

RELIEF, BY-PASS, BACK PRESSURE & ANTI-SIPHON VALVES

Angle and In-Line Designs for Corrosive Chemicals, Water and Ultra-Pure Liquids providing smooth sensitive operation

Applications:

- Handle highly corrosive or ultra pure liquids.
- Provide by-pass flow relief to avoid pumping problems.
- Prevent overpressures in vessels and piping systems.
- Maintain back pressure in piping systems.
- Prevent gravity-induced siphon through pump.
- Enhance pump performance.
- Simplify piping and eliminate the need for 3-port valves.
- 1/4" through 3" pipes sizes in PVC, CPVC, Natural Polypro, Glass-Filled Polypro, PVDF and Teflon®.

Performance:

- Set pressure adjustable from 5 to 150 psi.
- Inlet pressure rating up to 210 psi.
- Flow rates up to 200 gpm.
- Multi-million cycle designs.



Features:

- Offer wide range of pressure settings with sensitive operation.
- Provide smooth operation with less pressure drop.
- Fail-Dry® safety feature.
- No wetted metals.
- Each valve is individually tested prior to shipment.
- Stainless steel fasteners standard.
- Rugged thermoplastic construction.
- Maintenance free designs.
- Designs for crystallizing liquids.
- Designs with no wetted elastomers.
- Factory pre-set if requested.
- Tamper-proof option.
- Field proven performance since 1967.



PLAST-O-MATIC VALVES, INC.

Supplied by KTH Sales, Inc. Merrillville, IN 46410
(219) 736-0060 ☎ Fax (219) 769-0263☎ www.KTHSales.com

RELIEF VALVES FOR CORROSIVE AND ULTRA PURE LIQUIDS

VALVE SELECTION CHART	STYLES & FEATURES										APPLICATIONS				BODY MATERIALS				SIZES				FLOW					
	ANGLE PATTERN	IN-LINE PATTERN	DIAPHRAGM	ROLLING DIAPHRAGM	TEFLON® SHAFT	FAIL-DRY SAFETY	PRESSURE-BY-PASS RELIEF	BACK PRESSURE REGULATOR	ANTI-SIPHON	SPIGOT ENDS AVAILABLE	OK W/CRYSTALLIZING LIQUIDS	PVC	CPVC	NATURAL POLYPRO	GLASS-FILLED POLYPRO	TEFLON	PVDF	1/4"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	3"	MAX. INLET PRESSURE (PSI)	SET PRESSURE RANGE	
RVDT	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	150	5-100	RVDT
RVDM	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	150	5-100*	RVDM
RVD	●	●			●	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	210	5-150	RVD
RVT	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	150	5-100	RVT
RVTX	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	150	5-100	RVTX

○ – Depends on application, consult factory.

*5-120 for 1/2" size.

Contents & Quick Guide

PAGE

RVD

3

- Most economical
- Angle pattern, 1/4" and 1/2" sizes
- Barrier type seal (flat elastomer diaphragm)
- High pressure ratings

RVDM

4

- In-line pattern with "Fail-Dry®"
- 1/2", 3/4", and 1" sizes
- Barrier type seal (elastomer rolling diaphragm)

RVT

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- Angle pattern with "Fail-Dry"
- Complete 1/2" through 2" pipe sizes
- Sliding U-cup seal: Not for use with crystallizing liquids

RVDT

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- Highest flow at lowest overpressure
- In-line pattern, 1/4" through 2" sizes with "Fail-Dry"
- Barrier type seal (flat Teflon diaphragm)
- No wetted elastomers

RVTX

7

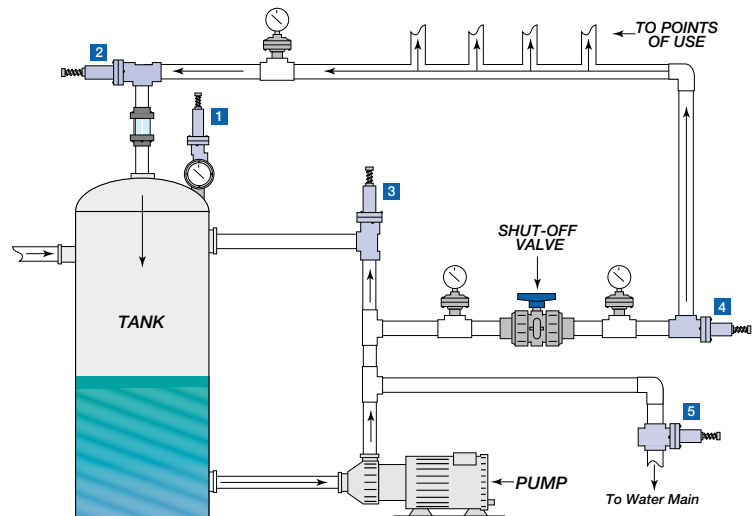
- 200 GPM capacity
- Angle pattern, 3" size only
- Barrier-type seal (elastomer rolling diaphragm)

Relief Valve Selection Sample Specifications Fail-Dry® Valves

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APPLICATION DIAGRAM

Illustrating The Multi-Functions Of
Plast-O-Matic's Relief Valves



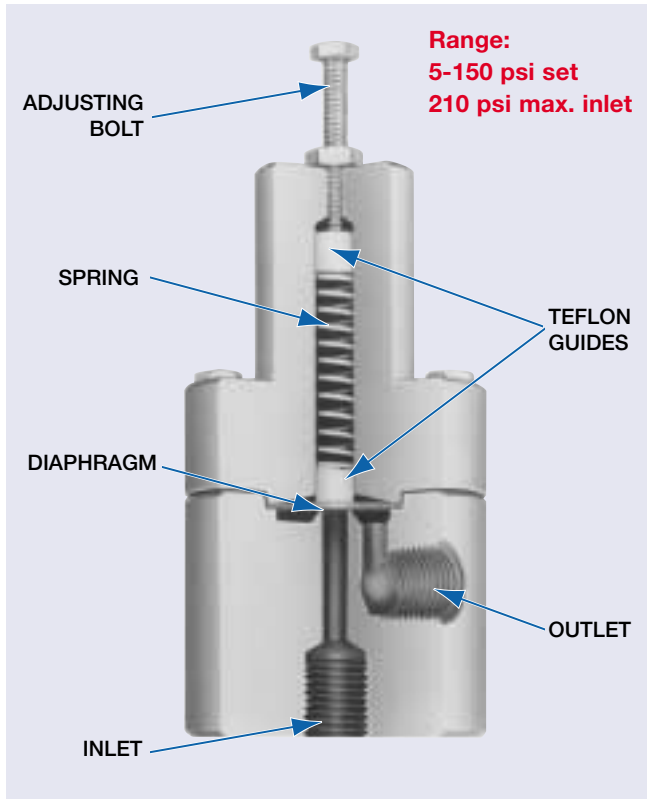
- 1 "Pressure Relief Valve"**, to protect a system (e.g. pump, pipe segment or tank) from excessive pressure (in excess of the set point).
- 2 "Back Pressure Regulator"**, to provide a means of retaining desired system pressure to points of use in upstream line(s).
- 3 "By-Pass Relief Valve"**, to protect a pump from "dead heading" by enabling the flow to by-pass an obstruction back to the tank or pump.
- 4 "Back Pressure Valve"**, to provide back pressure directly on the discharge of a pump to enhance its performance.
- 5 "Anti-Siphon Valve"**, to prevent unwanted chemical siphoning, if city water pressure drops to zero, and changes in elevation create negative pressure.

NOTE: Pressure Relief, By-Pass Relief and Anti-Siphon Valves may require piping tee which eliminates the need for 3-port valve.

SERIES RVD • Single Diaphragm Design



**compact and economical;
ideal for low through high pressure applications**



Features:

- Single diaphragm provides quick response, prevents crystallization.
- Teflon® guides designed for smooth, chatter-free operation.
- Heavy-duty; machined from solid thermoplastics and built for corrosive applications.
- Designed for low maintenance and easy to adjust.
- Angle pattern in 1/4" and 1/2" pipe sizes.
- No wetted metal parts.

Design:

Series RVD angle pattern pressure relief valves features a single flat diaphragm which is an advantage where salt crystallization problems can cause valve sticking. Relief setting is infinitely adjustable from 5 psi to 150 psi. Maximum inlet pressure is 210 psi.

Materials of Construction:

Available in PVC, Natural Polypropylene, PVDF and Teflon. Seals are available in EPDM or Viton®. The adjusting bolt, lock nut and fasteners are stainless steel. The control spring is plated steel. No metal parts are in contact with liquid.

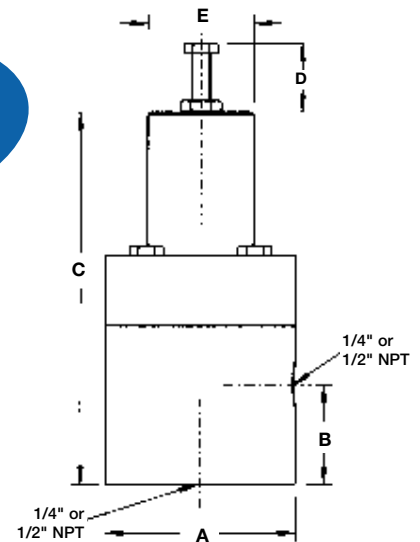
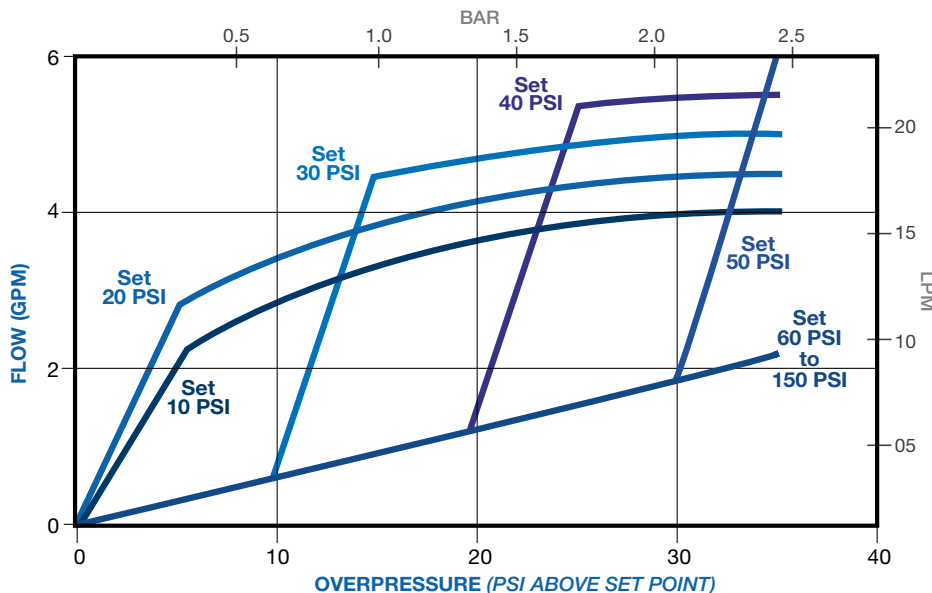
Series RVD Model Numbers

PIPE SIZE	PVC Model No.	POLYPRO* Model No.	PVDF Model No.	TEFLON Model No.
1/4"	RVD025V-PV	RVD025V-PP	RVD025V-PF	RVD025V-TF
1/2"	RVD050V-PV	RVD050V-PP	RVD050V-PF	RVD050V-TF

*Natural unpigmented polypropylene For EPDM Seals change "V" to "EP"

EVERY PLAST-O-MATIC VALVE IS INDIVIDUALLY TESTED PRIOR TO SHIPMENT.

Series RVD Flow Characteristics

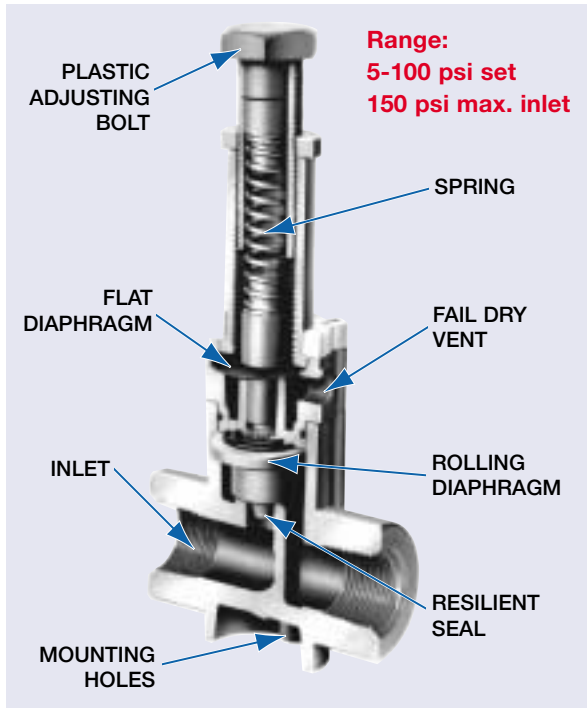


Series RVD Dimensions

	NPT or BSP			
	1/4		1/2	
	in.	mm.	in.	mm.
A	2	50.8	2.375	60.3
B	1.125	2.85	1.500	38.1
C	4	100.6	4.687	119.0
D	1.125	28.5	1.125	28.5
E	1.125	28.5	1.125	28.5

SERIES RVDM • Rolling Diaphragm Design

eliminates crystallization problems; smooth, sensitive operation for corrosive and high purity liquids



Features:

- Rolling diaphragm provides high accuracy, prevents crystallization.
- Flat secondary diaphragm provides a second isolation of the control spring.
- Patented Fail-Dry® safety vent gives advance warning of need to replace primary seal.
- In-line pattern in 1/2", 3/4" and 1" pipe sizes.
- No wetted metals.

Design:

Series RVDM in-line pressure relief valve features a primary rolling diaphragm and a secondary flat diaphragm which incorporates the Plast-O-Matic patented Fail-Dry design for added protection. Relief setting is infinitely adjustable from 5 psi to 100 psi. 1/2" size to 120 psi. Maximum inlet pressure is 150 psi. Not recommended for applications with vacuum on the outlet.

Materials of Construction:

Available in PVC, CPVC, Glass-Filled Polypropylene and Teflon®. Seals are available in EPDM or Viton®. The valve adjusting bolt, lock nut, and body are thermoplastic. The plated steel control spring and stainless steel external fasteners are not in contact with liquid.

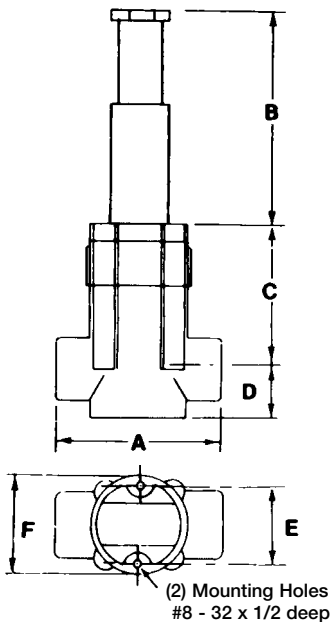
Series RVDM Dimensions

	1/2		3/4		1	
	in.	mm.	in.	mm.	in.	mm.
A	2.25	57.1	4.0	101.6	4.0	101.6
B	4.12	104.1	4.0	101.6	4.4	101.6
C	2.88	73.7	3.3	83.8	3.3	83.8
D	0.94	24.0	1.3	33.3	1.3	33.3
E	1.50	38.1	1.5	38.1	1.5	38.1
F	1.88	48.0	1.9	48.0	1.9	48.0

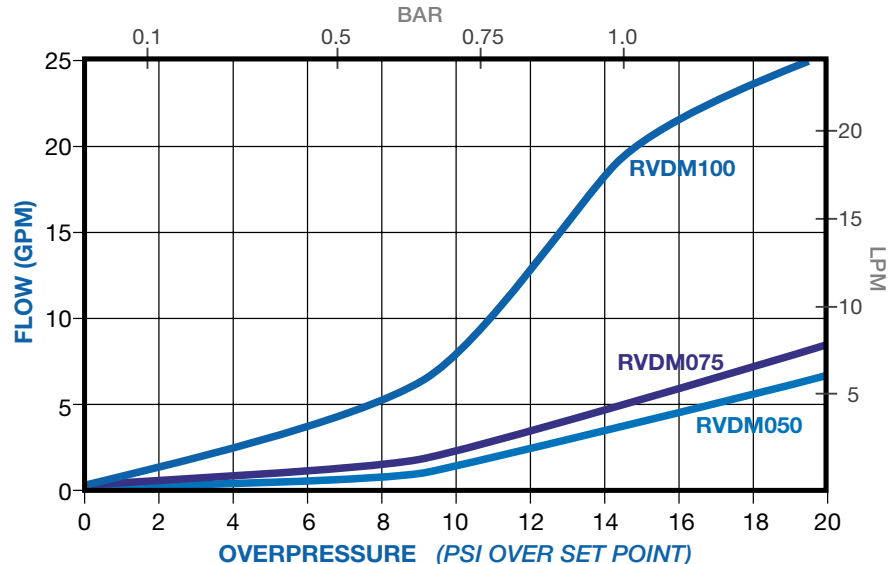
Series RVDM Model Numbers

NPT or BSP	PVC Model No.	POLYPRO Model No.	CPVC Model No.	PVDF Model No.
1/2	RVDM050EP-PV	RVDM050EP-PV	RVDM050EP-CP	RVDM050EP-PF
3/4	RVDM075EP-PV	RVDM075EP-PV	RVDM075EP-CP	RVDM075EP-PF
1	RVDM100EP-PV	RVDM100EP-PV	RVDM100EP-CP	RVDM100EP-PF

Model numbers shown are for EPDM seals. For Viton, change "EP" to "V".



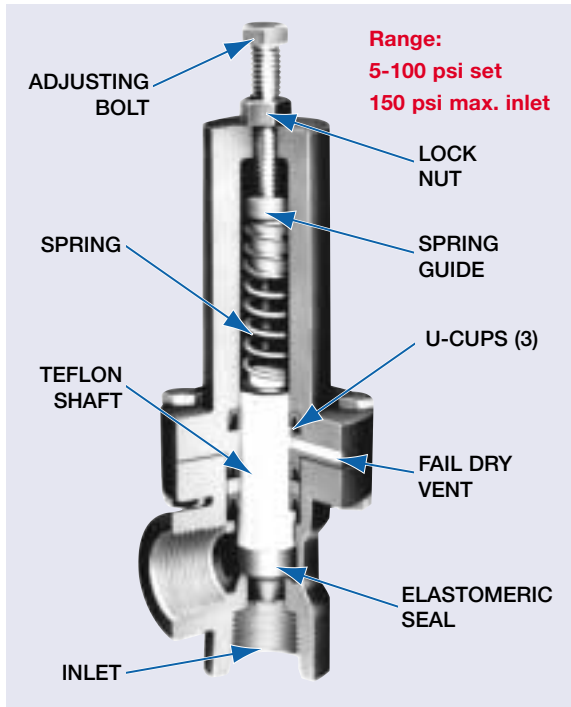
Series RVDM Flow Characteristics



SERIES RVT • Solid Teflon® Shaft Design



angle pattern valve with high pressure and flow rates



Features:

- Teflon shaft prevents chatter and sticking.
- Triple U-cup seal isolates spring, provides added safety.
- Patented Fail-Dry® advance warning vent allows maintenance to be scheduled conveniently, without costly shut-down.
- Angle pattern offers compact size and convenient piping.
- 1/2" through 2" pipe sizes.
- No wetted metal parts.

Design:

Series RVT angle pattern pressure relief valve features a solid, non-sticking Teflon shaft passing through three U-cup seals. It is a proven, high performance relief valve providing rugged dependability for acids and other highly corrosive liquids. Relief setting is infinitely adjustable from 5 psi to 100 psi. Maximum inlet pressure is 150 psi. Not recommended for salt solutions and other liquids that can crystallize.

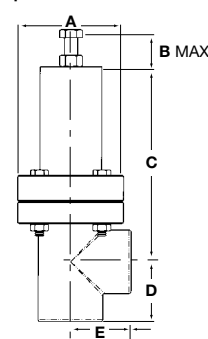
Materials of Construction:

Available in PVC, CPVC, Natural Polypropylene, PVDF and Teflon. Seals are available in EPDM or Viton®. For alternate body or seal materials, consult factory. The adjusting bolt, lock nut and fasteners are stainless steel. The control spring is plated steel. No metals parts are in contact with liquid.

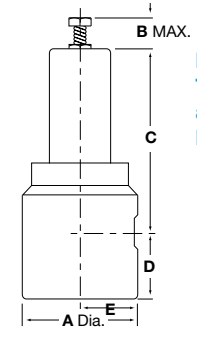
Series RVT Dimensions

NPT or BSP	A		B		C		D		E	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.
For PVC (PV) and CPVC (Corzan™) Bodies										
1/2	2.5	63.5	1	25.4	5	127.0	1.25	31.7	1.25	31.7
3/4	2.5	63.5	1.5	38.1	5.25	133.3	1.5	38.1	1.5	38.1
1	3.0	76.2	1.75	44.4	5.5	139.7	1.75	44.4	1.75	44.4
1 1/4	3.5	88.9	2.5	63.5	7.625	193.6	2	50.8	2	50.8
1 1/2	3.75	95.2	2	50.8	7	177.8	2.187	53.9	2.125	53.9
2	4.25	109.7	3.25	82.5	8.5	215.9	2.25	57.1	2.25	57.1
For Polypro (PP), Teflon® (TF), PVDF (PF) Bodies										
1/2	2.5	63.0	1	55.0	5	127.0	1.25	31.0	1.25	31.0
3/4	3	76.0	2.25	57.0	5.375	137.0	1.25	31.0	1.5	38.0
1	3	76.0	2.25	57.0	5.562	141.0	2	51.0	1.5	38.0
1 1/2	4.5	114.0	3.875	98.0	7.125	181.0	2.25	57.0	2.25	57.0
2	5.5	140.0	3.875	98.0	8.5	216.0	2.625	67.0	2.75	70.0

PVC and CPVC



Polypro, Teflon and PVDF

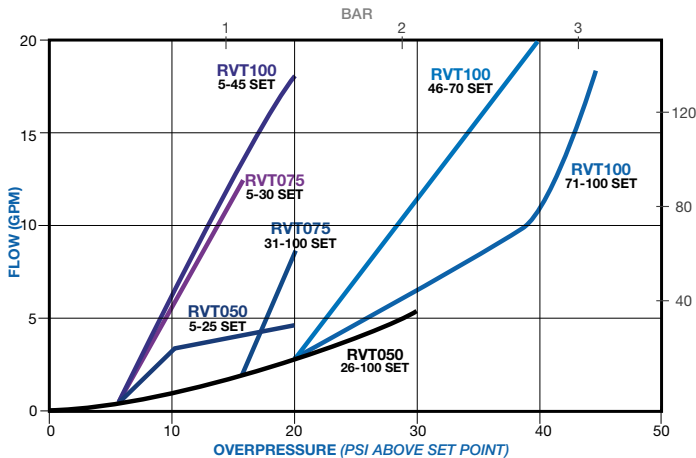


Series RVT Model Numbers

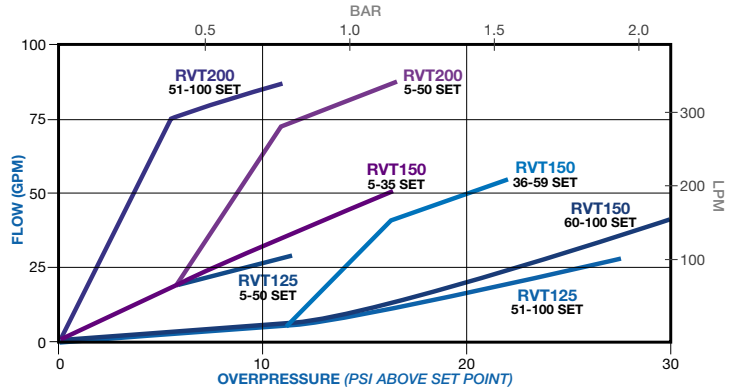
PIPE SIZE	PVC* Model No.	POLYPRO Model No.	PVDF Model No.	TEFLON Model No.
1/4	RVT025V-PV	RVT025V-PP	RVT025V-PF	RVT025V-TF
1/2	RVT050V-PV	RVT050V-PP	RVT050V-PF	RVT050V-TF
3/4	RVT075V-PV	RVT075V-PP	RVT075V-PF	RVT075V-TF
1	RVT100V-PV	RVT100V-PP	RVT100V-PF	RVT100V-TF
1 1/2	RVT150V-PV	RVT150V-PP	RVT150V-PF	RVT150V-TF
2	RVT200V-PV	RVT200V-PP	RVT200V-PF	RVT200V-TF

* For CPVC change -PV to -CP.

Series RVT 1/2", 3/4" and 1" Flow Characteristics



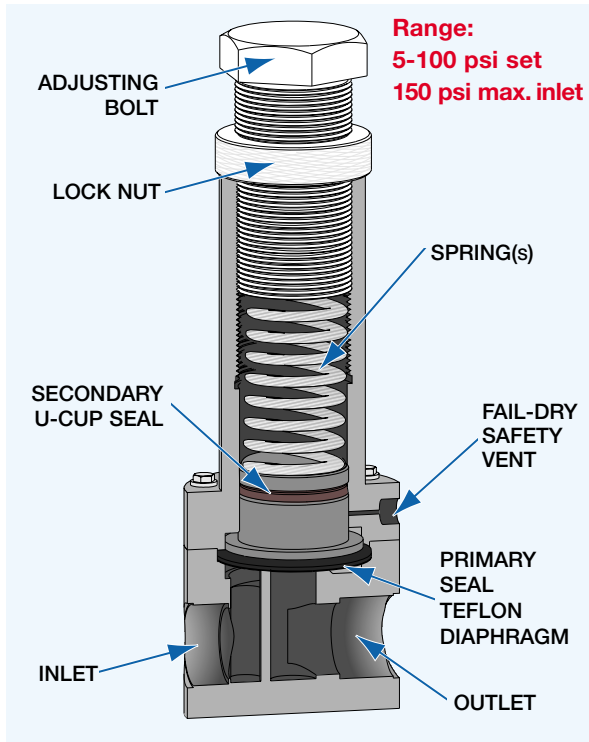
Series RVT 1 1/4", 1 1/2" and 2" Flow Characteristics



SERIES RVDT • Teflon® Diaphragm Design



the ultimate in corrosion resistance
with no wetted metals or elastomers!

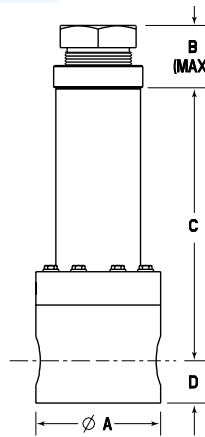


Features:

- One valve design functions as a relief valve, by-pass valve, back-pressure valve and anti-siphon valve.
- Teflon diaphragm – no wetted metal or elastomeric parts.
- Unique Teflon diaphragm is excellent for use with highly aggressive liquids... and also provides the ultimate in contamination-free sealing.
- Rugged thermoplastic construction is ideal for a broad range of industrial applications.
- Large diaphragm area delivers more sensitivity and less pressure drop under flow conditions.
- Patented Fail-Dry® safety feature provides visual warning of seal malfunction and permits the valve to continue operation until a scheduled maintenance can be planned.
- Non-leaching feature of Teflon makes it ideal for use with ultra-pure water and concentrated etchants, as in the semiconductor industry.
- Available in 1/4", 1/2", 3/4", 1", 1 1/2" and 2" sizes.

Design:

Series RVDT in-line pressure relief valves feature a wetted flat Teflon diaphragm to resist both chemical attack and salt crystallization problems. A large active diaphragm area provides for smooth, chatter-free operation. Relief setting is infinitely adjustable from 5 psi to 100 psi. Maximum inlet pressure 150 psi. Series RVDT is available in 1/4", 1/2", 3/4", 1", 1 1/2" and 2" pipe sizes.



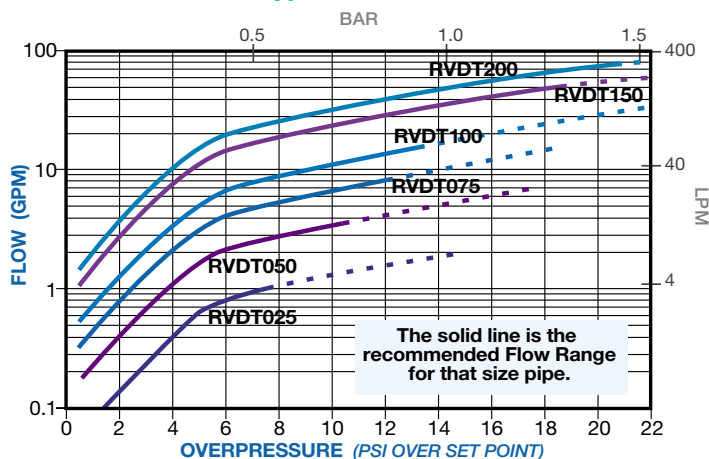
Materials of Construction:

Series RVDT relief valves are available in PVC, Polypropylene, PVDF (Kynar®) and Teflon body materials. The wetted diaphragm is Teflon energized by a non-wetted Viton® diaphragm. Springs (not in wetted area) are plated steel and fasteners are stainless steel. Standard spring housing is PVC, and adjusting screw is high-density polyethylene.

Series RVDT Dimensions

PIPE SIZE NPT	A		B		C		D	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.
1/4	2.0	50	1.38	35	4.30	109	.470	11
1/2	2.5	63	1.48	37	4.41	112	.687	17
3/4	3.0	76	2.81	71	5.39	137	.780	19
1	3.5	83	3.00	76	7.65	194	1.187	30
1 1/2	5.0	127	3.50	89	7.00	178	1.500	38
2	6.0	153	2.80	71	8.13	207	1.750	45

Series RVDT Typical Flow Characteristic



Series RVDT Model Numbers

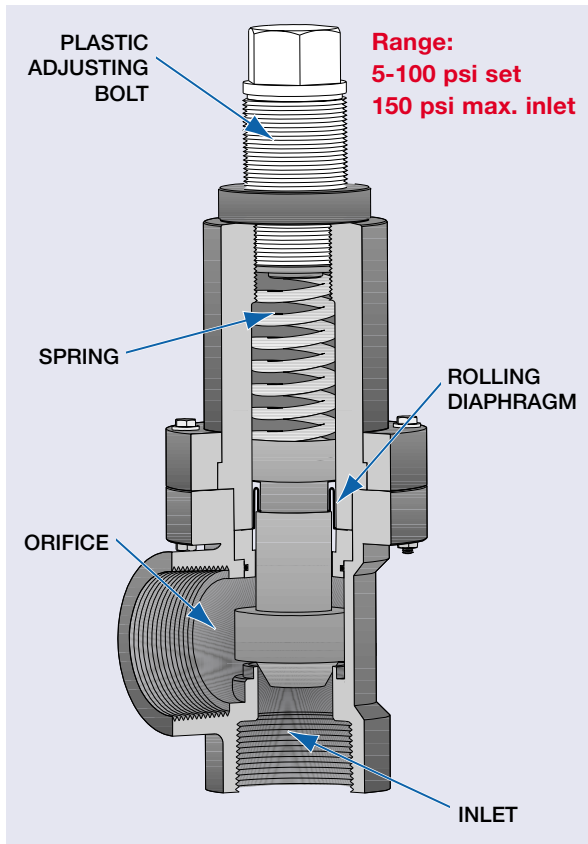
PIPE SIZE	PVC Model No.	POLYPRO* Model No.	PVDF Model No.	TEFLON Model No.
1/4	RVDT025V-PV	RVDT025V-PP	RVDT025V-PF	RVDT025V-TF
1/2	RVDT050V-PV	RVDT050V-PP	RVDT050V-PF	RVDT050V-TF
3/4	RVDT075V-PV	RVDT075V-PP	RVDT075V-PF	RVDT075V-TF
1	RVDT100V-PV	RVDT100V-PP	RVDT100V-PF	RVDT100V-TF
1 1/2	RVDT150V-PV	RVDT150V-PP	RVDT150V-PF	Consult Factory
2	RVDT200V-PV	RVDT200V-PP	RVDT200V-PF	

*Natural Polypropylene

SERIES RVTX • Rolling Diaphragm Design



a super-high performance 3" relief valve



Features:

- Large area rolling diaphragm provides precise, sensitive operation.
- Ideal for use with liquids that crystallize.
- Heavy-duty industrial construction.
- Angle pattern offers compact size and convenient piping.
- 3" pipe size.
- No wetted metal parts.

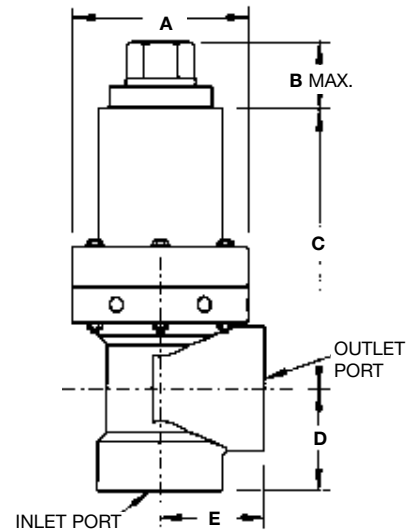
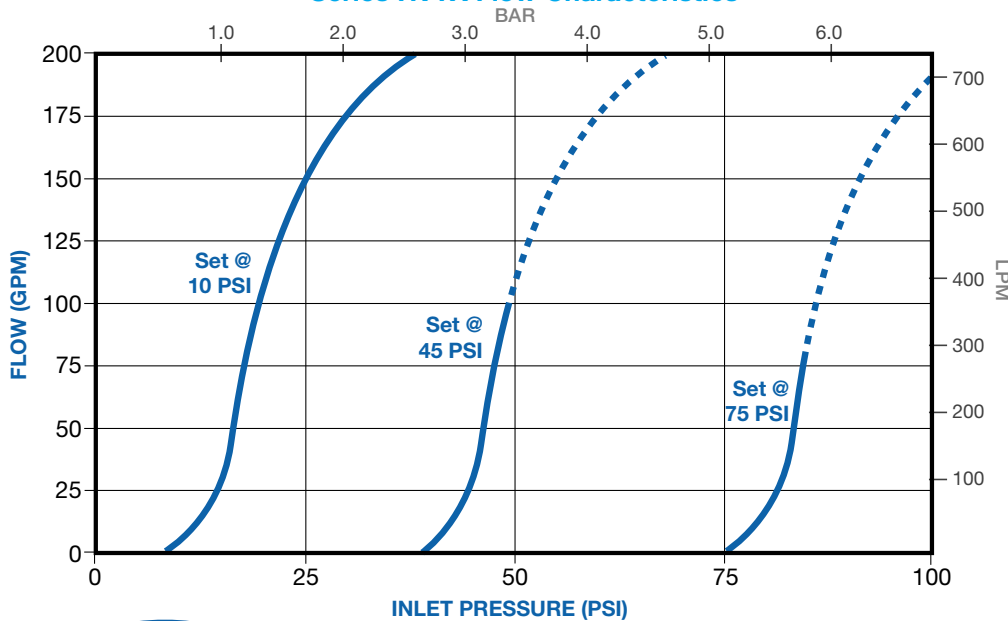
Design:

Series RVTX angle pattern pressure relief valve features a solid, PVC shaft with a Teflon® thrust washer for reduced friction, working in conjunction with a large area rolling diaphragm. This high flow capacity relief valve provides rugged dependability for acids, salt solutions, and other highly corrosive liquids. Relief setting is infinitely adjustable from 5 psi to 100 psi. Maximum inlet pressure is 150 psi. Not recommended for applications with a vacuum on the outlet.

Materials of Construction:

Available in PVC. Thrust washer is Teflon. Seals are available in EPDM and Viton®. For other body or seal materials, consult factory. The valve adjusting bolt and lock nut are high density polyethylene. The control spring is plated steel. The fasteners are stainless steel. No metal parts are in contact with liquid.

Series RVTX Flow Characteristics



Series RVTX Dimensions

	in.	mm.
A	6.0	152.4
B	2.3	58.4
C	9.6	243.8
D	3.5	88.9
E	3.6	91.4

Series RVTX Model Numbers

PIPE SIZE	EPDM Model No.	VITON Model No.
1/4	RVTX300EP-PV	RVTX300V-PV

EVERY PLAST-O-MATIC VALVE IS INDIVIDUALLY TESTED PRIOR TO SHIPMENT.

RELIEF VALVE SELECTION adjustment, operation, sizing and installation

Adjustment: To adjust relieving pressure simply turn adjusting bolt down to increase and up to decrease pressure setting.

Operation: Once the Plast-O-Matic relief valve is set the valve will remain closed as long as the tank or line pressure does not reach the set pressure. The valve will begin to weep or relieve when the set pressure is reached and will require an over-pressure to fully open. When the pressure falls below the set pressure the valve will again close.

Sizing: To determine the proper size relief valve required, it is necessary to know how many gallons per minute of liquid must pass through the valve and the allowable pressures to achieve that flow. Keep in mind that the relief valves open gradually as they build up to the maximum flow rates depending on the amount of overpressure present.

The next step is to consult the flow reference chart. The chart recommends the maximum flow to be used with each valve size and the overpressure required to reach that flow. Overpressure is the amount of pressure needed beyond the set pressure.

CAUTION: RV Series are not "POP SAFETY" valves and should not be used in applications requiring such valves.

Installation: Several control springs are supplied so that the user can select the spring having the proper pressure range in order to set the valve at the desired relief setting.

Before installing the valve in the line, follow the procedure for setting the relief pressure as recommended on the instruction sheet supplied with the valve.

The relief valve should be mounted upright in applications where particulate may settle, and should be installed as near as possible to the line or equipment being protected.

All threaded connections should have an acceptable pipe sealant to effect a good seal. Use care with Teflon tape so that it does not "string". Loose "strings" could lay across the valve seat and prevent it from closing completely. The assembly need only be made hand-tight followed by a one-quarter turn with a strap wrench. Do not overtighten or breakage will result. Never use pipe wrenches, channel pliers, or metal pipe nipples which could distort or cut into the plastic and cause a fracture.

SAMPLE SPECIFICATIONS

Series RVD

Thermoplastic [material] pressure relief valve, [1/4" or 1/2"] NPT threads*, is to be 90° angle pattern featuring a one piece [elastomer] diaphragm for sealing. The valve is to have a solid, machined and polished Teflon plunger in the spring chamber; and stainless steel external fasteners. Manufacturer shall factory set the pressure relief valve at ____PSI....

Series RVDM

Thermoplastic [material] pressure relief valve [size] NPT threads*, is to be in-line ported with molded, fabric reinforced [elastomer] rolling diaphragm as the primary seal. Adjusting bolt and lock nut are to be all plastic. Valve is to have Fail-Dry® Safety Design incorporating a vented chamber between the rolling diaphragm and a secondary flat diaphragm, with a 1/8" NPT port. Manufacturer shall factory set the pressure relief valve at ____PSI....

Series RVT

Thermoplastic [material] pressure relief valve, [size] NPT threads*, is to be 90° angle pattern featuring three [elastomer] molded U-cups for sealing. The valve is to have a solid, machined and polished Teflon shaft; and stainless steel external fasteners. Valve is to have Fail-Dry® Safety Design incorporating a vented chamber between the middle and upper U-cups to protect the spring chamber. Manufacturer shall factory set the pressure relief valve at ____PSI....

Series RVDT

Thermoplastic [material] pressure relief valve [size] NPT threads*, is to be in-line ported with flat Teflon diaphragm, backed by Viton, as the primary seal. Adjusting bolt and lock nut are to be all plastic. Valve is to have Fail-Dry® Safety Design incorporating a vented chamber between the flat diaphragm and a secondary elastomer diaphragm to protect the spring chamber. Manufacturer shall factory set the pressure relief valve at ____PSI....

Series RVTX

Thermoplastic Grade 1 Type 1 PVC pressure relief valve, 3" NPT threads*, is to be 90° angle pattern featuring fabric reinforced [elastomer] rolling diaphragm. The valve is to have a solid, machined and polished PVC shaft with Teflon thrust washer; and stainless steel external fasteners. Manufacturer shall factory set the pressure relief valve at ____PSI....

**...All units are to be 100% individually tested at the factory.
As manufactured by Plast-O-Matic Valves, Inc., Cedar Grove, NJ.**

*Change NPT thread specification as required.

Add "with tamper-proof option" after pressure setting, if required.

FAIL-DRY® VALVES • The Ultimate in Process Safety

relief valves remain sealed and fully operational – even after primary seal failure

The Fail-Dry Safety System

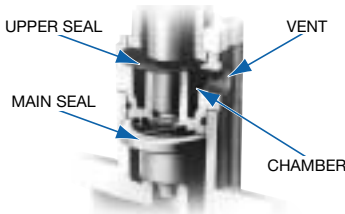
Under normal conditions, Plast-O-Matic elastomers last over 1,000,000 cycles. But in the event of excessive pressure or other unexpected conditions, the patented Fail-Dry safety feature provides advance warning... and enables you to prevent a complete valve failure before it occurs. The Plast-O-Matic Fail Dry is the unique concept of having a vented chamber separating two sealed sections of a valve. One of these sections is the fluid media; the other is the spring (operational) chamber. The primary seal – in contact with the fluid media and subject to pressure – will naturally break down before the secondary seal. When the primary seal begins to fail, it releases trace amounts of fluid through the Fail-Dry vent. The secondary seal still isolates the steel spring, so that it remains dry...Fail-Dry!

Fail Dry Relief Valves Remain Fully Operational

...and so does your system. Since the failure can be diagnosed early, valve repair can be performed before a catastrophic failure (such as a seized valve) can occur. Early detection by the Fail Dry reduces the number of parts to be replaced.

Repair Costs are Lower

All valves require maintenance. Although some manufacturers offer a slightly lower initial price, the Fail-Dry prevents the operating springs from being attacked, so that only the elastomers need to be replaced. Most importantly, it's your best protection against dangerous valve-related spills, injuries, and costly downtime.



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