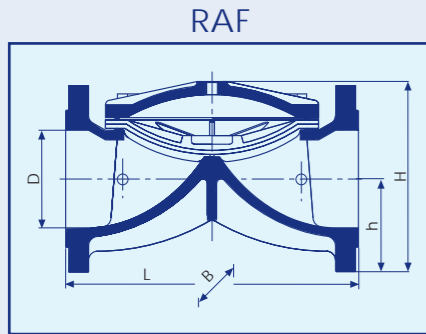
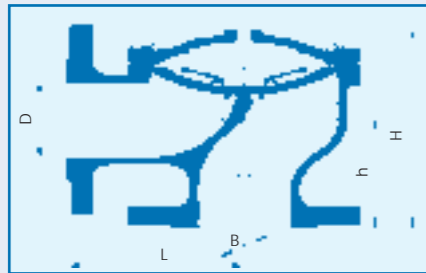


# Technical Information

## Dimensions of RAF & RAF-A



RAF-A (Angle)

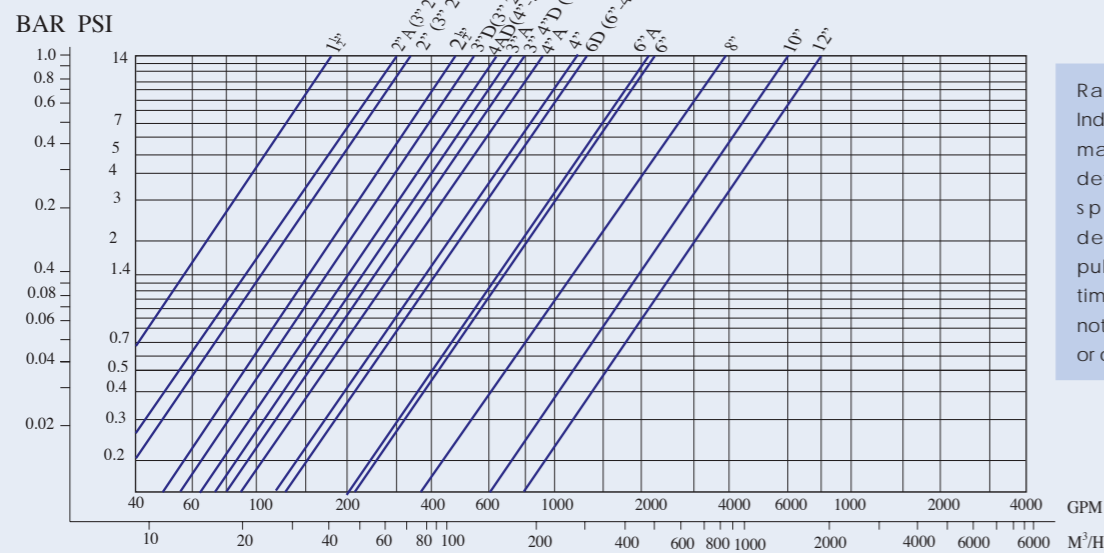


Nom. Dia.	L		H		B	h	Weight kg.	Connections
	mm	inch	mm	mm				
40	1 1/2	159	80	96	29	1.8	Thread / Grooved	
50	2	190	100	125	38	3.9	Thread / Grooved	
50	2	190	159	165	76	7.9	Flange	
65	2 1/2	216	110	125	46	6.7	Thread / Grooved	
65	2 1/2	216	173	185	80	10.1	Flange	
80-50-80	3-2-3	230	125	125	50	5.0	Thread / Grooved	
80-50-80	3-2-3	230	175	200	100	11.0	Flange	
80-65-80	3-2 1/2-3	244	127	138	50	5.4	Thread / Grooved	
80-65-80	3-2 1/2-3	216	192	200	92	11.4	Flange	
80	3	290	138	200	50	10.4	Thread / Grooved	
80	3	283	200	200	100	17.5	Flange	
100-80-100	4-3-4	283	222	222	111	20.1	Flange	
100	4	346	220	230	60	16.5	Thread / Grooved	
100	4	305	220	230	99	25.5	Flange	
125-100-125	5-4-5	305	243	250	120	29.5	Flange	
150-100-150	6-4-6	325	285	285	143	35.8	Flange	
150	6	406	295	300	142	49.5	Flange	
200	8	470	383	354	160	71.0	Flange	
250	10	635	430	464	197	109.0	Flange	
300	12	749	474	480	234	140.0	Flange	

Nom. Dia.	L		H		B	h	Weight kg.	Connections
	mm	inch	mm	mm				
50	2	90	150	125	81	4.2	Thread / Grooved	
50	2	112	159	165	77	8.1	Flange	
65	2 1/2	117	160	125	83	7.0	Thread / Grooved	
65	2 1/2	122	160	185	83	11.0	Flange	
80-50-80	3-2-3	110	146	125	72	4.9	Thread / Grooved	
80-50-80	3-2-3	140	200	200	100	12.0	Flange	
80-65-80	3-2 1/2-3	130	170	140	86	6.2	Thread / Grooved	
80-65-80	3-2 1/2-3	130	215	200	115	12.4	Flange	
80	3	148	205	200	107	12.0	Thread / Grooved	
80	3	154	210	200	115	19.0	Flange	
100-80-100	4-3-4	155	225	220	110	21.0	Flange	
100	4	150	227	230	118	15.9	Thread / Grooved	
100	4	177	230	230	113	26.5	Flange	
150	6	218	315	300	148	48.7	Flange	

## Flow-chart



Raphael Valves Industries (1975) Ltd. may modify any details or product specifications described in this publication at any time, without prior notice, for technical or other reasons.

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## Recommended Working Conditions Range

Nom. Dia.	Inlet Pressure, Bar		*Kv factor Fully opened Valve		Control Chamber Volume		
	mm	inch	RAF	RAF -A	Liter	Gallon	
40	1.5	0.8	16	40	—	0.06	0.016
50	2	0.7	16	70	62	0.08	0.021
65	2.5	0.7	16	100	90	0.16	0.042
80-50-80	3-2-3	0.7	16	72	62	0.08	0.021
80-65-80	3-2.5-3	0.7	16	130	100	0.16	0.042
80	3	0.6	16	170	155	0.3	0.079
100-80-100	4-3-4	0.6	16	170	155	0.3	0.079
100	4	0.4	16	290	200	0.7	0.185
125-100-125	5-4-5	0.4	16	290	200	0.7	0.185
150-100-150	6-4-6	0.4	16	300	220	0.7	0.185
150	6	0.4	16	490	470	1.5	0.396
200	8	0.4	16	790	—	3.5	0.924
250	10	0.3	16	1400	—	7.6	2.006
300	12	0.3	16	1800	—	7.6	2.006

$$Q = Kv \sqrt{\Delta P}$$

Q = Flow rate, m<sup>3</sup>/h  
 $\Delta P$  = Head loss across the valve, bars  
 Cv = 1.16Kv

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# RAF GENERAL PURPOSE HYDRAULIC VALVES

## Technical Information



RAF Valves are used for general water supply and irrigation. The RAF valves are made of only three parts, each one is made of durable materials. The inner flow passages are streamlined and coated with low-friction materials. This provides quiet flow in both directions, low head-loss and minimal wear.

## Technical Specifications

- Body and Cover: Cast Iron with Rilsan (Nylon 11) coating. Epoxy or enamel coating are available by request.
  - Bolts, Nuts and Washers: Zinc plated Steel.
  - Diaphragm: Natural Rubber reinforced with Nylon Fabric.
- Working Pressure: Up to 16 bars.  
 Temperature Rating: -10°C to 80°C.

A special leaflet for each of the applications appearing in this brochure is available upon request.

## SPECIALY DESIGNED



Cross section of RAF valve  
 RAF valves operate with a patented reinforced diaphragm, which eliminates the need for a retaining metal spring. The special elastic design enables gradual and precise opening or closing of the valve. By eliminating a metal spring, the RAF is virtually maintenance free.

Size & Connections			
RAF	Threaded	1 1/2"-4"	ISO, BSP, NPT
	Grooved	1 1/2"-4"	ISO, ANSI
	Flanged	2"-12"	ISO, BSTD, JIS, ANSI, DIN
RAF -A	Threaded	2"-4"	ISO, BSP, NPT
	Grooved	2"-4"	ISO, ANSI
	Flanged	2"-6"	ISO, BSTD, JIS, ANSI, DIN



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**RAF 10** is used to maintain a preset water level in a reservoir or water tank in a simple manner. The RAF valve is activated by the line pressure. The **RAF 10** stays open as long as the water level in the reservoir is below a preset level. As the water level rises and floats the pilot's arm, the RAF gradually closes.

**RAF 10**  
Float Level Control Valve

**RAF 1031**  
Electric Float Control Valve

**RAF 1031** is a normally closed electric float control valve, activated by line pressure. The electric circuit is switched by a float hanging over the water surface at the desired height. When the water level drops below the float, the electric circuit is switched on and opens the **RAF 1031** through a solenoid valve. As the rising water reaches the float level, the circuit is disconnected and the **RAF 1031** closes.



**RAF 20** valve regulates the pressure level during the start and shut-off of pumps to protect the pumping assembly and the downstream network. The **RAF 20** is applicable, with slightly different layout and switching, for either vertical (deep well) or horizontal (booster) pumps. In both configurations, the **RAF 20** is connected electrically to the pump's control panel.

**RAF 20**  
Pump Control Hydraulic Valve

**RAF 13**  
Bi-Level vertical float control valve

**RAF 13** is a level control valve, which uses a vertical float that activates a 3-way pilot. The float has maximum and minimum stoppers, adjustable according to level requirements, both changing the position of the pilot. When the float reaches maximum level stopper, the pilot commands the valve to close, and when reaching minimum level stopper, commands the valve to open.



**RAF 30-33** valves are activated by line pressure. The valves open or close by electric command through a selection of solenoid valves. The solenoid opens or closes the RAF as it energized by an electric pulse. The electric pulse originates with a controller, timer, sensor or remote control device.

**RAF 30-33**  
Electric Control Hydraulic Valve

**RAF 40**  
Altitude Control Hydraulic Valve

**RAF 40** is used to maintain a preset water level of reservoir or water tank in a simple manner. The RAF valve is activated by line pressure. The **RAF 40** stays open as long as the water level of the reservoir is below a preset level. As the water level rises the **RAF 40** gradually closes. Three adjustable altitude ranges are provided.



**RAF 60/62** and **RAF 63/63B** are piloted hydraulic valves activated by line pressure. The pilot valve has a spring-loaded membrane which is sensitive to downstream pressure. The pilot's spring is preset to a desirable reducing pressure. The pilot valve maintains a constant downstream pressure by gradually opening and closing of the RAF, at any flow rate.

**RAF 60/63**  
Pressure Reducing Hydraulic Valve



**RAF 6300** is a piloted hydraulic valve activated by line pressure. The valve is normally closed, opens by hydraulic command. The valve reduces the line pressure to maintain a preset constant pressure downstream the RAF, at all flow rates. The set point of reduced pressure is adjustable. The **RAF 6300** is controlled by a three-way pilot valve, made of plastics. A spring-loaded membrane inside the pilot moves according to the downstream pressure changes. The pressure fluctuations are compensated by gradual opening and closing of the RAF.

**RAF 6300**  
Pressure Reducing Hydraulic Remote Control Valve

**RAF 68/683**  
Pressure Reducing/Sustaining Hydraulic Valve

**RAF 68** and **RAF 683** are piloted hydraulic valves activated by line pressure. Both pilots have spring-loaded membranes. One pilot is sensitive to upstream pressure and the other to downstream pressure. The combined operation of the two pilot valves sustains a constant pressure upstream of the RAF valve, and at the same time, reduce the downstream pressure to a preset pressure. The RAF valve opens or closes gradually to maintain both required pressures simultaneously.



**RAF 70** and **RAF 73** are piloted hydraulic valves activated by line pressure. Normally the **RAF 70/73** is partly open to allow a preset constant flow rate. The flow rate through the **RAF 70/73** is determined indirectly using an orifice plate. The headloss across the orifice is proportional to the actual flow rate. On rising headloss, the **RAF 70/73** is automatically piloted to close. On the other case, the valve opens. Thus the flow rate is maintained constant, regardless of line pressure fluctuations or the downstream demand.

**RAF 70/73**  
Flow Rate Control Hydraulic Valve

**RAF 80/83**  
Pressure Sustaining/Relief Valve

**RAF 80/82** and **RAF 83/83B** are piloted hydraulic valves activated by line pressure. The pilot valve has a spring-loaded membrane which is exposed to the upstream pressure. The valve is normally closed. Only when the line pressure rises above a preset point, the **RAF 80/83** opens to relieve the excessive pressure downstream without causing surge hazards. When the line pressure drops the RAF recloses.



**RAF 80Q** is a piloted hydraulic valve activated by line pressure. The two-way pilot valve has a spring-loaded membrane which is sensitive to upstream pressure. The **RAF 80Q** is normally closed. As line pressure rises above the preset level, the valve opens quickly to relieve the excessive pressure.

**RAF 80Q**  
Quick Pressure Relief Valve

**RAF 88**  
Surge Anticipating Hydraulic Valve

**RAF 88** is adjusted to eliminate hazardous pressure surges typical of water hammer conditions. A water hammer is caused by an abrupt shutoff of a pump or rapid closure of a main valve, causing a fast propagation of low pressure front, followed by an extremely high pressure back-wave. A series of pressure waves, each one composed of alternating low and high pressure, is created within a few minutes. **RAF 88** is a piloted hydraulic valve activated by line pressure. The valve has two pilots, for high and low pressure. Under normal conditions the **RAF 88** is closed. It opens when the line pressure drops below a preset pressure, in anticipation to the following surge, and remains open until the fluctuations subside.



**RAF 90** and **RAF 93** are piloted hydraulic valves activated by line pressure. Normally the valve is open. Only in case of flow rate higher than a preset maximum, due to a burst or excessive demand downstream, the **RAF 90/93** are automatically closed down and can reopen manually. The actual flow rate through the **RAF 90** is determined by comparing the headloss across an orifice plate. The valve is closed down by a hydraulic relay. The **RAF 93** closes automatically whenever the upstream pressure drops below a preset point. It reopens manually.

**RAF 90/93**  
Anti Burst Control Valve