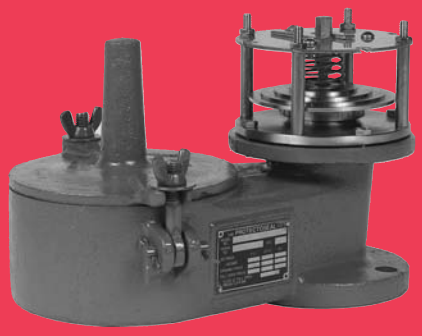
SAFETY WITHOUT COMPROMISE

SPRING LOADED VENTS

Set Points of 3 PSIG and Above

PROTECTOSEAL

SERIES	STYLE
9540	End-of-Line Pressure/Vacuum Breather Vent
19540	Pipe-Away Pressure/Vacuum Breather Vent
9240	End-of-Line Vacuum Relief Vent
19240	Side Mount Vacuum Relief Vent
9800	End-of-Line Pressure Relief Vent
19800	Pipe-Away Pressure Relief Vent



Spring Loaded Vents

OBJECTIVE

Protectoseal's Spring Loaded Vents provide pressure and vacuum relief so that a tank's vapor space can be maintained within safe operating parameters. Different versions of these vents allow for spring loaded pressure settings, spring loaded vacuum settings or combinations of spring loaded pressure/weight loaded vacuum or weight loaded pressure/spring loaded vacuum settings. Spring loading allows for higher pressure or vacuum settings than are available with conventional weight loading techniques. Spring loaded vents are intended for use on tanks and vessels that have higher pressure or vacuum design ratings when compared to atmospheric storage vessels. The vents are normally closed to minimize loss of product and open only to allow required pressure/vacuum relief.

TECHNIQUE

Even tanks with high design ratings require protection from excessive pressure/vacuum accumulation in their vapor spaces. With the set pressures allowed by a spring loaded design, the vents can remain closed at higher pressures and are allowed to open only when the tank structure may be in jeopardy. Vapors can then be relieved, or make up air can be drawn into the tank, to maintain the tank within its design parameters. Product loss is minimized.

The ability to operate tanks at elevated pressure/vacuum is provided. This becomes more important as tank storage systems continue their transition from stand alone structures to manifolded, multi-tank operations equipped with vapor recovery devices, flares, inert gas blanketing systems, etc.

Protectoseal offers a full range of spring loaded vent designs. Vents suitable for relieving vapors to the atmosphere are available. Vents with flanged connections on their outlets are also available so that relieved vapors may be directed to connecting piping for disposal or further processing.

SPECIAL FEATURES

Easy Inspection and Maintenance. The spring packages are readily removable from the cast housings to facilitate inspection and maintenance. For the 9800 Series Pressure Vent the entire vent can be removed from the system. Replacement spring packages or vents can be easily installed in the systems so that disruption of plant operations can be minimized. The pressure /vacuum vents may be provided with any combination of spring loading on the pressure, vacuum or both pressure and vacuum sides. Conventional weight loading techniques are used when spring loading is not required. For most series and designs spring loaded vents are available for setting of 3 PSIG and above. Maximum set points of 15 PSIG can be provided (12.5 PSIG for 12" size vents).

Wide Range of Set Points. The spring loaded vents can be set at 3 PSIG or higher. Maximum set points of 15 PSIG (12.5 PSIG for 12" vents) can be provided. Minimum set points on the weight loaded side of any spring loaded vent is 2 oz./in. Standard Viton® seating material. Other materials may be furnished upon request.

Numerous Sizes Available. Available in 2" (DN50) thru 12" (DN300) Sizes. Aluminum flanged to mate with 125# ANSI and DIN PN 16 flat face flanges. All other materials mate with 150# ANSI and DIN 16 raised face flanges. Other drilling patterns available upon special request.

PRO-FLOW III® Sizing and Selection Software.
Use PRO-FLOW III® to select the correct size for pressure and vacuum relief calculated in accordance with API 2000, ISO 28300, NFPA 30 and OSHA 1910.106.

Quality Assurance. Each vent is Factory tested for casting integrity, correct setting and leakage to meet Protectoseal's high standards prior to shipment.

CONSTRUCTION

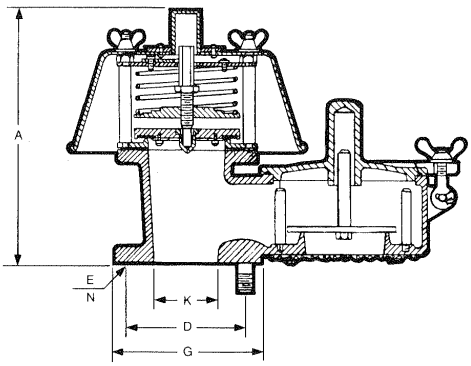
The vents are available in a wide range of materials to meet process requirements. Aluminum, Ductile Iron, 316 Stainless Steel, Cast Steel and C/C76 housings can be provided. Consult factory for other special alloys. The standard spring packages are 316 Stainless Steel with Stainless Steel springs. Refer to material specifications in the "How to Order Protectoseal Spring Loaded Vents" on Page 5.

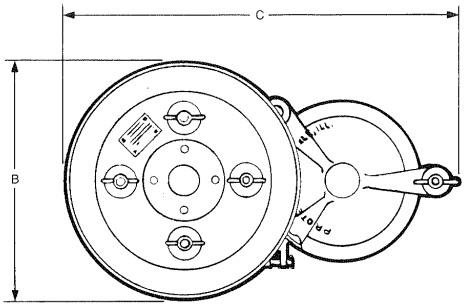
Available Options

- Alternate diaphragm materials
- Material certifications for castings
- Lower than standard minimum pressure and/or vacuum settings
- Steam jacketing available
- Manual or electronic indication of vent opening
- FEP coating
- Kynar® coating *(Kynar® is a Registered Trademark of Arkema, Inc.)*
- Special cleaning & packaging for the storage of ultrapure liquids

Series 9540 - End-of-Line Pressure/Vacuum Breather Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*





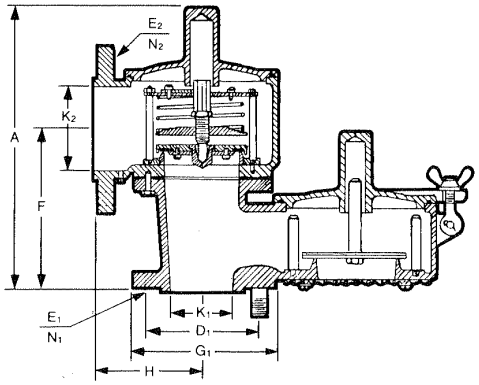


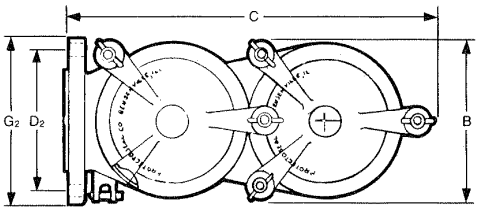
Cat. No.*	Flange K	Ht. A	Width B	Length C	B.C. D	Dia. G	Dia. E	Holes N
9542P/V	2"	10 1/2"	8 1/2"	15"	4 3/4"	6"	3/4"	4
9543P/V	3"	11 1/2"	9"	15"	6"	7 1/2"	3/4"	4
9544P/V	4"	14"	13"	20 1/4"	7 1/2"	9"	3/4"	8
9546P/V	6"	19 1/4"	17"	26 1/2"	9 1/2"	11"	7/8"	8
9548P/V	8"	26 3/4"	17 1/2"	30 1/4"	11 3/4"	13 1/2"	7/8"	8
9550P/V	10"	30 1/4"	22 1/2"	36 3/4"	14 1/4"	16"	1"	12
9552P/V	12"	34 5/8"	25"	38 1/2"	17"	19"	1"	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series 19540 - Pipe-Away Pressure/Vacuum Breather Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*





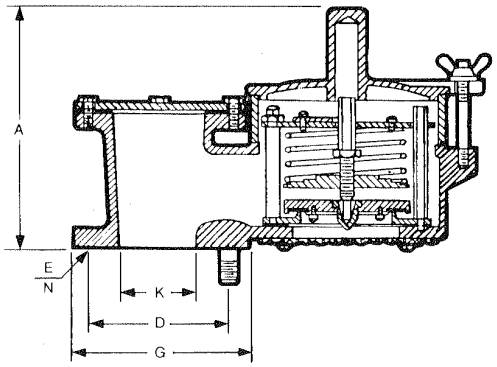


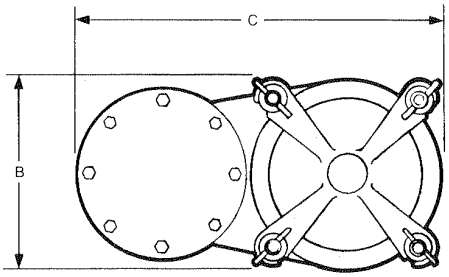
Cat. No.*	Flange Size K_1 x K_2	Ht. A	Width B	Length C	F	H	B.C. D1	B.C. D2	Dia. G1	Dia. G2	Dia. E1	Dia. E2	Holes N1	Holes N2
19542P/V2	2" x 2"	16"	9 7/8"	16"	7 1/8"	5 3/8"	4 3/4"	4 3/4"	6"	6"	3/4"	3/4"	4	4
19542P/V3	2" x 3"	13 1/2"	9 1/4"	16"	7"	5 1/2"	4 3/4"	6"	6"	7 1/2"	3/4"	3/4"	4	4
19543P/V3	3" x 3"	15"	9 5/8"	16"	7 1/4"	5 9/16"	6"	6"	7 1/2"	7 1/2"	3/4"	3/4"	4	4
19543P/V4	3" x 4"	14"	9 5/8"	16 1/8"	8"	5 5/8"	6"	7 1/2"	7 1/2"	9"	3/4"	3/4"	4	8
19544P/V4	4" x 4"	19 3/4"	10"	20 1/2"	9 1/8"	6 1/2"	7 1/2"	7 1/2"	9"	9"	3/4"	3/4"	8	8
19544P/V6	4" x 6"	18"	11"	20 1/2"	9 5/8"	6 1/2"	7 1/2"	9 1/2"	9"	11"	3/4"	7/8"	8	8
19546P/V6	6" x 6"	22 1/4"	13"	25 3/4"	12"	8 3/8"	9 1/2"	9 1/2"	11"	11"	7/8"	7/8"	8	8
19546P/V8	6" x 8"	22 1/2"	13 1/2"	26 1/2"	13"	8 1/2"	9 1/2"	11 3/4"	11"	13 1/2"	7/8"	7/8"	8	8
19548P/V10	8" x 10"	26 1/2"	16"	32"	11 3/4"	10 1/2"	11 3/4"	14 1/4"	13 1/2"	16"	7/8"	1"	8	12
19550P/V12	10" x 12"	25 3/8"	19"	37 5/8"	15 1/4"	12"	14 1/4"	17"	16"	19"	1"	1"	12	12
19552P/V14	12" x 14"	28 1/4"	21"	39 3/4"	16 1/2"	12"	17"	18 3/4"	19"	21"	1"	1 1/8"	12	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series 9240 - End-of-Line Vacuum Relief Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*





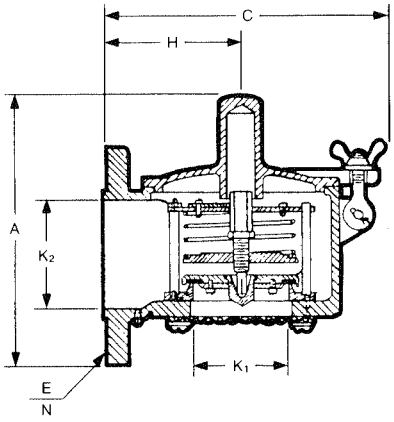


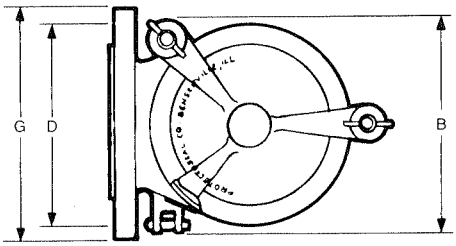
Cat. No.*	Flange K	Ht. A	Width B	Length C	B.C. D	Dia. G	Dia. E	Holes N
9242V	2"	9 3/4"	9 7/8"	13 7/8"	4 3/4"	6"	3/4"	4
9243V	3"	7 1/8"	9 5/8"	14 1/4"	6"	7 1/2"	3/4"	4
9244V	4"	12 1/4"	10"	18 1/2"	7 1/2"	9"	3/4"	8
9246V	6"	14 1/4"	12 7/8"	23 1/2"	9 1/2"	11"	7/8"	8
9248V	8"	21"	15 3/4"	28"	11 3/4"	13 1/2"	7/8"	8
9250V	10"	23 3/4"	18 1/2"	33 5/8"	14 1/4"	16"	1"	12
9252V	12"	27 3/4"	21 1/2"	35 1/2"	17"	19"	1"	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series 19240 - Side Mount Vacuum Relief Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*





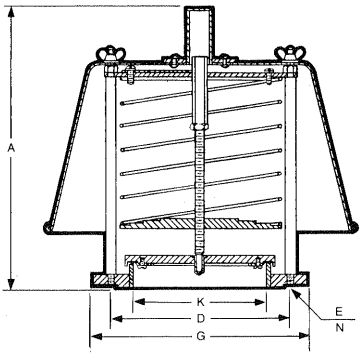


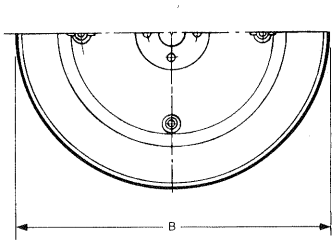
Cat. No.*	Flange K_2	Valve K_1	Ht. A	Width B	Length C	Width H	B.C. D	Dia. G	Dia. E	Holes N
19240V2	2"	2"	9 3/4"	9 3/4"	8 7/8"	5 1/4"	4 3/4"	6"	3/4"	4
19240V3	3"	3"	10 1/2"	9 5/8"	9"	5 1/2"	6"	7 1/2"	3/4"	4
19240V4	4"	4"	10 1/4"	10"	12"	6 3/8"	7 1/2"	9"	3/4"	8
19240V6	6"	6"	15 3/4"	13"	15 1/4"	8 3/8"	9 1/2"	11"	7/8"	8
19246V8	8"	6"	16 1/4"	13"	15 1/2"	8 1/2"	11 3/4"	13 1/2"	7/8"	8
19248V10	10"	8"	17 1/4"	15 3/4"	19 1/4"	10 1/2"	14 1/4"	16"	1"	12
19250V12	12"	10"	19 3/4"	18 3/4"	21 3/4"	12"	17"	19"	1"	12
19252V14	14"	12"	22 1/4"	21"	21"	12"	18 3/4"	21"	1 1/8"	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series 9800 - End-of-Line Pressure Relief Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*





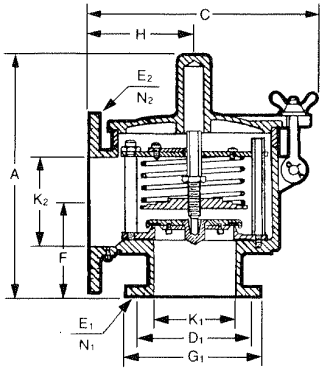


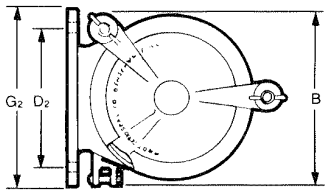
Cat. No.*	Flange K	Ht. A	Width B	B.C. D	Dia. G	Dia. E	Holes N
9802P	2"	5 1/2"	8 1/2"	4 3/4"	6"	3/4"	4 Studs
9803P	3"	6 1/2"	9"	6"	7 1/2"	3/4"	4
9804P	4"	8 1/2"	12 7/8"	7 1/2"	9"	3/4"	8
9806P	6"	10 1/4"	16"	9 1/2"	11"	7/8"	8
9808P	8"	18 1/4"	18 3/4"	11 3/4"	13 1/2"	7/8"	8
9810P	10"	21"	21 3/4"	14 1/4"	16"	1"	12
9812P	12"	23 1/2"	25"	17"	19"	1"	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series 19800 - Pipe-Away Pressure Relief Vent *(Dimensions shown are for reference only, contact factory for certified drawings.)*







Cat. No.*	Flange Size K_1 x K_2	Ht. A	Width B	Length C	F	H	B.C. D1	B.C. D2	Dia. G1	Dia. G2	Dia. E1	Dia. E2	Holes N1	Holes N2
19802P2	2" x 2"	13 1/4"	9 3/4"	8 5/8"	3 7/8"	5 1/2"	4 3/4"	4 3/4"	6"	6"	3/4"	3/4"	4	4
19802P3	2" x 3"	11"	9 3/4"	9 1/4"	4 3/8"	5 1/2"	4 3/4"	6"	6"	7 1/2"	3/4"	3/4"	4	4
19803P3	3" x 3"	12"	9 5/8"	9"	4 1/4"	5 1/2"	6"	6"	7 1/2"	7 1/2"	3/4"	3/4"	4	4
19803P4	3" x 4"	10 1/2"	9 5/8"	9"	5 1/4"	5 5/8"	6"	7 1/2"	7 1/2"	9"	3/4"	3/4"	4	8
19804P4	4" x 4"	16 5/8"	9"	12 1/8"	6 1/16"	6 7/16"	7 1/2"	7 1/2"	9"	9"	3/4"	3/4"	8	8
19804P6	4" x 6"	15"	11"	12 1/4"	6 3/8"	6 1/2"	7 1/2"	9 1/2"	9"	11"	3/4"	7/8"	8	8
19806P6	6" x 6"	18 5/8"	11"	15 1/2"	7 3/4"	8 3/8"	9 1/2"	9 1/2"	11"	11"	7/8"	7/8"	8	8
19806P8	6" x 8"	18"	13 1/2"	15 1/2"	8 1/2"	8 1/2"	9 1/2"	11 3/4"	11"	13 1/2"	7/8"	7/8"	8	8
19808P10	8" x 10"	27 1/2"	16"	18 3/4"	10 1/2"	10 1/2"	11 3/4"	14 1/4"	13 1/2"	16"	7/8"	1"	8	12
19810P10	10" x 12"	29 7/8"	19"	21 3/4"	11"	12"	14 1/4"	17"	16"	19"	1"	1"	12	12
19812P14	12" x 14"	23 3/4"	21"	21"	12"	12"	17"	18 3/4"	19"	21"	1"	1 1/8"	12	12

**Note Cat. No. specifies Aluminum construction. Refer to "How to Order Protectoseal Spring Loaded Vents" on Page 5 for more options.*

Series Part Number	Pressure & Vacuum		Pressure Only	Vacuum Only	Configuration	Prefix Body, Cover and/or Weatherhood Material				
	Spring Loaded Pressure Side	Spring Loaded Vacuum Side				Aluminum	Ductile Iron	Steel	Stainless Steel	C/C276
9540P	Yes	No	-	-	End-of-Line	No Prefix	C	CS	F	M
9540V	No	Yes	-	-	End-of-Line	No Prefix	C	CS	F	M
9540PV	Yes	Yes	-	-	End-of-Line	No Prefix	C	CS	F	M
19540P	Yes	No	-	-	Pipe-Away	No Prefix	C	CS	F	M
19540V	No	Yes	-	-	Pipe-Away	No Prefix	C	CS	F	M
19540PV	Yes	Yes	-	-	Pipe-Away	No Prefix	C	CS	F	M
9420V	-	-	-	Yes	End-of-Line	No Prefix	C	CS	F	M
19240V	-	-	-	Yes	Side Mount	No Prefix	C	CS	F	M
9800P	-	-	Yes	-	End-of-Line	N/A	N/A	C	F	M
19800P	-	-	Yes	-	Pipe-Away	No Prefix	C	CS	F	M

MATERIAL SPECIFICATIONS

1. Select the basic vent or vent configuration required: 9540 Series, 9800 Series, etc. - Refer to chart above.
2. Add correct prefix letter as shown below:

   No Prefix Model Number - Cast Aluminum (ASTM B26-Grade 356) Bodies and Covers; 316 S.S. Spring Package Components; Stainless Steel Setting Springs (302, 17-7PH); Viton® Diaphragms; Aluminum Weight Loaded Pallet Assembly; Steel or Lead Setting Weights (if required).

   "C" Prefix Model Number - Cast Ductile Iron (ASTM A536-Grade 65-45-12) Bodies and Covers; 316 S.S. Spring Package Components; Stainless Steel Setting Springs (302, 17-7PH); Viton® Diaphragms; 316 S.S. Weight Loaded Pallet Assembly; Epoxied 316 S.S. Seat on Weight Loaded Side; Steel or Lead Setting Weights (if required).

   "CS" Prefix Model Number - Cast Steel (ASTM A216-Grade WCB) Bodies and Covers; 316 S.S. Spring Package Components; Stainless Steel Setting Springs (302, 17-7PH); Viton® Diaphragms; 316 S.S. Weight Loaded Pallet Assembly; Epoxied 316 S.S. Seat on Weight Loaded Side; Steel or Lead Setting Weights (if required).

   "F" Prefix Model Number - Cast Stainless Steel (ASTM A743-Grade CF8M) Bodies and Covers; 316 S.S. Spring Package Components; Stainless Steel Setting Springs (302, 17-7PH); Viton® Diaphragms; 316 S.S. Weight Loaded Pallet Assembly; Epoxied 316 S.S. Seat on Weight Loaded Side; Steel or Lead Setting Weights (if required).

   "M" Prefix Model Number - Cast Alloy C (ASTM A494-Grade CW12MW) Bodies and Covers; C276 Spring Package Components; C276 Springs; Viton® Diaphragms; C276 Weight Loaded Pallet Assembly; C276 or Lead Setting Weights (if required). Note: Maximum setting available with C276 springs are controlled by availability of C276 spring material. Consult Factory for availability.

3. Add suffix letter: (Refer to chart above.)
   "P" for spring loaded pressure side
   "V" for spring loaded vacuum side
   "PV" if both sides require spring loading
4. Determine pressure and/or vacuum settings desired.
5. Determine required vent size based on flow capacity - Refer to Pro Flow® Sizing Software.
6. Specify and describe special materials (monel, C276, plastic coated, etc.) and other special requirements.

Examples:

Model No. F19543_4 - Cast Stainless Steel Pipe-Away Pressure / Vacuum Breather Vent with pressure set at 5 PSIG and vacuum set at 3 PSIG = F19543PV4

Model No. 9546_ - Cast Aluminum End-of-Line Pressure / Vacuum Breather Vent with pressure set at 5 PSIG and vacuum set at 2 oz. = 9546P

Model No. C9244_ - Cast Ductile Iron End-of-Line Vacuum Relief Vent with vacuum set at 3 PSIG = 9244V

SPRING LOADED SET POINT RANGES FOR ALL SERIES NUMBERS

Inlet Flange Size	MINIMUM (PSIG)	MAXIMUM (PSIG)
	Pressure or Vacuum	Pressure or Vacuum
	All Materials	All Materials
2"/DN50	3.00	15.00
3"/DN80	3.00	15.00
4"/DN100	3.00	15.00
6"/DN150	3.00	15.00
8"/DN200	3.00	15.00
10"/DN250	3.00	15.00
12"/DN300	3.00	12.50

WEIGHT LOADED SET POINT RANGES (PRESSURE OR VACUUM)

Consult factory for settings outside of STANDARD RANGE.

Series	Flange Size	MINIMUM (oz. / in.^{2})		MAXIMUM (oz. / in.^{2})			
		Pressure	Vacuum	Pressure		Vacuum	
		All Materials	All Materials	Aluminum	Other Materials	Aluminum	Other Materials
Series No. 9540 - End-of-Line Pressure/Vacuum Breather Vent							
9542P/V	2"/DN50	2.00	2.00	44.00	48.00	7.50	11.00
9543P/V	3"/DN80	2.00	2.00	45.00	48.00	9.50	11.00
9544P/V	4"/DN100	2.00	2.00	43.00	48.00	5.00	7.40
9546P/V	6"/DN150	2.00	2.00	44.00	48.00	16.00	18.00
9548P/V	8"/DN200	2.00	2.00	48.00	48.00	16.00	18.00
9550P/V	10"/DN250	2.00	2.00	48.00	48.00	16.00	19.00
9552P/V	12"/DN300	2.00	2.00	48.00	48.00	21.00	23.00
Series No. 19540 - Pipe-Away Pressure/Vacuum Breather Vent							
19542P/V2	2"/DN50 x 2"/DN50	2.00	2.00	41.00	46.00	7.50	11.00
19542P/V3	2"/DN50 x 3"/DN80	2.00	2.00	13.00	18.00	7.50	11.00
19543P/V3	3"/DN80 x 3"/DN80	2.00	2.00	32.00	36.00	9.00	11.00
19543P/V4	3"/DN80 x 4"/DN100	2.00	2.00	19.00	23.00	9.00	11.00
19544P/V4	4"/DN100 x 4"/DN100	2.00	2.00	42.00	47.00	5.00	7.40
19544P/V6	4"/DN100 x 6"/DN150	2.00	2.00	28.00	32.00	5.00	7.40
19546P/V6	6"/DN150 x 6"/DN150	2.00	2.00	28.00	32.00	16.00	18.00
19546P/V8	6"/DN150 x 8"/DN200	2.00	2.00	28.00	32.00	16.00	18.00
19548P/V10	8"/DN200 x 10"/DN250	2.00	2.00	23.00	28.00	16.00	18.00
19550P/V12	10"/DN250 x 12"/DN300	2.00	2.00	23.00	28.00	16.00	19.00
19552P/V14	12"DN300 x 14"/DN 350	2.00	2.00	19.00	23.00	21.00	23.00