

A stylized green valve symbol consisting of two curved segments meeting at a central point, resembling a valve handle or a specific valve component.

11. Subsea and HIPPS Valves

Section 11. Subsea and HIPPS Valves

High Integrity Pressure Protection Systems (HIPPS)

What is HIPPS

- The increased reliability of the HIPPS system minimises the need for other safety related devices such as relief valves
- Prevent Against - Fatal accidents
 - Damage to expensive equipment
 - Production down time
- Allows a reduction in the downstream pressure ratings for equipment/pipelines
- Substantially reduce flare capacity

Hipps Definition

- High Integrity Pipeline Protection System
- High Integrity Process Protection System
- High Integrity Pressure Protection System
- Instrumented Overpressure Protection System (IOPS)

Pressure Range

ANSI 150 to ANSI 2500, API 2000 to 15000

Materials

Alloy Steel, Alloy Steel internally Clad with Inconel 625. Duplex, Super Duplex, Inconel, etc

Sizes

½" to 42"

Subsea Valves

Type

Through Conduit Gate Valve, Ball Valve, Check valves, Double Block & Bleed Valves

Operators

Manual, ROV, Gearbox, Hydraulic Actuator (Spring Return Fail Safe & Double Acting)

Pressure Range

ANSI 150 to ANSI 2500, API 2000 to API 15000

Sizes

½" to 42"

Materials

Alloy Steel, Alloy Steel internally Clad with Inconel 625. Duplex, Super Duplex, Inconel, etc

Standards

API 6D, API 6DSS, API 6A, Appendix F PR2, API 17D

Design Qualifications

include API 6A, 17D, 6D, PR2, Hyperbaric, 1200 cycle and sand slurry testing.

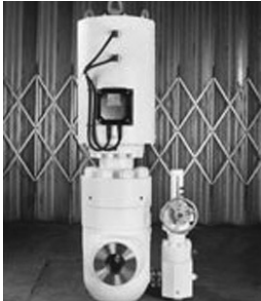
visit www.rbvenergy.com for more info

Section 11. Subsea and HIPPS Valves



visit www.rbvenergy.com for more info

Diagram 11.1 Fully Intergrated HIPPS System



- Valve (Ball or Gate)
- Actuator (Quick Closing)
- Control Panel
- Logic Solvers
- Sensors/Transmitters
- By-Pass Valves (if required)
- All Valves and Actuators supplied to SIL3 as standard

Diagram 11.2 HIPPS Benefits

- Reduce downstream pipe wall thickness.
- Reduce downstream component size.
- Reduce weight of subsea manifolds.
- Reduce riser wall thickness.
- Tie back high pressure into existing pipeline infrastructure.
- Reduce exposure of topsides personnel to HP production.

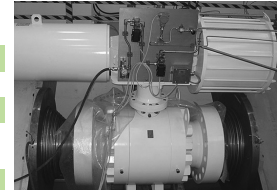


Diagram 11.3 What does HIPPS do?

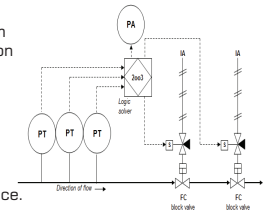


- Exploits the difference between Shut in pressure and Flow pressure
- Permits the downstream flowline to be de-rated.
- Protects by sensing over pressure.
- Quick acting system shutdown < 2 secs.

Diagram 11.4 Functional Safety

Safety Integrity Level (SIL):

- A SIL is a measure of a safety system performance, or probability of failure on demand (PFD) for a SIF or a SIS.
- There are four discrete levels associated with SIL.
- The higher the SIL level, the lower the probability of failure on demand and the better the system performance.



SIL	Reliability Requirement (Probability of failure to perform its designed function on demand)	Failure
SIL 4	$10^{-5} \leq \text{SIL } 4 < 10^{-4}$	1 out of 10,000 times
SIL 3	$10^{-4} \leq \text{SIL } 3 < 10^{-3}$	1 out of 1000 times
SIL 2	$10^{-3} \leq \text{SIL } 2 < 10^{-2}$	1 out of 100 times
SIL 1	$10^{-2} \leq \text{SIL } 1 < 10^{-1}$	1 out of 10 times

Section 11. Subsea and HIPPS Valves

Diagram 11.5 Subsea Ball Valves



End and top entry configurations.

Metal to metal sealing.

PR2 qualified.

Hyperbarically tested to 3000M.

Flanged, BW, hub, compact flange ends

Diagram 11.6 Subsea Through Conduit Gate Valves

Flanged, butt weld, hub, compact flange ends.

Tungsten carbide coated gates and seats.

Rising or non rising stem.

Cast or forged bodies.

PR2 qualified.

Hyperbarically tested to 3000M.



Diagram 11.7 Subsea Check Valves



Flanged, BW, hub, compact flanged ends.

Swing and piston type.

PR2 & hyperbarically qualified.

Diagram 11.8 Subsea Needle/ DB&B Valves

High integrity service.

Diver or ROV operated.

Bespoke arrangements to suit client design.

Metal to metal sealing.



visit www.rbvenergy.com for more info