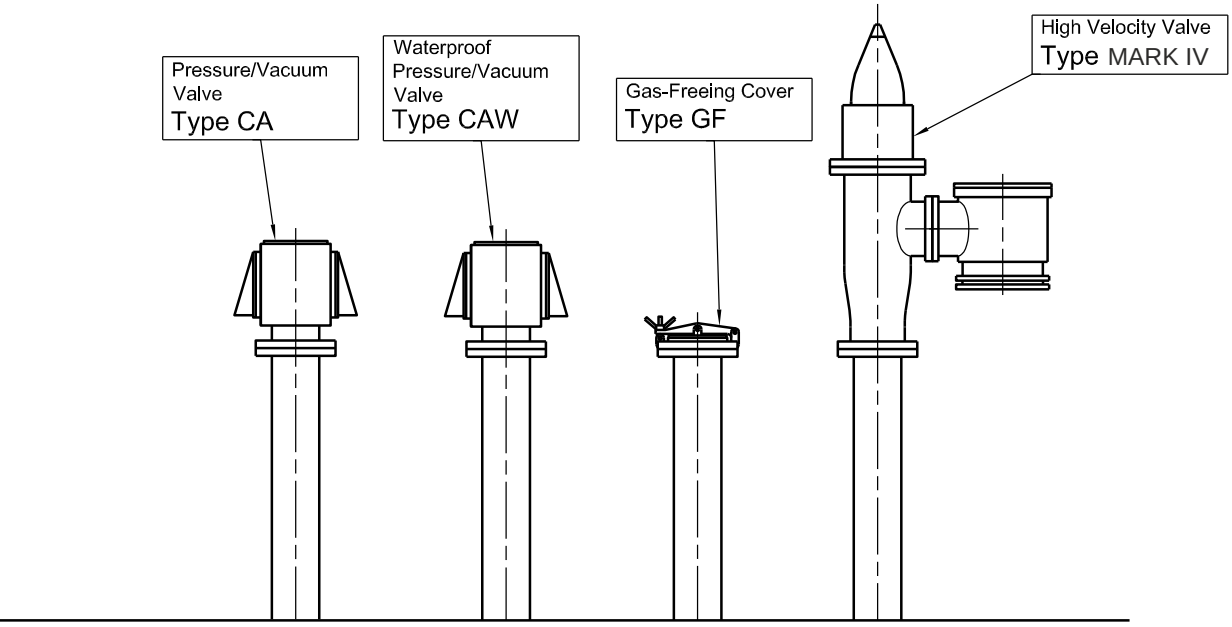


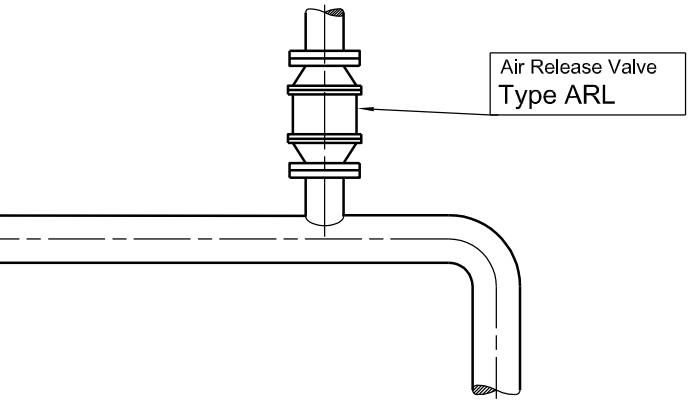
SOLAS	The main set of regulations, to which all internationally trading ships must comply. When in doubt, this is the decision making instrument.
IMO MSC/Circ. 677	Test and design standard for tank venting equipment laid down by the IMO by reference to SOLAS. This is the determining standard for ship applications and was developed specifically with ship applications in mind.
ISO 15364	Incorporated by means of reference in MSC/Circ. 677 and was developed at the initiative of IMO in order to strengthen in-service properties of valves. Thus, it has the same legal position as IMO MSC/Circ. 677, 1009 and 1324.
EN 12874	A general European test standard for flame arresting equipment; be it for refineries, pharmaceutical plants, chemical plants, river barges, paint shops, mining equipment, whatever. It is not dedicated to ships and ship applications: it is applicable for 677-ships as appropriate when EU flag registered.

Product range

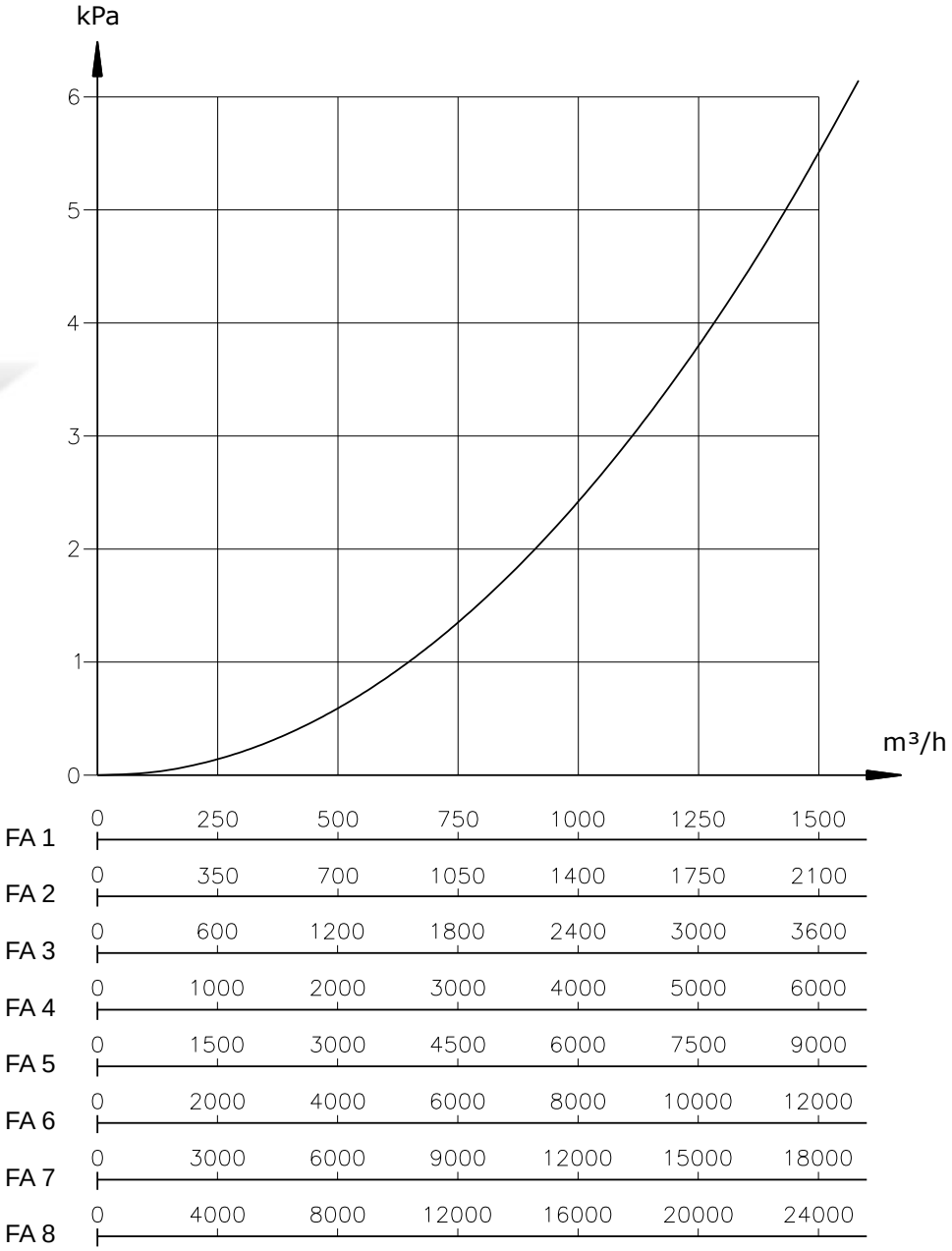



Flame Arrester
Type FAV
In-line Pressure
Valve
Type VOCON
In-line
Pressure/Vacuum
Valve
Type FPS

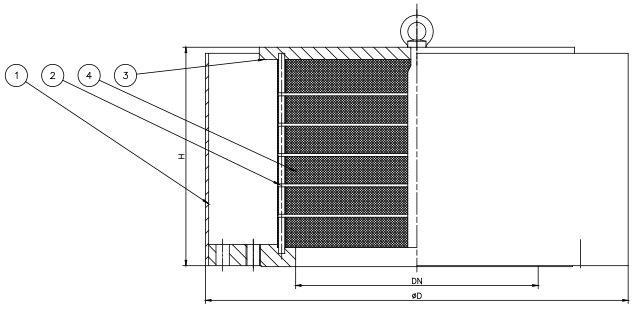

Pressure/Vacuum
Valve
Type CA
Waterproof
Pressure/Vacuum
Valve
Type CAW
Gas-Freeing Cover
Type GF
High Velocity Valve
Type MARK IV


Air Release Valve
Type ARL

Flame arresters for mast riser application



Item	Description	Spec 1	Spec 2
1	House	Steel	Stainless steel
2	Net support frame	Steel	Stainless steel
3	Flame screen, double	Stainless steel	Stainless steel
4	Top cover	Steel	Stainless steel



Test rig

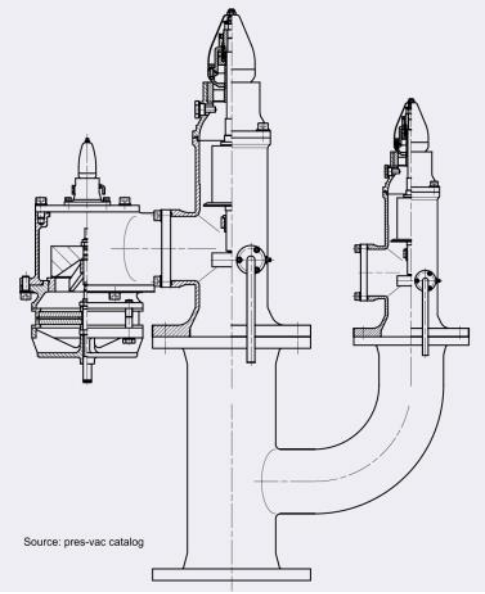
Portable calibration test rig type PCR - one touch verification of opening settings. Test flange and control box can easily be stored or moved to in-situ test.

FPSO applications

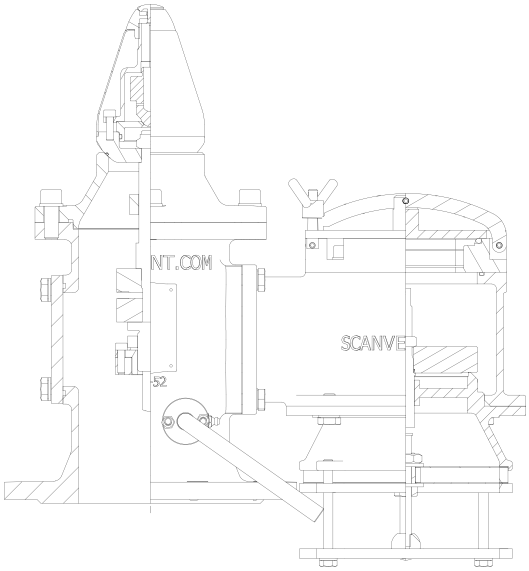
Venting on an FPSO comes with two inherent problems: Dispersion height and a huge span of venting range (from topping up to tank-to-tank emergency) that prevent valves from fully opening, which results in heavy wear due to hammering with gas close to deck and process equipment.

The Mark IV is able to maintain 30 m/s at all flow rates and still provide full capacity due to its dual nozzle system.

To achieve the same functionality, competition must install 3 valves:

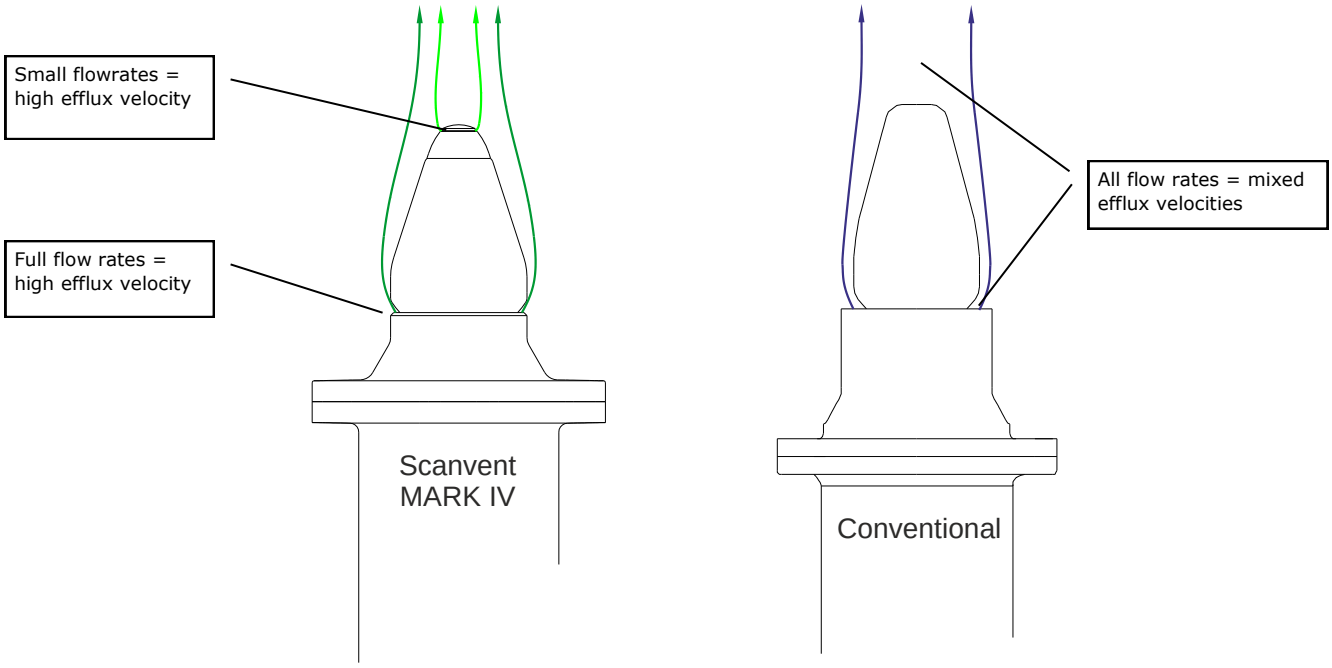


Example of competition's actual solution to FPSO applications.



The SCANVENT dual nozzle integral solution to FPSO applications (including gas-freeing cover).

Dispersion height



Equation

The velocities in question can be calculated as follows:

$$v = \frac{Q \; x \; 10^6}{A \; x \; 3600} \quad = \quad m/s$$

Where:

Q = venting rate (Nm^3/h)

A = effective discharge area (mm^2)

8.1.2 Velocities

Loading rate vs. jet speed (m^3/h and m/s)	**DN 100 Scanvent Mark IV**	**DN 100 Conventional valve**
50	**30** (small nozzle only. Tank pressure does not drop below set-point of the small nozzle)	**Near nil** (in fact this is leakage and not venting, causing excessive wear of the seat and disc due to flut-tering)
100	**60** (small nozzle only. Tank pressure does not drop below set-point of the small nozzle)	**24** (capacity is 500 m^3/h because the valve is fully open, so ullage space pressure is quickly halved at this low loading rate)
500	**75** (capacity is 1,800 m^3/h because the valve is fully open)	**44** (capacity is 900 m^3/h because the valve is fully open)

Factors influencing dispersion height

A Swedish health and safety research study has shown that crew onboard chemical carriers are up to ten times more likely to develop cancer than the average Swede. A Danish study called "Healthy Ship" pinpointed tank venting as a major source of working environment pollution on tankers.

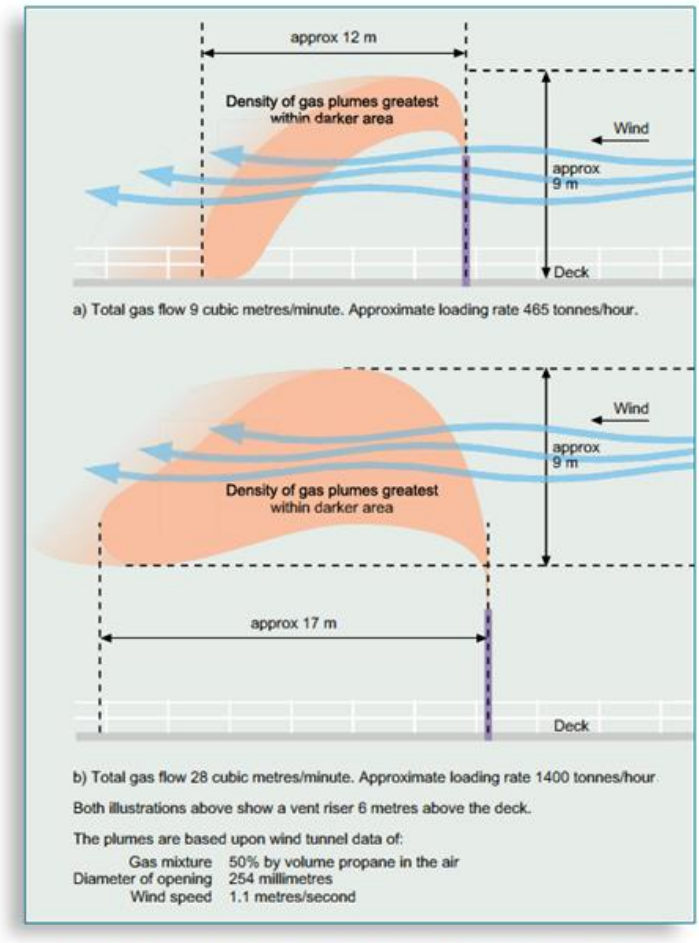
The problem involved, i.e. release of gases, cannot be avoided completely. However, designs limiting the volume of venting can have an important, positive impact and so can designs with greater efflux velocity resulting in improved dispersion height. For FPSO applications, this is also important to avoid hydrocarbon gases in the vicinity of the production facilities where alarms may be tripped due to vents opening.

Dispersion factors

During tank loading (without a controlled gas-return system (VECS) in operation), the cargo loaded will develop a certain volume of gas that must be vented to atmosphere. The actual volume generated depends on volatility of the various gases boiling off from the cargo, which again depends on cargo temperature, velocity in the drop line, pre-pressurization IG level and IG temperature. And predominantly in the case of crude: the quality of de-gassing prior to loading. Moreover, the gas concentration will affect the achieved gas dispersion height.

Jet speed

The jet of gas from a high velocity vent is directed upwards and, regardless of valve design, at a certain height starts to develop into a 45° plume where the jet speed rapidly decelerates and starts to "peel off". An important factor in determining the achievable height is of course prevailing wind conditions. However, the only dispersion factor within control is the average speed of the jet at the valve's exit. Not meant as the speed of the gas at the vertical curtain formed area at the seat/disc, but rather the true average speed across the jet forming above the outer member of the valve. The gas speed at the seat/disc area of a low stroke valve with a DN 250 seat may be the same as in a DN 150 valve with a large stroke, but once the jet forms, the speed of the former will be significantly lower than the latter.



Figures 2.3 (a) and (b) – Indicative effect of gas flow rate on flammable zone

Source: OCIMF, 5 edition

What matters

Put differently, the single most important factor is the velocity achieved - expressed as the valve's capacity at working pressure in relation to the seat diameter. A valve with a huge capacity does not achieve the sought after dispersion height if the seat diameter is equally large.

The higher the flow rate and the smaller the seat diameter, the better the dispersion height turns out. This is the only parameter within control of the valve designer, and this is precisely where the SCANJET Mark IV design excels.

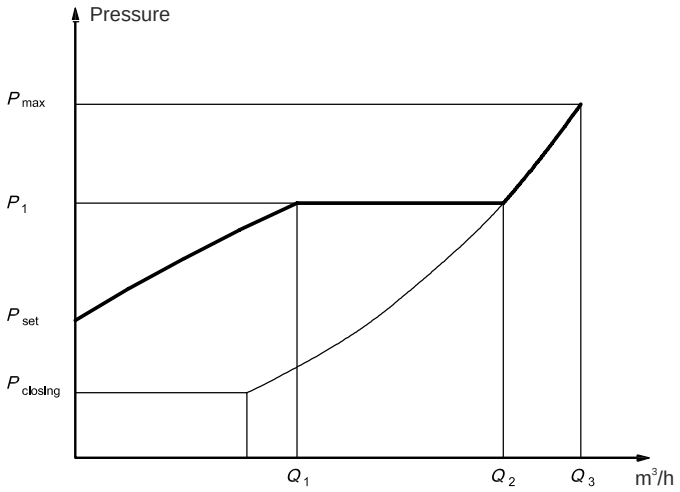
Valve designs come in numerous configurations, as illustrated by examples in ISO 15364:2007:

Scanvent's design

The dual nozzle design of the Scanvent valve is a combination of the characteristics of a modulating and full-lifting design whereby the best of both types is achieved without the inherent downsides.

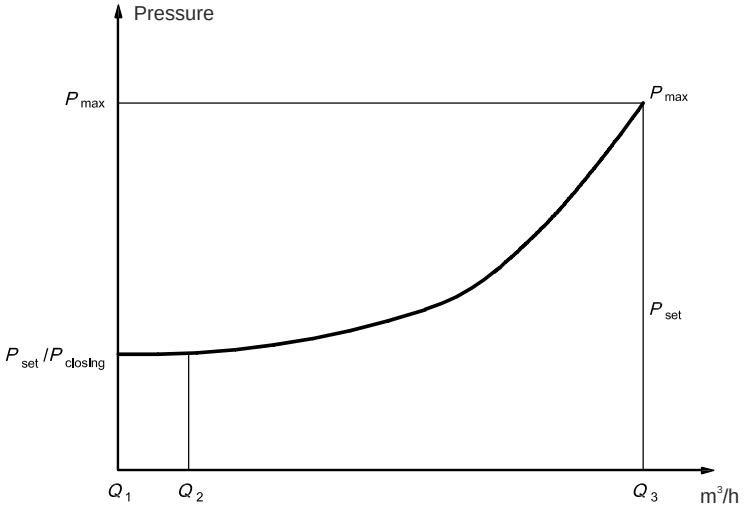
Transition Point Valve

The transition point valve suffers from a low venting capacity over a relatively large seat diameter (where it is in fact a modulating valve) until the valve reaches the transition point and becomes fully open. Example: Tanktech type ISO.



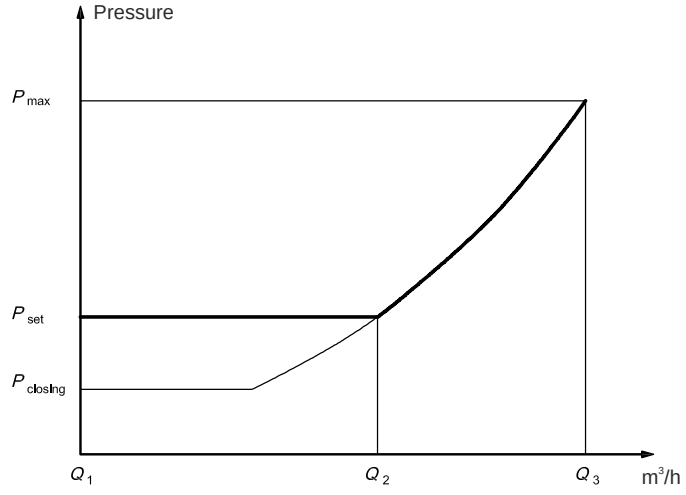
Modulating Valves

Modulating valves cannot be used for full capacity, the cost would be prohibitive and the dispersion height would be inadequate because of an enormous seat diameter. This is the design used in the small capacity unit of the SCANVENT design.



Full Opening Valves

The full opening valve has a good dispersion height when operating at full loading rate. However, when venting for small flow volumes, for instance due to thermal variation, topping-off etc., the volume vented is dictated by the valve's blow-down and therefore excessive volumes are vented. Often 50-70% of the ullage gas is lost to atmosphere, most of which for no good, and boil -off re-commences. Example: ABS from Turkey and Pres-Vac type HS-ISO.



ISO 15364:2007 Ordering information

1	Nominal pipe size, configuration of piping, and pipe length	Compliance with design parameters for tank pressure limits, and for high velocity vents, compliance with non-hammering conditions.	A: Type approval certificate. B: For high velocity vents: test records indicating piping limitations for safe, non-hammering performance (minimum diameter and maximum length from valve to ullage/buffer volume).
2	Maximum gas density considered	Compliance with design parameters for tank pressure limits.	B: Convert to standard air.
3	Lowest MESG	Suitability for the application.	A: Type approval certificate. B: The lowest MESG of the IEC explosion group allowed.
4	Set opening points for pressure and vacuum	Suitability for the application.	A: Type approval certificate. B: The upper and lower values applied during flow testing shall not be exceeded.
5	Maximum pressure drop	Compliance with design parameters for tank pressure limits and the selected opening setting of the device.	A: Certified flow charts. B: The flow chart format shall show the maximum pressure drop over the valve for any flow volume. This value is essential for pressure drop calculations.
5a	Pressure drop at maximum flow	Compliance with design parameters for tank pressure limits and the selected opening setting of the device.	A: Certified flow charts. B: The flow chart shall show the pressure drop over the valve at the maximum required flow rate to be established.
6	Minimum reseating pressure	Suitability for the application with regard to minimizing the loss of cargo vapour.	A: Certified flow charts. B: The flow chart format shall indicate the reseating pressure.
7	Maximum and minimum ambient temperature	Suitability for the application.	A: Instruction manual. B: The manufacturer's recommendations shall not be exceeded.

8	Materials of construction	Suitability for the application.	A: Verified drawing. B: The combination of materials chosen may not have lower corrosion resistance than the version tested. The drawing shall include a bill of materials in accordance with Clause 5.	
9	Surface treatment and coating	Suitability for the application.	A: Instruction manual. B: The surface treatment and coating, if any, shall be decided by the buyer with due consideration to Annex D.	
10	Maximum gas flow in standard air, pressure drop of the piping system, and maximum tank pressure	Suitability for the application and compliance with design parameters for tank pressure limits, alarms, liquid-filled breakers, filling limitations for high density cargoes.	A: Certified flow chart. B: The maximum tank pressure allowed in normal operations less an appropriate fouling factor and margin for alarm and breaker settings, etc., shall not be exceeded when calculating the combined pressure caused by the valve and the pressure drop over the piping system.	
11	Maximum outer ice layer thickness	Suitability for the application.	A. Type approval certificate. B. Due consideration shall be given to vessel service conditions and facilities available for on-deck de-icing before cargo operations and during voyage.	
12	For high velocity vents: the minimum average velocity required for cross section of the valve's outlet to atmosphere	Suitability for the application.	Recorded in test report. The ability to disperse gas above deck relates to the velocity through the cross section of the valve's outlet to atmosphere.	
13	Maximum air leakage rate	Suitability for the application.	A: Instruction manual. B: The verified product data shall state the maximum leakage rate expressed in air of a new valve at 80 % of the nominal setting.	

Notes

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SCAN VENT
CMA CGM
MARK IV SuperGreen valves for VLCC new building in Korea

SCAN VENT

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DENMARK

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WWW.SCANVENT.COM

Tank Cleaning Questionnaire
TCQ

General Instructions: The sections with an * (asterisk), is the minimal required information preferred by engineering to make an evaluation and subsequent recommendation.

I. REFERENCE INFORMATION

DATE PREPARED:	INQUIRY # (Filled in by Orbijet):	PROJECT # (Filled in by Orbijet):

Industry Information (Filled in by Orbijet):
☐Industrial ☐Marine
Market Segment:

II. TECHNICAL AND COMMERCIAL RESPONSIBILITY

TCQ Information Source
☐A ☐B ☐C

*	**A) Customer (End-User)**			
	Company		Contact	
	Web Site			
	Address		Position	
	City		Main Telephone #	
	State/Province		Direct Telephone #	
	Postal Code		Direct Telefax #	
	Country		E-Mail	
	B) Representative/Dealer Assignment -- ☐Representative ☐Dealer			
	Company		Contact	
	Web Site			
	Address		Position	
	City		Main Telephone #	
	State/Province		Direct Telephone #	
	Postal Code		Direct Telefax #	
	Country		E-Mail	
	C) Engineering Firm or Other:			
	Company		Contact	
	Web Site			
	Address		Position	
	City		Main Telephone #	
	State/Province		Direct Telephone #	
	Postal Code		Direct Telefax #	
	Country		E-Mail	

	D) Additional Contact Information (If Applicable)		
1	Name:	Company:	Position:
	Phone:	Fax:	E-Mail:
2	Name:	Company:	Position:
	Phone:	Fax:	E-Mail:

III. TANK / VESSEL TO BE CLEANED (**If drawing attached, X the appropriate box within question.**)	
01 *	Name of tank/vessel, or tag number designation, to be cleaned: ☐Drawing Attached
02 *	Dimensions of the tank/vessel to be cleaned: ☐Drawing Attached
03 *	Purpose of the tank/vessel to be cleaned: ☐Transportation ☐Storage ☐Process ☐Other:
04 *	Orientation of tank vessel to be cleaned: ☐Drawing Attached
05 *	Material of construction for the tank/vessel to be cleaned: ☐Drawing Attached
06	Surface roughness of the tank/vessel to be cleaned (relate in Ra Microinch, if possible):
07	☐New Construction ☐Existing
08 *	Quantity of tank/vessels for this type to be considered:
09 *	Does this application require that the cleaning design is of a sanitary nature: ☐Yes ☐No (Note: Sanitary means that the M.O.C.[1] are of a sanitary nature and the design/devices adhere to the hygienic requirements of either the client or a regulatory authority for the application)
10	What regulatory and/or classification society approvals are required for this application: ☐USDA Dairy Grading ☐USDA Meat & Poultry ☐FDA ☐IMO ☐USCG ☐EEHDG ☐ATEX ☐DNV ☐Lloyds ☐None ☐Other:
11 *	What tank/vessel openings are available for the installation of cleaning devices: ☐Drawing Attached
12	What cleaning validation method/protocol is intended or applied for this application: ☐ Microbial Swab Test ☐Visual ☐ATP Bioluminescence ☐Rinse Sample ☐Conductivity ☐None ☐Other:
13	Is a shadow study analysis required on this application: ☐Yes ☐No If yes, charges for engineering services will apply. Detailed structural drawings of the tank/vessel are required. Contact Engineering for a list of drawings required to perform this analysis.
14	Drawings attached with this TCQ: Drawing format: ☐AutoCAD (Preferred) ☐AutoDESK Inventor ☐ SolidWorks ☐PDF ☐Other; Explain:

[1] M.O.C. = Materials of Construction

IV. PRESENT METHOD OF CLEANING

01 *

Present practice:

☐None, new application ☐Manual ☐Floatation ☐Static Spray Device ☐Rotating Sphere

☐Rotating Jet-Head ☐Other:

If a current cleaning device is being used, name of manufacturer and device model, if available:
(Note: It is important to know the number of nozzles, nozzle orifice, and turbine/stator configuration for RJH device types.)

MFG: Model: Operating Pressure:
Operating Temperature:

Comments:

02

Frequency of cleaning:

☐Daily ☐Weekly ☐Monthly ☐Annually

☐Other and/or comments:

03

Current cleaning time, per present practice:

04

Current cleaning recipe (attached recipe sheet if necessary):
General System Info:
Max Pressure/Flow: Max Temperature: ☐Recirculated ☐Once-Through
Filtered: ☐Yes ☐No Filter type and mesh size in micron:

Step	Description	Time

05 *

Reason for cleaning:

☐Sanitation ☐Prevent Cross-Contamination ☐Improve Heat-Transfer

☐Sludge/Sediment Control ☐Preparation for maintenance/inspection ☐Demolition

☐Other:

06 *

Type of cleaning system required:

☐Fixed ☐Portable ☐Retractable ☐Other:

Note: Fixed indicates that the cleaning design will be permanently installed within the subject tank and not removed, except for periodic maintenance.

07 *

Desired total cleaning time per vessel:
Number of vessels to be cleaned per day:

Note: Include complete recipe times, including drain and drying times.

V.	**MATERIAL TO BE REMOVED**
01 *	In addition to the following check boxes, describe the material to be removed from the subject tank/vessel: ☐Sticky/Tenacious ☐Hard/Crusted to surface ☐Toxic ☐Hydrocarbon ☐Volatile/Explosive ☐Chemical ☐Organic ☐Inorganic ☐Soft/Soluble Material name/description:
02 *	Solubility..., what solution places the material to be removed, in a soluble condition: ☐Water Only ☐Temperate Water Heated to: ☐Chemical Solutions; currently using: ☐Unknown Comments: Do you want us to perform a lab analysis to determine solubility and provide cleaning chemistries with offering? ☐Yes ☐No Note: Lab analysis may be a billable service.
VI.	**BUDGET CONSIDERATIONS**
01	What are the total cost expectations, relative to the supply of material, for this application:
VII.	**OPERATING PARAMETERS**
01 *	**SUPPLY:** **Is it required, that a specific pump is to be utilized for this application: ☐Yes ☐No** **Or do you want Us to recommend and provide pricing: ☐Yes ☐No If a specific pump is to be utilized, please complete the following:** Pump performance curve attached: ☐Yes ☐No Supply pressure/flow @ pump (max.) : Supply pressure/flow @ current cleaning device (max.) : Comments:
02 *	**RETURN:** Maximum available return/evacuation flow from tank to be cleaned: ☐Unknown ☐Recommend ☐Currently as follows:
03 *	**TEMPERATURE:** Maximum operating temperature that the cleaning system will be subjected: Static: Operational: ☐Recommend
VIII.	**CUSTOMER COMMENTS**

IX.	CLEANING DEVICE REQUIREMENTS/PREFERENCES
01	Cleaning Device Type Preference: ☐Static ☐Rotating Spray Head (RSH) ☐Rotating Jet-Head (RJH) Integrated Turbine ☐Rotating Jet-Head (RJH) External Drive ☐Rotating Jet-Head (RJH) External Drive Programmable ☐Recommend ☐Propose Options & Explain
02	Cleaning Device Connection Preferences: ☐Pipe Threads ☐Weld-Joint ☐Tri-Clamp ☐Clip-On ☐Recommend ☐Size Preference: ☐Other:
03	Surface finish requirements for cleaning design: ☐Applicable ☐Not Applicable Inside Tank/Vessel: Internal of Device: ☐Recommend ☐Ra Value: External of Device: ☐Recommend ☐Ra Value: Outside Tank/Vessel: Internal of Device: ☐Recommend ☐Ra Value: External of Device: ☐Recommend ☐Ra Value:

X.	CIP SYSTEM REQUIREMENTS – GENERAL INFORMATION - ☐Required ☐Not-Required
01	CIP Systems involve design aspects that are difficult to address in a form and are best served via an interview process with one of our CIP process professional. However, basic information can be provided here in lieu of that interview and any comments that you might have; relative to the system that you require beneficial to that process.
02	**System Type** ☐ Single pass; single use ☐ Single pass; recirculatory ☐ Multi-tank solution recovery ☐ Other Explain:
03	Number of tanks to clean at a time:
04	**Controls** ☐ Manual Push button start and stop on pump; manual valves. ☐ Semi-Automated Push button start and stop on pump; with automatic valve actuation on main control valves. ☐ Fully automated PLC controlled ☐ Recommend
05	**Temperature Control** ☐Heat Exchanger ☐Shell and Tube ☐Plate and Frame ☐Recommend Maximum temperature required : ΔT requirements : Control Valve : ☐Manual ☐Automatic Comments:
06	**General Comments**

X. PROPOSAL OFFERINGS

(Advise us of the following requirements, relative to our offering)

☐Cleaning Device Only.....	Free
☐Location Recommendations:	
☐Verbal or written.....	Free (Not a detailed review of tank geometries)
☐Drawings.....	Subject to Billable Engineering Services
☐Shadow Analysis.....	Subject to Billable Engineering Services
☐3D Analysis.....	Subject to Billable Engineering Services
☐Installation Assemblies.....	Subject to Billable Engineering Services
☐Engineering Scope.....	Free
☐Cleaning Chemicals (no lab analysis).....	Free
☐Soilage Lab Analysis.....	Subject to Billable Engineering Services
☐Cleaning Recipe (Preliminary)	
☐No lab analysis.....	Free; for proposals in excess of $6,000.00
☐Lab analysis solubility report.....	Subject to Billable Engineering Services
☐CIP Supply/Control System	
☐Budgetary Proposal.....	Free
☐Proposed with PFD &/or P&ID.....	Subject to Billable Engineering Services refundable in event of purchase.

Comments:

Notes to this section:

1) In the event that this section is not completed, we will assume that only a Tank Cleaning Machine Recommendation is required.
2) Billable Engineering Services are optional. We can submit a proposal for estimated charges after discussion of the needs with the client.

Terms and Conditions of Sale

1. In the absence of a written acceptance of these conditions by the Purchaser, placement of an order for any of the goods covered by this order/quotation herein shall constitute an acceptance of these terms and conditions and shall constitute the entire contract between us. Our failure to object to provisions contained in a purchaser's order or other communication shall not be deemed a waiver of the terms and conditions hereof.

2. The prices and terms herein are not subject to verbal changes or other agreements unless approved in writing by an authorized representative of Orbijet, Inc. The prices are based on costs and conditions existing on date of quotation and are subject to change by the Seller before final acceptance.

3. Typographical and stenographic errors are subject to correction.

4. We shall not be responsible for any delay in filling this order caused by machinery breakdown, differences with workmen, strikes, floods, lack of transportation facilities, or other causes which are unavoidable or beyond our control.

5. Limited Lifetime Warranty - Products sold by Orbijet, Inc. are warranted to be free of defects in materials and workmanship, exclusive of corrosion, damage from abuse or misuse, negligence, alteration, normal wear and tear, and improper installation. Liability under this warranty shall be limited to the repair or replacement of any defective work or material Ex-Works: Shipping Point. Orbijet, Inc. shall not be liable for any other damages or losses. The Buyer's sole and exclusive remedy against Orbijet, Inc. for any defective material or workmanship shall be the repair or replacement of the defective parts or products as provided herein. No other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available to the Buyer.

6. Indemnity - Buyer shall indemnify and hold harmless Orbijet, Inc., Its affiliated companies, owners, employees, agents, and successors from and against any and all claims expenses, liability, and loss arising from claims for injury, death, or damage to, or destruction of property arising from unauthorized repair or modifications to the products provided under this purchase order/quotation, as well as failure to properly maintain said products. Improper use of said products, use of said products for anything other than their intended purpose, and/or the equipment not working or functioning properly caused by a change in working parameters that were unknown by Orbijet, Inc. as referenced in item 14 below.

7. Invoices for material delivered under this order are payable only in United States Dollars. Should the Buyer prefer sending a check drawn in currency other than United States Dollars, we reserve the right to charge the Buyer whatever exchange we are required to pay.

8. The sale of goods covered by this order/quotation does not grant the Purchaser any license or right of any kind under any patent owned or controlled by us or under which the company is licensee.

9. All drawings, specifications, data, or other information supplied to the Buyer by Orbijet, Inc. may contain proprietary design information belonging to Orbijet, Inc. They are the property of Orbijet, Inc. and shall so remain. They may not be copied in whole or in part, nor disclosed to third parties, without the expressed written consent of an office of Orbijet, Inc. All said information must be returned immediately upon demand.

10. All sales are Ex-Works with all freight charges to the account of the Buyer, unless otherwise noted on the quotation/order.

11. Returns - All returns must be with prior written approval of Orbijet, Inc. Only standard catalog stock items can be returned. Returns must be in salable condition and accompanied by a Return Material Authorization Form available from our office. Unauthorized returns will be refused. The return is subject to a restocking charge and is to be shipped freight prepaid to the destination specified on the Return Material Authorization Form.

12. In the even that Orbijet, Inc. is unable to collect any funds due arising from orders placed, all collection costs, court costs, and legal fees as well as legal interest charge on unpaid balances shall be borne by the Buyer and its principals.

13. Liens - Orbijet, Inc. reserves its right to lien and will provide final lien waivers only after payment has been received in full.

14. The parameters and/or field measurements utilized in formulating the prices for the equipment supplied herein, in total or in part, have been supplied by the Purchaser or their representative. Any failure of the equipment to operate satisfactorily that is caused by incorrect data and;/or field measurements being supplied to the Seller is the responsibility of the Purchaser whether actual measurements were performed by the Buyer's personnel or Seller's representative. Further it is the Buyer's responsibility to ensure correctness and accuracy of all dimensions and information provided to the Buyer by the Seller for approval. Failure to note inaccurate or incorrect dimensions or information on drawings for approval is the responsibility of the Buyer. This shall include any changes in operating procedures, types of vessels being serviced, or any changes to the physical surroundings which cause conditions to be outside the parameters and/or field measurements represented. All costs associated with such charges, additions, deletions, or modifications shall be borne by the Purchaser.

15. Purchaser assumes liability for patent and copyright infringement when goods are made to the Purchaser's specifications.

16. If Buyer cancels an order at any time prior to its completion, Buyer agrees to pay Seller the percentage of the selling price equal to the percentage of the completion, plus any and all costs for the disposal of used material. Seller determines the percentage of completion. Minimal cancellation fee is 20% of the entire order. An order is deemed canceled if after the issuance of the buyers official purchase order or the signing of our order confirmation, the order is canceled by the buyer. This cancellation charge would be invoiced to the buyer within 5 days of order cancellation and payable to the seller within 10 days or invoice issuance.

17. Buyer agrees to abide by the terms of this contract. Seller is not bound by any contracts that Buyer may make with third parties. Such contracts or agreements shall have no bearing upon the agreement between Buyer and Seller.

Standard Warranty

Products supplied under the Agreement will be free from defects in materials and workmanship. The Seller's sole and exclusive liability shall be its option either to repair or replace Ex-Works point of shipment, any defective Products, or to accept return, transportation prepaid, of such Products and refund the purchase price; in either case, provided that written notice of such defect is given to the Seller within twelve (12) months from date of shipment to the customer, the product is found by the Seller to have been installed and/or operated in accordance with the Seller's instructions, that no repairs, alterations or replacements have been made by another without the Seller's written approval. In no event shall the aggregate liability of the Seller in connection with breach of any warranty or warranties exceed the purchase price paid for the Product hereunder. Seller shall not be liable for damages, consequential or otherwise, caused by defective equipment or accessories. The Seller may at its option, require the return of any Product, transportation and duties prepaid to establish any claim of defect made by the customer. Unless otherwise agreed in writing, the Seller will not accept and shall have no responsibility for the Products returned without its prior written consent.

THE SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THE SELLER HEREBY EXPRESSLY DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS.