

Ebullated Bed Hydrocracking

Valve Number	Valve Description	Design Temperature Range		Design Pressure Range		Pipe Size		Recommended Valve ¹							
		deg F	deg C	psig	bar g	in	dn	C-Series	T-Series	G-Series	ISOLATOR 2.0	IRSVP	Watson Series	FlexStream®	
1	Chopper Valve	200 – 500	90 – 260	3200	220	8 – 12	200 – 300	•							
2	Hydrogen Heater Inlet Emergency Block Valve	200 – 500	90 – 260	3200	220	8 – 12	100 – 300	•							
3	Feed Heater Outlet Emergency Block Valve	500 – 800	260 – 430	3200	220	10 – 16	250 – 400	•							
4	Hydrogen Heater Outlet Emergency Block Valve	500 – 800	260 – 430	3200	220	10 – 16	250 – 400	•							
5	Reactor Catalyst Addition	800 – 1000	420 – 540	3200	220	2 – 4	50 – 100	•							
6	Reactor Catalyst Withdrawal	800 – 1000	420 – 540	3200	220	2 – 4	50 – 100	•							
7	Hot High Pressure Separator Automated Level Control Valve	800 – 900	420 – 482	3700	260	8 – 12	200 – 300	•							
8	Hot High Pressure Separator Manual Level Control Valve	800 – 900	420 – 482	3700	260	8 – 12	200 – 300	•							
9	Hot High Pressure Automated Overhead Vapor Isolation	800 – 900	420 – 482	3700	260	8 – 12	200 – 300	•							
10	Hot High Pressure Manual Overhead Vapor Isolation	800 – 900	420 – 482	3700	260	8 – 12	200 – 300	•							
11	Cold High Pressure Separator Automated Level Control Valve	200	100	1000 – 2600	70 – 180	3 – 10	80 – 250		•						
12	Cold High Pressure Separator Manual Level Control Valve	200	100	1000 – 2600	70 – 180	3 – 10	80 – 250		•						
13	Hot Intermediate Pressure Separator Automated Level Control Valve	800 – 900	420 – 482	600	40	12 – 16	300 – 400	•			•				
14	Hot Intermediate Pressure Separator Manual Level Control Valve	800 – 900	420 – 482	600	40	12 – 16	300 – 400	•			•				
15	Unit Depressurization	200	100	1000 – 2600	70 – 180	8 – 16	200 – 400								•
16	Rich Amine Manual	200	100	1000 – 2600	70 – 180	3 – 10	80 – 250	•							
17	Feed Pump Drain	480	250	300	20	2 – 4	50 – 100				•				
18	Feed Pump Suction	480	250	300	20	8	200				•				
	Heat Exchanger	300 – 1500	150 – 815	200 – 900	13.8 – 62.0	1/2 – 2	13 – 50					•			
	General Ball Valves	25 – 900	-4 – 482	25 – 600	1.7 – 41.4	1 – 3	25 – 75			•					

¹ Recommend ISOLATOR 2.0 or T-Series if size, pressure and temperature conditions are met.

Hydrocracking

Ebullated Bed

Typical operating conditions are:

- High temperature
100 – 900° F (38 – 482° C)
- High pressure
150 – 3500 psig (10 – 241 bar g)
- High pressure / temperature
hydrogen
- Coking service
- Asphaltene formation
- Ammonium bisulfide corrosion
- Viscous sludge
- Hydrogen sulfide corrosion

