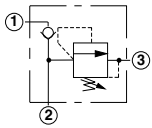
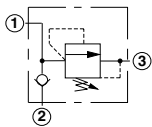
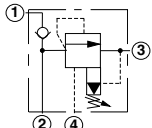
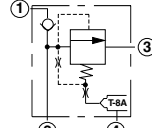
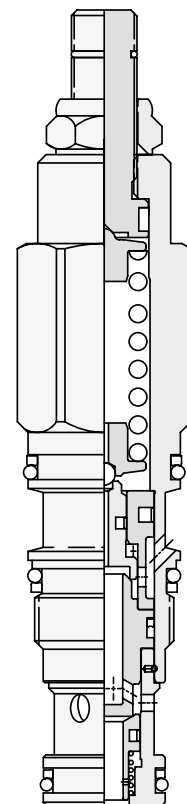
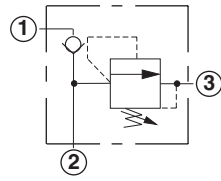
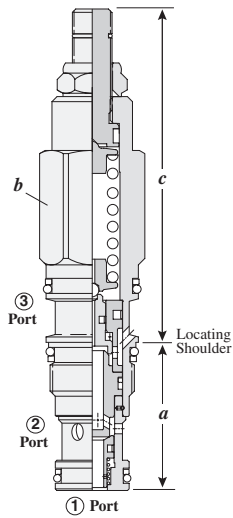


Hybrid Relief Valves

	<i>Cartridge Type</i>	<i>Page</i>
	Direct Acting Relief Valve - Before Check	156
	Direct Acting Relief Valve - After Check	157
	Ventable, Pilot Operated, Balanced Piston, Relief Valve - Before Check	158
	Ventable, Pilot Operated, Balanced Piston, Relief Valve - Before Check with Integral Pilot Control Cavity	159



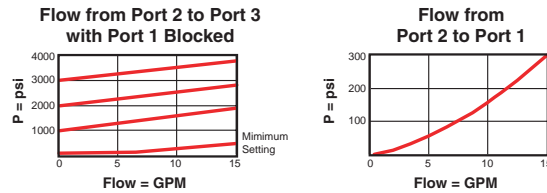
DIRECT ACTING RELIEF VALVE - BEFORE CHECK



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (lb. ft.)
			a	b	c			
					L	C	K	
10 GPM	HRDA - LAN	T - 11A	1.38	7/8	3.09	3.15	3.34	30/35

Performance Curves

HRDA



- Maximum operating pressure = 5000 psi
- Maximum valve leakage at reseal = 5 drops/min.
- Reseat exceeds 85% of crack pressure
- Factory pressure setting established at 4 GPM
- Free flow check cracking pressure = 25 psi
- Typical response = 2 ms
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute.
- Note: This valve deviates from Sun's normal flow path for three port relief valves; port 2 is the inlet, port 1 is the system and port 3 is tank. Therefore, it is probably not useable in existing standard Sun relief manifolds.

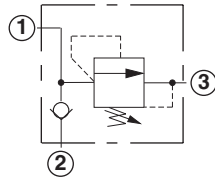
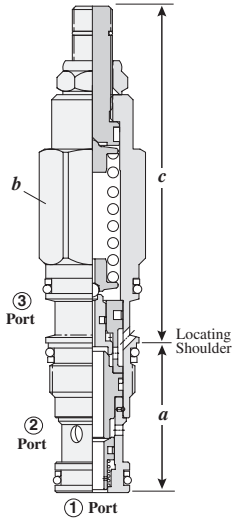
HRDA - LAN

Nominal Capacity	Control**	Adjustment Range	Seal
D 10 GPM	L Standard Screw Adjustment	A 500 - 3000 psi	N Buna-N
	C Tamper Resistant Factory Set	W 800 - 4500 psi	V Viton
	K Handknob		

** See page 162 for information on Control Options

Customer may specify pressure setting.

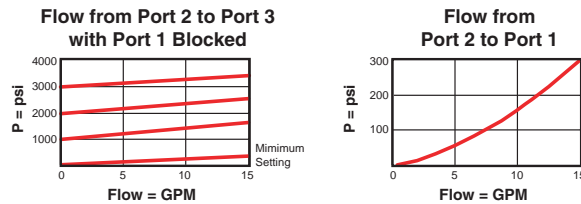
DIRECT ACTING RELIEF VALVE - AFTER CHECK



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (lb. ft.)
			a	b	c			
					L	C	K	
10 GPM	HRDB - LAN	T - 11A	1.38	7/8	3.09	3.15	3.34	30/35

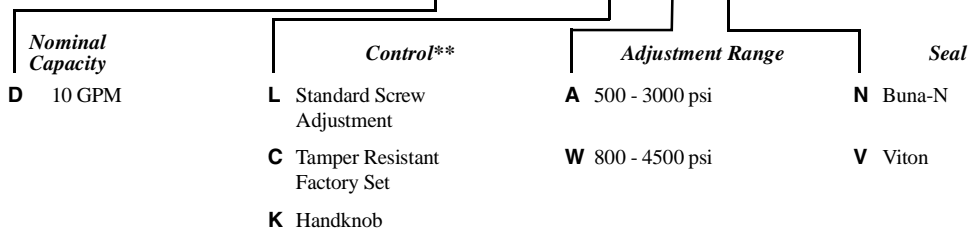
Performance Curves

HRDB



- Maximum operating pressure = 5000 psi
- Maximum valve leakage at reseal = 5 drops/min.
- Reseat exceeds 85% of crack pressure
- Factory pressure setting established at 4 GPM
- Free flow check cracking pressure = 25 psi
- Typical response = 2 ms
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute.
- Note: This valve deviates from Sun's normal flow path for three port relief valves; port 2 is the inlet, port 1 is the system and port 3 is tank. Therefore, it is probably not useable in existing standard Sun relief manifolds.

HRDB - LAN

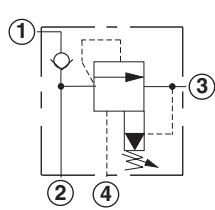
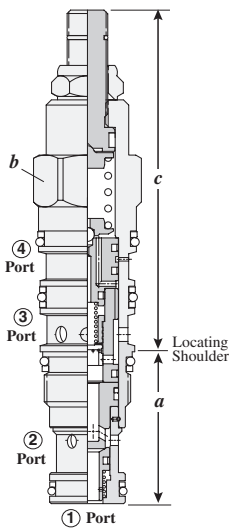


** See page 162 for information on Control Options

Customer may specify pressure setting.



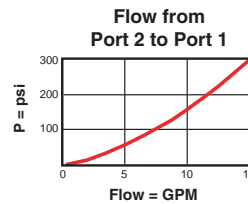
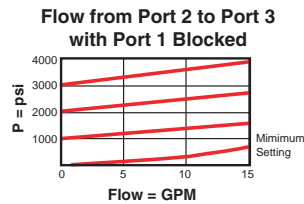
VENTABLE, PILOT OPERATED, BALANCED PISTON, RELIEF VALVE - BEFORE CHECK



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (lb. ft.)
			a	b	L	C	K	
10 GPM	HVCA - LAN	T - 21A	1.38	7/8	3.09	3.15	3.34	30/35

Performance Curves

HVCA



- Maximum operating pressure = 5000 psi
- Maximum valve leakage (port 2 to port 3) = 2 in³/min. at 1000 psi
- Factory pressure setting established at 4 GPM
- Free flow check cracking pressure = 25 psi
- Typical response = 10 ms
- Minimum setting is 75 psi for all spring ranges.
- Back pressure at port 3 (tank) is directly additive to the valve setting at a 1:1 ratio.
- Pressure at port 4 (vent) controls the valve below its setting.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute.
- Note: This valve deviates from Sun's normal flow path for four port relief valves; port 2 is the inlet, port 1 is the system, port 3 is tank and port 4 is vent. Therefore, it is probably not useable in existing standard Sun relief manifolds.

HVCA - LAN

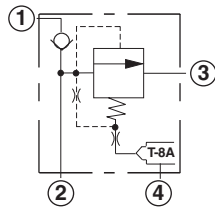
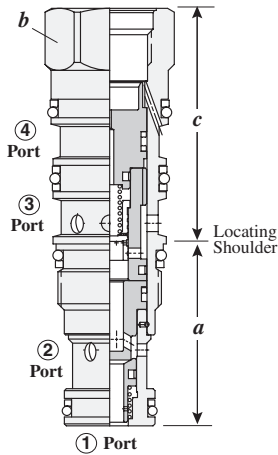
Nominal Capacity	Control**	Adjustment Range	Seal
C 10 GPM	L Standard Screw Adjustment	A 75 - 3000 psi	N Buna-N
	C Tamper Resistant Factory Set	B 75 - 1500 psi	V Viton
	K Handknob	D 75 - 800 psi	
		W 75 - 4500 psi	

** See page 162 for information on Control Options

Customer may specify pressure setting.

Visit www.sunhydraulics.com for detailed and complete technical information on our full line of products.

VENTABLE, PILOT OPERATED, BALANCED PISTON, RELIEF VALVE - BEFORE CHECK WITH INTEGRAL PILOT CONTROL CAVITY

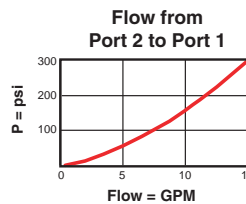
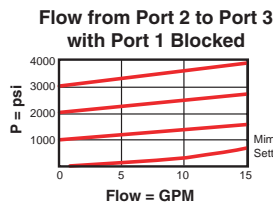


The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges on page 121.

Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions			Installation Torque (lb. ft.)
			a	b	c	
10 GPM	HVCA - 8DN	T - 21A	1.38	7/8	1.78	30/35

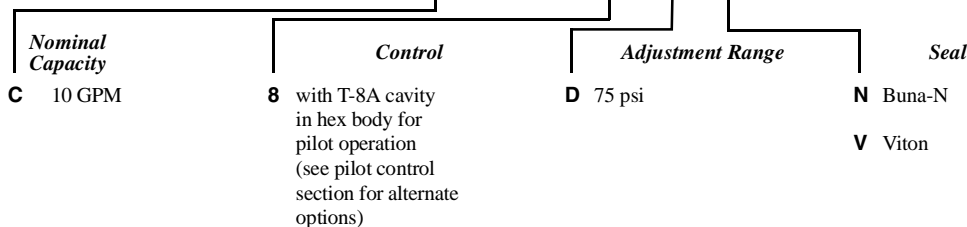
Performance Curves

HVCA-8



- Maximum operating pressure = 5000 psi
- Maximum valve leakage (port 2 to port 3) = 2 in³/min. at 1000 psi
- Free flow check cracking pressure = 25 psi
- Minimum setting is 75 psi for all spring ranges.
- Back pressure at port 4 (tank) is directly additive to the valve setting at a 1:1 ratio.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute.
- Note: This valve deviates from Sun's normal flow path for four port relief valves; port 2 is the inlet, port 1 is the system, port 3 is tank and port 4 is vent. Therefore, it is probably not useable in existing standard Sun relief manifolds.
- With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.

HVCA - 8DN



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NOTES