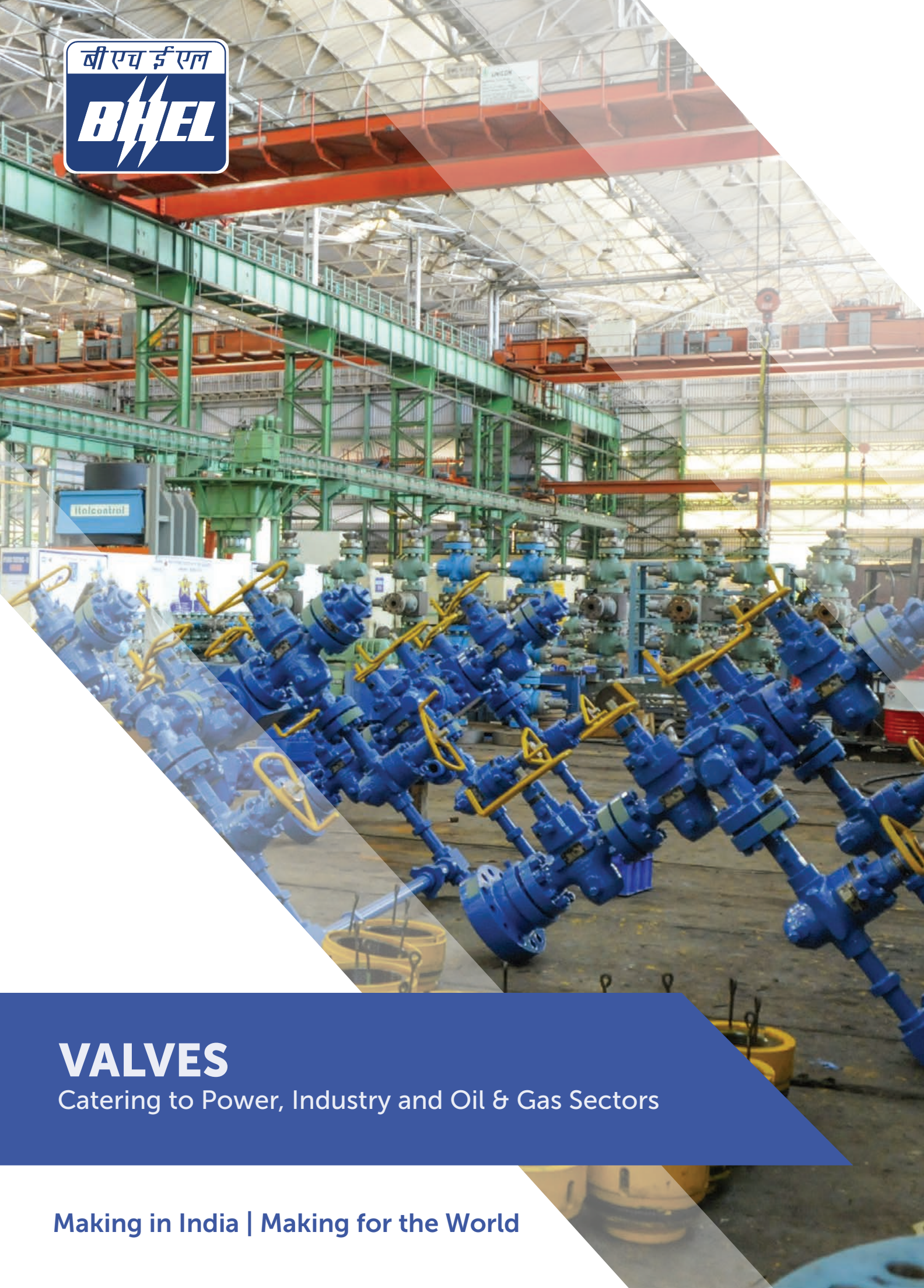


VALVES

Catering to Power, Industry and Oil & Gas Sectors

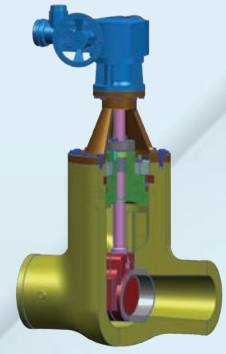
Making in India | Making for the World

About BHEL

Since 1964, BHEL has been 'Making in India' as a leading Capital Goods sector company. Today, the company's businesses are in the areas of power and industry, offering comprehensive solutions, including products, systems and services to power generation (thermal, hydro, gas, nuclear and solar PV), transmission, transportation, defence, aerospace, oil & gas and other core sectors of the country, and also abroad. BHEL, incorporated as a Public Sector Undertaking of the Government of India with a shareholding of 63.17%, has established 16 manufacturing plants spread across India, producing capital goods for the customers in domestic as well as international markets. The Company has steadily expanded its product portfolio through both partnerships with global OEMs as well as in-house product development. The in-house product development is backed by consistent investment of more than 2.5% of revenue on R&D and innovation. At BHEL, we firmly believe that serving our customers, protecting the environment, and contributing to society are intrinsically linked, and form the core of our corporate ethos. The Company has been supporting communities through programs like skill development; promoting health, hygiene & education; and running several programs on environmental protection & improvement.

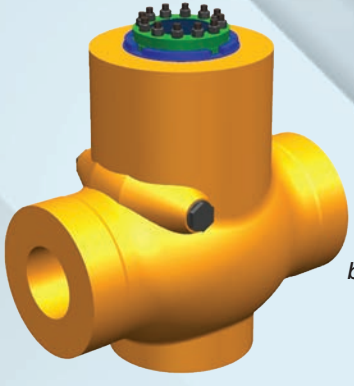
High Pressure Gate Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate fluids like air, water, oil and gas.



Parameter	Value
Pressure Class	900 - 3500
Material	WCC, WC9, C12A & F92
Size	2½" - 24"

High Pressure Check Valve

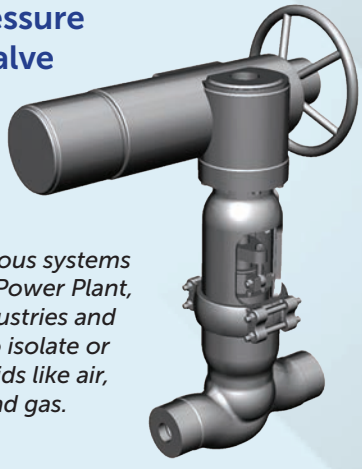


Used in various systems in Thermal Power Plant, process industries and refineries to prevent the backflow of fluid in a pipeline.

Parameter	Value
Pressure Class	1500 - 3500
Material	WCC, WC9 & C12A
Size	2½" - 24"

Hydraulic Test Unit for Valves up to 22,500 psi

High Pressure Globe Valve

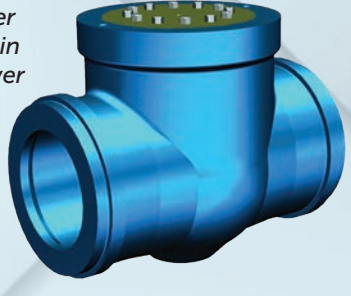


Used in various systems in Thermal Power Plant, process industries and refineries to isolate or regulate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	1500 - 3500
Material	WCC, WC9, C12A & F92
Size	2½" - 10"

Re-heater Isolating Device

Used in Power Cycle Piping in Thermal Power Plant.



Parameter	Value
Pressure Class	500, 900, 1500
Material	WCB, WCC, WC9, C12A & F92
Size	18", 20", 22", 28", 30", 32" & 36"

Valves

BHEL manufactures valves to the highest international standards for a wide range of critical applications in the power, industry and oil & gas sectors covering Gate Valves, Globe Valves and Swing-check Valves of various materials from carbon steel to stainless steel with special features like motorized, pneumatic or gear operation, limit switch and indicator arrangement, lock or chain-wheel, etc.

Safety Relief Valve

Widest range of Valves

BHEL's product range includes Gate, Globe and Non-return Valves, Angle Drain and Blow Down Valves, Safety Valves and Safety Relief Valves, Electrical Relief Valves, Quick Closing Non-return Valves, Power Assisted Non-Return Valves, Forged Steel Valves, HP-LP Bypass Systems, Spring Loaded Bypass Valves, Ash Discharge Valves, Knife Edge Gate Valves and Oil-field Equipment such as Well-heads, X-mas Trees, Block Valves, Mud-line Suspension Systems and Choke and Kill Manifold.

Meeting World Standards

BHEL valves conform to international codes such as ASME, API, ANSI, DIN and IBR. BHEL holds API certifications for Oil Field Equipment. BHEL had previously collaborated with TOA Valve Company (Japan) for High Pressure Cast Steel Valves and Quick Closing Non-Return Valves; Dresser Industries Inc., (USA) for Forged Steel Valves, Safety Valves, Safety Relief Valves, Electrical Relief Valves and Y-type Valves; Kvaerner National (USA) for Oil-field equipment and Sulzer Thermtec (Switzerland) for HP-LP Bypass Systems. BHEL has successfully developed and supplied many new Valves for various applications.

Well Head Test Facility

Cast Steel Gate Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	150, 300, 600
Material	WCB, WCC, WC9, C12A & CF8M
Size	2" to 38"

Cast Steel Globe / Regulating Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate or regulate fluids like air, water, oil and gas.

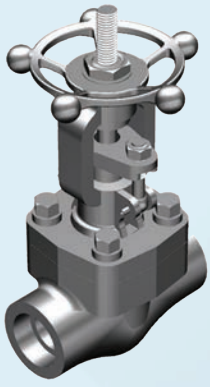
Parameter	Value
Pressure Class	300, 600
Material	WCB, WCC, WC9, C12A & CF8M
Size	2" to 16"

Cast Steel Non-Return Valve

Used in various systems in Thermal Power Plant, process industries and refineries to prevent the backflow of fluid in a pipeline.

Parameter	Value
Pressure Class	150, 300, 600
Material	WCB, WCC, WC9 & CF8M
Size	2" to 38"

Forged Steel Medium Pressure Gate Valve



Used in various systems in Thermal Power Plant, process industries and refineries to isolate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	800
Material	A105, F316
Size	¼" TO 2"

Forged Steel Medium Pressure Globe Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate or regulate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	800
Material	A105, F316
Size	¼" TO 2"

Forged Steel High Pressure Globe/ Regulating Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate or regulate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	1500, 2500, 3000 SPL, 3000 LTD, 3500 SPL & 4500
Material	A105, F22, F91, F92, F316, F316L
Size	¼" TO 2"

PR2 Test Unit

Sophisticated manufacturing and testing facilities

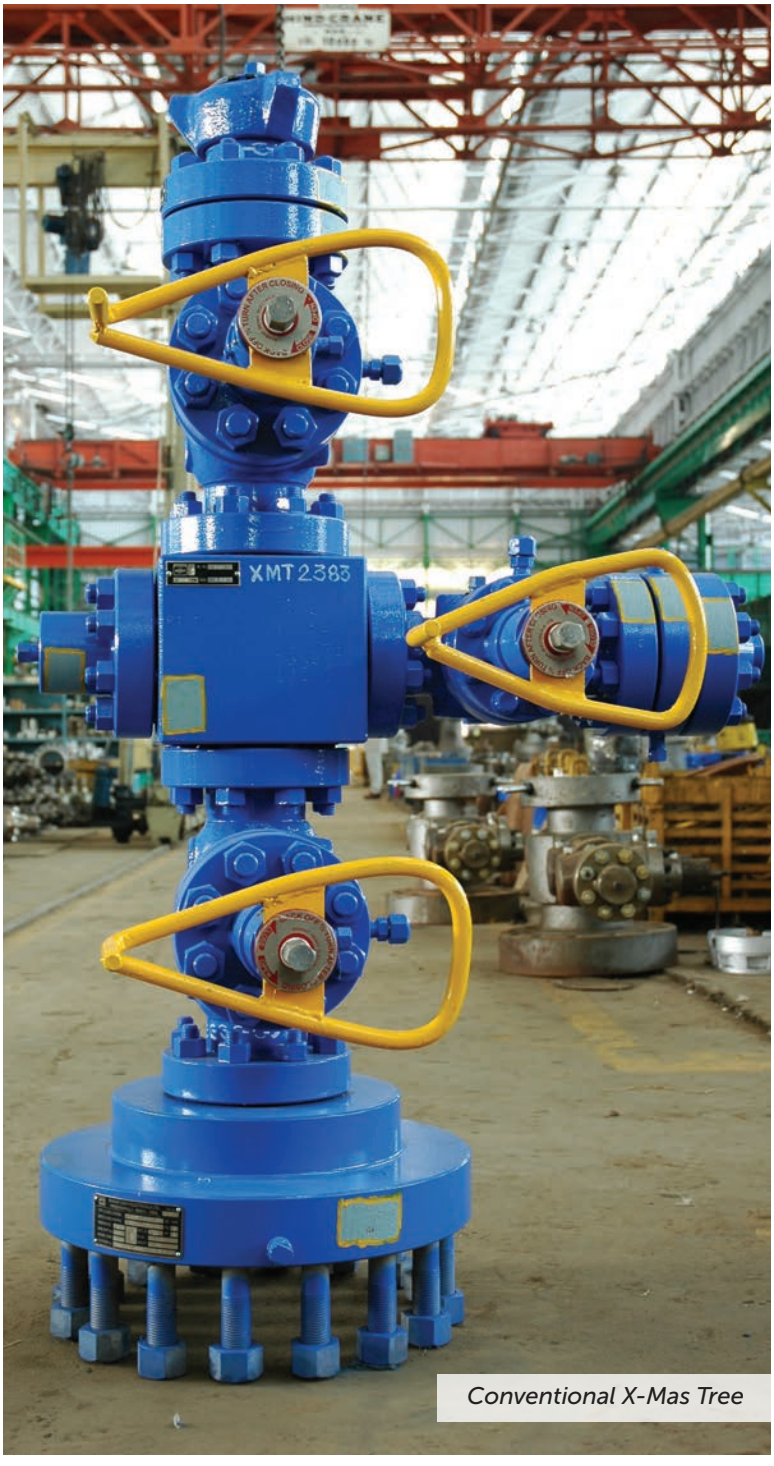
BHEL's valves production shops are equipped with state-of-the art CNC machines capable of performing intricate operations. Testing facilities include radiographic testing for castings and forgings, a full-fledged steam testing station for Safety Valves and Safety Relief Valves, hydraulic test benches and an air-test station for Conventional Valves, besides hydraulic testing facilities for High Pressure Valves and testing facilities for Oil-field Equipment up to 30,000 psi.

In its constant endeavour to offer high quality products, BHEL has recently established a state-of-the-art testing facility at its manufacturing plant at Tiruchirappalli. The new facility is equipped to provide validation testing of critical components from extremely low temperature to high temperature (-29°C to 350°C) while dynamically cycling under various pressure conditions (0 to 30,000 psi) and will be useful in the development and supply of higher rating equipment, in addition to extension of testing services to similar equipment of other manufacturers.

Focus on Quality

BHEL is known for its International Quality standards and has obtained certified Quality Management System (ISO 9001:2015), Environmental Management System (ISO 14001:2015), Occupational Health & Safety Management System (ISO 45001:2018) and Information Security Management System (ISO 27001:2013) certification. BHEL practices EFQM model towards Business Excellence.

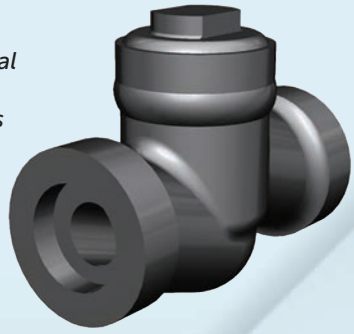
Continuous design improvements through in-house research & development (R & D), quality management systems and state-of-the-art precision manufacturing technology ensure



Conventional X-Mas Tree

Forged Steel High Pressure Check Valve

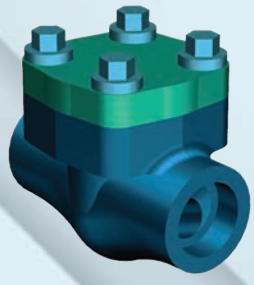
Used in various systems in Thermal Power Plant, process industries and refineries to prevent the backflow of fluid in a pipeline.



Parameter	Value
Pressure Class	1500, 2500, 3000 SPL, 3000 LTD, 3500 SPL
Material	A105, F22, F91, F92, F316, F316L
Size	¼" TO 2"

Forged Steel Medium Pressure Check Valve

Used in various systems in Thermal Power Plant, process industries and refineries to prevent the backflow of fluid in a pipeline.



Parameter	Value
Pressure Class	800
Material	A105, F316
Size	¼" TO 2"

Y-type Globe Valve

Used in various systems in Thermal Power Plant, process industries and refineries to isolate or regulate fluids like air, water, oil and gas.

Parameter	Value
Pressure Class	2500
Material	A105
Size	2½"

Forged Steel Blow Down Valve

These High Pressure drop blow down valves are used in Power and Industrial boiler drums as continuous and intermediate blow down device.

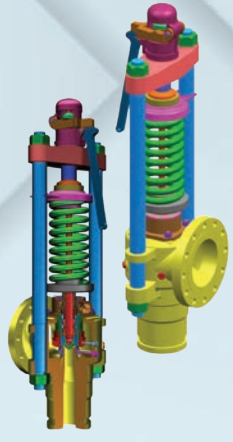
Parameter	Value
Pressure Class	800, 1500, 2000 & 2750
Material	A105
Size	1", 1 ½"
Orifice	1/8" to 1"

Elbow Down Valve

Used in Steam Generator piping in Thermal Power Plant.

Parameter	Value
Pressure Class	2000
Material	WCC
Size	12"

Safety Valve



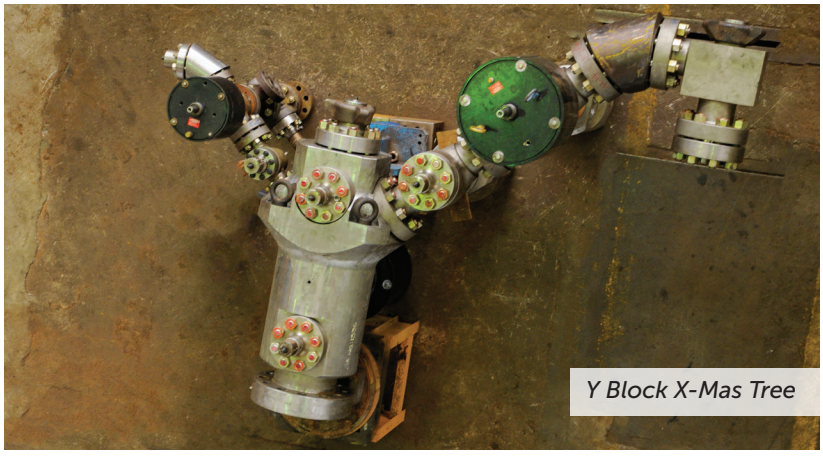
Safety valves are overpressure protection devices used in Thermal Power Plants, and Industrial Captive Power Plants. These valves are used in ASME Sec. I applications (Boiler drum, Separator, Superheater, Cold Reheater, Hot Reheater Lines, Soot Blower Lines).

Parameter	Value
7000 Series	
Pressure	600 to 5300 psi
Material	WCB, WC6, WC9, C12A & CF8M
Size	1 ½" to 6"
7800 Series	
Pressure	300 to 900 psi
Material	WCB, WC6 & WC9
Size	1 ¼" to 6"

Non-Return Valve

that BHEL Valves set the standards for quality and reliability. Quality Assurance services are provided by a team of qualified scientists equipped with advanced diagnostic and measuring equipment including spectroscopes, high magnification microscopes, x-ray diffraction strain gauges besides fatigue and creep testing machines.

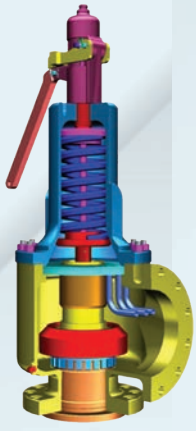
Non-destructive testing facilities use X-rays up to 400 kV and isotopes up to 800 Curies. Precision gauges, tools and instruments are calibrated at BHEL's in-house, nationally accredited Calibration Centre.



Y Block X-Mas Tree

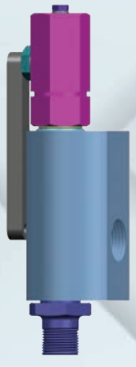
Safety Relief Valve

They are overpressure protection devices used in Thermal Power Plants, pressure vessels in refineries, process industries, chemical industries. These valves are used in ASME Sec. VIII & API applications (PRDS stations, HP/ LP Heaters, Deaerator, CBD Tanks, Extraction Lines, back pressure applications, other liquid & gas lines).



Parameter	Value
9000 Series	
Pressure Class	150 to 2500 psi
Material	WCB, WC6, CF8M
Size	1" to 8"
Certified by Petroleum and Explosives Safety Organization (PESO), India.	

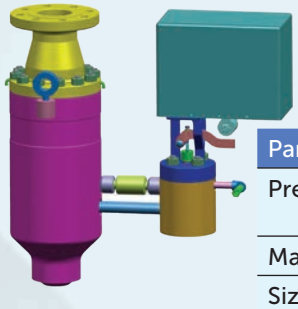
Portable Relief Valve



They are overpressure protection devices used in refineries, process industries, chemical industries. These valves are used for thermal relief applications.

Parameter	Value
9900 Series	
Pressure	150 to 8000 psi
Material	WCB, CF8M
Size	½" - 2"

Electromatic Relief Valve



These are electrically operated relief valves used for overpressure protection in Thermal Power Plants. These valves are used primarily in ASME Sec. I applications (Superheater & Hot Reheater Lines).

Parameter	Value
Pressure	1500, 2500, 3000, 4500, 5300 psi
Material	WC9, C12A, F92
Size	2½" - 6"

Silencer

Silencers are noise attenuation devices used in power plants, process industries, chemical industries, blowers, compressors etc., to reduce noise of high pressure gaseous mediums before discharging to atmosphere. Typical examples include safety valve discharge, startup vent, air compressor discharge.

Parameter	Value
Absorptive and Reactive Type	
Insertion Loss	25 to 40 dBA
Size	500 to 2700 mm OD

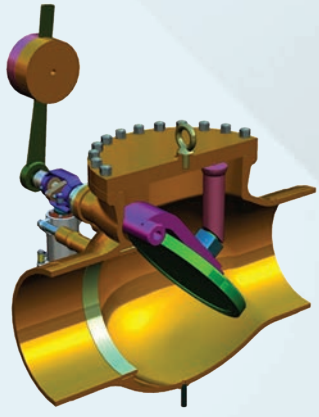
Angle Drain Valve

Used in Turbine integral piping of Thermal Power Plants.

Parameter	Value
Size	25/40, 25/65, 40/50, 40/65, 50/65 & 65/100
Ratings	C1500 to C3000 SPL
Material	SA105, F22, F91 & F92

Quick Closing Non-Return Valve

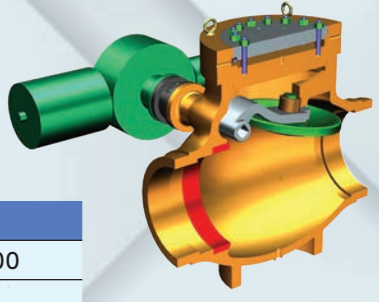
Used in Turbine extraction lines as protection device to prevent backflow to Turbine from LP/HP Heaters.



Parameter	Value
Pressure Class	150 to 900
Material	WCB, WC6, WC9
Size	3" - 36"

Power Assisted Non-Return Valve

Used in Cold Reheat lines to admit steam flow from HP Turbine to Boiler Reheater and prevent backflow to HP Turbine.



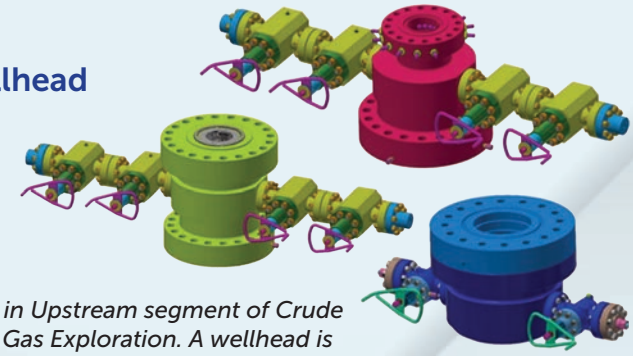
Parameter	Value
Pressure Class	600, 700, 900
Material	WC6, WC9
Size	18", 24", 32", 34"

Pressure Gauge Valve

Used in Turbine integral piping and SG integral piping of Thermal Power Plants.

Parameter	Value
Pressure Class	1500 to 4000
Material	SS 316
Size	3mm
End Conn.	M20/G0.5/ R0.5/0.5NPT

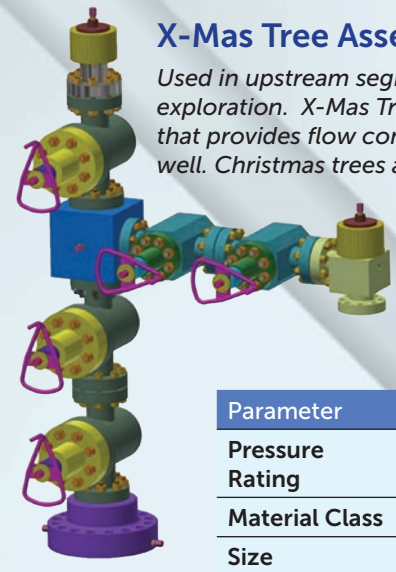
Wellhead



Used in Upstream segment of Crude Oil & Gas Exploration. A wellhead is an equipment installed at the surface of a completed oil or a gas well that provides a structural and pressure containing interface for the drilling and production equipment.

Parameter	Value
Pressure Rating	2000, 3000,5000,10000, 15000 psi
Material Class	AA through HH
PSL	1 to 4
String	Single & Multiple
Casing Policy	2, 3 & 4

X-Mas Tree Assembly



Used in upstream segment of crude oil and gas exploration. X-Mas Tree is a piece of equipment that provides flow control on an oil or gas well. Christmas trees are a vertical assembly of valves with gauges and chokes that allow for adjustments in flow control as well as injections to stimulate production.

Parameter	Value
Pressure Rating	3000, 5000, 10000, 15000 psi
Material Class	AA through HH
Size	2 1/16", 2 9/16", 3 1/8", 4 1/16", 5 1/8"
PSL	1 to 4
Single Arm, Double Arm	

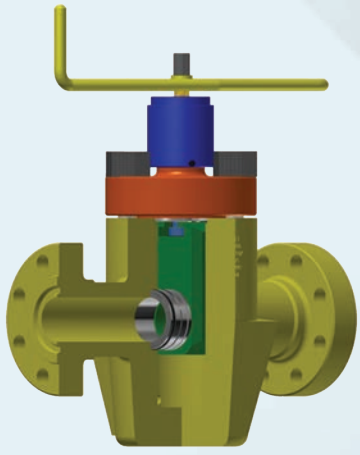
Dual Block X-Mas Tree Assembly

Used in upstream segment of crude oil and gas exploration. It is a block type X-Mas Tree, where two strings of output can be taken through a single X-Mas Tree.

Parameter	Value
Pressure Rating	5000, 10000 psi
Material Class	AA through HH
Size	2 1/16", 2 9/16"
PSL	1 to 4

Full Bore Gate Valve

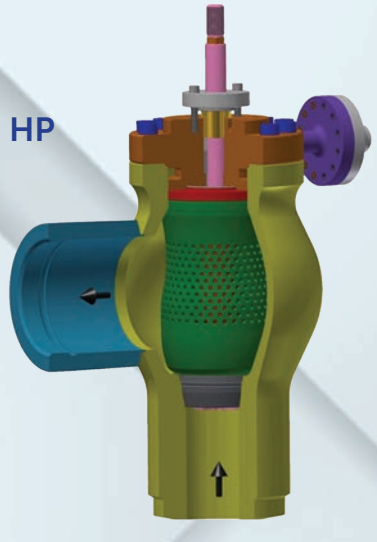
Used in upstream segment of crude oil and gas exploration as an annulus valve for wellheads and in the assembly of X-Mas Tree. Gate valves are designed as full-port valves. Full-bore gate valve passes the fluid flow without any obstruction to flow and do not cause any pressure drop in the pipeline.



Parameter	Value
Pressure Rating	2000, 3000, 5000, 10000, 15000 psi
Material	Carbon, Alloy & Stainless Steel
Size	1 13/16", 2 1/16 ", 2 9/16", 3 1/8", 4 1/16", 5 1/8"

High Pressure Turbine Bypass System - Angle Type HP Bypass Valve

They are are used to bypass steam from HP turbines and admit it to the cold reheat lines of power plants.

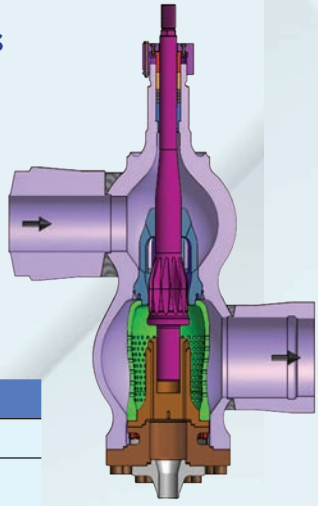


Parameter	Value
Max Design Pressure	337 kg/cm^2
Max Design Temperature	718^{0}C
Standard Flow Capacities	30%, 60%, 65% & 100% of TMCR
Designs for Higher Parameters/ Intermediate Flow Capacities available on request	

System Comprises of
• HP Turbine Bypass Valves
• Spray Water Valves
• Electro-hydraulic Actuators
• Hydraulic Power Unit
• Position Feedback Transmitters
• Proportional Valves/Servo Valves

High Pressure Turbine Bypass System - Z-Type HP Bypass Valve

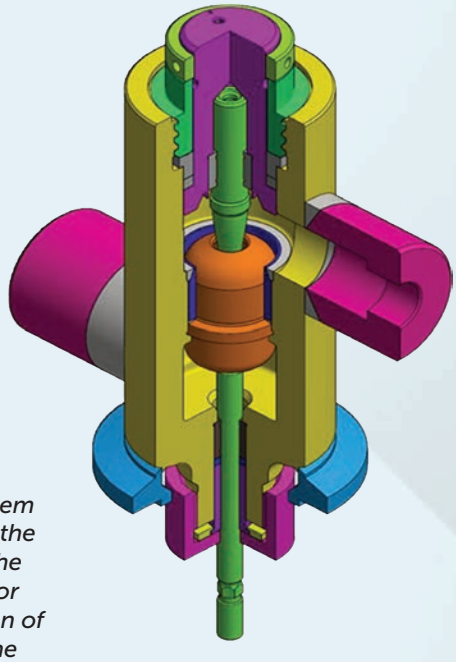
They are used to bypass steam from HP turbines and admit it to the cold reheat lines of power plants.



Parameter	Value
Max Design Pressure	237 kg/cm^2
Max Design Temperature	568^{0}C
Standard Flow Capacities	30%, 60%, 65% & 100% of TMCR
Designs for Higher Parameters/ Intermediate Flow Capacities available on request	

System Comprises of
• HP Turbine Bypass Valves
• Spray Water Valves
• Electro-hydraulic Actuators
• Hydraulic Power Unit
• Position Feedback Transmitters
• Proportional Valves/Servo Valves

High Pressure Turbine Bypass System - Spray Valve

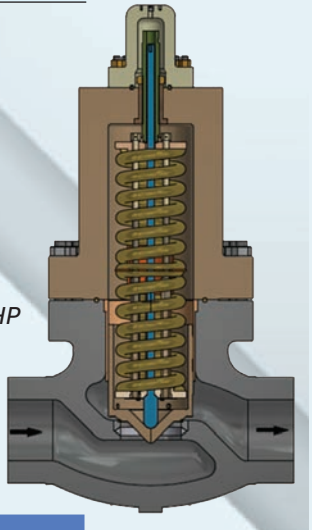


Spray valves of HP Turbine bypass system are used to reduce the water pressure to the required pressure for use in attemperation of the steam before the steam is admitted to cold reheat lines.

Parameter	Value
Max Design Pressure	400 kg/cm^2
Max Design Temperature	300^{0}C
Design for higher parameters available on request	

Spring loaded Bypass Valve

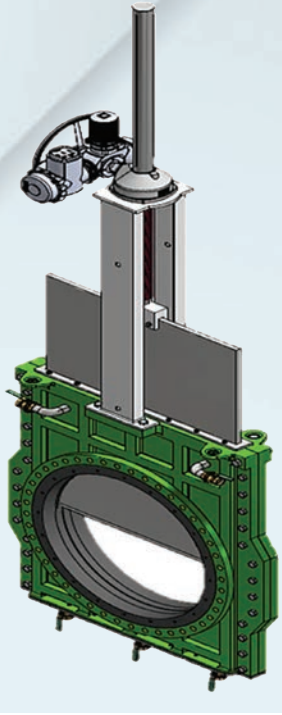
These valves are used to bypass the HP heaters of a power plant.



Parameter	Value
Max Design Pressure	440 kg/cm^2
Max Design Temperature	200^{0}C
Size	16"
Class Rating	ASME B16.34-2500 SPL
Medium	Water
Utilised in HP Heaters Group Bypass application of a Thermal Power Plant.	
Works on differential pressure application	
Valve for different design parameters are available on request	

Knife Edge Gate Valve

Used in absorber pump suction and discharge lines in FGD projects to isolate the limestone slurry.



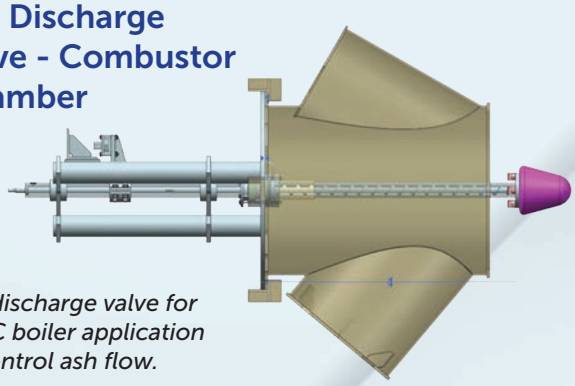
Parameter	Value
Size	1300NB 1400NB
Medium	Slurry

Ash Discharge Valve - Seal pot

Ash discharge valve for CFBC boiler application to control ash flow.

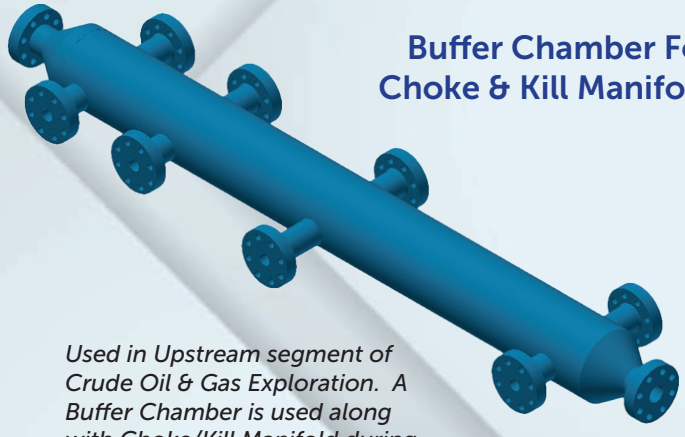
Parameter	Value
Application	CFBC Boiler
Lance Size	Ø135 mm
Stroke	300 mm

Ash Discharge Valve - Combustor Chamber



Ash discharge valve for CFBC boiler application to control ash flow.

Parameter	Value
Application	CFBC Boiler
Lance Size	Ø75 mm
Stroke	300 mm



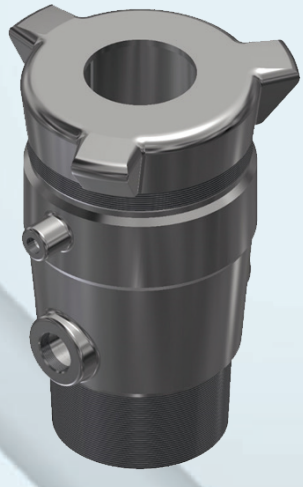
Buffer Chamber For Choke & Kill Manifold

Used in Upstream segment of Crude Oil & Gas Exploration. A Buffer Chamber is used along with Choke/Kill Manifold during the drilling.

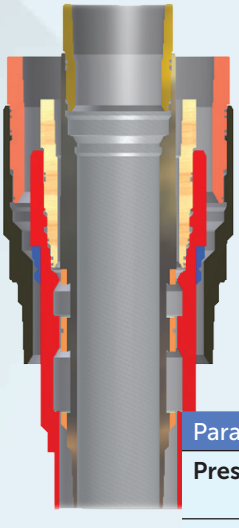
Parameter	Value
Pressure Rating	2000, 3000, 5000, 10000 psi
Material Class	AA through FF
PSL	1 to 4
Monogram	API 16C

CBM Wellhead

Used in Upstream segment of Coal Bed Methane Exploration.



Parameter	Value
Pressure Rating	2000 psi
Size	7" & 11"
End Connections	Flanged & Screwed



Mudline Suspension System

Used in Upstream segment of Crude Oil & Gas Exploration. A mudline suspension system is a system designed to support the considerable casing weight of a deep-sea drilling operation such as that on a floating Jack-Up Rig.

Parameter	Value
Pressure Rating	2000, 3000, 5000, 10000 psi
Size	20x18-5/8x13-3/8x9-5/8"
Monogram	API 17D

Dual Block X-Mas Tree

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