TALIS

RAF Diaphragm Control Valves
for Waterworks

RAPHAEL RANGE

RAF PURPOSE HYDRAULIC VALVES
Technical Information

Contents

Recommended Working Conditions Range

Norn. Dia.		Inlet Pressure, Bar		*Kv factor Fullv opened Valve		Control Chamber Volume	
mm	inch	Min.	Max.	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
80-65-80	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	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
350-300-350	14-12-14	0.3	16	1450	—	7.6	2.006
350-400-350	14-16-14	0.3	16	1850	—	25	6.6
400	16	0.3	16	1950	—	25	6.6

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.

SPECIALLY DESIGNED

Cross section of RAF valve

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.

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.

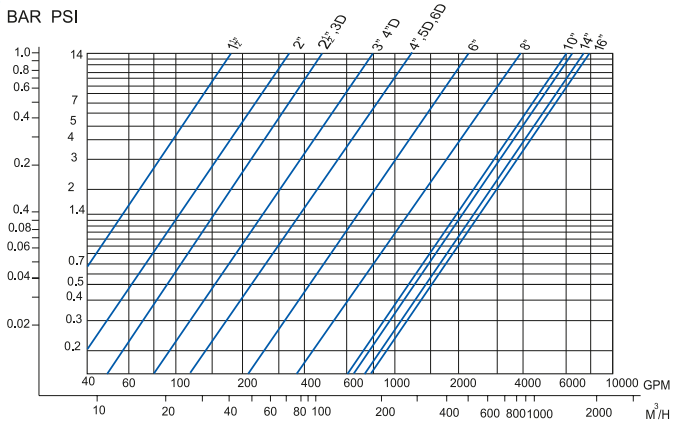
Working Pressure: Up to 16 bars.
Temperature Rating: -10° C to 80° C.

$Q = Kv \sqrt{\Delta P}$
Q = Flow rate, m3/h

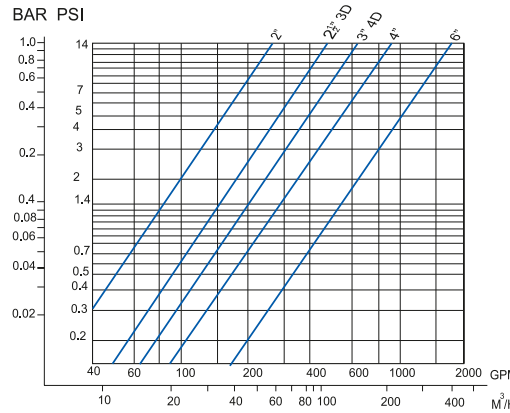
ΔP = Head loss across the valve,bars Cv=1.16Kv

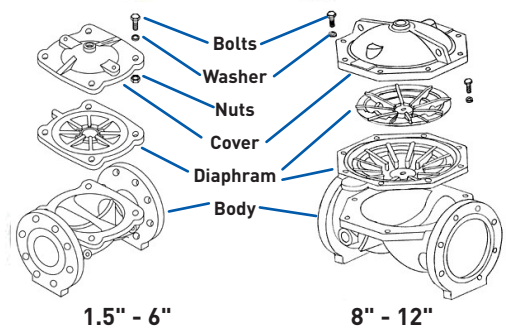
PRESSURE-LOSS CHART FOR VALVES

IN LINE



ANGLE





RAF In Line

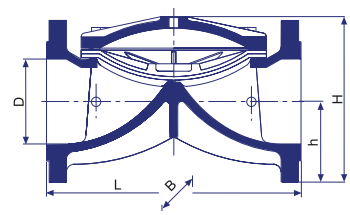
Nom. Dia.		L	H	B	h	Weight Kg.	Connections
mm	inch		mm				
40	1 1/2	159	80	96	29	1.8	Thread / Grooved
50	2	190	100	125	38	3.9	Thread / Grooved
50	2	190	159	165	76	7.9	Flange
65	2 1/2	216	110	125	46	6.7	Thread / Grooved
65	2 1/2	216	173	185	80	10.1	Flange
80-65-80	3-2 1/2-3	244	127	138	50	5.4	Thread / 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
250-300-250	10-12-10	635	430	464	197	109.0	Flange
300	12	749	474	480	234	140.0	Flange
350-400-350	14	766	648	616	267	257	Flange
400	16	860	705	616	298.5	305	Flange

RAF A Angle

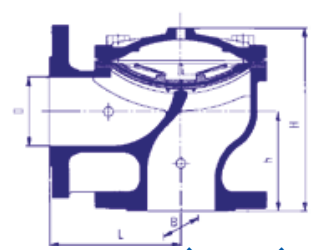
50	2	90	150	125	81	4.2	Thread / Grooved
50	2	112	159	165	77	8.1	Flange
65	2 1/2	117	160	125	83	7.0	Thread / Grooved
65	2 1/2	122	160	185	83	11.0	Flange
80-65-80	3-2 1/2-3	130	170	140	86	6.2	Thread / Grooved
80-65-80	3-2 1/2-3	130	215	200	115	12.4	Flange
80	3	148	205	200	107	12.0	Thread / Grooved
80	3	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

Dimensions of RAF & RAF-A

RAF



RAF (Inline)



RAF-A (Inline)

RAF GENERAL PURPOSE HYDRAULIC VALVES

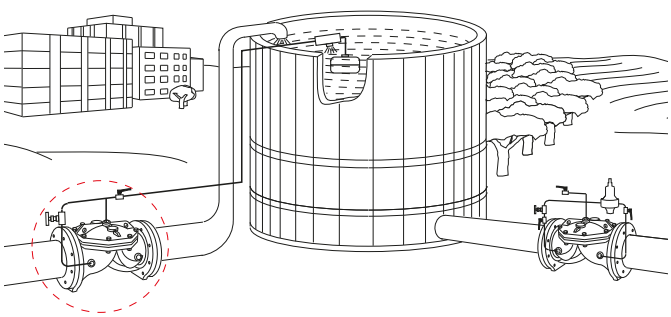
RAF 10 Float Level Control Valve

Description

RAF 10 is used to maintain a preset water level in a reservoir or a water tank in a simple, economic manner. The RAF valve is activated by the line pressure.

The RAF10 stays open as long as the water level in the reservoir is below the preset level. As the water level rises and lifts the float, the valve gradually closes.

Typical Application



RAF 10 Float Level Control Valve controls the water level of a water tank. The valve can also be located above the water level.
Use RAF 10 for reservoirs and water tanks level control in any situation that maximum water level should be maintained. No need for energy other than line pressure. RAF 10 is best fit in remote sites. Due to its simple design, it is virtually maintenance free.

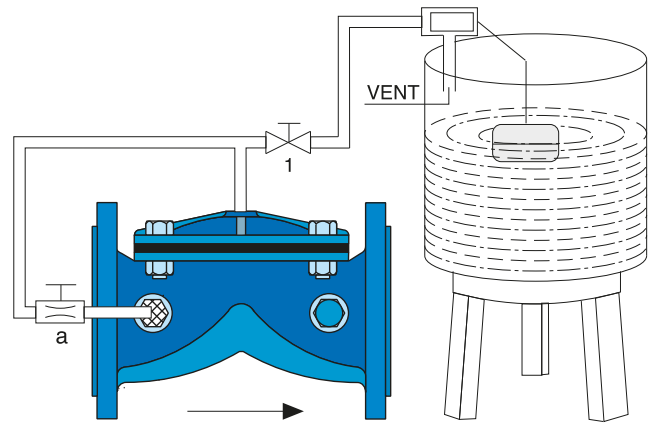
Recommended Flow

Nominal Diameter		Flow Rate m^3/h
mm	Inch	Max.
40	1.5	25
50	2	45
65	2.5	70
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100- 125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 10 control mode

RAF Float level control Valve
is activated by line pressure and controlled by a two-way float pilot. The pilot vent is opened or closed according to the float level. The float is located inside the reservoir as shown. The vertical water level changes are amplified by a lever and conveyed to the float. The float valve will close when water level reaches its preset.

Automatic Operation:
When the water level is low, the lever drops due to the float weight. The vent is open. The control chamber of the RAF is drained through the vent. The diaphragm of the RAF is forced upward by the line pressure. The RAF opens and reservoir is being filled. As the float lever moves upward, due to the rising water level inside the water tank, the vent closes mechanically. The RAF is then closed by the line pressure, forcing its diaphragm downwards.



RAF 10 - Float Level Control Valve

Adjustment

Adjust the needle valve **a** to allow a sufficiently short closure time. Preset the pilot to the reservoir's desired maximum water level.

Please Specify:

- Maximum Operating Pressure (Closed valve)
- Minimum & Maximum Flow rates.
- Maximum water level

Standard RAF 10:

Basic RAF valve Rilsan coated
Self-cleaning screen filter
Brass Pilot P-10
Brass Float arm
Stainless Steel float
Cock valve
Needle valve
Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
Stainless Steel Pilot P-10T
Stainless Steel Float arm
-
-
-
Copper or stainless steel tubing

RAF GENERAL PURPOSE HYDRAULIC VALVES

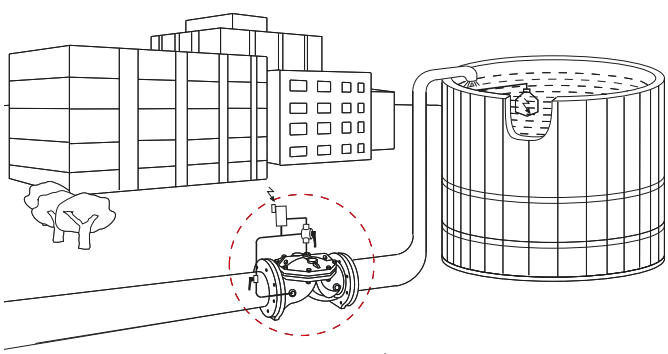
RAF 1031 Electric Float Control Valve

Description

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 maximum level, the solenoid is de-energized and the RAF 1031 closes. The RAF 1031 is a non modulating service valve, operating as an on/off valve.

Typical Application



RAF 1031 electric float controls the water level of a water tank. The valve can be located also above the upper water level of the tank.

Use RAF 1031 for water level control. The valve is best for remote or local control of reservoirs and water tanks level control when electricity is available. Due to its simple design it is virtually maintenance free.

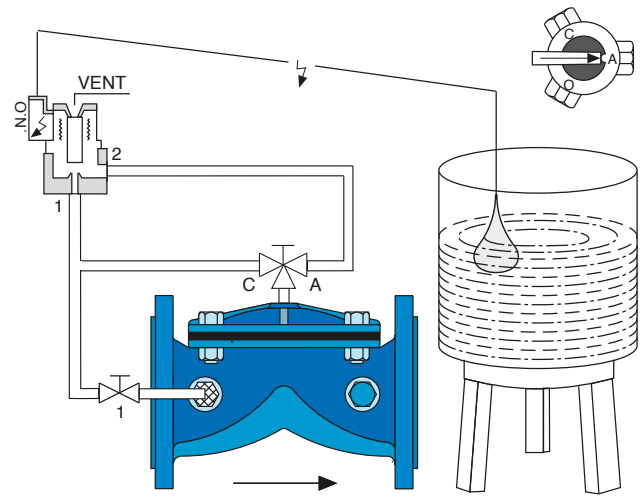
Recommended Flow

Nominal Diameter		Flow Rate Max. m³/h	
mm	Inch	Normal	Intermittent
40	1.5	25	35
50	2	45	60
65	2.5	60	80
80-65-80	3-2.5-3	70	100
80	3	90	120
100-80-100	4-3-4	90	120
100	4	150	180
125-100- 125	5-4-5	150	200
150-100-150	6-4-6	150	200
150	6	320	400
200	8	550	750
250	10	950	1150
300	12	1000	1200
350	14	1300	1500
400	16	1400	1600

RAF 1031 control mode

RAF Electric Float Control Valve

Is activated by line pressure and controlled by a three-way solenoid valve. The RAF 1031 is normally closed. An electric circuit is switched ON/OFF by a dry contact float hanging over the water surface. When the floats hangs by is cable vertically above the water surface, the circuit is connected , the solenoid is energized and the RAF valve fully opens. When the float turns over by the rising water level the electrical circuit is disconnected, the solenoid is de-energized and the RAF is closed .In case of power failure, the RAF 1031 remains tight-close to avoid uncontrolled spill of water.



RAF 1031 - Electric Float Control Valve

Automatic Operations:

Position the selecting cock on **AUTO** when the water level is low, the electric circuit is connected. The solenoid is energized. The RAF's control chamber drains out. The RAF is fully open When the water level rises and turns over the electric float, the electric circuit turns off and de-energizes the solenoid. Line pressure is then connected to control chamber through solenoid. The RAF 1031 closes and stops the water flow into the tank.

Manual Operations:

To open the valve overriding the float place the Selecting Cock in **Open** position.

To close the valve overriding the float place the Selecting Cock in **Close** position.

Adjustment

Fix the float's cable to the reservoir's inner wall at the desired level. This fixation point will be in between minimum and maximum levels, allowing the float to turn up and down. The length of electric cable left after the fixation between minimum and maximum water level pre set.

Standard RAF 10:

Basic RAF valve Rilsan coated
Self-cleaning screen filter
3 way 24 AC N.O. Solenoid valve 50/60Hz
Dry contact eletric float w/10m. cable Selecting Cock valve (3 port ball valve) Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
110V, 220V AC and 9V, 12V, 24V DC
Copper or stainless steel tubing

Please Specify:

- Maximum Operating Pressure (Closed valve).
- Electric source data if different than standard.

RAF GENERAL PURPOSE HYDRAULIC VALVES

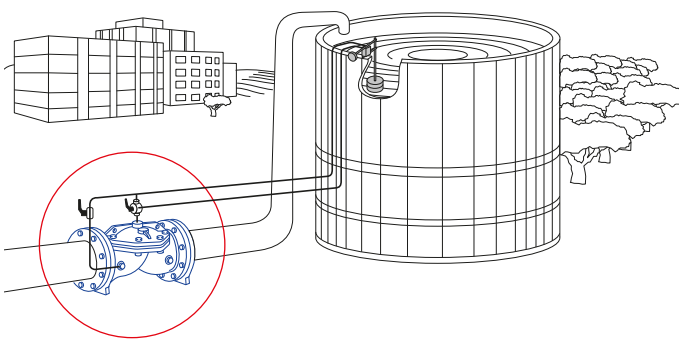
RAF 13 Bi - level Float Control Valve

Description

RAF 13 is used to control filling of water reservoirs and tanks. The RAF 13 is a non-modulating service valve, operating as an on/off valve. The RAF valve is activated by the line pressure only and controlled by a float pilot. The valve will open at a low preset water level and close at a preset high water level, different than the opening level.

The RAF 13 allows filling and draining of a reservoir or a water tank in a level range that can be easily changed. The RAF13 stays in its last position (fully open or fully closed) as long as the water level is in between minimum and maximum preset levels.

Typical Application



Use RAF 13 for reservoirs and water tanks for level control in any situation that water level controlled. No need for energy other than line pressure. RAF 13 is best fit where On/Off, non-modulating valve operation is essential.

Recommended Flow

Nominal Diameter		Flow Rate Max. m^3/h	
mm	Inch	Normal	Intermittent
40	1.5	25	35
50	2	45	60
65	2.5	60	80
80-65-80	3-2.5-3	70	100
80	3	90	120
100-80-100	4-3-4	90	120
100	4	150	180
125-100-125	5-4-5	150	200
150-100-150	6-4-6	150	200
150	6	320	400
200	8	550	750
250	10	950	1150
300	12	1000	1200
350	14	1300	1500
400	16	1400	1600

RAF 13 control mode

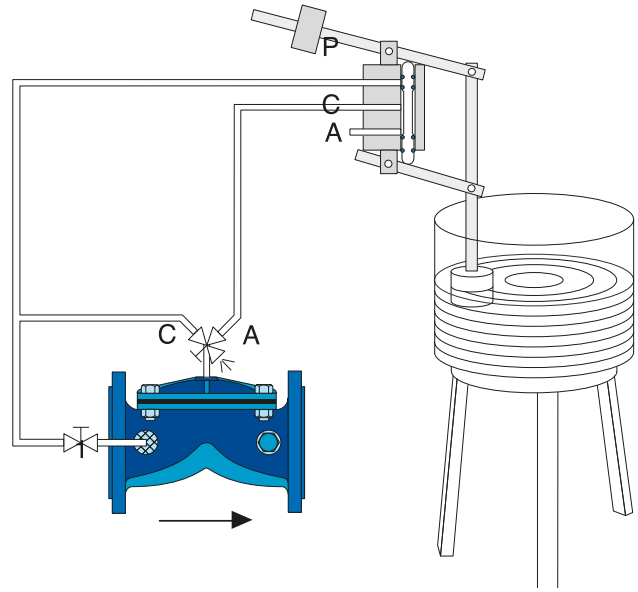
RAF 13 Float level control Valve

is activated by line pressure and controlled by a three-way float pilot. The float is located inside the reservoir as shown. The vertical water level changes are conveyed to the float.

Automatic Operation:

When the water level reduces the float slides down on the rod due to its weight. When it reaches the minimum preset level indicated by the lower stopper attached to the Pilot's rod, the pilot's vent port is connected to the control chamber of the RAF The diaphragm of the RAF is forced upwards by line pressure, the RAF opens and reservoir is filled.

When water level rises, the float slides upwards on the rod. The valve in this case will remain open until maximum preset level (upper stopper) is reached. At maximum level the float forces upper stopper up. The control chamber is connected then through the pilot to pressure supply. The line pressure forces the RAF diaphragm downward and the valve closes, cutting water supply to the reservoir.



RAF 13 - Bi-level Float Control Valve

Manual Operations:

To open the valve overriding the float place the Selecting Cock in **Open** position.

To close the valve overriding the float place the Selecting Cock in **Close** position.

Adjustment

After installing the float pilot adjust the upper stopper to maximum required water level, fixing it to the rod. Adjust in the same manner the lower stopper in the required minimum water level.Place the selecting Cock in **auto** position. The float should not suffer fluctuations caused by the waves in the reservoir . The float should be protected from the water inlet of the reservoir or water tank and as distant as possible.

Standard RAF 13:

Basic RAF valve Rilsan coated
Self-cleaning screen filter
Brass Pilot P-73
Stainless Steel float
Stainless Steel Float rod (Standard 1m.)
Selecting Cock valve (3 port ball valve)
Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
Stainless Steel Pilot P-73T
-
Stainless steel rod extension
-
Copper or stainless steel tubing

Please Specify:

- Maximum Operating Pressure (Closed valve).
- Minimum & Maximum Flow rates.
- Maximum water level.
- Float rod length if not standard.

RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 20 - Pump Protection Control Valve

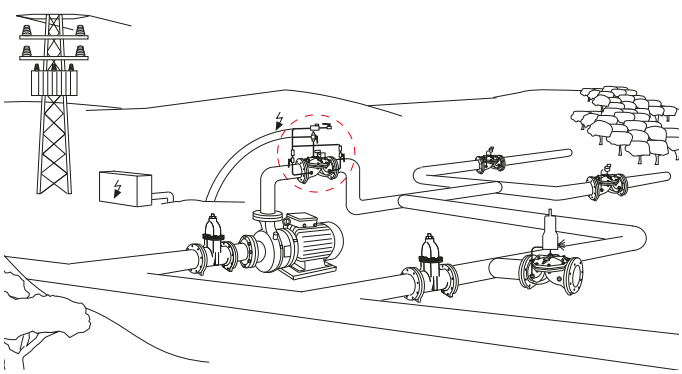
Description

The **RAF 20** valve regulates the pressure level during the start and shut-off of a pump 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. For booster pumps control the RAF 20 is installed on the main line downstream of the pump. Generally the valve protects the booster pump and its engine by sustaining the pressure in starting and shutoff, and function as a check valve otherwise. The valve protects the pump in case of power shutdown by sustaining the pressure downstream the pump.

In deep well configurations, the RAF 20 is installed on a tee branch off the main line. It functions basically as a pressure relief. Letting a low pressure in starting and shut-off, and closes other wise to enable a gradual pressure buildup. In case of emergency shutdown, the RAF 20 opens to relieve pressure from the vertical pump.

Typical Application



RAF 20 controls the out flow of booster pump. the pump's intake is on the main line at the left. note also a quick relief valve- RAF 80Q on the right.

Use pump control Hydraulic valve with any pump to protect the pump housing, the pumping accessories and water lines. protection is needed in both horizontal and vertical pumps.

consult RAPHAEL engineers for the most suitable layout, switching and sizing of pump contol valve for your application.

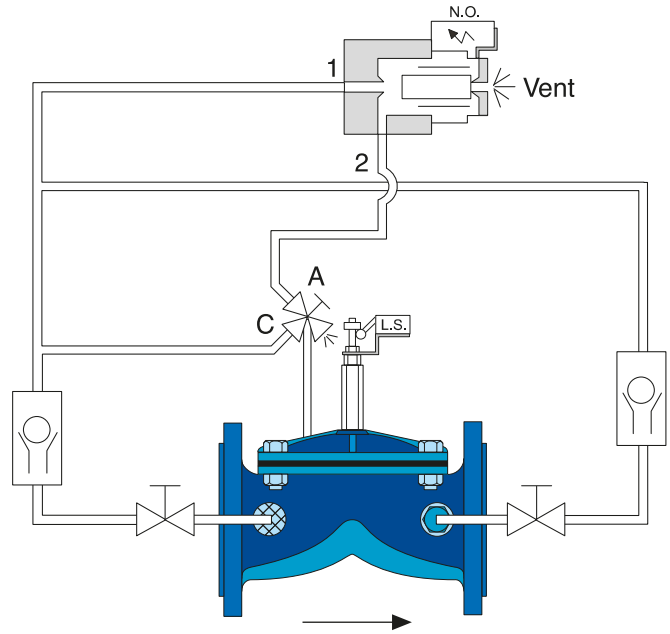
Recommended Flow

Nominal Diameter		Flow Rate Max. m^3/h	
mm	Inch	Normal	Intermittent
40	1.5	25	35
50	2	45	60
65	2.5	60	80
80-65-80	3-2.5-3	70	100
80	3	90	120
100-80-100	4-3-4	90	120
100	4	150	180
125-100-125	5-4-5	150	200
150-100-150	6-4-6	150	200
150	6	320	400
200	8	550	750
250	10	950	1150
300	12	1000	1200
350	14	1300	1500
400	16	1400	1600

RAF 20 control mode

Booster pump configuration

Automatic: The three-way cock should be positioned at **A**. Normally, the power is turned **OFF** and the valve is closed, as illustrated. When the pump is turned **ON,** the solenoid is energized and its plunger flips to the left.
Port 1 of the solenoid closes and the vent opens.
The control chamber of the RAF 20 drain, the RAF opens gradually, allowing the pump to achieve higher outflow. As the RAF 20 opens, the indicator rises to its upper position.
When the electric power is turned **OFF,** from any reason, the solenoid de-energizes, its plunger flips back to the right (as shown), and the RAF 20 gradually closes. The pressure is sustained. In normal shutdown the pump is turned off electrically by the limit switch only after the RAF 20 is completely closed. In case of unexpected shutdown the RAF 20 closes at the same time. Check valves are located on each side of the RAF 20 to ensure its closure.



RAF 20 - Pump Protection Control Valve

Deep well configuration

Automatic:
The RAF is installed on a tee branch off the main line.
The RAF 20 is normally open to allow low pressure and build up of full pumping. as the pump is turned **ON**, a timer starts a countdown and eventually De-energizes the solenoid, the valve closes gradually under increasing pressure. when the power is turned **OFF**, the RAF 20 opens to relieve the pressure gradually.

Manual: Use the three-way cock to open or close the RAF 20, by turning the handle to **O** or **C,** respectively.

Standard RAF 13:

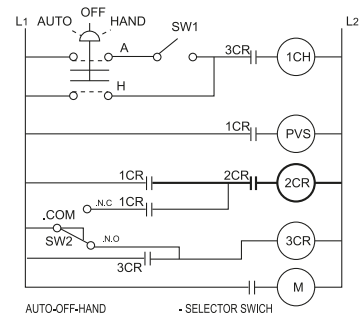
Basic RAF valve Rilsan coated
Self-cleaning screen filter
Brass check valves
Indicator with limit switch assembly
3 way 24V AC N.O. Solenoid valve 50/60Hz
Selecting Cock valve (3 port ball valve)
Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
-
-
110V, 220V AC and 9V, 12V, 24V DC
-
Copper or stainless steel tubing

Electric scheme

WELL PUMP CONTROL VALVE ELECTRIC SCHEM



AUTO-OFF-HAND	- SELECTOR SWICH
1CR	- RELAY, DPST NORMALLY OPEN
2CR	- RELAY, DPST NORMALLY OPEN
3CR	- RELAY, DPST NORMALLY OPEN
SW1	- SWITCH, REMOTE START, AUTOMATIC
SW2	- SWITCH, SPDT VALVE LIMIT SWITCH (CONNECT TO N.C. TERMINAL)
PVS	- PILOT VALVE OLENOIDS HOOKED IN PARLLEL
M	- PUMP MOTOR STARTED

NOTE: SW2, and PVS supplied by RAPHAEL.
All other electrical items supplied by customer

Please Specify:

- Electric source (If not standard)
- Pump Configuration (Booster or deep well pump)

RAF GENERAL PURPOSE HYDRAULIC VALVES

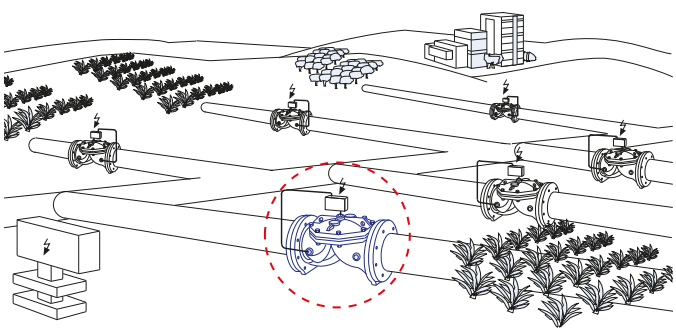
RAF 31-33 Electric Control Valve

Description

RAF 31 and **RAF 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 is energized by an electric pulse.

The electric pulse that commands the valves is generated by a controller, timer, sensor or an electric control device.

Typical Application



A programmed irrigation controller commands several NC valves to water various crops. Each plot has a different interval and cycle duration.

On/Off electric valves are used for remote operation of hydraulic valves by an electric command. The valves can be configured either as Normally open (N.O. - With no energy the valve is opened by line pressure) or Normally closed (N.C. - With no energy the valve is closed by line pressure).

Recommended Flow

Nominal Diameter		Flow Rate. m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 31/33 control mode

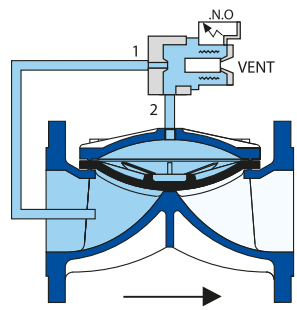
Normally Close Mode

By default of the normally closed RAF valve, the line pressure is connected to the RAF valve's control chamber above its diaphragm. Thus, the diaphragm is pressed downwards against the valve seat and the valve is closed. When the solenoid is energized by an electric pulse the line control chamber is disconnected from line pressure and drained through the solenoid's vent. The RAF's diaphragm is then forced upward by line pressure and fully opens.

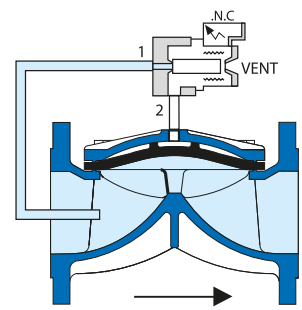
Normally Open Mode

By default of the normally open RAF valve, the RAF valve's control chamber is connected to the drain of the solenoid, the diaphragm is pressed upwards by line pressure and the valve fully opens. When the solenoid is energized by an electric pulse the pressure source connects to the control chamber of the valve. The line pressure pushes the diaphragm all the way downwards and the RAF closes.

The standard RAF 31/33 Electric control valve is a Three 3 way configured. When the water from the control chamber cannot be drained to the atmosphere, from any reason, two way configurations are also available. The valve can be then configured as a 2 way Normally Close (RAF32 - 2W N.C.), Electric Control valve, or a 2 way Normally Open (RAF 30 - 2W N.O.), Electric Control valve.



RAF 31 - Three Way NC
Electric Control Valve



RAF 33 - Three Way NO
Electric Control Valve

Standard RAF 31 (Normally Close):

Basic RAF valve Rilsan coated
Self-cleaning screen filter
3 way N.O. Solenoid valve
24V AC 50/60 Hz power source
Reinforced plastic tubing

Standard RAF 33 (Normally Open):

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
3 way N.C. Solenoid valve
24V AC 50/60 Hz power source
Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
2 way N.O. Solenoid valves
11 OV, 220V AC and 9V, 12V, 24V DC
Copper or stainless steel tubing

RAF GENERAL PURPOSE HYDRAULIC VALVES

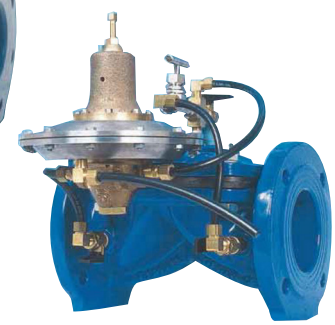
RAF 40/43 Altitude Control Valve

Description

RAF 40/43 is used to maintain a preset water level of reservoirs or water tanks. The RAF valve is activated by line pressure, and is commanded by an Altitude pilot. The Altitude pilot is mounted on the valve, therefore there is no installation required on top of the reservoir. The RAF 40 valve controls the maximum water level of the reservoir by controlling the maximum water column pressure generated by the water inside the water storage.

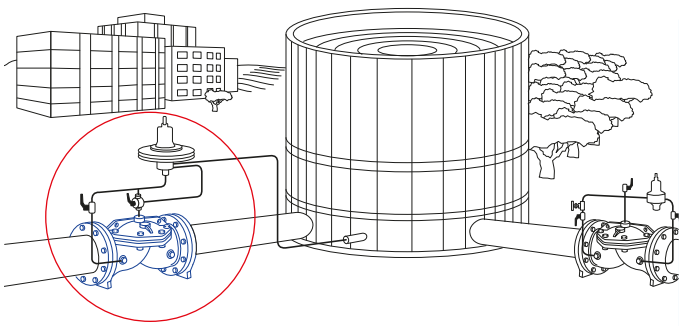
The RAF 40/43 stays open as long as the water level of the reservoir is below a preset level. The RAF 40 is a modulating service valve, operating as an on/off valve.

RAF 43



RAF 40

Typical Application



RAF 40/43 Altitude Control Valve controls the water level in a water tank.

Use RAF 40/43 for reservoirs and water tanks level controls, especially in high rise reservoirs. Line pressure provides energy suitable for operation. RAF 40 is particularly suitable for remote sites. Due to its simple design it is virtually maintenance free.

Recommended Flow

Nominal Diameter		Flow Rate Max. m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100- 125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 40 - 2 Way Altitude Control Hydraulic Valve. Especially fit when high precision is requested and small variation between minimum and maximum levels. Altitude ranges: 15m, 25m & 40m.

RAF 40/43 - 3 Way Altitude Control Hydraulic Valve. Especially fit for low height water tanks. Altitude ranges: 8m, 15m & 30m.

RAF 40/43 control mode

RAF 40 - 2 Way altitude control valve

Automatic Operation: Under normal conditions, when the water level in the reservoir is lower than the pre set altitude, the RAF 40 is open. The line pressure used to control the valve flows from the upstream through the RAF's control chamber to the downstream. When the water level raises the pressure head under the pilot's membrane raises consequently. When the water reaches its maximum pre set level the pressure overcomes he pilot's spring. The pilot's membrane moves upwards and closes the drain. The RAF 40 is closed completely due to the line pressure. When the water level drops, the pilot opens again.

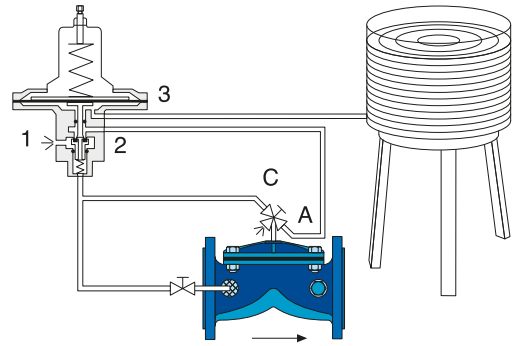
Manual Operation: Open the RAF 40 overriding the pilot by closing cocks 1 and 2 and opening the vent. Close the RAF 40 overriding the pilot by closing cock and vent and opening cock 1.

RAF 43 - 3 Way altitude control valve

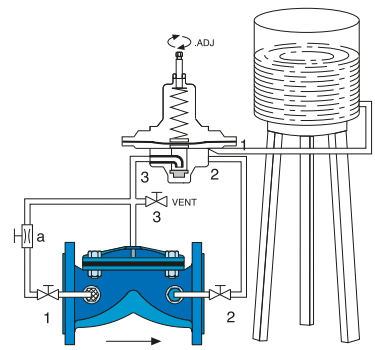
Automatic Operation: Under normal conditions, when the water level in the reservoir is lower than the pre set altitude, the RAF 43 is open. When the water level raises the pressure head under the pilot's membrane raises consequently. When the water reaches its maximum pre set level the pressure overcomes the pilot's spring. when the pilot's membrane moves upwards and connects the control chamber to line pressure, The RAF 43 fully closes. When the water level in the reservoir drops again, the valve's control chamber drains to the atmosphere through the pilot's vent. Line pressure supply is closed in parallel. The RAF 40/43 fully opens, due to the line pressure.

Manual Operation:

To open the valve overriding the float place the Selecting Cock in **Open** position.
To close the valve overriding the float place the Selecting Cock in **Close** position.



RAF 43 - Three Way Pilot



RAF 40 - Two Way Pilot

Adjustment

Adjust the desired altitude within the allowable range using the adjustment screw. Turn the screw counter clockwise to lower the control altitude.

Standard RAF 40:

Basic RAF valve Rilsan coated
Self-cleaning screen filter
2 Way Altitude metal pilot ALT2
Spring set for reservoir maximum level 15m.
Reinforced plastic tubing

Standard RAF 43:

Enamel coating
Self-cleaning screen filter
3 Way Altitude metal pilot ALT3
Spring set for reservoir maximum level 15m.
Reinforced plastic tubing

Optional Features:

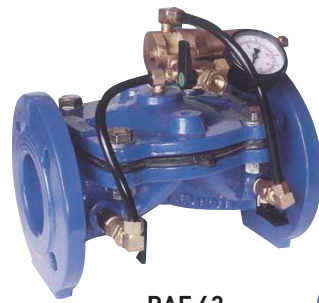
Basic RAF valve Rilsan Coated
Large capacity external filter
2 Way Altitude stainless steel pilot
Spring set for reservoir maximum level 25m and 40m.
Copper or stainless steel tubing

RAF GENERAL PURPOSE HYDRAULIC VALVES

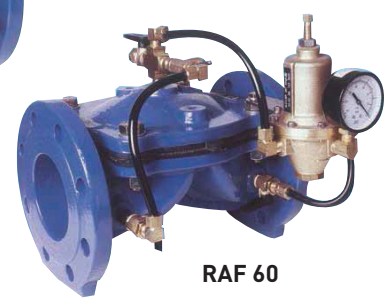
RAF 60/62 Two Way Pressure Reducing Control Valve

Description

RAF 60 and **RAF 62** 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 reduced pressure. The pilot valve maintains a constant downstream pressure by gradually opening and closing of the main valve. The pressure is maintained constant regardless of changes in the flow rate.

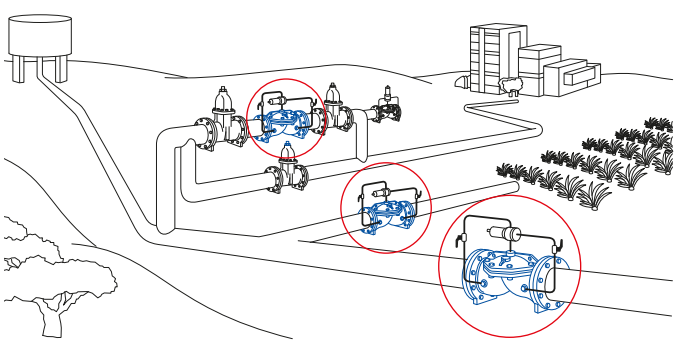


RAF 62



RAF 60

Typical Application



Use RAF 60/62 for general water supply systems with medium pressure rating. The 2-way pilot configuration together with RAPHAEL'S patented diaphragm enables smooth and precise pressure control.

Recommended Flow

Nominal Diameter		Flow Rate m^3/h
mm	Inch	Max.
40	1.5	25
50	2	45
65	2.5	70
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 62- General Application two-way Pressure reducing valve and metal pilot with a built-in needle valve. Pressure setup up to 16 bars. Diameters 1 "to 4" (DN40 to DN100).

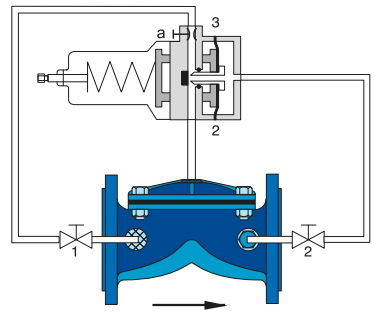
RAF 60- General Application two-way Pressure reducing valve with a high precision, quick response metal pilot. Pressure setup up to 16 bars.

RAF 60/62 control mode

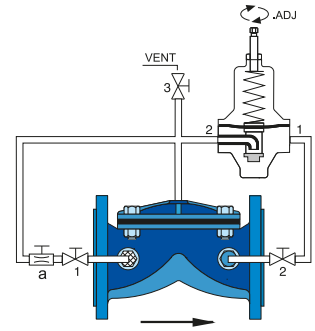
RAF Pressure Reducing Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane, which is exposed to the downstream (controlled) pressure. The displacement of the membrane due to downstream fluctuations defines the flow inside the pilot. When the downstream pressure is lower than desired, the RAF valve is automatically directed to open. In the opposite case it is automatically directed to close. When line pressure is inserted into the control chamber of the RAF valve (above its diaphragm) the valve closes. When the control chamber drains the RAF valve opens due to the line pressure from below its diaphragm.In two-way configurations, the control chamber drains downstream, enabling faster and gradual opening without water spill.

Automatic: When downstream pressure is lower than that of the pilot spring (pre-adjusted set point). the RAF's control chamber drains downstream and the RAF valve is opened. When the downstream pressure rises above the preset spring load, the pilot's membrane is forced upwards closing the pilot's water passage. The RAF 60 then closes reducing downstream pressure.

Manual: To open the **RAF 60** and **RAF 62,** close cocks **1** and **2** and open the Vent. To close the valves, open cock **1** and close cock **2** and Vent **(3).**



RAF 62- Two Way Metal Pilot



RAF 60 - Two Way Metal Pilot

Adjustment

Use needle valve a to control the RAF 60 and RAF 62 operational speed. Adjust the sustained pressure by the adjusting screw. See table of available springs below.

Standard RAF 60:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 Way pilot P-161
Brass needle valve
Reinforced plastic tubing
Pressure check point

Standard RAF 62:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way pilot w/built in needle valve P-162
-
Reinforced plastic tubing
Pressure check point

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
Stainless steel needle valve
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar)

RAF 60

Green Standard	Blue	Red	Yellow
2-10	0.5-4	0.5-6	2-16

RAF 62

Green Standard	Red	Yellow
2-12	0.5-8	2-16

Please Specify:

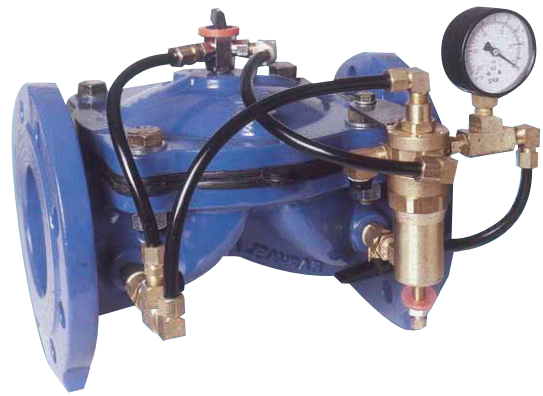
- Minimum & maximum flow rates.
- Normal line pressure.

RAF GENERAL PURPOSE HYDRAULIC VALVES

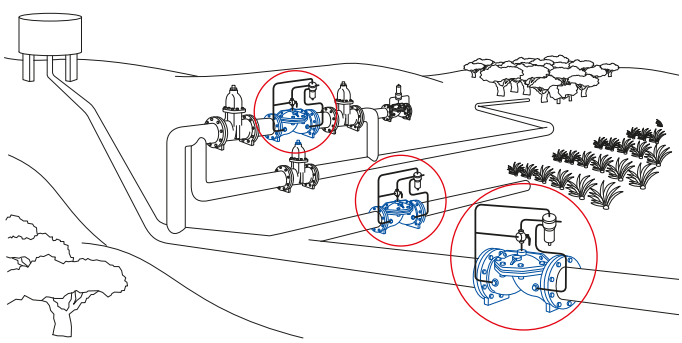
RAF 63B Three Way Pressure Rreducing Control Valve

Description

RAF 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 reduced pressure. The pilot valve maintains a constant downstream pressure by gradually opening and closing of the RAF. The pressure is maintained constant regardless of changes in flow rate.



Typical Application



Use RAF 63B for general water supply systems with medium pressure rating. The RAF 63B is best for Use for water treatment circulation and filtration networks. The 3 - way brass pilot is used in cases where downstream pressure equalizes to upstream pressure.

Recommended Flow

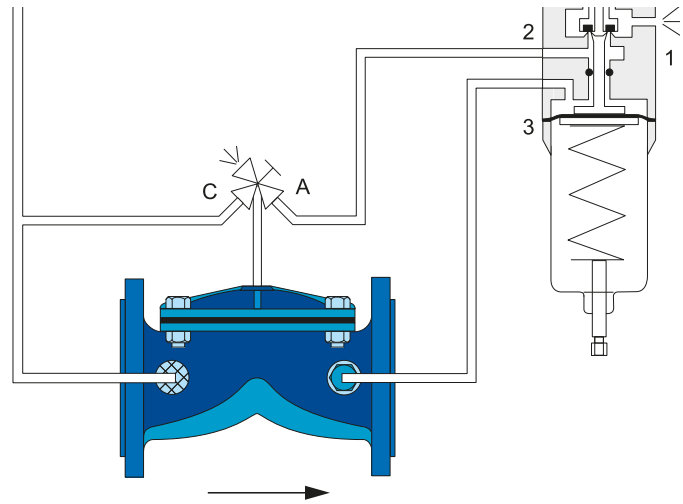
Nominal Diameter		Flow Rate Max m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 63B - General Application three-way Pressure reducing valve with metal pilot. Pressure setup up to 16 bars.

RAF 63B control mode

Control mode

RAF Pressure Reducing Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring - loaded membrane, which is exposed to the downstream (controlled) pressure. The displacement of the membrane due to downstream fluctuations defines the flow inside the pilot.
When the downstream pressure is lower than desired, the RAF valve is automatically directed to open. In the opposite case it is automatically directed to close. When line pressure is inserted into the control chamber of the RAF valve (above its diaphragm) the valve closes. When the control chamber drains the RAF valve opens due to the line pressure from below its diaphragm. As in three-way control configurations, the control chamber drains out, enabling the valve to open fully.



RAF63B-Three Way Pilot

Adjustment: Adjust pressure set points by the adjusting screws of the pilots. See the list of available springs below.

Standard RAF 63B:

Basic RAF valve Rilsan coated
Self-cleaning screen filter
3 way brass pilot P-683
Selecting cock valve
Reinforced plastic tubing
Pressure check point

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
-
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Please Specify:

- Minimum & maximum flow rates.
- Normal line pressure.
- Set point (downstream) pressure

Spring Selection (bar)

RAF63B

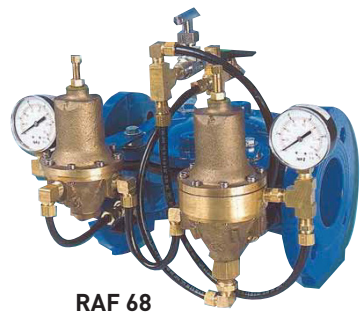
Green Standard	Red	Yellow
2-12	0.5-6	2-16

RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 68/682 Two Way Pressure Reducing/Sustaining Control valve

Description

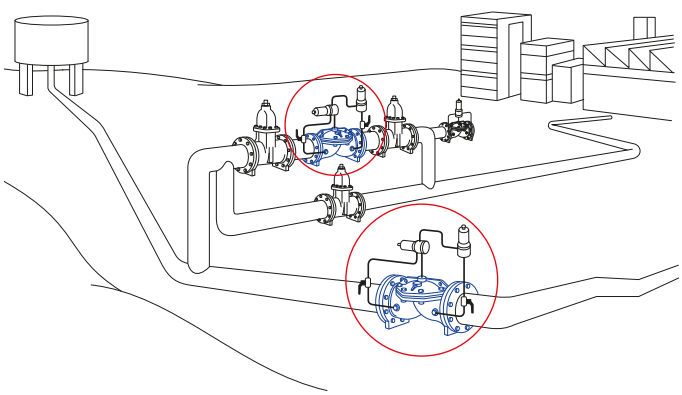
RAF 68 and **RAF 682** are piloted hydraulic valves activated by line pressure. Both pilots have spring-loaded membranes. One pilot is sensitive to upstream pressure and the other to downstream pressure. The combined operation of the two pilot valves sustains a constant pressure upstream of the RAF valve, and at the same time, reduces the downstream pressure to a preset pressure. The RAF valve opens or closes gradually to maintain both required pressures simultaneously.



RAF 68

RAF 682

Typical Application



Use the pressure reducing/sustaining valve to define two pressure zones along a supply line, typically, along a downhill flow. Use RAF 68/682 for general water supply systems with medium pressure rating. The elaborated 2-way command with RAPHAEL'S patented diaphragm enables smooth and precise pressure control.

Recommended Flow

Nominal Diameter		Flow Rate Max. m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

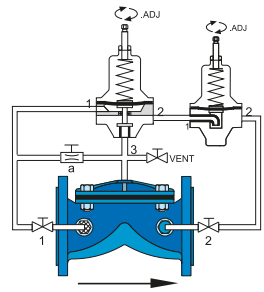
RAF 682- General Application two-way pressure reducing/ sustaining control vaive. Diameters 1 .5"to 4" (DN40 to DN100).

RAF 68- General Application two-way pressure reducing/ sustaining control valve. Pressure setup up to 16 bars.

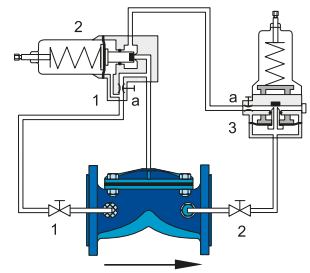
RAF 68/682 control mode

RAF Pressure Reducing/sustaining Valve is activated by the line pressure and controlled by two pilot valves. Both pilots include spring- loaded membranes. The sustaining pilot (the left one in the drawings) is preset to sustain the upstream pressure at a preset point. The reducing pilot (on the right) reduces the downstream pressure and maintains it at a lower preset level. In normal flow regime, the valve is partly open to sustain the upstream pressure and reduce the downstream pressure. It partly closes when the downstream pressure rises above the lower set point or when the line pressure drops below the upper set point. It opens again when the upstream pressure rises. The control chamber drains downstream, enabling faster and gradual opening without water spill.

Automatic: When line pressure is low, the pilots are positioned as shown. The RAF control chamber is connected to the line pressure, the RAF closes. When the line pressure rises and overcomes the spring of the sustaining pilot (the left one), the pilot's membrane moves upward to open its port. Then the RAF's control chamber drains downstream through the right pilot. the RAF valve opens and reduces the upstream pressure. When the line pressure reduces, the left pilot closes, as does the RAF. If the downstream pressure is greater than the set point of the reducing pilot (on the right), the reducing pilot's membrane moves upward and closes its port . Again the RAF control chamber is connected to the upstream pressure and the RAF closes.



RAF 68- Two Way Pilot



RAF 682 - Two Way Pilot

Manual: To open the RAF 68, close cocks 1 and 2 and open the Vent. To close the RAF, open cock 1 and close cocks 2 and Vent.

Adjustment

Use needle valve a to control the RAF 68 operational speed. Adjust the sustained pressure by the abjusting screw. See table of available springs below.

Standard RAF 68:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 Way pilot P-181
2 Way pilot P-161
Brass needle valve
Reinforced plastic tubing
Pressure check points

Optional RAF 682:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way pilot w/built in needle valve P-182
2 way pilot w/built in needle valve P-162
-
Reinforced plastic tubing
Pressure check points

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
Stainless steel pilot
Stainless steel needle valve
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar)

RAF 68

Green Standard	Blue	Red	Yellow
2-10	0.5-4	0.5-6	2-16

RAF 682

Green Standard	Red	Yellow
2-12	0.5-8	3-16

Please Specify:

- Minimum & maximum flow rates. Normal line pressure. Set point (sustain) pressure.

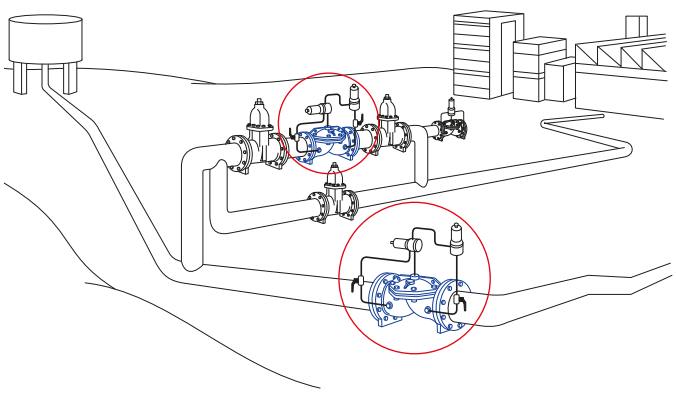
RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 683B Three Way Pressure Reducing/Sustaining Control Valve

Description

RAF 683B 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, reduces the downstream pressure to a preset pressure. The RAF valve opens or closes gradually to maintain both required pressures simultaneously.

Typical Application



Use the pressure reducing/sustaining valve to define two pressure zones along a supply line, typically, along a downhill flow. Use RAF 683B for general water supply systems with medium pressure rating with metal pilots.

Recommended Flow

Nominal Diameter		Flow Rate. m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

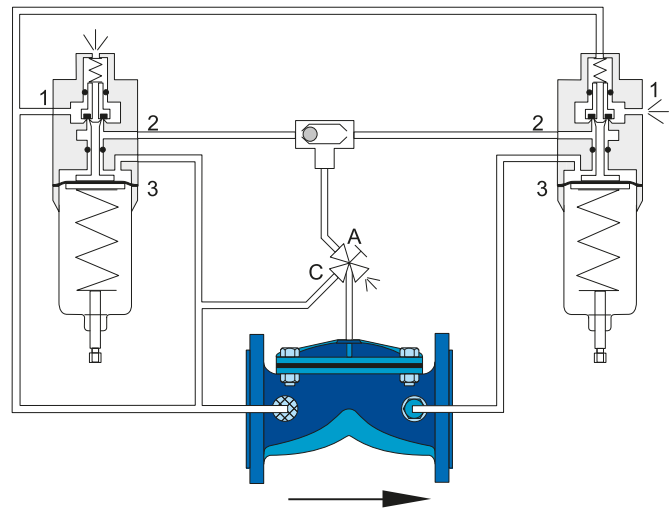
RAF 683B control mode

RAF Pressure Reducing Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring - loaded membrane, which is exposed to the downstream (controlled) pressure. The displacement of the membrane due to downstream fluctuations defines the flow inside the pilot.
When the downstream pressure is lower than desired, the RAF valve is automatically directed to open. In the opposite case it is automatically directed to close. When line pressure is inserted into the control chamber of the RAF valve (above its diaphragm), the valve closes. When the control chamber drains the RAF valve opens due to the line pressure from below its diaphragm. As in three-way control configurations, the control chamber drains out, enabling the valve to open fully.

RAF 683B - control mode:

Automatic: The three-way cock should be positioned in A. When the upstream pressure is low, both pilots are in the lower position as shown. The line pressure flows through ports 4-2 of the sustaining pilot (the left one), flips the shuttle valve open, and flows into the RAF control chamber. The RAF closes to sustain upstream pressure. When the upstream pressure rises above the set point, the membrane of the left pilot moves upward and opens its ports 2-3. The RAF control chamber drains this way (the shuttle valve remains open). Thus the RAF opens. When the downstream pressure rises above the preset reducing level (right pilot), the right pilot membrane moves upwards. The line pressure then flows through its ports 3-2 , flips the shuttle valve to the left and flows into the RAF's control chamber. The RAF closes. The downstream pressure reduces.

Manual: Use the three-way cock to close or open the RAF by turning the handle to C or 0, respectively.



RAF 683B-Three Way Metal Pilot

Adjustment

Adjust pressure set points by the adjusting screws of the pilots. See the list of available springs below.

Standard RAF 683B:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
3 way brass pilot P-683 (configured as Sustaining)
3 way brass pilot P-683 (configured as reducing)
Selecting cock valve
Reinforced plastic tubing
Pressure check point

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot (configured as Sustaining)
Stainless steel pilot (configured as Reducing)
-
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Please Specify:

- Minimum & maximum Flow rates. Normal line pressure. Set point (sustain) pressure.

Spring Selection (bar)

RAF 683B

Green Standard	Red	Yellow
2-12	0.5-8	3-16

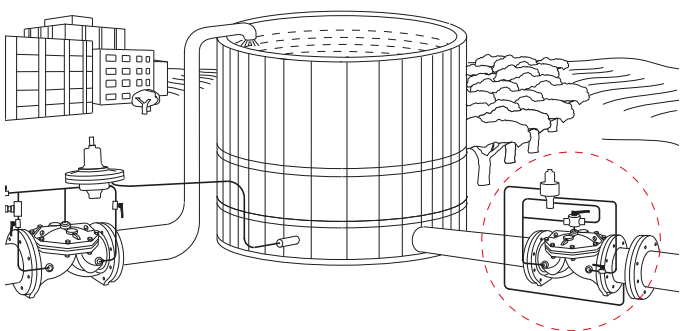
RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 70 Flow Rate Control Valve

Description

RAF 70 are piloted hydraulic valves activated by line pressure. Normally the RAF 70 is partly open to allow a preset constant flow rate. The flow rate through the RAF 70 is determined indirectly using an orifice plate. The head loss across the orifice is proportional to the actual flow rate. On rising head loss, the RAF 70 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.

Typical Application



Use RAF 70 Flow Rate Control valve to maintain a compensated constant flow rate to limit the flow downstream. RAF 70 has two-way metal pilot valve for general use in water supply systems of medium pressure rating. Apply RAF 70 to eliminate excessive pumping or to limit the water demand.

Recommended Flow

Nominal Diameter		Flow Rate Max.
mm	Inch	M^3/h
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 70 - General Application two-way Flow Rate Control Hydraulic Valve. Pressure rating up to 16 bars.

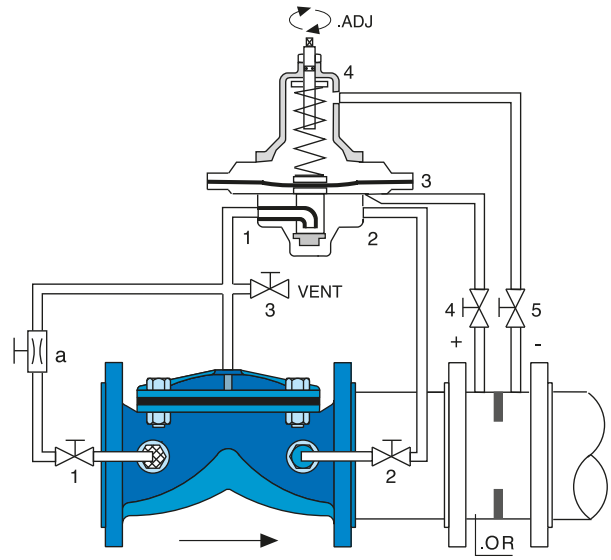
RAF 70 control mode

RAF Flow Rate Control Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane. An orifice plate is installed either downstream or upstream of the RAF. The orifice size is prepared in advance to suit the specified required flow rate. The head loss across the orifice is proportional to flow rate through the RAF valve. This head loss is transferred to the opposite sides of the pilot's membrane, which moves upward or downward accordingly. These movements open or close the inner ports of the pilot valve, directing the line pressure to control the RAF 70. In **two-way** configurations, the control chamber drains downstream, enabling faster and gradual opening without water spill. In **three-way** configurations, the control chamber drains out, enabling the valve to open fully.

RAF 70 control mode:

Manual: To open the RAF 70, close **cocks 1** and **2** and open the Vent. To close the RAF open cock 1 and close **cock 2** and **Vent.**

Automatic: In normal flow rate the RAF 70 is open. The head loss across the orifice is low, and the pilot membrane is maintained in its lower position, as shown. The line pressure flows through the open pilot, **ports 1-2,** and drains downstream. When the flow rate through the valve increases, so does the head loss across the orifice. When the head loss is higher than preset, the pilot membrane is pushed upward closing port **2.** The RAF is forced to close by line pressure. The flow rate decreases as does the head loss across the orifice. The pilot's membrane moves back and the RAF gradually reopens.



RAF 70 - Two Way Pilot

Adjustment

Use the needle valve **a** to control the RAF 70 operational speed. Adjust the operational set point by the adjusting screw. See the list of available springs below.

Standard RAF 70:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way metal pilot P-100
Brass Needle valves
Orifice plate
-
Reinforced plastic tubing

Optional Features:

Enamel coating
Large capacity external filter
3 way metal pilot P-103
-
-
-
Copper or stainless steel tubing

Please Specify:

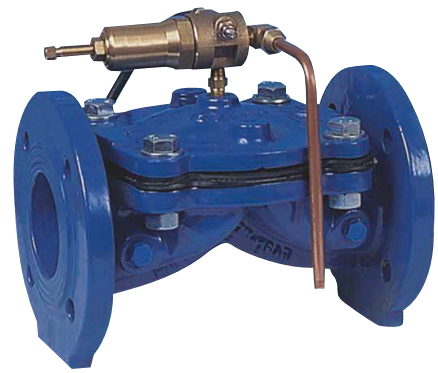
- Maximum permissible pressure drop.
- Flow rate (Set point).

RAF GENERAL PURPOSE HYDRAULIC VALVES

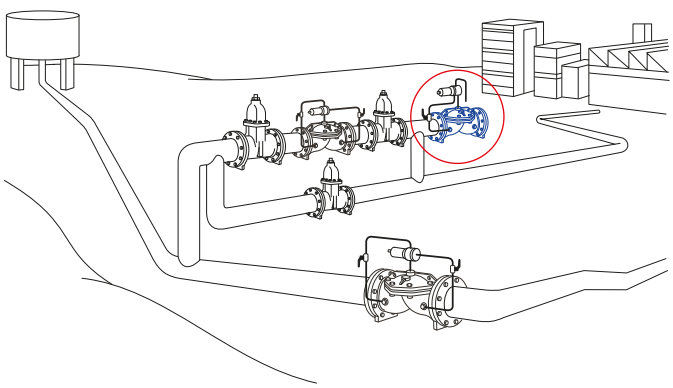
RAF 80Q Quick Pressure Relief Cotrol Valve

Description

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. Quick pressure relief valve protects water systems from quickly rising excessive pressure, due to water hammer surge. It is recommended to install RAF 80Q at the system head, right next to the main supply line or booster pump. RAF 80Q - General Application two-way Pressure Relief valve. Pressure rating up to 16 bars. The RAF 80Q is supplied in two standard configurations, both with metal pilots: small sizes (up to 4") and medium size (6" -12").



Typical Application



RAF 80Q valve relieves excessive line pressure to protect from pressure surge.

Use RAF 80Q for general water supply systems with medium pressure rating. The elaborated two-way pilot with RAPHAEL'S patented diaphragm enables smooth and precise pressure control.

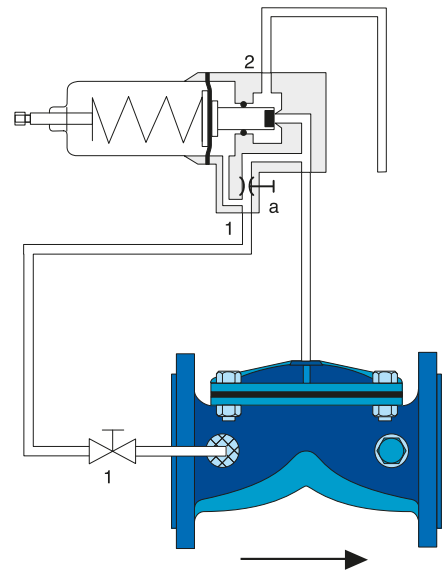
Recommended Flow

Nominal Diameter		Flow Rate Max.
mm	Inch	Max
40	1.5	35
50	2	60
65	2.5	80
80-65-80	3-2.5-3	100
80	3	120
100-80-100	4-3-4	120
100	4	180
125-100-125	5-4-5	200
150-100-150	6-4-6	200
150	6	400
200	8	750
250	10	1150
300	12	1000
325	14	1500
300	16	1600

RAF 80Q control mode

RAF 80Q Pressure Relief Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane, which is exposed to line pressure. The displacement of the membrane due to a rise of line pressure against the spring force changes the water flow inside the pilot. The RAF 80Q is normally closed. Only when the line pressure is higher than the preset value, the RAF 80Q is piloted to open.

Automatic: When line pressure is low, the pilot is closed as illustrated. The RAF 80Q remains closed by line pressure. When line pressure is higher than the set point of the pilot, the spring is biased, enabling the membrane to move upward under the line pressure. The inner port of the pilot opens; the RAF control chamber drains through the vent. Then the RAF 80Q opens and relieves the excessive pressure.



RAF 80Q - Quick Pressure Relief Control Valve

Adjustment

Use needle valve to control the RAF 80Q operational speed (The needle valve should be between 0.5 to 1 turns open). Adjust the sustained pressure by the adjusting screw. See table of available springs below.

Standard RAF 80Q 11/2"-4":

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way pilot w/built in needle valve P-182
-
Reinforced plastic tubing
Pressure check points

Standard RAF 80Q 6"-12":

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 Way pilot P-181
Brass needle valve
Reinforced plastic tubing
Pressure check points

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
Stainless steel needle valve
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar)

RAF 11/2" -4"

Green Standard	Red	Yellow
2-12	0.5-8	3-16

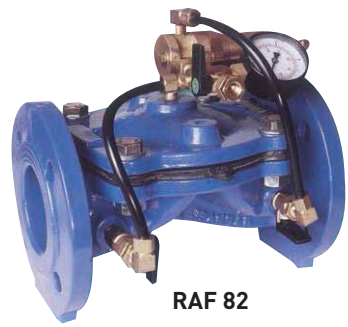
Green Standard	Blue	Red	Yellow
2-10	0.5-4	0.5-6	2-16

RAF GENERAL PURPOSE HYDRAULIC VALVES

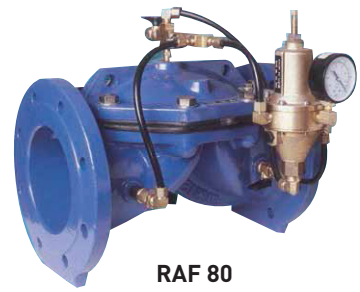
RAF 80/82 Two Way Pressure Sustaining/Relief Control Valve

Description

RAF 80 and **RAF 82** 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 80/82 opens to relieve the excessive pressure downstream without causing surge hazards. When the line pressure drops the RAF closes.

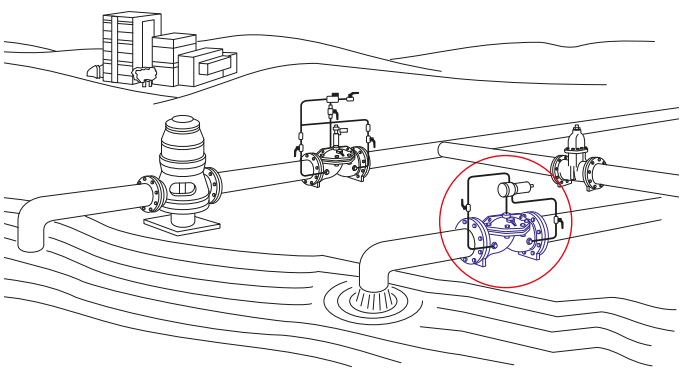


RAF 82



RAF 80

Typical Application



Use the pressure sustaining/relief valve to maintain constant upstream pressure and to avoid undesirable high pressure. This protection is required for most irrigation devices, domestic and industrial utilities. Use RAF 80/82 for general water supply systems with medium pressure rating. The elaborated 2-way command with RAPHAEL'S patented diaphragm enables smooth and precise pressure control.

Recommended Flow

Nominal Diameter		Flow Rate Max. m^3/h
mm	Inch	Max
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

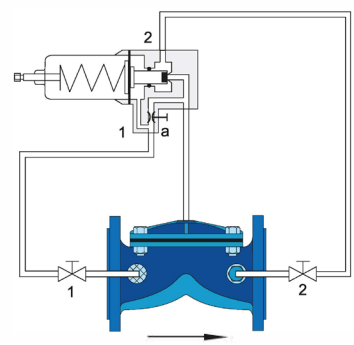
RAF 82 - General Application two-way Pressure sustaining/ relief valve. Pressure setup up to 16 bars. Diameters 11/2" to 4"(DN40 to DN100).

RAF 80 - General Application two-way Pressure sustaining / relief valve .Pressure setup up to 16 bars.

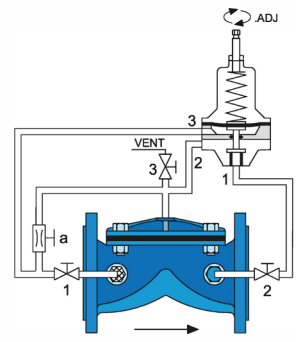
RAF 80/82 control mode

RAF Pressure Sustaining/Relief Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane. A sustained pressure is preset by adjusting the pilot retaining spring. The pilot is connected to line (upstream) pressure. The displacement of the pilot spring-loaded membrane due to upstream pressure defines the flow directions inside the pilot. When the upstream pressure is higher than the set point, the RAF valve is piloted to open. The excessive line pressure is relieved downstream. Otherwise the RAF remains closed, maintaining constant upstream pressure. As in two-way configurations, the RAF's control chamber drains downstream, enabling faster and gradual opening without water spill.

Manual: To open the RAF 80, close cocks **1** and **2** and open the Vent. To close the RAF open cock 1 and close cock 2 and Vent. Automatic: When the upstream pressure is lower than that of the sustained pressure set point, the RAF control chamber is connected to the line, as illustrated. The RAF is closed. When the upstream pressure rises above the set point, the pilot's membrane is forced upward. Port 1 opens, the control chamber of the RAF drains downstream and the RAF 80 opens to relieve the excessive pressure.



RAF 82 - Two Way Pilot



RAF 80- Two Way Pilot

Adjustment

Use needle valve **a** to control the RAF 80 operational speed. Adjust the sustained pressure by the adjusting screw. See table of available springs on the next page.

Standard RAF 80:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 Way pilot P-181
Brass needle valve
Reinforced plastic tubing
Pressure check points

Standard RAF 82:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way pilot w/built in needle valve P-182
-
Reinforced plastic tubing
Pressure check points

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
Stainless steel needle valve
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar)

RAF 80

Green Standard	Blue	Red	Yellow
2-10	0.5-4	0.5-6	2-16

Green Standard	Red	Yellow
2-12	0.5-8	3-16

Please Specify:

- Minimum & maximum flow rates.
- Normal line pressure. Set point (sustain) pressure.

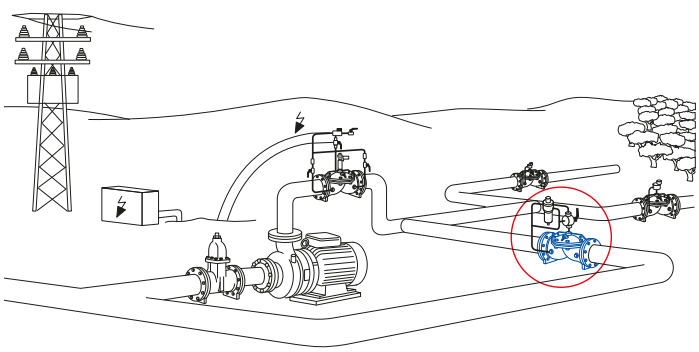
RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 83B Three Way Pressure Sustaining/Relief Control Valve

Description

RAF 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 83B opens to relieve the excessive pressure downstream without causing surge hazards. When the line pressure drops the RAF re-closes.

Typical Application



Use the pressure sustaining/relief valve to maintain constant upstream pressure and to avoid undesirable high pressure. This protection is required for most irrigation devices, domestic and industrial utilities. RAF 83B- General Application three-way Pressure sustaining/ relief valve with metal pilot. Pressure setup up to 16 bars.

Recommended Flow

Nominal Diameter		Flow Rate Max
mm	Inch	M^3/h
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

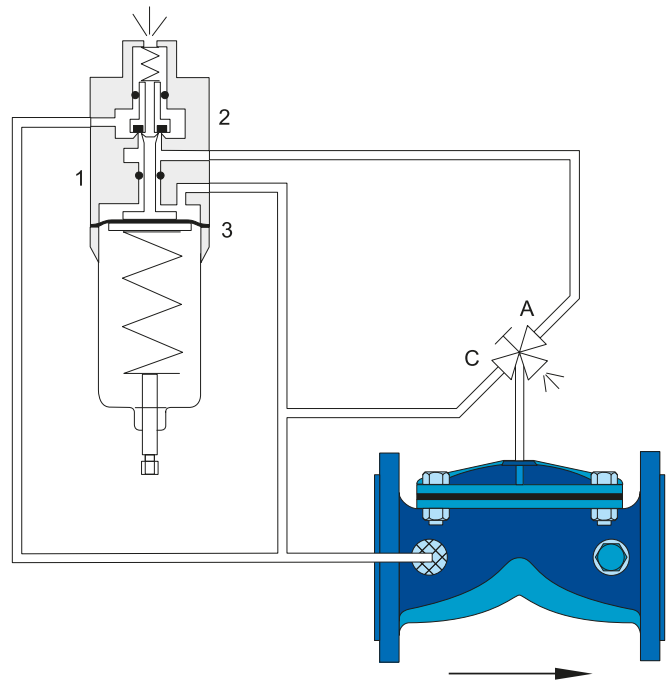
RAF 83B control mode

RAF Pressure Sustaining/Relief Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane. A sustained pressure is preset by adjusting the pilot retaining spring. The pilot is connected to line (upstream) pressure. The displacement of the pilot spring-loaded membrane due to upstream pressure, defines the flow directions inside the pilot. When the upstream pressure is higher than the set point, the RAF valve is piloted to open. the excessive line pressure is relieved downstream. Otherwise the RAF remains closed, maintaining constant upstream pressure. As in three-way configurations, the RAF's control chamber drains out, enabling the valve to open fully.

RAF 83B - control mode

Automatic: The three-way cock should be positioned at **A**. When the upstream pressure is low, the pilot's membrane is in its lower position as illustrated. The RAF 83 control chamber is exposed to line pressure through the ports 4-2 of the pilot. The RAF closes to sustain the upstream pressure. When the upstream pressure is higher than preset, it overcomes the pilot spring and force the pilot membrane to move upward. Then ports 2-3 open and port 4 closes. The RAF 838 control chamber drains and the valve opens to relieve the excessive pressure downstream.

Manual: Use the three-way cock to close or open the RAF by turning the handle to the **C** or **O** positions, respectively.



RAF 83B - Three Way Metal Pilot

Adjustment: Adjust pressure set points by the adjusting screws of the pilots. See the list of available springs below.

Standard RAF 83B:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
3 way brass pilot P-683
Selecting cock valve
Reinforced plastic tubing
Pressure check point

Optional Features:

Enamel coating
Large capacity external filter
Stainless steel pilot
-
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar}

RAF 838B

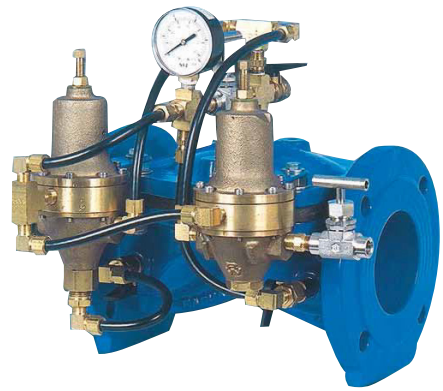
Green Standard	Red	Yellow
2-12	0.5-8	3-16

RAF GENERAL PURPOSE HYDRAULIC VALVES

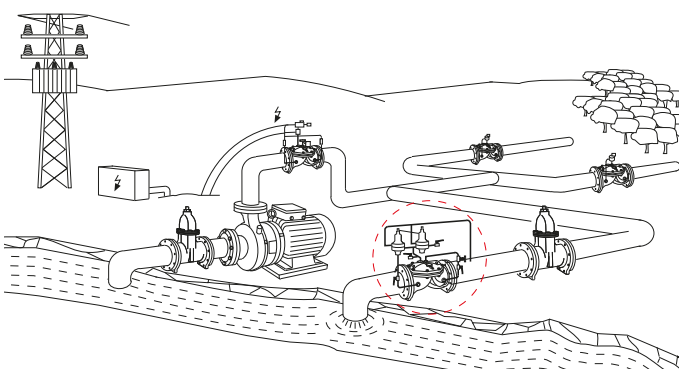
RAF 88 Surge Anticipating Control Valve

Description

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 seconds. 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.



Typical Application



RAF 88 is located next to a booster pump to protect the supply line downstream of the pump from water hammer damages.

Use a surge-anticipating valve to protect water lines against water hammer damages. Uphill supply lines of considerable length and large diameter pipes are more susceptible to water hammer damages. For more info or hazard analysis of a particular network consult RAPHAEL Engineers.

Recommended Flow

Nominal Diameter		Flow Rate m^3/h
mm	Inch	Max
40	1.5	35
50	2	60
65	2.5	80
80-65-80	3-2.5-3	100
80	3	120
100-80-100	4-3-4	120
100	4	180
125-100- 125	5-4-5	200
150-100-150	6-4-6	200
150	6	400
200	8	750
250	10	1150
300	12	1200
350	14	1500
400	16	1600

RAF 88 control mode

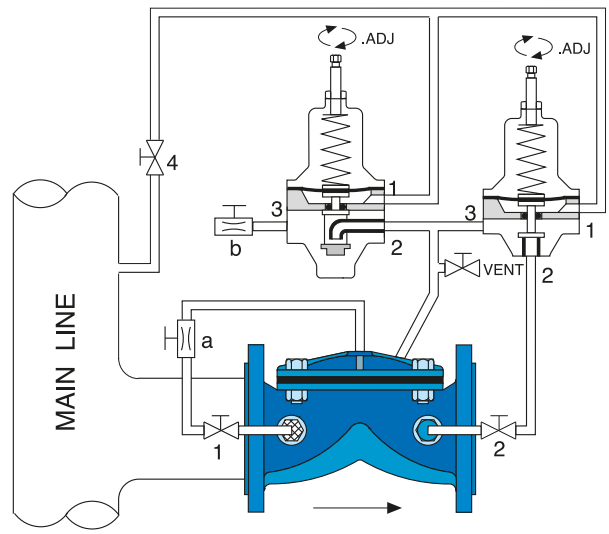
RAF Surge Anticipating hydraulic Valve is activated by line pressure and controlled by two pilot valves. Both pilots include spring-loaded membranes. The low-pressure pilot (the left one in the drawings) is preset to open the RAF 88 gradually when the line pressure drops about 10m below normal. The high-pressure pilot (on the right) is preset to open the RAF 88 when the line pressure rises about 10m above normal. The RAF is normally closed. Only when the line pressure drops below or rises above the preset limits, the RAF 88 is piloted to open. A water hammer event starts with a considerable pressure drop, which cause the RAF 88 to open. Then, as the water wave rolling backward, the valve remains open and let the pressure out to diminish its impact.

RAF 88- control mode

Manual: To open the RAF 88, close cocks 1,2 and 4 and open the Vent.
Automatic: The RAF 88 is normally closed. Ensure that all cock valves (except the vent) are fully open. Normally, line pressure is higher than the set point of the low-pressure pilot (the left one), but lower than that of the high-pressure pilot (the right one). Thus, ports 2 in both pilots are closed.

There is no flow from the main line to the pilots. The RAF control chamber is connected directly to the line pressure through needle valve **a**. The RAF is closed. When line pressure drops below the lower set point, the spring of the low-pressure pilot (left) push the pilot's membrane downward and on the way opens port 2, as shown in the drawing. The right pilot does not change.

The RAF control chamber drains out through port 2 -Vent **b** of the left pilot. The RAF 88 opens in anticipation to a surge. The pressure drop is soon followed by a surge, which closes the left pilot but opens the right one (the high pressure pilot) at the same time. The RAF control chamber now drains through ports 2-3 of the right pilot and thus remains open. The high-pressure wave is allowed to flow through. After the surges subside, and the line pressure returns to normal level, both pilots close and the RAF 88 follows suit.



RAF 88 - Surge Anticipating Hydraulic Valve

Adjustment

Use needle valve a-b to control the RAF operational speed. Adjust the low and high pilot's set points by the adjusting screws. See list of available springs below.

Standard RAF 88:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way pilot P-181
2 way pilot P-161 B
Brass needle valves
Reinforced plastic tubing
60mm pressure gauge

Optional Features:

Enamel coating
Large capacity external filter
2 way high capacity pilot P-181-3/4
2 way high capacity pilot P-1618-3/4
-
Copper or stainless steel tubing
Glycerinated 60mm pressure gauge

Spring Selection (bar)

RAF 88

Green Standard	Blue	Red	Yellow
2-10	0.5-4	0.5-6	2-16

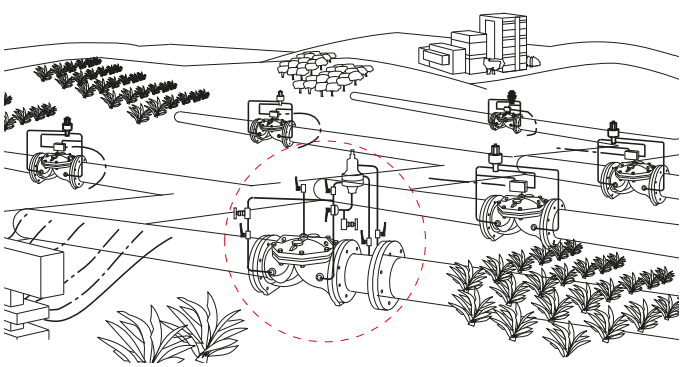
RAF GENERAL PURPOSE HYDRAULIC VALVES

RAF 90 Anti-Burst Control Valve

Description

RAF 90 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 are automatically closed down and can re-open 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.

Typical Application



RAF 90 valve controls a water supply network downhill of a reservoir. Use Anti-Burst Control valve to eliminate water loss and damage due to piping burst. The valve is best in networks susceptible to burst due to old piping, vandalism or pressure surge. The RAF 90 features a metal pilot valve and hydraulic relay to ensure precise and reliable response in general use.

Recommended Flow

Nominal Diameter		Flow Rate Max
mm	Inch	m^3/h
40	1.5	25
50	2	45
65	2.5	60
80-65-80	3-2.5-3	70
80	3	90
100-80-100	4-3-4	90
100	4	150
125-100-125	5-4-5	150
150-100-150	6-4-6	150
150	6	320
200	8	550
250	10	950
300	12	1000
350	14	1300
400	16	1400

RAF 90 - General Application two-way Anti-Burst Control Hydraulic Valve. Pressure rating up to 16 bars. Hydraulic relay guarantees tight closing and manual re-opening.

RAF 90 control mode

RAF Anti-Burst Control Valve is activated by line pressure and controlled by a pilot valve. The pilot includes a spring-loaded membrane. An orifice plate is installed down-or upstream of the RAF 90. The orifice size is prepared in advance to suit the specified maximum allowable flow rate. The head loss across the orifice is proportional to flow rate through the RAF 90. This head loss is transferred to the opposite sides of the pilot membrane. When it exceeds the preset point of the pilot's spring, a hydraulic relay is operated to close down the RAF 90. The RAF 90 is reopened only manually.

RAF 90- control mode

Manual: Use the manual override option of the hydraulic relay.

Automatic: Set the manual override handle of the hydraulic relay on automatic position (designated **R2**). In normal flow rate, the pilot is closed, as shown. The RAF control chamber is allowed to drain out through the relay's vent. The RAF 90 is fully open. When the head loss across the orifice exceeds the preset level, the pilot membrane is pushed upward with its plunger. The line pressure flowing via pilot ports 3-4 flips the hydraulic relay to its other position (designated **R1**). The line pressure is then directed to the RAF's control chamber. The RAF closes. After the problem is fixed, re-open the RAF by re-setting the hydraulic relay manually and shift back to auto position.

Adjustment

Use the needle valve **a** to control the RAF 90 operational speed. Adjust the operational set point by the adjusting screw. See the list of available springs below.

Standard RAF 90:

Basic RAF valve Rilsan Coated
Self-cleaning screen filter
2 way metal pilot P-100
Orifice plate
3 way hydraulic relay
Reinforced plastic tubing

Optional Features:

Enamel coating
Larae caoacitv external filter
3 way metal pilot P-103
-
-
Copper or stainless steel tubing

Please Specify:

- Maximum flow rate (Set point).

TALIS

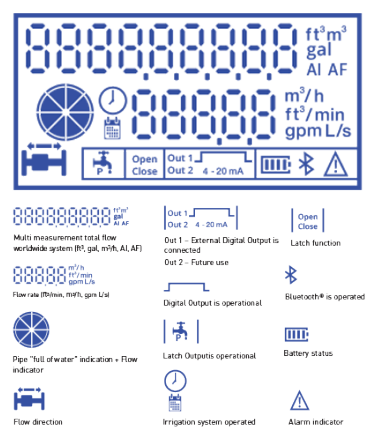
Ultraf PRO

Hydraulic control valve With high performance Ultrasonic water meter All in one compact case.

- Flow measuring unit and hydraulic valve combined.
- No damage due to debris, no wearing parts – always accurate.
- Battery powered, 10 years no maintenance, measuring unit.
- Simple maintenance & installation, no straight pipe upstream & downstream needed.
- Accuracy according to ISO 4064 (2005) standard.
- Multi measurement worldwide system (Gallons, M³/h, ft³, Etc.)
- Bluetooth® communication with RAPHAEL controller. smartphone application for measuring units Preference, selection and controller setting.
- Separate volume pulls output and external card for 4-20mA continues volume output.
- 16 bar pressure rating.
- Available in all flange standard, from 50mm to 200mm.
- All metal, water resistant unit according to IP68.

Digital LCD for multi system information:

- Flow rate.
- Total flow.
- Flow direction.
- Batteries' power st.
- Pipe "full of water" indication.
- Bluetooth® communication.
- Expansion optional cards connection status, Etc.



Additional options:

- Open collector output for remote irrigation controller and open collector output for latch type operating.
- Analog output (4-20mA type).
- Serial connection (Future mode).
- RF/GPRS remote system (Future mode).

RAPHAEL was founded in 1949, almost at the same time that Israel was formed.
It is the first Israeli company to develop and manufacture control valves for water supply systems.
Today, RAPHAEL is one of the leading industrial enterprises in Israel, the main supplier of pipeline valves in Israel's domestic market and a well-known international brand in 30 countries.

RAPHAELis part of the international TALIS GROUP.

RAPHAEL'S professional management and highly qualified technical staff, along with its extended experience in the indus-try, are one of the company's major assets. Raphael's engineering department constantly works on new technical solutions and technology to improve the quality and service life of its products.

The company's products are protected by numerous patents and international invention certificates.
The company is certified for quality management system of ISO-9001, and its products have a variety of regional certificates of compliance, including the Russian GOST.

The company focuses on the production of hydraulic shut-off and control valves for automation of water supply, reclamation and fire suppression.

Hydraulic valves are used to control, reduce and stabilise pressure, reduce leakage, protect pipelines against excessive pressure, prevent water hammer and protect pumping equipment.
Proper use of control valves contributes significantly to reducing leaks or unreported water losses, bringing down the number of accidents and normalizing the distribution of the water supply systems.

TALIS is a leading global provider of premium valves, hydrants and other solutions for water flow control.

With a varied range of products, we offer comprehensive solutions for the entire water cycle. From hydrants to butterfly valves. From the knife-gate valves to the needle valves. Our experience, innovative technology, global expertise and individual consultation process form the basis for developing sustainable solutions for the efficient handling of the vital resource "water".

With over nine strong brands and 25 entities in Germany, France, Spain, Portugal, Italy, Great Britain, the Netherlands, Russia, Poland, Israel, China, the Middle East, Mexico, India, South Africa, Kazakhstan, Peru and Brazil,
TALIS is the largest supplier of valve technology and first choice when it comes down to watervalves and services for the whole water cycle.

RAPHAEL RANGE | **BAYARD** RANGE | **BELGICAST** RANGE | **ERHARD** RANGE

ATPLAS RANGE | **UNIJOINT** RANGE | **FRISCHHUT** RANGE | **STRATE** RANGE

RAPHAEL

RAPHAEL, founded in 1949, was the first Israeli manufacturer of quality control valves.
RAPHAEL's research department constantly strives to introduce new and innovative products and solutions for water control systems including water-works, sewage, irrigation, Fire Protection and industrial applications.

BELGICAST

BELGICAST, based in Munguia, Spain, started out as a valve manufacturer for the naval industry in 1957.
In the 1980s, BELGICAST began to diversify its product range, focusing on products for the water market featuring diameters from 20 mm to 1 600 mm.
BELGICAST gained a worldwide reputation with the development of the soft-sealing gate valve for use in drinking water.
Today, BELGICAST has developed an unmatched know how in desalination solutions.

BAYARD

BAYARD in Meyzieu, France, is a well-known specialist for fire hydrants, network protection devices, control valves and pipe fittings.
BAYARD supplies a full range of equipment designed to cover all requirements, from the production of fresh water and water supply to domestic metering units and waste water disposal.

ERHARD

ERHARD is one of the most important manufacturers of water valves in the world with experience dating back over 145 years. Its success story began in 1871 when Johannes Erhard founded a small workshop in Heidenheim, Germany, for producing brass water taps. ERHARD Double eccentric butterfly valves, needle valves and ball valves are recognized by customers around the world as the benchmark for high quality and long life expectancy. experienced engineering teams can provide individual customized solutions for all customers' needs.

ATPLAS

TALIS UK, based in Birmingham and Bridgend (South Wales) in the UK, has a rich history of servicing the water industry, both in the UK and around the world and is a recognised and reliable supplier of the ATPLAS RANGE connection systems for all water-related areas. With an extensive range of meter boxes, water fittings and valves for a variety of mains and service pipes, the British company's products stand for certified quality and many years of know-how.

FRISCHHUT

In addition to high quality castings for the engineering industry, plant engineering and the building trade, the main business of FRISCHHUT is fittings for the supply Of potable water.
Founded more than 60 years ago, the company from Pfarrkirchen, Germany, still orients itself on the tradition and reliability of a family company. Its in-house foundry also produces cast parts for safety-related applications in the fields of mechanical engineering, reinforced concrete and bridge-building.

UNIJOINT

UNIJOINT, based in the Netherlands, offers a comprehensive range of adapters and extensions, pipe couplings, flange adapters and dismantling joints for international pipe standards up to maximum dimensions. Individual customer specific solutions can also be designed and produced.

SCHMIEDING

SCHMIEDING has established itself as the expert in the TALIS Group in Germany for house connections, repair systems and accessories. SCHMIEDING - founded in 1874 - is a reliable partner with fast response times to customer requests, supported by its customer oriented warehouse concept. Innovative solutions for sustainable and efficient use of systems like for example no dead space, and the limescale free water meter connection system "Kondicht" or the SCHMIEDING tapping saddles with EISI connections meet all the requirements for daily use.

STRATE

For more than 60 years, STRATE in Sarstedt near Hannover, Germany, has stood for efficient and comprehensive product and problem-solving competence in the sewage industry. AWALIFT sewage pumping systems are among the best known products, as evidenced by over 30,000 systems sold. They provide optimum protection from blockage and use highly efficient pumps.

TALIS is the leadingchoice in the world of shut off and control valves. At TALIS, we have the best solutions for the sustainable use of water and energygeneration, industry and municipalities. With a wide range of products, TALIS offers an extensive line of solutions for the entire water control, hydrants, rotary butterfly valves, knife gate valves or needle valves.

Our experience, innovative technology, global knowledge and individual approach lay a foundation for the development of sustainable solutions for the efficient processing of such a vital resource as water.

Raphael Valves Industries Ltd
Hailan st.,
North Industrial Zone
Or-Aquiva
Israel 30600
Tel: +972 4 626 35 55
Fax: +972 4 626 35 58
www.raphael-valves.com
www.talis-group.com

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