



CIRULATION BYPASS VALVE

"LIMIT THE LESS WITH LIMITLESS..."



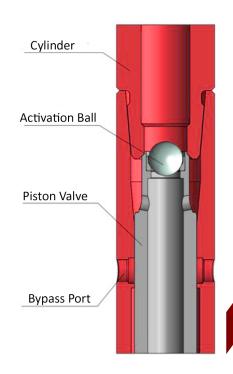
Vigor USA's latest technology LIMITLESS Circulation Bypass Valve is engineered to provide multiple-opening circulation with unlimited activation of "on" and "off" by a single ball drop that changes the drilling fluid flow path from the ID of the string (non-bypass) to the annulus (bypass).

FEATURES AND BENEFITS

- Safe, Reliable and easy operation with only one ball
- > The working mode for bypass and non-bypass can be switched easily within 10 seconds when the ball seating is activated
- > Limitless cycling flow rate control with on-ball activation
- > Different ball sizes with flexibility for various string IDs
- >> Configure anywhere in the drill string above a tool that does not require fluid to pass through the water hole
- >> Saves time by avoiding unwanted wasted trips for an exhausted ball catcher
- Empty the strings automatically during tripping
- Fishing can be operated below the tool, open through bore before activation, or by a fishing ball
- Ports will be automatically closed when pump flow is significantly reduced, to keep the control well safe.

SPECIFICATION

1	Tool OD	4.75 "	6.50 "	7.00 "	8.00 "
		(121mm)	(165mm)	(178mm)	(203mm)
2	Connections	NC38	NC50	NC50	6-5/8REG
3	Tool ID	1.25 "	1.875 "	1.875 "	2.375 "
		(31.8mm)	(47.6mm)	(47.6mm)	(60.3mm)
4	Bypass Port ID	2×0.75 "	2×0.97 "	2×0.97 "	2×1.38 "
		2×19mm	2×24.6mm	2×24.6mm	2×35mm
5	Non-Bypass Port ID	2×0.70 "	2×0.96 "	2×0.96 "	2×1.13 "
		2×17.8mm	2×24.4mm	2×24.4mm	2×28.7mm
6	Standard Activation ball OD	1.63 "	2.25 "	2.25 "	2. 5 "
		41.3mm	57.2mm	57.2mm	63.5mm
7	Tensile Yield	500, 000lbs	1,250, 000lbs	1,250, 000lbs	1,800, 000lbs
		(2222.5kN)	(5556.3kN)	(5556.3kN)	(8001kN)
8	Torsional Yield	30, 000ft-lbs	50, 000ft-lbs	50, 000ft-lbs	110, 000ft-lbs
		(40.7kN.m)	(67.8kN.m)	(67.8kN.m)	(149kN.m)
9	Max. recommended Operating Torque	18, 000ft-lbs	30, 000ft-lbs	30, 000ft-lbs	60, 000ft-lbs
		(24.4kN.m)	(40.7kN.m)	(40.7kN.m)	(81.3kN.m)
10	Max. allowable flow rate	700gpm	900gpm	900gpm	1,400gpm
		(2650L/M)	(3401L/M)	(3401L/M)	(5299L/M)
11	Activation flow rate (water)	230gpm	430gpm	430gpm	580gpm
		(871L/M)	(1628L/M)	(1628L/M)	(2195L/M)
12	Shoulder to Shoulder Length	82.5 " (2096mm)	81.125 " (2060mm)	81.125 " (2060mm)	96 " (2438mm)



Notes: Optional non - standard diameter activation balls are available upon request to accommodate different drill string diameters (optional activation ball diameter is respectively 1.14'', 2'', 2.38'')