CLA-VAL **CRD-L**

Direct Acting Pressure Reducing Valve

- **Sizes [R"]: 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2" - 2 1/2"**
- **Operates in Any Position**
- **Easy Installation**
- **All Bronze Body and Cover**
- **Stainless Steel Trim Standard**
- **Gauge Connections Standard Rp 1/8" (2x)**
- **Available with optional SS-material**
- **Meets Requirements of "Reduction of Lead in Drinking Water Act"**

The CLA-VAL Model CRD-L Pressure Reducing Valve automatically reduces a higher inlet pressure to a steady lower downstream pressure with our unique design. This valve is an accurate regulator capable of holding downstream pressure to a predetermined amount, regardless of upstream pressure fluctuations.

Periodic maintenance consists of regular internal cleaning that is accessed only by removing its bottom plug.

TYPICAL APPLICATIONS

High rise buildings use CRD-L Pressure Reducing Valves in various water systems (potable water, boiler feed air conditioning, etc.) to control pressure fluctuations between floors.

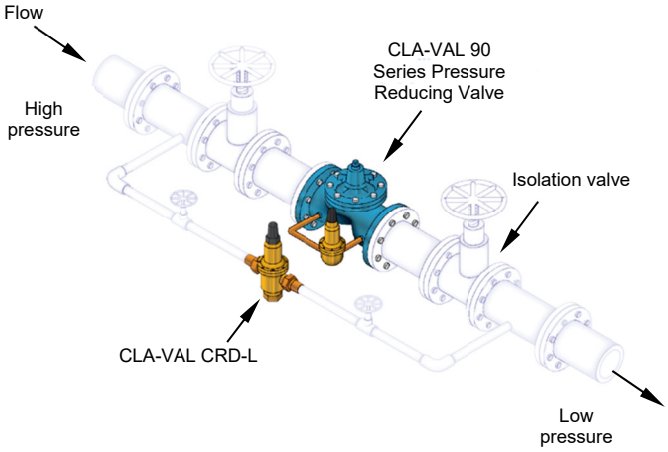
Industrial plants use CRD-L Pressure Reducing Valves between a high pressure supply system and equipment requiring lower pressure.

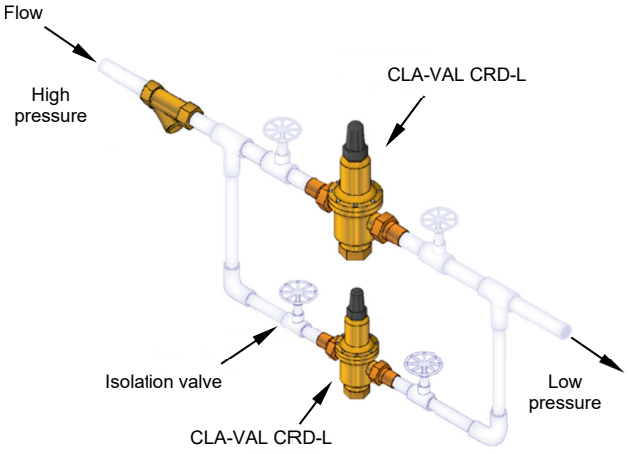
Typically CRD-L Pressure Reducing Valves are used at supply connections for water heaters, boiler feed water or other process water systems.

Municipal water systems use CRD-L Pressure Reducing Valves at service connections between high/low pressure distribution zone. Depending on flow requirements, CRD-L's may be installed in parallel.

One CRD-L provides desired outlet pressure while the second CRD-L handles low flow conditions. If necessary, additional CRD-L's can be added for more flow capacity.

The CRD-L is also ideal for a low flow bypass around a larger CLA-VAL 90 Series Pressure Reducing Valve or as pilot reducing valve of a CLA-VAL Series Pressure Reducing Valve TYTAN 790.





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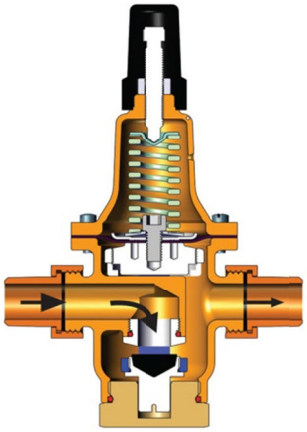
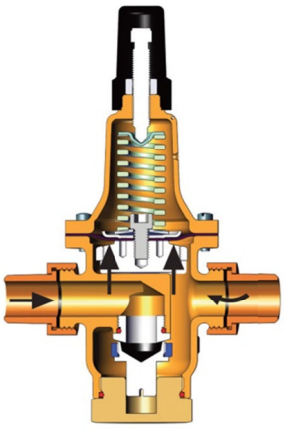
VALVE OPERATION





Flow Condition:

When flow begins, the pressure on the underside of the diaphragm will be lower than the set-point of the spring causing the diaphragm to move the valve seat away from the valve seal allowing flow to occur. As the flow increases downstream, the pressure acting on the spring pushes the diaphragm and the valve seat away from the valve seal to regulate outlet pressure to desired value.

No Flow Condition:

When there is no flow, the downstream pressure increases and acts against the under side of the diaphragm, pulling the valve seat up against the valve seal to close the valve drip tight.

REDUCED PRESSURE FALLOFF [RPF]

Unlike pilot controlled pressure reducing valves, direct acting valves are subject to "reduced pressure falloff" (RPF). Reduced pressure falloff is the decrease in downstream regulated pressure that occurs when the flow increases. When the demand for flow increases, the valve must open wider and wider to permit the flow. The only way the valve can open is for the spring force to be greater than the hydraulic force under the diaphragm (the force trying to close the valve). The downstream pressure therefore, must "fall off" or decrease before the spring can open the valve. All spring actuated direct acting valves have similar operating characteristics.

NOISE AND VELOCITY GUIDELINES

Noise in water piping systems can sometimes be attributed to high velocities [v] of water through the valve seat. In general, as the water velocity [v] increases, the noise produced by the installation will increase.

Where noise levels are important, such as residences, hospitals, or schools, pipeline velocities should be in the range [1.5 <v < 3.0 m/s]. The chart below shows velocity [v] and the corresponding reduced pressure falloff [**RPF**]. If these values for falloff are not exceeded, the CRD-L will produce the least amount of noise.

SIZING

Step One

Determine the following from the application:
1. Inlet pressure [P_1] and desired outlet pressure [P_2]
2. Maximum [Q_{MAX}] and minimum [Q_{MIM}] flow rate
3. Allowable reduced pressure falloff [**RPF**] or maximum velocity [v] based on acceptable noise level

Step Two

Determine the pressure differential {$\Delta P = [P_1] - [P_2]$} across the valve CRD-L.

If there will be any fluctuations in the inlet pressure [P_1], calculate both high [ΔP_{MAX}] and low [ΔP_{MIN}] differentials. At all times the differential pressure must comply with :

2.1 [ΔP_{MIN}] $\geq$ 1.0 bar

2.2 [ΔP_{MAX}] > 10.0 bar $\Rightarrow$ use two valves in series

Step Three

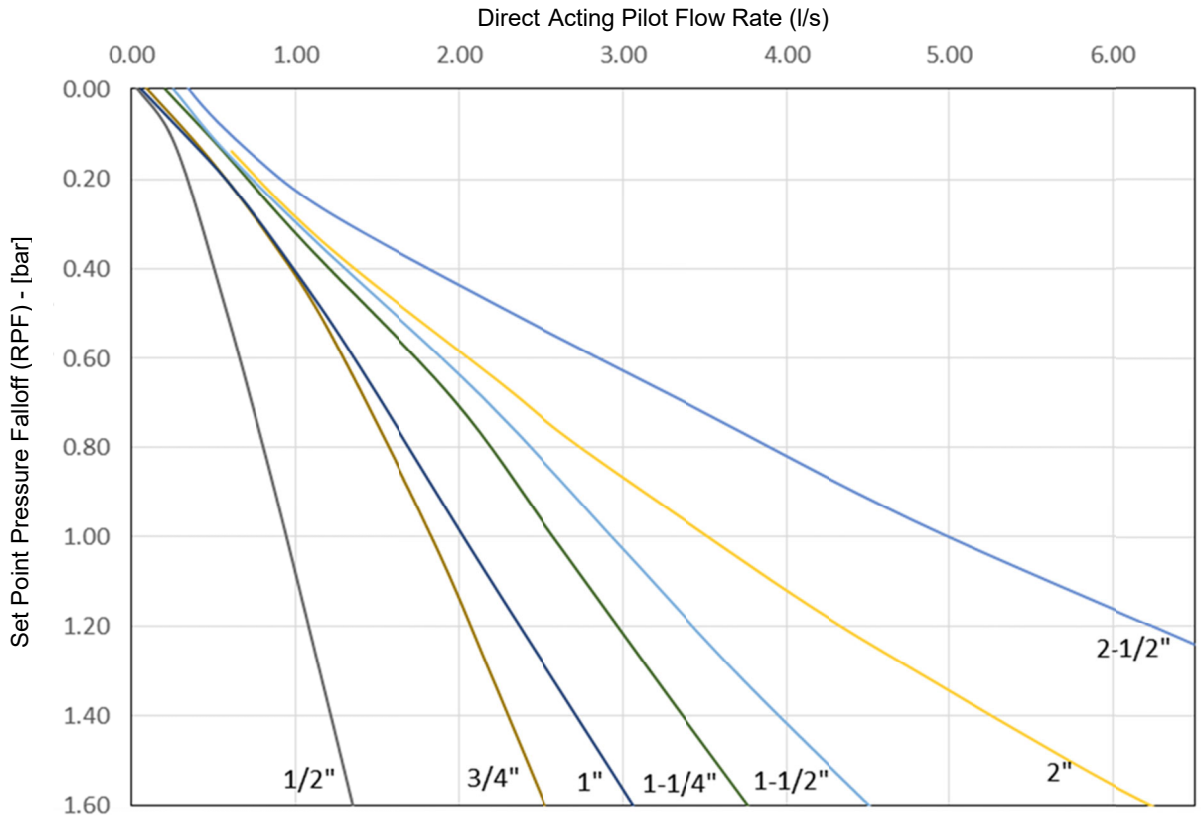
Determine the valve size by using the Valve Capacity Chart (next page), where the system's maximum flow rate [Q_{MAX}] and the maximum allowable [**RPF**] for the application must be reported. Select the valve size with a [**RPF**] value that is less than the prescribed value

If flow demand [Q_{MAX}] fluctuates beyond the capacity of one valve, use two or more CRD-L's in parallel. Size one valve to handle the low flow and the other valve(s) to handle the higher flows. Set the low flow valve to approximately (0.2 to 0.3 bar higher than the other valve(s).

VELOCITY GUIDE CHART

Velocity Delta from Set Point [v] (m/s)	Set Point Pressure Falloff [RPF] - (bar)						
	R 1/2"	R 3/4"	R 1"	R 1 1/4"	R 1 1/2"	R 2"	R 2 1/2"
1.5	0.15	0.18	0.34	0.50	0.66	0.93	0.93
2.3	0.31	0.30	0.56	0.82	1.03	1.31	1.31
3.0	0.46	0.43	0.81	1.19	1.43	1.64	1.68

VALVE CAPACITY CHART



VALVE SIZE AND SPRING ADJUSTMENT RANGE (bar)

R 1/2", R 3/4" and R 1"	R 1 1/4" and R 1 1/2"	R 2"	R 2 1/2"
1.0 - 4.5	0.3 - 4.1	1.2 - 3.4	1.2 - 3.4
1.7 - 6.9	1.7 - 6.9	2.1 - 6.6	3.4 - 6.6
5.5 - 10.3	5.2 - 11.0	5.2 - 13.8	5.2 - 13.8
8.6 - 17.2	-	-	-

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SPECIFICATIONS

Temperature Range:

Water: to 60°C - max

Pressure Ratings:

Inlet Pressure [**P1**]: 25 bar

Differential Pressure: 10.0 bar - max.

Differential Pressure: 1.0 bar - min.

MATERIALS

Body and Cover:

Low Lead Bronze

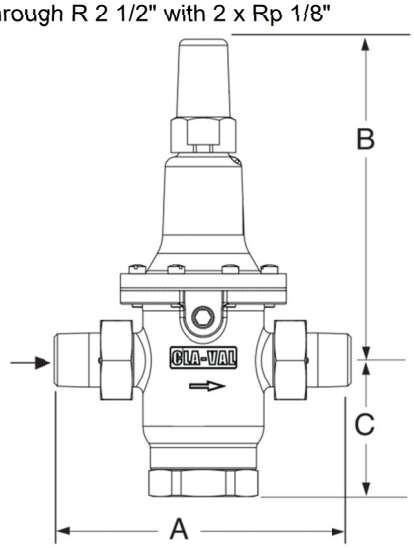
Note: Available with optional Stainless Steel material: Consult CLA-VAL Europe.

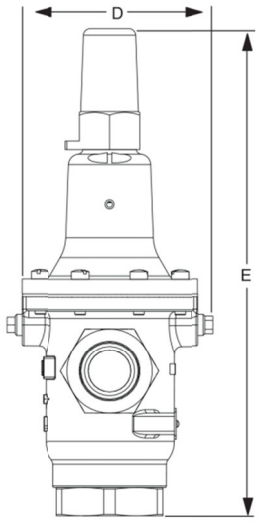
DIMENSIONS [mm]

Size [R"]	A	B	C	D	E	Weight [kg]
1/2	145	154	65	80	219	1.8
3/4	142	154	65	80	219	1.8
1	170	154	65	80	219	1.8
1 1/4	214	199	70	105	269	3.4
1 1/2	243	199	70	105	269	3.9
2	289	206	78	125	284	5.7
2 1/2	310	206	78	125	284	6.2

GAUGE CONNECTIONS

R 1/2" through R 2 1/2" with 2 x Rp 1/8"





WHEN ORDERING, PLEASE SPECIFY

1. Catalog No. CRD-L / 2. Size / 3. Adjustment Range / 4. Optional Locking Cap