MAINTENANCE FOR ISOLATION LIFT PLUG & 4 WAY SWITCH PLUG VALVES FOR DELAYED COKER UNIT



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- 1. APPLICATIONS
- 2. DESIGN AND PERFORMANCE OF LIFT PLUG (ISOLATION) & 4 WAY SWITCH PLUG VALVES
- 3. MRO VALVES & MAINTENANCE AFTER MARKET

1. APPLICATIONS



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VALVES ON DELAYED COKER UNIT

• Isolation Lift Plug valves and Switch Lift Plug valves:

Isolation up to 36" 900# (35 years experience with more than 40 coker projects)

Switch: up to 18" 900# (since 2000 year)

• Throttling Ball valve:

Up to 36" 300#





1. APPLICATIONS



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APPLICATIONS FOR LIFT PLUG VALVE IN REFINERY

- Fluid Catalytic Cracking (FCC)
- Visbreaking
- Delayed Coking
- THF(Tetrahydrofuran-Hydroforming)
- Sulphur Recovery
- Ethylene Craker
- Olefins



1. APPLICATIONS



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DELAYED COKER



HP Pump Inlet Isolation	Severe Service Ball Valve	
Cutting Water Pump Isolation	Severe Service Ball Valve	
Overhead Vapor Isolation	on Lift & Turn Plug Valve	
Quench Extraction	Severe Service Ball Valve	
Coke Drum Bypass Isolation	Lift & Turn Plug Valve	
Coke Drum Switching	Lift & Turn Switch Valve	
Coke Drum Feed Isolation	Lift & Turn Plug Valve	
Quench Extraction Isolation	Lift & Turn Plug Valve	
Light Coker Gas Oil Pump EBV	Lift & Turn Plug Valve	
Heavy Coker Gas Oil Pump EBV	Lift & Turn Plug Valve	
Frac Bottoms EBV	Lift & Turn Plug Valve	
Coke Filter Isolation	Lift & Turn Plug Valve	
Furnace Charge Pump Inlet Isolation	Lift & Turn Plug Valve	
Furnace Charge Pump Discharge Isolation	Lift & Turn Plug Valve	
Furnace Feed Isolation	Lift & Turn Plug Valve	
General Utility Valves (Steam, Water, Condensation)	Severe Service Ball or Gate Valve	
Drain Valves	Severe Service Ball or Gate Valve	



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DESIGN STANDARS FOR LIFT PLUG VALVE & SWITCH VALVES



- ✓ DESIGN: API599
- ✓ BORE DIAMETER: API 6D
- ✓ WALL THICKNESS: API 600
- ✓ BOLTING: API 600, ASME B16.34, ASME VIII
- ✓ END FLANGES(RF RTJ):
 ASME B16.5: <= 24''
 ASME B16.47A: >26''
 ASME B16.47B: >26''
- ✓ STEM DIAMETER: STD POYAM
- ✓ STEM GLAND PACKING: STD POYAM BC-103
- ✓ FACE TO FACE DIMENSION: ASME B.16.10, AMPO POYAM Std, Customer spec.



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DESIGN DETAILS FOR LIFT PLUG VALVE & SWITCH VALVES







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HOW IS OPERATING:





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PERFORMANCE VIDEO





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DESIGN DETAILS FOR SWITCH PLUG VALVES



ND.	PART	MATERIAL	
1	BODY	ASTM A 217 C5+STELLITE-6	
2	BONNET	ASTM A 217 C5	
5	PLUG	ASTM & 487 CA6NH+STELLITE-6	
6	STEN	ASTM A 479 Gr. 410	
8	gland Bushing	ASTM A 479 Gr. 410	
9	GLAND FLANGE	ASTM A 516 Gr. 70	
13	PIPE	ASTM A 29 Gr.1015	
13A	RETAINING RING	ASTM A 29 Gr. 1516	
- 14	GASKET	SPRAL WOUND 316+GRAPHOL	
14A	GASKET	KLINGER	
148	GASKET	ASTM B 62	
15	LANTERN	ASTM A 479 Gr. 410	
16	STUD BOLT	ASTM A 193 816	
17	NUT	ASTM A 194 Gr. 2H	
18	STUD BOLT	ASTM A 193 816	
19	NUT	ASTM A 194 Gr. 2H	
ZÓ	PACKING	GRAPHOIL	
47	BLISHING	ASTM A 479 Gr. 410+STELLITE-6	
48	PIN	ASTM A 29 Gr. 4135	
48A	PIN	ASTM A 29 Gr. 4135	
68	PIN	ASTM A 29 Gr. 4135	
68A	PIN	ASTM A 29 Gr. 4135	
71	KEY	ASTM A 29 Gr. 1045	
85	ACTUATOR+GEAR	COMMERCIAL	
109	SOEKET BOLT	ASTM A 29 Gr. 1518	
110	SOCKET BOLT	ASTM A 29 Gr. 1518	
161	ACTUATOR+GEAR	COMMERCIAL	
178	STUD BOLT	ASTM A 193 816	
178A	NUT	ASTM A 194 Gr. 2H	
179	COUPLING	ASTM A 346 + Cd.	
17 9 A	COUPLING	ASTM A 36 + Cd.	
325	Bushing	ASTM A 29 Gr. 4135	





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STEAM FLUSHING

- + Steam only for the valve internal cavity (not external)
- + NO steam consumption when the valve is fully closed or fully open
- + Low steam consumption when the valve is operating
- + Steam pressure to be 2 or 3 bar higher than line pressure

1.00e+00 9.50e-01 9.00e-01 8.50e-01 8.00e-01 7.50e-01 7.00e-01 6.50e-1 6.00e-0 5.50e-0 5.00e-0 4.50e-01 4.00e-01 3.50e-01 3.00e-01 2.50e-01 2.00e-01 1.50e-01 1.00e-01 5.00e-02 0.00e+08



DRAIN/PURGING

+ Bottom port can be use for draining and for flushing.



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ADVANTAGES OF LIFT PLUG VALVES

- 1.- Robust design, valve internals simplicity, less maintenance
- 2.- Seats protected against wear due to no friction

- 3.- Steam comsuption only during valve operation
- 4.- Seating surfaces stellited, grinding and polished



- 5.- Low torque requirements due to no friction
- 6.- Guided plug able to install with stem in vertical or horizontal
- 7.- Axial pushing for the plug to get good seating
- 8.- Top entry design



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ACCESORIES

- + Limit switches
- + Encoder located on the top of actuator
- + Local control panel (for switch and main isolation valves)







3. MRO VALVES & MAINTENANCE – AFTER MARKET



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KEYS FOR RELIABILITY AND GOOD MAINTENANCE

- * TOP ENTRY DESIGN FOR EASY MAINTENANCE
- * GREASING THE LIFTING MECHANISM EVERY 6 MONTHS
- * ACTUATOR TORQUE MONITORING FOR VALVE DIAGNOSTIC

Valve Torque Profile	Statistics	Starts Log	Advanced Statistics
Time	Latest	Average Ref	Position
Latest Closing Torque			120% 100%
Position 0-1% 9-10% 19 Range	-20% 29-30% 39-40% 4	9-50% 59-60% 69-70% 79-8	0% 80% 89-90% 99-100% 120% 100%
Dening Torque	B R	8	\rightarrow 0%

3. MRO VALVES & MAINTENANCE – AFTER MARKET

AMPO POYAM VALVES

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KEYS FOR RELIABILITY AND GOOD MAINTENANCE

*BONNET & LIFTING MECHANICAL DEVICE SEPARETED IN 2 PARTS AND EASY TO REPLACE THE MECHANISM AT SITE.

*STEAM CONSUMPTION IN THE SEATING POSITION CAN DEFINE THE SEALING PERFORMANCE

* RETROFITTING: FACE TO FACE DIMENSION CAN MATCH IN ORDER TO REPLACE EXISTING VALVES AT SITE.

* IN ORDER TO SAFE SPACE THE VALVE CAN BE INSTALL WITH STEM IN VERTICAL OR HORIZONTAL POSITION



+COKE DRUM LIFE EXTENSION: LIFT PLUG ALLOW MORE FLOW IN MIDDLE POSSITION IN ORDER TO COOL DOWN A DRUM SMOOTHLY AND START HEATING THE OTHER ONE

Switch Ball Valve

GEOMETRIC ADVANTAGE

DRUM 1





By-pass







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DRUM 2

PLUG

BODY









SWITCH value: real example in USA, after 5 years of operation.







SWITCH value: real example in USA, after 15 years of operation.



3. MRO VALVES & MAINTENANCE – AFTER MARKET



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REFERENCES









THANKS FOR YOUR ATTENTION



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MUMBAI

REFCOMM

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