Reforming

Continuous Catalytic Regeneration (CCR)

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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	Automated Reactor Overhead Purge	400 – 1000	204 – 538	300 – 800	20 – 55	1 – 8	25 – 200				•			
2	Automated Reactor Overhead Regeneration	400 – 1000	204 – 538	300 – 800	20 – 55	1 – 8	25 – 200				•			
3	Manual Standby Reduction Zone Purge	400 – 1000	204 – 538	300 – 800	20 – 55	1 – 8	25 – 200				•			
4	Manual Reactor Bottoms Unloading Valve	400 – 1000	204 – 538	300 – 800	20 – 55	1 – 8	25 – 200	•						
5	Automated Reactor Bottoms Unloading Valve (qty. 2)	400 – 1000	204 – 538	300 – 800	20 – 55	1 – 8	25 – 200	•						
6	Manual Hydrogen Loading to Lockhopper 1	400 – 700	204 – 371	300 – 700	20 – 48	1 – 8	25 – 200				•			
7	Manual Hydrogen Vent for Lockhopper 1 & 2	400 – 700	204 – 371	300 – 700	20 – 48	1 – 8	25 – 200				•			
8	Manual Nitrogen Purge for Lockhopper 1 & 2	400 – 700	204 – 371	300 – 700	20 – 48	1 – 8	25 – 200				•			
9	Manual Catalyst to Lift Engager 1 & 2	400 – 700	204 – 371	300 – 700	20 – 48	1 – 8	25 – 200	•						
10	Automated Catalyst to Lift Engager 1 & 2 (qty. 2)	400 – 700	204 – 371	300 – 700	20 – 48	1 – 8	25 – 200	•						
11	Manual Air Valve to Regeneration Cooler	400 – 700	204 – 371	300 – 700	20 – 48	6	150				•			
12	Manual Air Valve to Surge Hopper	400 – 700	204 – 371	300 – 700	20 – 48	6	150				•			
13	Automated Fresh Catalyst Addition	200 – 300	93 – 149	300 – 500	20 – 34	2 – 8	50 – 200				•			
14	Manual Regen Catalyst Unloading from Surge Hopper	400 – 700	204 – 371	300 – 700	20 – 48	6	150	•						
15	Automated Regen Catalyst Unloading from Surge Hopper (qty. 2)	400 – 700	204 – 371	300 – 700	20 – 48	6	150	•						
16	Manual Pressure Balancing for Lockhopper / Lift Engager 2	400 – 700	204 – 371	300 – 700	20 – 48	6	150				•			
	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.

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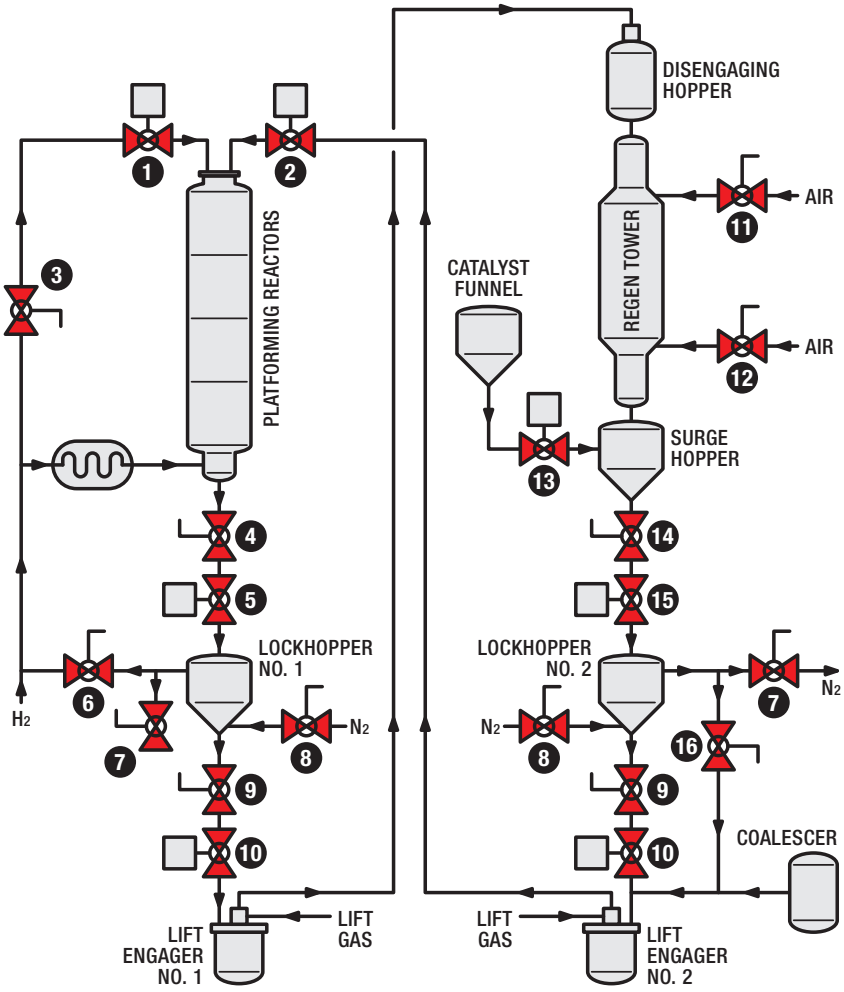

Typical operating conditions are:

- High temperature 200 – 1000° F (93 – 538° C)
- High cycle
- High pressure / temperature hydrogen
- Bi-directional shutoff in the presence of H_2
- High pressure / temperature catalyst handling