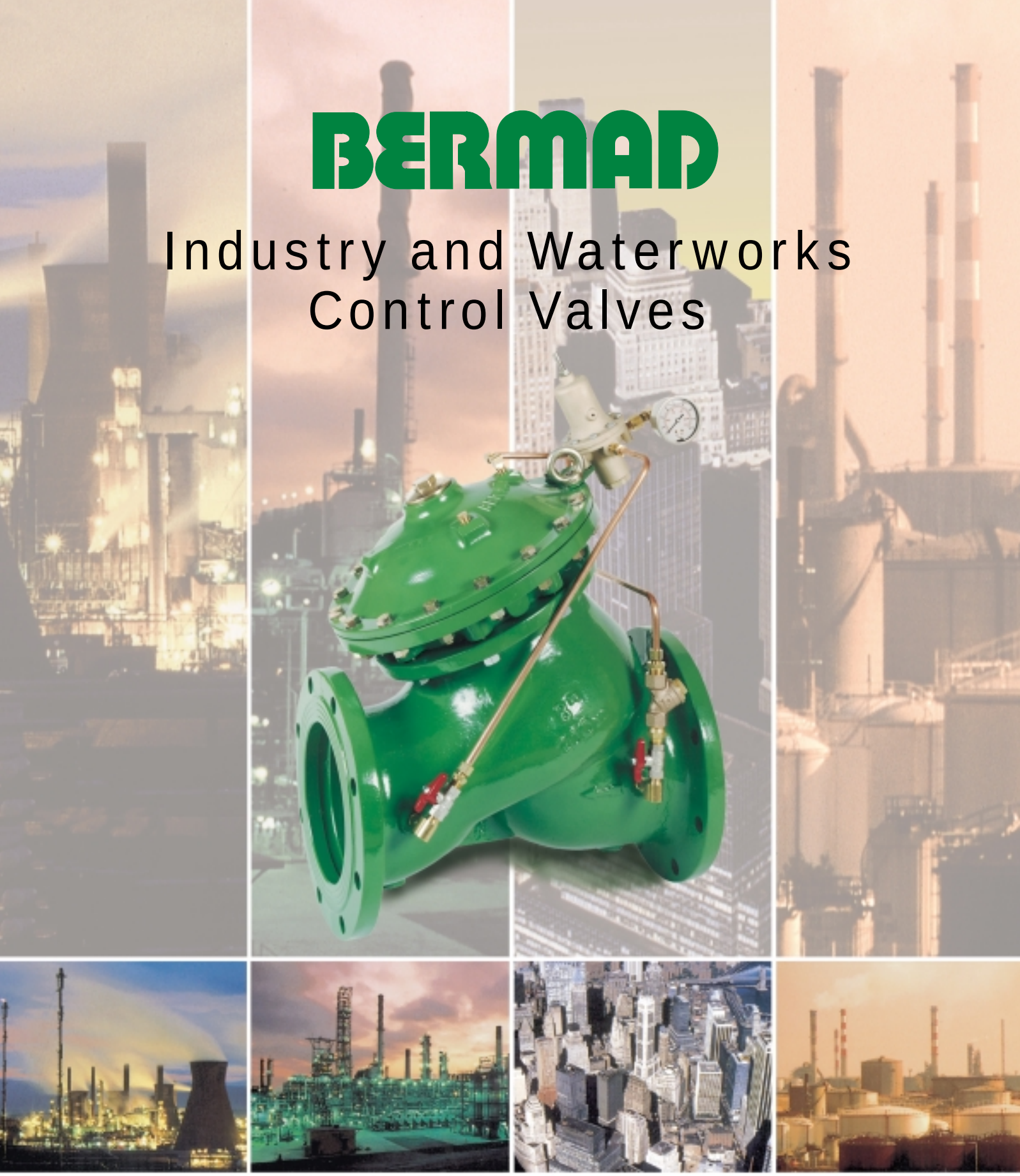
BERMAD

Industry and Waterworks Control Valves



CONTROL VALVES BERMAD

Company Profile

Since its foundation a quarter of a century ago BERMAD has focused emphasis on innovation, quality and reliability. Consequently, BERMAD is acknowledged as the world's foremost supplier of control valves for water management system. BERMAD Control Valves can be found in water supply and distribution systems throughout the world. The USA, Australia, New Zealand, Japan, Thailand, Italy, Spain and Israel are but some of the countries where BERMAD products are regularly employed.

Widely diversified, BERMAD designs and manufactures dozens of products for thousands of applications in agricultural and horticultural irrigation, industry, municipal waterworks, cooling systems, fire protection systems and petroleum industry . Its versatility and reliability, starting with sophisticated R&D and engineering, and ending with dependable service and maintenance, have resulted in engineers, consultants, agricultural organizations, water supply authorities and others to specify BERMAD valves exclusively.

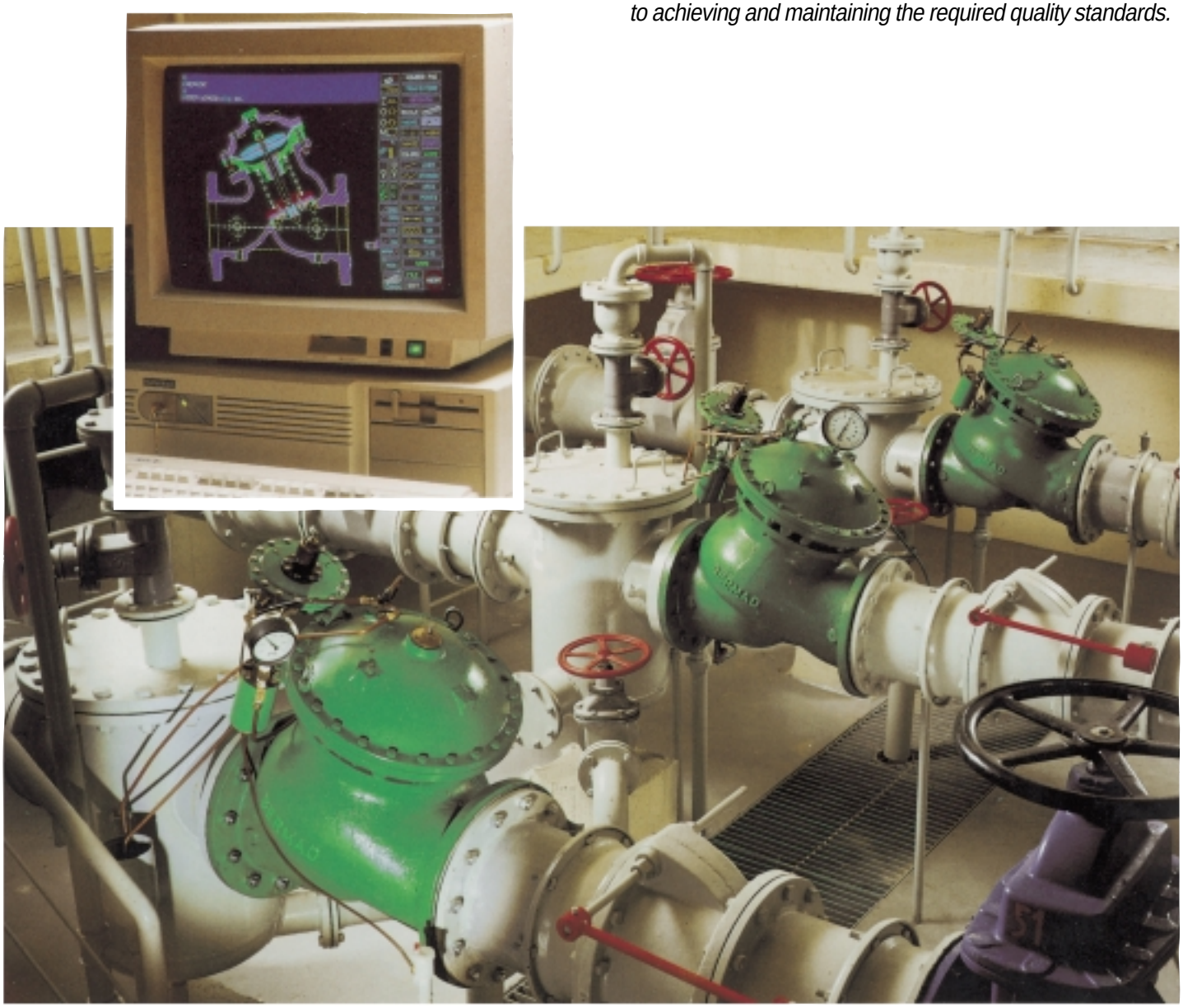
Quality Assurance & Control at BERMAD are maintained by its highly trained and experienced staff, using the most modern materials and production processes and sophisticated hydraulic testing facilities. As a result, several of BERMAD's products constitute an entirely new concept and approach to various liquid handling problems.

ISO 9001 Certified Quality Control System

BERMAD has established a quality assurance program for use in the construction of the control valves and related equipment.

Our policy is to assure that all the products are manufactured in compliance with our engineering specifications, international standards and certifications, as well as with customer requirements.

BERMAD management's commitment to quality requires that personnel at all levels of the organization contribute to achieving and maintaining the required quality standards.



700 Series Control Valves

General

The BERMAD 700 Series Control Valves are hydraulically operated by means of a double-chambered diaphragm actuator mounted on a wide Y-pattern valve body with semi-straight flow.

The BERMAD 700 Series consists of valves for various applications, each valve consisting of a combination of the basic Model 700 (or Model 705) valve with one or several control devices or accessories, in order to obtain the desired functions.

By combining the basic valve with appropriate control loops, a wide range of valve categories is obtained: electric and hydraulic remote control valves, pressure-reducing valves, pressure-sustaining, relief or back pressure valves, pump control valves, float and altitude control valves, check valves and rate-of-flow control valves.

- Models 700 and 705 basic valves are manufactured to international standards, in several pressure classes: Class 125, 250 and 400 to ANSI B16.1 standards, or Class 10, 16, 25 and 40 to ISO/DIN/BS 4504 standard
- Max. temperature range: Water up to 80°C (180°F)
- The basic valve is used for on/off operation with minimum head losses
- Available sizes 2"- 24" (50 mm-600 mm)
- Special materials and coatings are available on request

Features

Double-Chambered Actuator

Superior to existing single-chambered actuator provides:

- Positive immediate response and accurate control
- Smooth drip-tight closing without causing water hammer

The actuator can be removed as one complete assembly without dismantling the diaphragm.

Diaphragm Assembly

Optional Inner Spring

Sealing Disc Assembly

- Free movement for perfect sealing
- Resilient seal for drip-tight sealing
- Optional: V-Port throttling plug for accurate regulation

"Semi-straight" flow

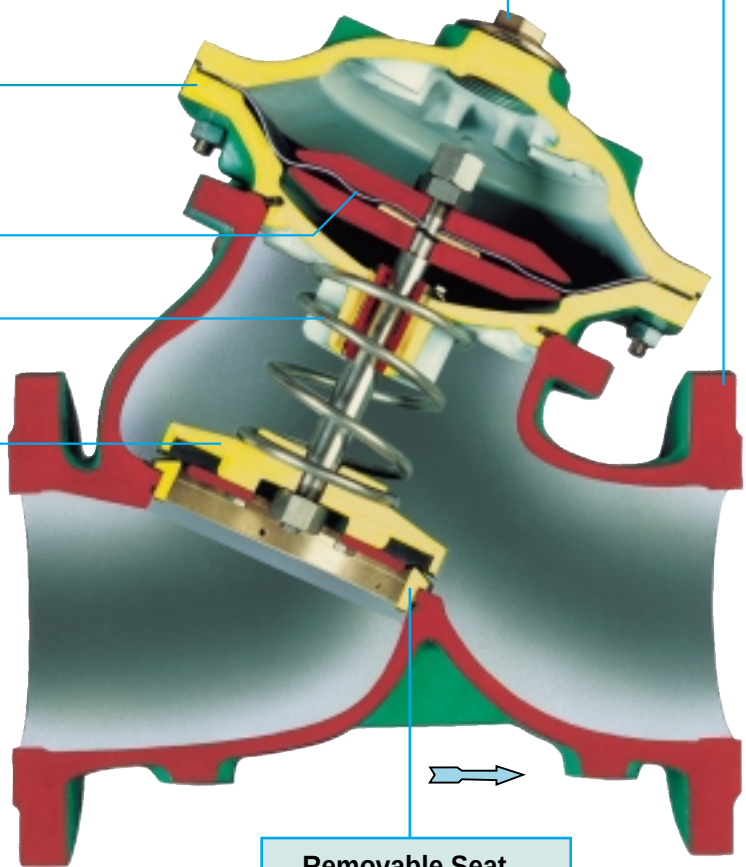
25% increased capacity over ordinary globe valves.

Cover Plug Options:

- Valve position indicator
- Mechanical closure and flow adjustor
- Limit Switch Assembly
- Lift Spring Assembly

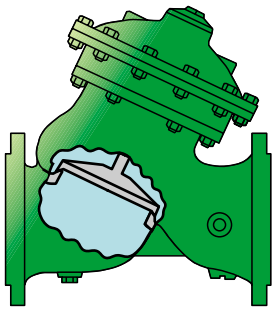
Y Pattern Wide Body

Designed for efficient flow with minimum pressure loss and excellent cavitation resistance.

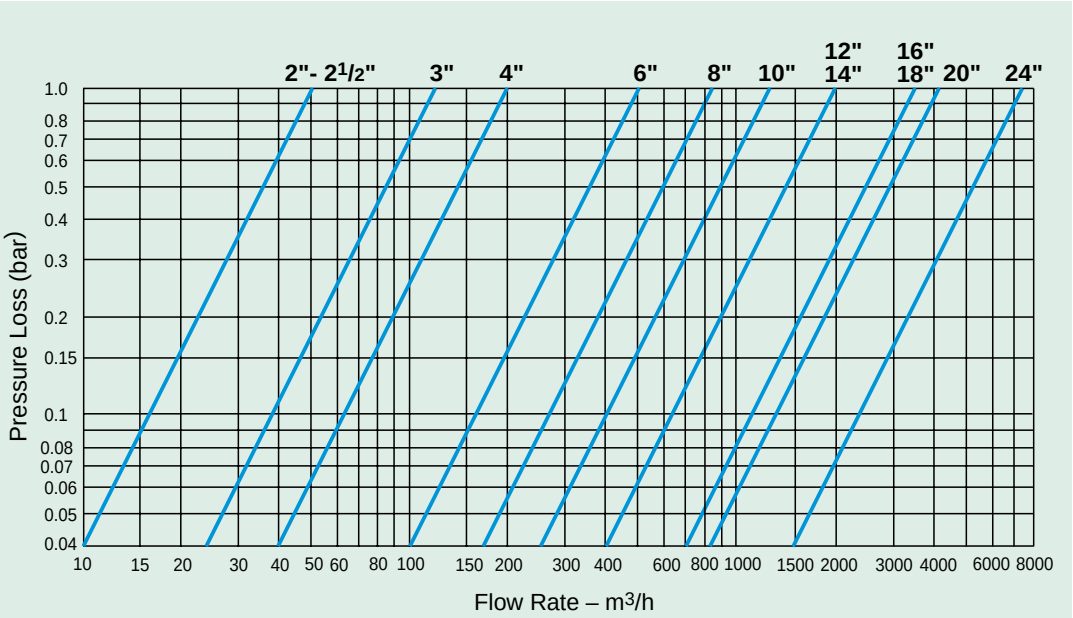


Removable Seat

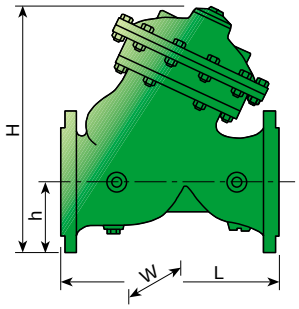
Technical Data



Flow Chart – "Y" Pattern Flat Disc, Fully Open Valve



Dimensions and Weights ("Y" Pattern Valve – Flanged)



	Size	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"*
ANSI 125 ISO 10; 16	L (mm)	205	209	250	320	415	500	605	725	733	990	1000	1100	1450
	W (mm)	155	178	200	223	320	390	480	550	550	740	740	740	1250
	h (mm)	78	89	100	112	140	170	202	240	262	298	330	358	470
	H (mm)	235	246	309	362	490	581	686	820	842	1096	1117	1155	1680
	Weight (kg)	10.6	13	22	37	75	125	217	370	381	846	945	962	3250
ANSI 250 ISO 20; 25	L (mm)	210	222	264	335	433	524	637	762	767	1024	1020	1136	Consult BERMAD representative.
	W (mm)	165	185	207	250	320	390	480	550	570	740	740	750	
	h (mm)	82	92	104	125	158	188	222	255	285	318	335	375	
	H (mm)	240	250	313	375	508	600	706	835	865	1116	1132	1172	
	Weight (kg)	12.2	15	25	43	85	146	245	410	434	900	967	986	

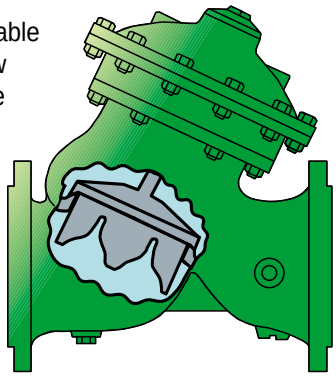
* Available also in sizes 28" (700 mm) to 32" (800 mm). Consult BERMAD representative.

V-PORT Throttling Plug

What is it?
The V-Port Plug is mounted under the standard flat seal disc. It is self-aligning with a close tolerance fit to the valve seal.

What does it do?
The V-Port Plug changes the ratio of flow to stem travel. It makes the stem travel longer than the flat disc for the same flow.

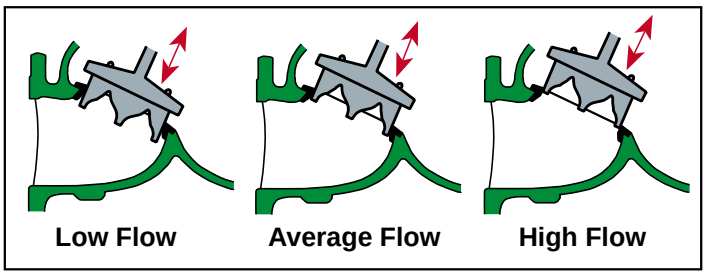
Why is this beneficial?
It provides more accurate, stable and smooth response for flow and pressure regulation while reducing noise and vibration.
It allows a very wide flow range with relatively high pressure reduction.
It may save the installation of a secondary smaller bypass valve needed for low flow.



Where is it used?
Pressure-reducing applications (Model 720) with high pressure reduction and/or low flows.
Pressure-relief applications (Model 730) venting to atmosphere.

Where it should not be used?
Where minimal pressure loss is required. As with electric remote control (on/off) (Model 710) or booster-type pump control valves (Model 740-Q).
Where supply pressure drops to downstream pressure set point on pressure-reducing valves (Model 720).

How is it installed?
By simply exchanging the standard flat seal disc washer with the V-Port Plug using the same set screws.



Main Models

Model 710
Electric Remote Control Valve

The valve opens and closes in response to an electric remote control signal.
The valve is operated by a solenoid control valve which either conveys the control pressure to the upper chamber to close the main valve or, alternatively, drains the upper chamber to open the main valve.

Main applications:
Pumping stations, water supply systems, automation systems, petroleum systems, fire protection systems.

Model 720
Pressure-Reducing Valve

The valve reduces high upstream pressure to a lower, constant preset downstream pressure, regardless of fluctuations in upstream pressure/flow rate.

Main applications:
Water supply, in systems of varying topography, in long supply lines (near the source) for creating a balance of pressures from various sources, as a safety measure in various facilities and for safe working pressures.

Model 730
Pressure-Sustaining/Pressure-Relief/Back Pressure Valve

The valve sustains a constant preset upstream pressure, regardless of fluctuations in upstream potential and/or downstrem system demand.

Main applications:
Pressure-sustaining/relief in pumping stations, prevention of line drainage during flow stoppage.

Model 735
Anticipating Control Valve

The Model 735 protects pumps and pipes against pressure surge produced by pump shut-off or power failure. When the pump is off, the valve is closed. Upon starting, the pump produces a pressure surge, a pilot opens the main valve and relieves the surge. There is the hazard of a shock wave being created by a sudden flow stoppage in the supply system and the tendency to create a lower pressure than the ordinary working pressure near the pump. In such case, the valve will immediately and fully open, admitting air into the system, and will remain open in anticipation of the returning shock wave.

Model 720, 730

Model 735-M

Model 740

Model 750-66

Model 740-Q
Pump Control Valve

Designed for installation at the pump's outlet, Model 740-Q Pump Control Valve prevents starting and stopping pressure surges. Pump and valve controls are synchronized to start and stop the pump while the valve is closed. Should power failure occur, the valve immediately closes.

Main functions:
- Gradual opening of the valve for gradual filling of the supply lines.
- Immediate closure upon power failure.
- Quick check valve action, without causing pressure surge.

Main applications:
Pumping stations, boosters, deep boreholes, urban and rural water supply.

Model 750
Reservoir Valve (float Valve)

Model 750 opens to fill reservoirs, tanks, etc. until water rises to a predetermined level. At this stage, float action causes the pilot to close the valve.
For such cases in which a fully opening valve is required when low operating pressure occur, a special model has been designed with a 4-way operating valve, enabling full opening and closure at two defined, adjustable levels.

Main applications:
Maintenance of a predetermined level in reservoirs, whether by direct sensing on the valve or by remote sensing and control.

Model 760-03
Check Valve

The valve opens to allow normal flow and immediately shuts-off to prevent returning flow. Should the downstream pressure even slightly exceed the upstream pressure, the valve closes without slamming and without causing pressure surge.
Model 760 Check Valve can be equipped with opening and closing speed controls. It can also be incorporated as an additional feature in other types of control valves, eliminating the need for a separate check valve.
The position indicator enables the incorporation of various electric devices and limit switches for pump starting and stopping.

Main applications:
Water supply systems (on the downstream side of the supply source), pumping stations, pressure pipelines, gardening and irrigation systems.

Main Models

Model 770
Flow Control Valve

The valve sustains a constant preset flow rate, regardless of fluctuations in network pressure and/or demand.
The flow rate can be sensed by one of the following means:

- A pilot responding to pressure differential as measured on a pitot tube.
- A rate-of-flow pilot sensing the flow rate at the center of the pipe cross-section by means of a paddle.
- A calibrated orifice on both sides of which pressure differentials are measured.

Main application:
Flow rate limitation in supply lines, in order to maintain constant network pressures (upstream or downstream). Water distribution at constant flow rate to various users, regardless of network pressure.

Model 772/773

This valve sustains a constant preset downstream pressure regardless of changing upstream pressure and or flow rate. The valve limits the flow to a preset rate.

Main applications:

- Sustains a constant reduced system pressure.
- Prevents excessive flow for pumps and filtering systems; limits flow rate from main line to distribution lines.

Model 770-55

This valve sustains a constant preset rate of flow regardless of changing pressure and system demand.
Electric remote control intercepts regulation to on/off control.

Control:

- Flow rate pilot valve with ultrasensitive adjustable spring-loaded direct-acting normally-open diaphragm valve with differential pressure sensing.
- Pitot tube.
- Two-way solenoid control valve.

Main applications:
Electric remote control shut off
Prevents excessive flow for pumps and filtering systems; limits flow rate from main line to distribution.

Model 770-I (Orifice)

Model 780-I-AX

Model 790-I

Model 70-N

Model 780
Altitude Valve

Without using external control devices such as floats etc, the valve controls water level in reservoirs (to prevent spilling).
The valve remains fully open until a closing command is transmitted by a 3-way altitude pilot.
The 2-way model enables the filling and emptying of the reservoir through the same line and starts the refilling when water drops below a preset level.

Main applications:
Reservoirs in remote locations, where it would be undesirable to expose the supply line to constant pressure and to pressure surges caused by mechanical floats.

Model 790
Burst Control Shutoff Valve

The valve is designed for water supply systems in which it is essential to guaranty immediate closure when the preset flow rate is exceeded. Such a situation is indicative of a burst in the line. The valve responds by immediate closure but in a controlled and cushioned way, without causing pressure surge.
The flow velocity is sensed by a flow rate pilot which responds accordingly.
Should a burst occur, leading to valve closure, reopening of the valve will be possible only by operator intervention.

Model 70-N
Check Valve
(Spring Loaded Type)

The Model 70-N is designed for installation on the pump discharge to prevent back-flow and to minimize shut-down pressure surge. It opens on normal flow conditions and closes drip-tight, preventing back-flow.
The Model 70-N is a lift type check valve characterized by a relatively short valve disc travel, resulting in immediate valve disc closing on no-flow conditions, eliminating any reverse flow and minimizing possible water hammer.

Model 70-F
Strainer (Stones & Gravel Trap)

The Model 70-F Strainer removes foreign matter suchas leaves, fish, sticks and stones from the pipe lines.
The Model 70-F Strainer is installed to protect system appliances, such as pumps, water meters and automatic valves.

Main Models

Model 73-Q
Pressure-Relief Valve
(Quick Type)

This innovative hydraulic relief valve is designed to replace the existing mechanical type. Its advantage lies in the fact that, despite its high speed of response, it creates no shocks or pressure surges in the system.

Operating conditions:

- Pressure rating: 10, 16 or 25 kg/cm^2
- Max. temperature range:
  Water up to 80°C (180°F)

Available Sizes:

1 1/2", 2", 2 1/2", 3", 4"
(40, 50, 65, 80, 100 mm)

Main applications:

Protection of urban water supply systems, pumping stations, automation and irrigation systems.

800 Series
Piston-Actuted Control Valves

The BERMAD 800 Series Control Valves are piston-actuated Hydraulic Control Valve for waterworks and industrial applications. The 800 Series are modified 700 Series Control Valves designed to operate with higher pressure conditions and accurate control.
All the features and control accessories associated with 700 Series Control Valves are available.

Specifications

- Valve pattern: "Y" Oblique or Angle
- Sizes: 2"-20" (50-500 mm)
- End connections:
  – 2"-3" BSP or NPT Threaded standard
  – 2"-20" ISO, ANSI, BS or DIN standard
- Pressure rating:
  – 2"-14"..... 3-40 bar (50-700 psi)
  – 16"-20"..... 3-25 bar (50-360 psi)
- Max. temperature range:
  Water up to 80°C (180°F)

Model 70-F

Model 73-Q

Model 820 (Pressure Reducing)

Model 7000

7000 Series
High Pressure Piston
Control Valves

The BERMAD 7000 Series Control Valve are especially designed for high pressure control applications such as pressure reducing, pressure relief or flow control on waterworks and industrial systems.
The valves have superior, smooth, quiet and accurate control even under extreme pressure and flow conditions.
The valves are constructed from high-strength materials and coatings to meet adverse pressure, flow, temperature and fluid conditions.
The valves are available with a wide range of control pilots and accessories to perform various control duties.

Features

- The BERMAD 7000 Series Hydraulic Control Valves have a double-chambered piston actuator mounted on a Y†or angle patterned wide valve body.
- The valve's plug is fitted with a cavitation-cage or with a flat washer as operating conditions demand.
- X-shaped double-acting low friction seals, with two backup teflon rings, provide accurate and smooth piston operation for extended service duration.
- Drip-tight closing features using a resilient seal.
- A removable seat permits servicing without having to remove the valve from the line.
- A valve can be installed in any position.

Specifications

- Valve pattern: "Y" Oblique or Angle
- Sizes: 4", 6", 8" (100, 150, 200 mm)
- End connections:
  – Flanged, ISO: 16, 25, 40, 64
  – ANSI: Class 150, 300, 400
- Pressure rating:
  – 3 to 16/25/40/64 bar
  – 50 to 240/700/930 psi
- Max. temperature range:
  Water up to 80°C (180°F)

Hydraulic Diaphragm Control Valves

Internationally Patented and Design Registered

General

The leading edge in control valve design. Combines simple and reliable construction with superior performance while, at the same time, being virtually free of the typical limitations associated with this type of product.

The valves have been designed for the control of all kinds of irrigation, waterworks and industrial systems.

Features

Diaphragm:

- One single type for all service conditions, on/off and pressure regulating.
- Exceptionally stable action during shut-off and pressure regulation. Absolutely no pressure surges.
- Valve opens even with low pressure supply.
- Perfectly balanced diaphragm with no distortion caused by uneven hydraulic forces on shut-off or during regulation.
- No need for special reinforcement nor for different types of diaphragms and springs to meet different operating conditions.

Valve Body:

- Exceptionally high flow capacity with very low head loss.

Cover:

- Connected to the valve body by only 4 bolts.
- Enables easy access and easy maintenance.
- Optional: flow control stem, valve position indicator.

End Connections:

- Threaded BSPT
- Threaded NPT
- Flanged, ISO: NP 10
- Flanged, BS: table D
- Flanged, ANSI: #125

Main Models

• Basic Hydraulic Valve	405
• Electric Remote Control	410
• Pressure Reducing Valve	420
• Pressure Sustaining/Relief Valve	430
• Quick Pressure Relief Valve	43Q
• Reservoir Float Control	450
• Rate-of-Flow Control	470
• Fire Protection Deluge Valve	400E

Technical Data

Specifications

Valve Pattern: Globe & Angle

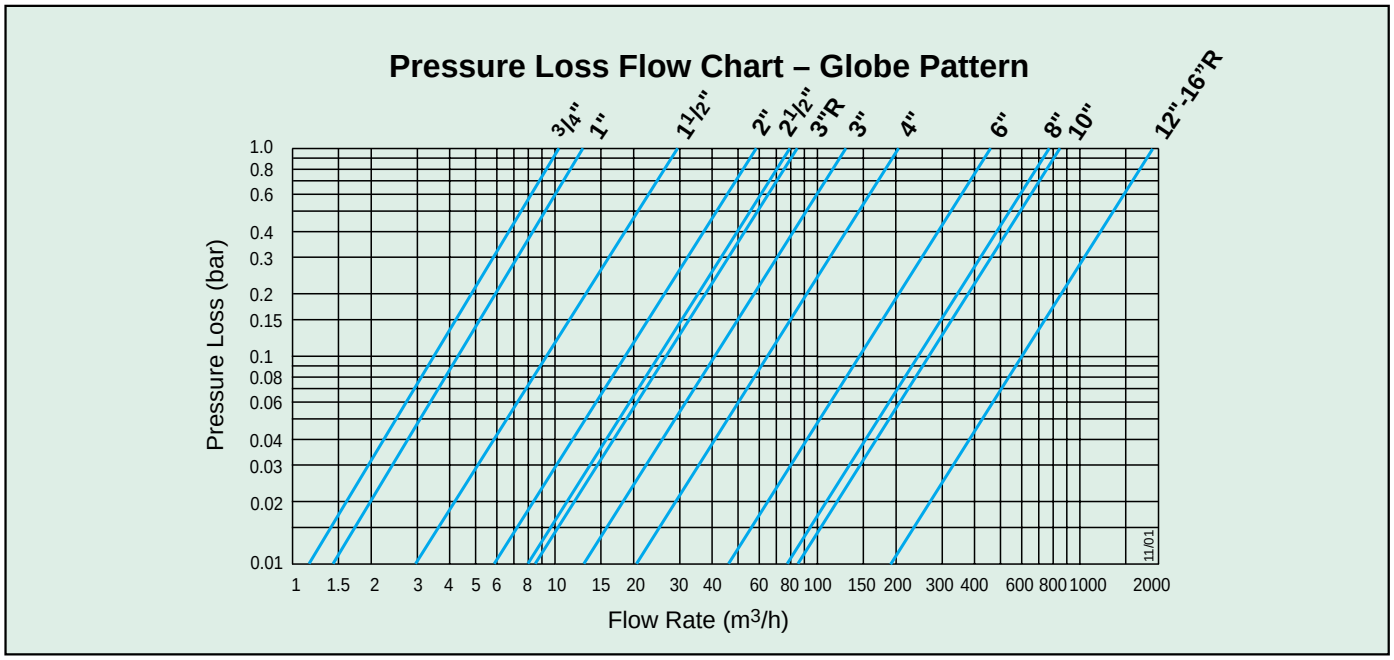
Sizes:
– Globe: 3/4", 1", 1 1/2" & 2", 2 1/2", 3"R, 3", 4", 6", 8", 10", 12" & 16"R
– Angle: 2", 2 1/2", 3" & 4"

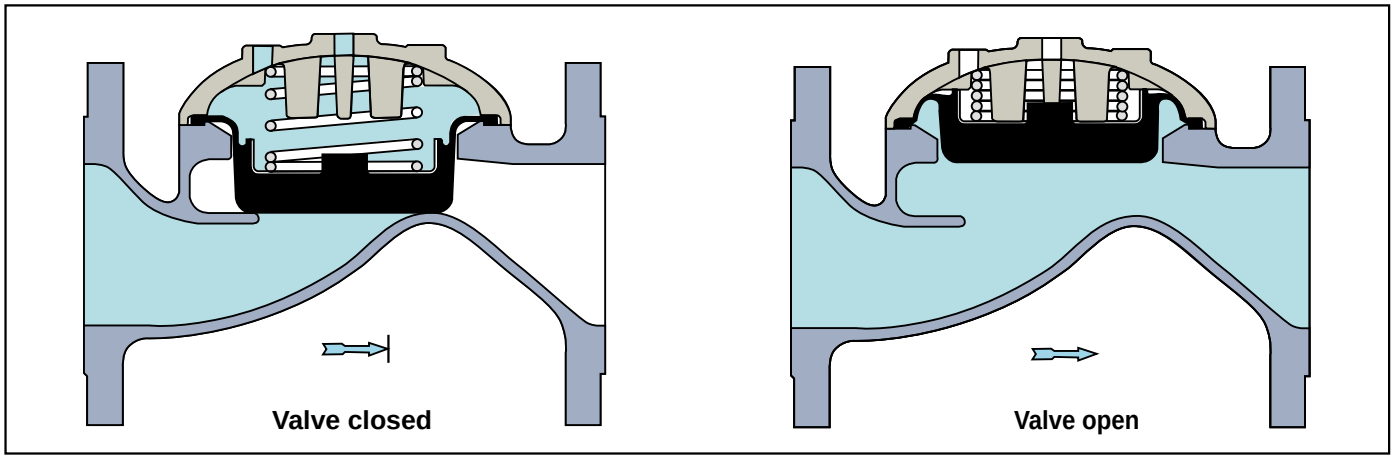
Pressure Rating:
0.5-16 bar (7-230 psi)

End Connections:
– **Female threaded** NPT/BSP
Globe - 3/4", 1", 1 1/2", 2", 2 1/2", 3"R & 3"
Angle - 2" & 3"
– **Grooved (Victaulic):**
Globe - 2", 3", 4" & 6"
Angle - 3" & 4"
– **Flanged:** ISO PN16, ANSI 125, BS-D
Globe: 2", 2 1/2", 3"R, 3", 4", 6", 8", 10", 12", & 16"R
Angle: 2", 3" & 4"

Max. Temperature Range:
Water up to 80°C (175°F)

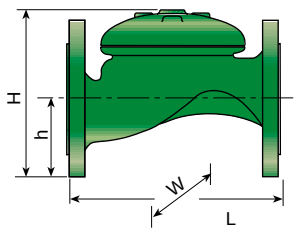
Materials:
– Body and cover: 3/4", 1" & 1 1/2" Brass only
2"-16"R Cast Iron, Polyester-coated
– Diaphragm: Nylon-fabric, Reinforced Natural Rubber. Options: NBR, EPDM
– Spring: Stainless steel
(Other materials and coatings available on request).





Dimensions and Weights

Globe Pattern



	Threaded							Grooved (Victaulic)				Flanged									
Size	3/4"	1"	1 1/2"	2"	2 1/2"	3R"	3"	2"	3"	4"	6"	2"	2 1/2"	3R"	3"	4"	6"	8"	10"	12"	16"R
L (mm)	112	112	150	180	210	210	255	205	250	320	415	205	205	210	250	320	415	500	605	724	742
H (mm)	67.5	67.5	83	111	133	140	160	106	156	190	404	155	178	187	210	242	345	430	460	635	695
Hf* (mm)	–	–	–	205	226	228	260	200	255	300	609	245	260	270	310	328	550	660	690	930	971
W (mm)	72	72	90	120	129	129	175	120	175	200	306	155	178	200	200	223	306	365	405	580	600
h (mm)	20	20	27.5	38	46	55	55	32	46	60	85	78	89	100	100	112	140	170	202	240	300
Weight (kg)	0.95	0.95	1.5	4.0	5.7	5.8	13.0	5.0	10.6	16.2	49.0	9.0	10.5	12.1	19.0	28.0	68.0	125.0	140.0	290.0	3770

*H_f = Height with optional flow stem (at open position)

AR Series Air and Vacuum Release Valves

These exclusive plastic-manufactured products offer outstanding features and advantages:

- Perfect sealing under very low system pressure
- High flow capacity
- Patented operation together with smart design
- Simple, compact and reliable

The BERMAD AR Series Air and Vacuum Release Valves includes four basic models:

1" Automatic Pressure Air Release Valve (Model 01-AR-A)

for the automatic release of entrapped air pockets from pressurized systems.

2" Kinetic Air and Vacuum Release Valve (Model 02-AR-K)

with large orifice for the release of large quantities of air from filling pipelines and for admitting air into quick-draining pipelines to prevent vacuum damage.

2" Combination Air and Vacuum Release Valve (Model 02-AR-C)

in which the features of the two previous models are incorporated in one single valve body for safe pipeline filling and draining and for releasing air pockets during system operation.

AR Series

Features:

- Only one or two moving parts, depending on model
- Corrosion-resistant construction
- Pressure-balanced float, free of distortion or collapse
- Drip-tight special dynamic seal
- Exclusive kinetic design prevents float from being blown shut
- Perfect sealing under system pressure as low as 0.1 bar

End Connections:

Male threaded NPT/BSP

Pressure Rating:

– Plastic body models, ISO: PN 10
– Cast iron body models, ISO: PN 16
– ANSI: #125

Temperature Range:

Water 4-80°C (40-180°F)

Materials:

– Body and cover: Plastic or polyester-coated cast iron
– Floats and kinetic shield: Plastic
– Automatic orifice: Stainless steel
– Seals: Buna-N and NR

Flow Control Devices

The Flow Control Device is constructed of a metallic flange-shaped seat, which contains a number of cavities according to flange size. Each cavity contains a flow controller made of a special elastomer. Each flow controller is calibrated for a constant flow rate.

Using a combination of flow controllers of known flow rates, it is possible to receive the total desired flow rate.

Applications:

- Waterworks
- Industry
- Irrigation

Features:

- Water treatment plants
- Fire protection systems
- Simple structure
- No moving mechanical parts
- Accurate flow control, better than ±10%
- Maintenance free
- Simple installation
- Change of controlled flow rate by simply changing flow control
- Flow Control Device can be mounted either horizontally or vertically
- Sturdy, non-corrosive structure
- Self cleaning

Flow Control Devices

Reference Projects - Among the thousands of satisfied customers worldwide, are the following:

Waterworks		
UK	Cities of London, Birmingham, Manchester and others	Municipal waterworks: pressure-reducing and leakage-control systems
Argentina	Lago Muster	350 km long national water carrier: monitoring and controlling
France	Euro-Disney	Park waterworks
USA	City of Orlando, Florida	Reclaimed water distribution system
Turkey	City of Izmir	Municipal waterworks: pressure-control, pump-protection
South Africa	Cities of Johannesburg, Capetown, Durban and others	Municipal waterworks: pressure-control, pump-protection
Philippine	City of Manila	Pressure-control for high rise buildings, float control valves
China	City of Shanghai	Pressure-control for public and high rise buildings, float control valves
Australia	City of Sidney	Municipal waterworks: pressure-control, pump-protection
Germany	Cities of Magdeburg and Leipzig	Municipal potables waterworks
Irrigation		
Spain	Acuifero project	Thousands of hectares, for hundreds of farmers, controlled by Hydrometers
South Africa	Symunya project	Thousands of hectares of sugar cane, controlled by Hydrometer
Brazil	CHESF project	Thousands of hectares controlled by Hydrometer
Japan	Okinawa	Thousands of hydrometers for governmental project
Columbia	Alto Chicamocha project	National water project for hundreds of farmers
Italy	Sicily	22 thousand hectares controlled by fully automatic distribution system
Fire Protection & Petroleum		
France-England	Euro-Tunnel	Fire protection system
Norway	Troll project	Fire protection system on off-shore platform
Brazil	Petro-Bras project, Atomic Energy Station	Fire protection system
Mexico	PEMEX refineries	Fire protection system
USA	NASA	Fire protection system for launch facilities
India	BPCL by ABB	Control valves for world's largest petroleum loading terminal
Italy	Milano Malpenza Airport	Fire protection system

Approvals

U.S.A. UL LISTED

U.S.A. FM APPROVED

UNITED KINGDOM WATER BYELAWS SCHEME WRc APPROVED PRODUCT

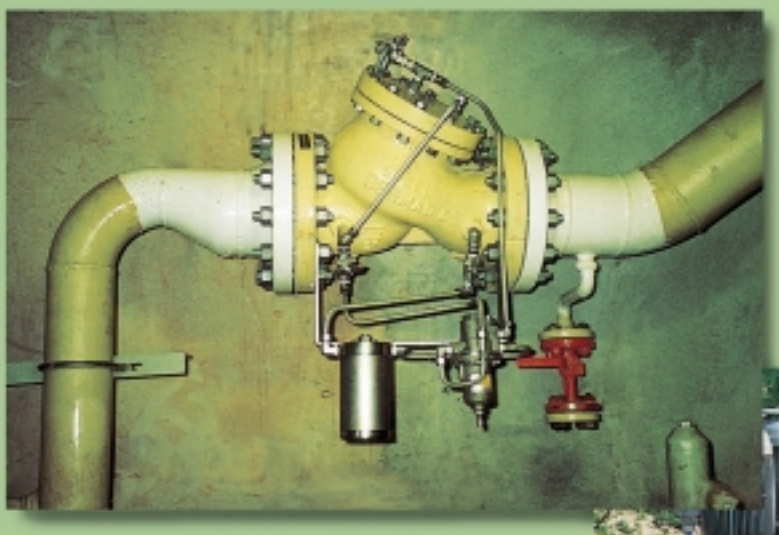
U.S.A. ILTA SUPPLIER

FRANCE C.A.M.E.R.A. Commision D'agrement Du Materiel D'equipement Des Reseaux Et Des Adductions

AUSTRIA ÖVGW

U.S.A. D.O.D. DEFENCE LOGISTICS AGENCY DEFENCE CONSTRUCTION SUPPLY CENTER

NEW ZEALAND The Insurance Council of New Zealand Inc.



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