PPS

Dedication, Integrity and Trust

PREMIER
PETROLEUM
SUPPLIER

CATALOGUE 2023

ENGINEERING SERVICES

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Engineering Services

Premier Petroleum Supplier (PPS) services cover the entire asset life cycle (Onshore, Offshore, Naval & Subsea) :

1. **Concept Selection**
   - Identify different engineering alternatives.
   - Cost estimation.
   - Techno-economic studies.

2. **FEED & Detailed Engineering**
   - Process Simulation.
   - Intelligent 3D Modelling.
   - Material Selection and Cathodic Protection.
   - Instruments and Plant Automation.
   - Storage Tanks and Pressure Vessels.
   - Rotating Equipment.
   - Piping and Pipelines.
   - Electrical.
   - Fire Fighting and Fire Detection
   - Civil and Structural.
   - Offshore, Naval and Subsea.

3. **Procurement Services**
   - Material requisitions.
   - Technical evaluation.
   - Commercial evaluation.
   - Vendor data review.
   - Witness tests/shop inspections for main equipment and materials
   - Release for shipment.

4. **Construction Support**
   - Technical support in all engineering disciplines.
   - Conformity check with design.
   - Punch lists.
   - Quantity survey.
   - Mechanical completion.

5. **Commissioning & Start-up Support**
   - Technical support in all engineering disciplines
   - Pre-commissioning, commissioning and start-up procedures.
   - Operating & Start-up Guide.

6. **Asset Integrity, Rehabilitation & Life Extension**
   - Risk Based Inspection.
   - Fitness for Service Assessment and life expectancy.
   - Online and Permanent Repairs.
   - Re-rating.
   - Alterations.

7. **Process Safety Studies**
   - Quantitative Risk Assessment (QRA).
   - Fire and Explosion Risk assessment (FERA).
   - Consequence Assessments (Gas dispersion, Jet fire, Explosion...etc.).
   - Hazard Identification Study (HAZID).
   - Hazard and Operability Study (HAZOP).
   - Safety Integrity Level (SIL).

OFFSHORE, NAVAL ARCH. & SUBSEA

Premier Petroleum Supplier expertise covers the Facility life cycle starting from FEED and including detailed engineering and construction support up to Brownfield projects. We have extensive experience in the structural assessment and modifications of offshore structures, starting from visual inspection of topside structures, anomaly report writing, weight information gathering and weight control assessment. We prepare specifications and evaluate inspection results of subsea structures, re-evaluating soil and pile capacities, and performing nonlinear Pushover analysis, in addition to any design for new topside extension using the proper installation and construction sequence according to the existing tools and limitations. **Premier Petroleum Supplier** has the expertise and capabilities to support our Customers during construction and installation phases, by providing the required engineered installation and construction sequence.

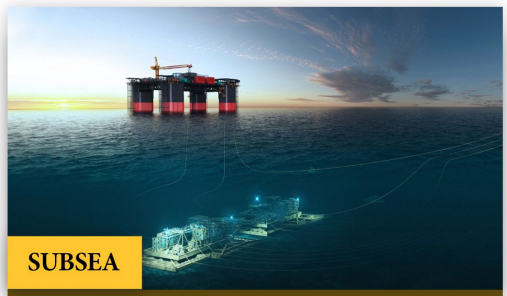
OFFSHORE

- Fixed Platforms
- Mobile Offshore Production Units (MOPU) connecting minimum facility Platforms
- Self-installed Platforms

Premier petroleum supplier has the qualified resources to perform the complete job, for jackets and topside structures, as well as qualified geotechnical engineers to handle soil, piles, and driving analysis.

NAVAL ARCH

- Hull stability calculations during both transportation and lifting process.
- Sea fastening analysis and design.
- Hull scantling checks and required stability and ballasting calculation sheets.
- Hull internal modifications according to both DNV and ABS.



SUBSEA

- Subsea manifold system design.
- Subsea pipeline stress analysis
- Subsea skid structures and protection frames (structural modeling, detailed drawings, in-place analysis, accidental analysis, foundation system analysis).

Engineering Services

Premier Petroleum Supplier has been utilised local skills and engineering talents with combine local experienced team with world class consultants to be competent and competitive engineering teams.

- Providing highly skilled engineering team to act as client representative.
- Performing engineering for offshore and onshore project.
- Supporting Clients from concept to execution phases.
- Brings world class expertise and consultants to support engineering teams.
- Project feasibility studies.
- Specialized numerical and analytical analysis.
- Failure investigation expertise to identify the root causes and provide solutions and repair plans for subsea assets.
- Develop and manage testing programs for projects; i.e material testing, components capacity or welding testing.
- Premier Petroleum Supplier is fully committed for the complete confidentiality of all client material, data, work and interest and always working to back the client until final close and certification of the project.

Commissioning Services

Why Petroleum Supplier ?

With more than 250,000 man-hours invested in commissioning and precommissioning services, our crew of engineers and expert technicians developed the ability to work with speed, efficiency, and agility while maintaining exceptional quality of the work done. Be it reviewing and auditing (punch listing) construction works, executing precommissioning tasks, spotting technical and engineering issues or managing the changes on the project, our crew is definitely an added value to the project execution.

Commissioning is defined as the act of bringing a newly constructed equipment, or plant, into service. We, at premier petroleum services, have perfected the science and art of commissioning, via bringing aboard the elite commissioning staff who brought large-scale projects to service

PPS provide two types of commissioning, conventional/traditional commissioning and procedural commissioning. Both types can be applied to process plants commissioning and building commissioning.Each has its own nature that fit with the needs of our valued customers. That said, we, at Premier Petroleum Services, prefer the procedural method for commissioning plants. In addition to commissioning services, PPS provide professional precommissioning services.

PRECOMMISSIONING SERVICES

In precommissioning, PPS will provide a wide range of services, ranging from conformity checks, paperwork handling, punch listing and verification, raising site and technical queries and work them through resolution with the proper authority, In addition to actual cold-testing on site, to ensure safe and proper introduction to energy, and readiness for hot or energized testing. Supported by our state-of-the-art completion management system, PPS guarantees an accurate and smooth handover process from construction to commissioning, with the highest quality measures.

COMMISSIONING SERVICES

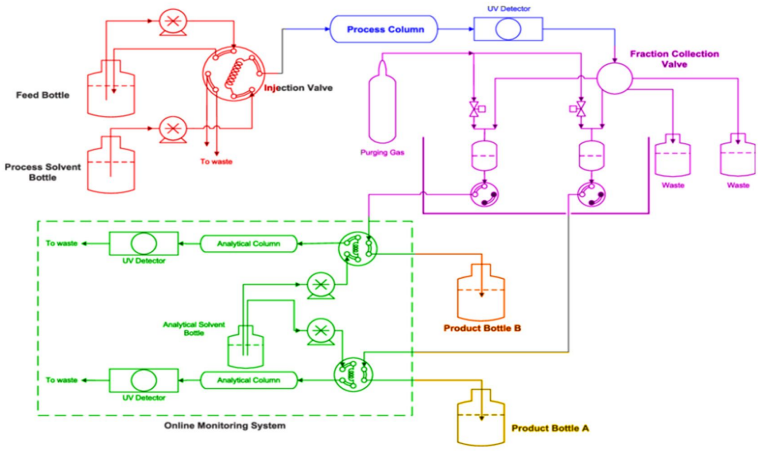
Procedural commissioning is the most thorough method to ensure every bit of your plant has been tended to. With well-established and proven inspection and testing procedures for each type of the project equipment, supported by a robust database of each element of the project equipment and devices, based and built on the detailed engineering documents.

The project is divided into multiple functional systems to facilitate the handover from construction to commissioning to startup, and finally to the plant operations. Each of the project systems shall have their own integrated commissioning procedure, to go along with the standardized procedures for each of the equipment. We believe that the commissioning phase, including both static and dynamic commissioning is the ultimate risk mitigation for the following stage: START-UP.

The services provided under procedural commissioning include the 10 key elements of successful commissioning:

1. Review and update of project HSE plan,
2. Review of project Risk Register,
3. Planning the commissioning process,
4. Managing the Mechanical Completion,
5. Precommissioning of systems, components and/or equipment,
6. Commissioning,
7. Pre-Startup Safety Review (PSSR),
8. Start-Up,
9. Performance test,
10. Project handover and closure.

Commissioning Services



Despite being oriented towards procedural commissioning, PPS also carries out conventional/traditional commissioning, with full function checking of plant instrumentations and devices, leak testing the plant's systems, and then moving on to the start-up and trial operations of the facility.

Moreover, our commissioning crew bring to the project both the projects experience and the maintenance experience, providing comprehensive eye for punch listing in areas such as accessibility and maintainability. Two areas that most commissioning teams overlook.

DELIVERABLES OF COMMISSIONING SERVICES

While we adhere to any client requirements, the deliverables expected from any commissioning service provider include:

- Set of Limits of System Handover (LOSH),
- Management of Change (MoC) registers, including:
- Set of approved red-lined drawings, reflecting changes made during construction,
- Set of green-lined drawings, reflecting change made during commissioning,
- Technical and engineering queries register,
- Commissioning plan and generic commissioning procedures,
- System-specific commissioning procedures,
- Inspection and testing plan,
- Comprehensive punch list per system,
- Check sheets listing all activities done and their results,
- Handover dossiers, per system, covering all the related engineering documents, check sheets, MoCdocuments, manuals, datasheets, punch lists and ITS's

DIRECT BENEFITS OF PROPER COMMISSIONING

It has been proven that with proper commissioning, an industrial facility will:

- Operate at lower cost and energy consumption,
- Have less corrective maintenance needs – as some studies estimate 40% less maintenance cost in the first 10 years of the facility lifetime,
- Have less change orders,
- Have near-zero deficiencies resulting from faulty construction,
- Have a managed and well-documented startup process,
- Have smoother turnover.

BUILDING COMMISSIONING

With the same concept adapted in the oil and gas field, PPS provide the commissioning services for building. It is quite a new application, but it has proven to be very beneficial. When a building is properly commissioned, you get:

- Lower energy and operational costs,
- Reduction of change orders and claims,
- Fewer deficiencies inherited from construction phase,
- Proper documentation eases building the data for the Building Management System,
- Better construction quality and faster project completion time.

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COMPLETION MANAGEMENT SERVICES

Computerized Completions Management Software (CCMS) is usually utilized. We, at PPS, take pride in having our own in-house developed Computerized Completions Management System, which provide a wide spectrum of featured, including:

- Comprehensive and clear built-in reporting, in real-time,
- Easy to understand and manage user interfaces,
- Centralized data servers in PPS premises and cloud storage, or localized database servers on site, with local backups,
- Flexible structure to accommodate project's workflow, if the custom errequires different workflow than PPS's standard completions work flow.
- Adaptable to any project size, specifications and/or forms.
- Ability to export the data into many different formats, including major computerized maintenance management software, to facilitate smooth transition of data to maintenance teams.
- Fully customizable reports and dashboards.
- Web based, hence can run on any operating system and/or computers, tablets or phones.
- Extensive user privileges setup, for advanced security and access control features.
- On request, the system can be run on PPS's own servers to enable project management team access to the status and progress reports from anywhere in the world, with the advanced access control measures.

Along with the Computerized Completions Management System, PPS's own completions engineers have the experience to manage the project's flow, and provide seamless support to all project's parties.

Supporting Product for Engineering services

ANODE

Sacrificial Anodes

- The platform anodes in trapezoidal or cylindrical cross-section with round solid bar or tubular steel inserts.
- The anode sizes and insert designs can be fabricated as per customer's requirement

- Pipelines anodes can be either half shell or segmented bracelet anodes.
- It can be fabricated from 2 "to56" diameter pipelines.
- Bracelet anodes can be made with square end for flush fitting with concrete coating or with taper ends for easy movements over stringer during pipeline laying.
- In addition, bracelet anodes can be designed for fitting on pipeline by welding or bolting the anode halves together and then connected to the pipelines by cables or steel continuity bars

- Zinc and Aluminum anodes are used for protection of ship hulls.
- Hull anodes are usually welded direct to the ship hulls, but it can be bolted if required.
- The anode size and insert designs can be fabricated as per customer's requirements

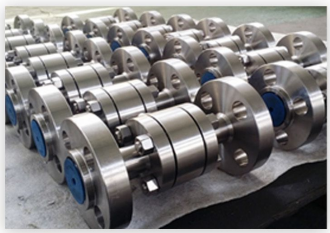
- Zinc and Aluminum anodes are used for protection of ballast tanks, and these are produced with either straight or double cranked core.
- The anode sizes and insert designs can be fabricated as per customer's requirements.
- Also, it can fabricate different types of tanks anodes fixing clamp

High Silicon Anodes

- Available in both tubular and solid rod form
- All standard sizes are available
- Optimizes metal structure and consistency of weight and dimensions.
- Zinc connector hydraulically pressed into taper seat at anode center withstands 1000 kg cable tension and 1000 kg dislodgement force.
- Quality controlled process outperforms 0.001 Ω criterion for connection resistance.
- Epoxy encapsulation design optimizes reliability.
- Improved impact resistance and shipment reliability.
- Enhances Deep Well utilization.

VALVE

Ball Valve



Supporting Product for Engineering services

Design Feature

· Fire safe and anti-static design. Metal to metal sealing shuts off valve flow when soft sealing materials are destroyed by fire.
· Optional stem extension. Extension stem can meet the customers' demand, to adapt to any condition.
· Secure line flow locking device. Valve is equipped with an integral locking device to secure line flow.
· Anti blow-out stem design. It has a taper on sealing surface, it can be replaced packing when the valve is open.
· Optional operation. Gear, electric or pneumatic actuator is available upon request.

Design Standard: API 6D, ASME B16.34, API 608
Body material: WCB, LCB, CF8, CF8M, CF3M etc.
(A105, LF2, F304, F316, F316L etc.)
Ball material: 13Cr, SS304, SS316, SS316L etc.
Seat material: PTFE, RPTFE, PEEK, NYLON
Class: 150LB to 1500LB
Size: 1/2" to 10"

Design Feature

· Optional DBB design. Double block and bleed design.
· Fire safe and anti-static design. Metal to metal sealing shuts off valve flow when soft sealing materials are destroyed by fire.
· Optional stem extension. Extension stem can meet the customers' demand, to adapt to any condition.
· Secure line flow locking device. Valve is equipped with an integral locking device to secure line flow.
· Anti blow-out stem design. It has a taper on sealing surface, it can be replaced packing when the valve is open.
· Optional operation. Gear, electric or pneumatic actuator is available upon request.

Design Standard: API 6D, ASME 16.34, API 608
Body material: WCB, LCB, CF8, CF8M, CF3M etc.
(A105, LF2, F304, F316, F316L etc.)
Ball material: 13Cr, SS304, SS316, SS316L etc.
Seat material: PTFE, RPTFE, PEEK, NYLON
Class: 150LB to 2500LB
Size: 2" to 48"

Gate Valve

Design Feature

* Flexible wedge. Flexible wedge to compensate for seat face distortion and body deformation due to pipe stress.
* Optional stem extension . Extension stem can meet the customers' demand, to adapt to any condition.
* Optional threaded or welded seat. we can also according to the customer demand surfacing with stellite 6.
* Anti blow-out stem design. It has a taper on sealing surface, when valve opens, it is closer to the valve cover seal seat.
* It can be interchanged the disc of gate valve under 8".

Design Standard: API 600,ASME B16.34
Body material: WCB,LCB,CF8,CF8M,CF3M etc.
Sealing face type:
13Cr/13Cr,13Cr/STL,STL/STL,304/304,316/316,316/STL etc.
Class: 150LB to 2500LB
Size: 1/2" to 48"
Connection: Flanged, welded
Material: Carbon & Stainless Steel

Globe Valve

Design Standard: BS 1873,ASME B16.34
Body material: WCB,LCB,CF8,CF8M,CF3M etc.
Sealing face type:
13Cr/13Cr,13Cr/STL,STL/STL,304/304,316/316,316/STL etc.
Class: 150LB to 1500LB
Size: 1/2" to 24"
Connection: Flanged, welded
Material: Carbon & Stainless Steel

Supporting Product for Engineering services

Check Valve

Design Standard: BS 1868,ASME B16.34 ,API 6D
Body material: WCB,LCB,CF8,CF8M,CF3M etc.
Sealing face type:
13Cr/13Cr,13Cr/STL,STL/STL,304/304,316/316,316/STL etc.
Class: 150LB to 2500LB
Size: 1/2" to 48"
Connection: Flanged, welded
Material: Carbon & Stainless Steel

Butterfly Valve

Design Feature

·Anti-blowout stem for high dependability, completely conforming to API 609.
·Elastic property of composite metal sealing ring to perform zero leakage.
·The valve position indicator on the stem and the flange mounted at the top are in favor of the indication of disc position.
·The design of right-angled rotation with zero friction is implemented by the distinctive triple eccentric principle. It eliminates the friction

Design Standard: API 609,ASME B16.34
Body material: WCB,LCB,CF8,CF8M,CF3M etc.
Sealing face type: 13Cr/13Cr,13Cr/STL,STL/STL,304/304,316/316,316/STL,PTFE etc.
Class: 150LB to 600LB
Size: 2" to 60"
Connection: Flanged, Wafer, Lug, Welded.
Material: Carbon & Stainless Steel between the seat and sealing ring in 90°rotation.

Control Valve and Other

SAFETY PRODUCTS

HIPPS is an instrumented safety system that is designed and built in accordance with the IEC 61508 and IEC 61511 standards. These international standards refer to safety functions (SF) and Safety Instrumented Systems (SIS) when discussing a solution to protect equipment, personnel and environment. A system that closes the source of over-pressure within 2 seconds, with at least the same reliability as a safety relief valve, is usually identified as a HIPPS.

Supporting Product for Engineering services

A HIPPS is a complete functional loop consisting of:
- The initiators that detect the high pressure. These initiators may be electronic or mechanical.
- For electronic HIPPS, a logic solver, which processes the input from the initiators to an output to the final element.
- The final elements, that actually perform the corrective action in the field by bringing the process to a safe state. The final element consists of a valve and actuator and possibly solenoids or mechanical initiators.

In practice the required protection level for HIPPS in Oil and Gas applications is often SIL3. But this is not cast in stone and should always be the result of Hazard and Operability study (HAZOP). The requirements of the HIPPS should not be simplified to a PFD level only, the qualitative requirements and architectural constraints form an integral part of the requirements to an instrumented protection system such as HIPPS.

High Integrity Pressure Protection System (HIPPS)

HIPPS is applied to prevent over-pressurisation of a plant or pipeline by shutting off the source of the high pressure

High reliability
Third parties have validated the failure data of the final element (valve and actuator) on applications with less than 2 seconds stroking time.

Fast acting
Fast acting axial on-off valve with integrated actuator, specifically designed for fast reliable stroking.

High capacity
The capacity of the axial on-off valve is extremely high, as a result of which the pressure drop is negligible.

Accuracy better than 1%
Mechanical initiators have an accuracy better than 1 percent of the set point. Failure data have been validated by third parties.

No partial stroke testing required
The final elements do not require additional electronic systems, like partial stroke testing devices, to meet SIL 3 with a 1 year test interval. A separate technical datasheet on this subject is available.

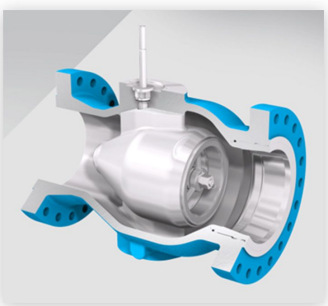
Scope for High Integrity Pressure Protection System (HIPPS)
- Sizes: 2" - 48"
- Ratings: ASME 150 - 2500 or API 3000 - 10 000
- Higher pressure ratings upon request
- All: EN14382 certified (former DIN3381)
- Full closure in 2 seconds.

In preference to
- Flare systems
- Venting or relief systems

other designations
- Safety shut-down systems (SSD)
- Safety Instrumented System (SIS)
- Safety Instrumented Function (SIF)
- Over-pressure protection systems (OPPS)

Advantages of HIPPS
HIPPS provides a technically sound and economically attractive solutions to protect equipment in cases where:
- High pressures and / or flow rates are processed
- The environment is to be protected
- The economic viability of a development needs improvement
- The risk profile of the plant must be reduced

Safety Shutdown Valve or Isolating Valve



This valve is specifically suitable for severe duty on-off (upstream) and for quick-acting safety applications (HIPPS, ESD). Pressure has no impact on the operating forces, and the valve can be opened against full differential pressure.

Axial flow
Streamlined flow path through the full-port expanded body avoids turbulence and prevents erosion and vibration. Process downtime and maintenance costs are reduced

Low pressure loss
The capacity of the axial on-off valve is extremely high, as a result of which the pressure loss is negligible. Operating costs of pumps and compressors are reduced.

Supporting Product for Engineering services

Pressure balanced
Operating forces are independent of pressure. Valve can be opened against full differential pressure without damage to sealing. Equalisation with a bypass valve is not required.

Easy actuation
Actuation force is low and constant because of pressure-balanced trim. Small, spring-opposed actuators can be selected and gearboxes are not required.

Excellent sealing
In the open position the main seal is protected against erosive flow. The self-energising sealing system offers reliable bi-directional and bubble-tight shut-off (class VI).

\Compact
The one-piece valve body provides 15-60% weight reduction compared with ball or gate valves. This benefit is even more attractive combined with spring-opposed actuators.

Fire-safe
The seals that prevent internal and external leakage are secured inside the valve body and therefore less susceptible to external heat sources. All axial on-off valves are certified fire-safe.

Type designation
Safety shutdown valve or isolating valve

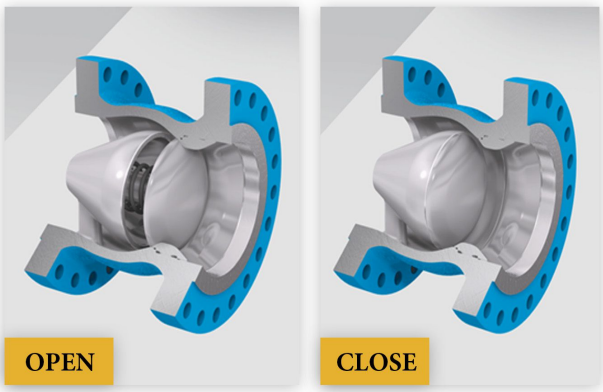
Model
RZD - X

Scope
- Sizes: 2" - 72"
- Ratings: ASME 150 - 2500 or API 3000 - 10 000
- Higher pressure ratings upon request

In preference to
- Ball valve
- Plug valve
- Gate valve

Typical applications
- Severe-duty on-off (upstream)
- Quick-acting on-off (HIPPS, ESD)
- Flow line and header on-off
- Critical isolation, start-up and blow-down
- Switching valve (mol sieve)

Check or Non-Return Valve



An axial check valve is the preferred solution for critical non-return applications such as the protection of rotating equipment and systems where low pressure loss, stable operation and dynamic behaviour are essential.

Axial flow
Streamlined flow path through full-port expanded body avoids turbulence and prevents erosion and vibration. Process downtime and maintenance costs are eliminated.

Low pressure loss
The full opening flow passage and high-pressure recovery of the venturi-shaped body result in very low pressure loss: reduced operating cost of pumps and compressors.

Tight shut-off
Tight shut-off is obtained by means of metal-to-metal sealing between the disc and the seat. This sealing is not affected by erosion and deformation of material (like with a soft seal).

Tight shut-off
Tight shut-off is obtained by means of metal-to-metal sealing between the disc and the seat. This sealing is not affected by erosion and deformation of material (like with a soft seal).

Low cracking pressure
The stability of a compressor system during startup benefits from a low cracking pressure. This is achieved with a large disc that has identical effective pressure areas on both sides (line contact sealing).

Easy opening and stable operation
The low static pressure in the venturi-shaped throat area creates a pressure differential over the disc, resulting in easy opening. The axial check valve responds smoothly to changes in flow and remains stable when it is supposed to be.

Non-slam operation
The spring-assisted design ensures ultra-fast closing with virtually no backflow and pressure surges in critical applications such as multi-pump systems or LNG trains.

Maintenance free
Internal construction is based on the application of sound basic mechanical engineering principles. Consequently, axial check valves do not require any maintenance.

Reliable performance prediction
Both the pressure drop and the dynamic behaviour can be predicted with great accuracy, based on full-scale laboratory flow tests and a mathematical model developed in cooperation with a recognized fluid hydraulics laboratory.

Type designation
Check or non-return valve

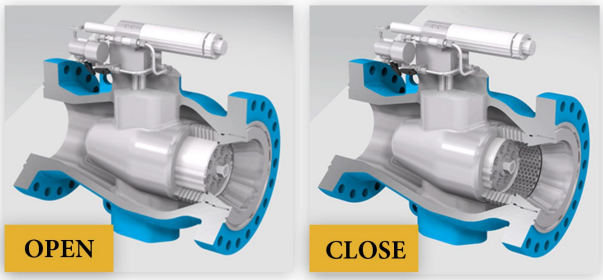
Scope
Sizes 2" - 84", Rating class ASME 150 - 2500 or API 3000 - 10000, higher pressure ratings on request

In preference to
- Swing check valve (including controlled closure devices)
- Dual-plate check valve
- Piston check valve

Typical applications
- Transmission pipeline compressor discharge
- LNG compressor train
- Cooling water system (Ethylene, LNG)
- Multiphase pumping
- Subsea pump and flowline application
- Hydro (power) installations
- Potable water transmission systems

Supporting Product for Engineering services

Surge Relief Valve



The high-capacity proportional pilot design allows fast response and will eliminate the dangers of a pressure surge. All components operate solely on fluid static pressure to provide ultimate protection.

High capacity
The capacity of the axial surge relief valve is extremely high: 50-100% increase compared with a conventional globe valve. Consequently, reduced valve size can be selected

Quick response
The high-capacity proportional pilot design allows fast response to surge pressure. This results in a prompt return to stable pressure conditions.

Unique TVM
Total Velocity Management concept: intelligent valve design that carefully manages fluid velocity in all areas of the valve.

No external energy
The pilot-type design eliminates the necessity for an expensive skid-mounted system with nitrogen bottles and associated temperature-compensating devices.

Low maintenance
Due to the absence of any external power supply such as nitrogen, maintenance is reduced to the bare minimum, making the valve ideal for remote or inaccessible locations.

High-performance
Pilot and surge valve designs are based on simplicity. All components are field-proven to provide maximum protection reliability. They operate solely on fluid static pressure.

Stable operation
The design of the pilot incorporates a snap-acting opening that operates when the set pressure is reached and automatic switching to control in the event of continuing high-pressure conditions.

Type designation
Surge relief valve

Scope
Sizes 6" - 12", rating class ASME 150 - 900, higher pressures upon request

In preference to
- Nitrogen-compensated surge relief valve
- Flexible-sleeve surge relief valve
- Angle relief valve

Typical applications
- Hydraulic pressure surge relief
- Transmission lines
- Oil-tanker loading terminals
- Remote locations

RENEWABLE ENERGY

PV Panels

It consists of 2 types :

POLYCRYSTALLINE
PolyCrystalline or MultiCrystalline solar panels are solar panels that consist of several crystals of silicon in a single PV cell. These solar panels have a surface that looks like a mosaic. These solar panels are square in shape and they have a shining blue hue as they are made up of several crystals of silicon.

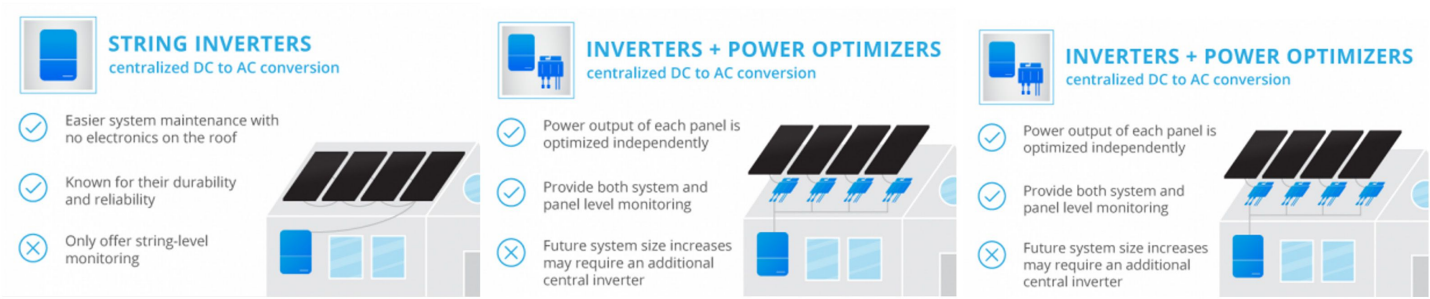
MONOCRYSTALLINE
A monocrystalline solar panel is a solar panel comprising monocrystalline solar cells. These cells are made from a cylindrical silicon ingot grown from a single crystal of silicon of high purity in the same way as a semiconductor. The cylindrical ingot is sliced into wafers forming cells

Supporting Product for Engineering services

Power Inverter

A solar inverter is one of the most important elements of the solar electric power system. It converts the variable direct current (DC) output of a photovoltaic (PV) solar panel into alternating 240V current (AC). This AC electricity then can be fed into your home to operate your appliances.

Types of power inverters :



Batteries

Types of solar batteries :

LEAD ACID
low self-discharge and relatively low capital cost, low cycle life as well as low energy and power density, bulky and heavy

LITHIUM ION
higher energy density than lead-acid, higher efficiency, normally more expensive, prone to self-discharge

NICKEL CADMIUM
higher energy and power density, and better cycle life than lead-acid batteries, high values of self-discharge

FLOW
- Little or no loss of storage capacity
- Ramp rates ranging from milliseconds for discharge if pumps are running, to a few seconds if pumps are not.
- Recharge rates for flow batteries also are reasonably fast
- Wide temperature ranges for operation and standby modes
- Little or no fire hazard.
- Easy scale-up of capacity by adding electrolyte volume
- High cost

PV Regulators

Used in off-grid and hybrid off-grid applications to regulate power input from PV arrays to deliver optimal power output to run electrical loads and charge batteries

Types of solar regulators :

Pulse Width Modulation (PWM) controllers

Pulse Width Modulation (PWM) controllers

Solar Heaters

A solar water heater is a device that captures sunlight to heat water

Supporting Product for Engineering services

CORROSION COUPON

2" Access Fitting Corrosion

An access fitting with a solid or hollow plug in it carry the internal corrosion monitoring or injection device. The access fitting is permanently attached to the vessel or pipe, and the service valve and retriever are used to insert or remove the various probes, corrosion coupons or injection equipment. This corrosion monitoring access system is the worldwide standard for high pressure access fitting systems and tools for "access under pressure" up to 6,000 psi (41 Mpa) and 450° F (232° C).

SPECIFICATIONS
Material : A105 CS, Other
Standard : ASME B31.3
Temperature : Standard Temperature Rating with Viton/Teflon Seals: From -15° F (-26° C) Up To +400° F (+204°C)
Type : Fitting Flarweld, Sockedweld, Buttweld, NPT, Flance

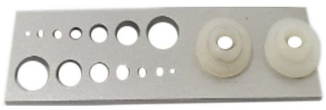
3" Retractable Strip / Retractable Coupon

Retractable Scale Coupon of various sizes and models for 1" retractable systems, which are commonly used for oil and gas, upstream and downstream, chemical companies, etc. 1 pcs corrosion coupon consists of: corrosion coupon (AISI 1018 or to order), standard nylon insulator, serial number * VCI cover / bag, evelope bag, silica and plastic bag

SPECIFICATIONS
Material : AISI 1018, ASTM A106 gr B, to order
Weight : Below 50 gram union depend on the model, details will be listed on the envelope
Standard : NACE RP-0775 and ASTM G-1
Dimension : 3" x 1/2" x 1/16"

3" Scale Corrosion Coupon

3" Scale Corrosion Coupon of various sizes and models for 2 "system access fittings, which are commonly used for oil and gas, upstream and downstream, chemical companies, etc. 1 pcs corrosion coupon consists of: corrosion coupon (AISI 1018 or to order), standard nylon insulator, serial number * VCI cover / bag, evelope bag, silica and plastic bag



SPECIFICATIONS
Material : AISI 1018, ASTM A106 gr B, to order
Weight : Below 50 gram union depend on the model, details will be listed on the envelope
Standard : NACE RP-0775 and ASTM G-1
Dimension : 2-7/8" x 7/8" x 1/8"

Coupon Holder for Corrosion Coupon

Strip Holders

Ladder Strip Holders

Multiple Disc Holders

Disc Holders

Supporting Product for Engineering services

Flush Disc Coupons

Flush disc coupons of various sizes and models for 1" retractable systems, which are commonly used for oil and gas, upstream and downstream, chemical companies, etc. Generally used in applications where the coupon cannot extend into the pipe to interfere with the flow or pigging operations. A circular coupon with a diameter a 1.25", a thickness of 0.125" (3.18 x 0.32 cm), and one mounting hole ID 0.312" (0.792 cm.).

SPECIFICATIONS
Material : AISI 1018, ASTM A106 gr B, to order
Weight : Below 50 gram union depend on the model, details will be listed on the envelope
Standard : NACE RP-0775 and ASTM G-1
Dimension : OD:1.25", Thickness 1/8"
Other Type : Multiple disc coupon, Multiple Disc Coupon Monitoring is available for pipes with diameters of 6" or more

HD protective cover

Protective Covers designed to protect the exposed threads on access fittings from mechanical damage, dust, dirt and moisture. Secondary Process Containment Covers offer an extra layer of protection when a second level of safety is required. With a pressure rating 3600 psi to 6,000 psi and standard viton o-ring, the high pressure retaining covers meet or exceed the extra level of protection required. (standard only not include p gauge and bleed valve).

Also available c/w bleed and P gauge (additional price)
A viton o-ring creates a tight seal retaining any pressure that may build up. The bleed valve allows any pressure accumulation to be released prior to the cover being backed off. The pressure gauge is used to indicate if there is any pressure build up.

SPECIFICATIONS
Material : A105 CS, Other
Type : Heavy Duty Protective Cover Without Hole
Heavy Duty Protective Cover With Hole
Heavy Duty Protective Cover With Bleed Valve and Pressure Gauge

Hollow Plug Body Assy

The Hollow Plug Body Assy is a key component to the high pressure access fitting assembly, as the plug body provides the seal in the access fitting, there by maintaining line pressure. The plug also serves an important function of holding the monitoring equipment which is exposed to the system, and is the component to which the Retriever attaches in order to access and service the monitoring equipment. There are two types of plug assemblies which can be used in any of the high pressure access fittings:

Solid Plug – used in conjunction with:
- Corrosion coupon holders
- Injection/Sampling equipment
- Bacterial sampling probes
- Sand probes

Hollow Plug – used in conjunction with:
- Electrical Resistance probes
- Linear Polarization probes
- Galvanic and Hydrogen probes

HOLLOW PLUG ASSEMBLY
The standard Hollow Plug Assembly consists of:
- Hollow Plug Body
- Primary Packing
- Hollow Plug Packing Retaining Nut
- Probe Packing
- Hollow Plug Seal Nut and Pipe Plug

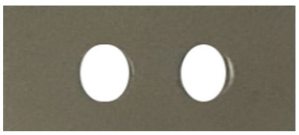
SPECIFICATIONS
Hollow Plug Body : 316L / SS, Others
Primary Packing : PTFE Glass
Hollow Plug Packing Retaining Nut : 316 SS
Probe Packing : PTFE GLass
Hollow Plug Seal Nut : 316 SS
Pipe Plug : 316 SS, Others

Ladder Strip Coupon Corrosion

Ladder Strip Coupon Corrosion of various sizes and models for 2 "system access fittings, which are commonly used for oil and gas, upstream and downstream, chemical companies, etc.

Supporting Product for Engineering services

Ladder strip coupon holders are designed to simultaneously monitor corrosion at various levels in a process line. This is a technique employed in large diameter pipelines (8″ O.D. and greater) where corrosion may not be uniform across the diameter of the pipe, or in systems where flow is stratified.



SPECIFICATIONS
Material : AISI 1018, ASTM A106 gr B, to order
Weight : Below 50 gram union depend on the model, details will be listed on the envelope
Standard : NACE RP-0775 and ASTM G-1
Dimension : 2" x 7/8" x 1/8″

Retractable Corrosion Coupon System

Coupon insertion system is a retractable unit commonly used in field and plant applications. A specially designed packing gland is used to insert or retract a coupon from a pressurized system without a process shutdown. The insertion system is designed to mount onto a 1″ piping system, but can easily be adapted to fit your specific requirements. The system consists of an insertion rod with a coupon adapter, and a packing gland. A safety chain and safety nut are also provided to prevent blowout. Standard packing material in the packing gland is Teflon®, however, grafoil packing can be provided for high temperature applications.

SPECIFICATIONS
Std. Length : 18", 24". 30", 36"
Material : 316L / SS, PTFE
Temperature Rating : 360° C
Pressure Rating : 1500 PSI / 103.4 Bar
Mounting : 1″ Full Port Valve (min.)
Standard : Meets NACE MR0175 and MR0103

Rod Corrosion Coupon

Rod Corrosion coupon standard size is Ø ¼" x 3″ (Ø 6.3mm x 76.2mm) for 1″ systems, which are commonly used for oil and gas.
This Rod Corrosion coupon is screwed into an insulator which is then screwed into an NPT Bullplug Coupon Holder. The rod coupon standard size is Ø ¼" x 3″ (Ø 6.3mm x 76.2mm), with a milled flat area for the serial number. One end is threaded for screwing the coupon into the insulator, the other is notched to accept a flathead screwdriver. The exposed surface area is 3.27 in2 (2,109mm2).

SPECIFICATIONS
Weight : Below 50 gram union depend on the model, details will be listed on the envelope
Material : Stainless Steel, Carbon Steel
Dimension : Ø ¼" x 3″ (Ø 6.3mm x 76.2mm)

Solid Plug Body Assy

Mechanical Solid Plug Body are the internal parts of the access fittings which act as the seal of access fitting to maintain the line pressure as well as the retrievable carrier for holding the monitoring devices. There are two types of plug assemblies which can be used for high pressure access fittings: Solid plugs – used for various types of coupon holders, sacrificial sand probes and Chemical Injection/Sampling devices. The standard Solid Plug assembly consists of: Solid Plug Body, Primary Packing, O-ring, Solid plug Nut with set screw, Pipe Plug

SPECIFICATIONS
Solid Plug Body : 316L / SS, Others
Primary Packing : PTFE Glass
O-ring : Viton
Solid plug Nut with set screw : 316L / SS, Other
Pipe Plug : 316L / SS

PPS registered in :

- **EGPC** (Egyptian General Petroleum Corporation) under number (82/2019) & (54/2020)
- **EGAS** (Egyptian Natural Gas Holding Co.) under number (2474)
- **EFCBC** (Egyptian Federation tor Construction & Building Contractors) under number (77301)
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