Valve Concepts
ISO Registered Company

TECHNICAL BULLETIN

3300-TB
10-21

MODEL 3300

END-OF-LINE VACUUM RELIEF VENT

MODEL 3300

OVERVIEW

The Model 3300 vacuum relief vent is intended for use on storage tanks, vapor recovery systems and process systems where vacuum relief is required.

SPECIAL FEATURES

Modular Design: The Model 3300 end-of-line conservation breather vent is part of Valve Concepts modular vent product line. The Model 3300 can easily be field converted to an end-of-line pressure/vacuum relief vent with the addition of weather hood components or an in-line pressure/vacuum relief with the addition of pipe away body components.

Maintains Accurate Settings: Minimum setting available is approximately 0.25 oz/in^2 and maximum setting upwards to 2.5 psig. See Set Point Limits Tables 4(a) and 4(b). If higher settings are required, see Valve Concets Series 4000 Spring Loaded Vents. All vents are tested to Valve Concepts high standards for both seat leakage and set point prior to shipment. A certified test certificate is included with each vent verifying the accuracy of vacuum setting and seat leakage. Seat leakage rates meet or exced current editions of API Standard 2000.

Condensate Drainage: Self-draining body and specially designed seat ring keeps condensate away from seating surfaces, preventing freezing, binding, and clogging.

Air-Cushioned Seating: Air-cushion seating provides tight sealing to reduce evaporation losses and the release of toxic vapors. The pallets have outer guiding and center stabilizing stem to provide self alignment and tight seating.

Sizes-Connections: Available in line sizes 2" (DN50) through 12" (DN300). Carbon steel and stainless steel vents have raised face tank connection flange. All other vent materials come standard with flat face flanges. Standard flanged bolt patterns are available to mate with ASME 150, PN16, or PN10 flanged connections.

*Derakane 470 and Hetron 800 are registered trademarks of Ashland, inc.

TECHNIQUE

Weight loaded pallets in the vent housing allow the intake of air and the escape of vapors as the tank breathes due to thermal changes and product movement out of the tank. The pallet opens and closes to permit in breathing necessary to maintain tank pressure and prevent tank damage due to excessive vacuum.

LINE SIZES AVAILABLE

2" (DN50), 3" (DN80), 4" (DN100), 6" (DN150), 8" (DN200), 10" (DN250), 12" (DN300)

END CONNECTIONS

FLANGED

COMMON APPLICATIONS

STORAGE TANKS, VAPOR RECOVERY SYSTEMS, PROCESS SYSTEMS WHERE VACUUM RELIEF IS REQUIRED

DESIGN PRESSURE

MULTIPLE SET VACUUM RANGES AVAILABLE

CONSTRUCTION

Housing Material: Available in aluminum, carbon steel, 316 stainless steel or corrosion resistance fiberglass reinforced plastic (FRP) with Derakane 470* or Hetron 800* resins.

Seat Rings: Replaceable metal seat rings available in aluminum or 316 stainless steel. FRP vents have integral seats that match the body resin material.

Pallets Assemblies: Replaceable 316 stainless steel pallet assemblies are standard for metal vents. Pallet assemblies lower than 0.5 oz/in^2 may contain a polycarbonate pallet material. Replaceable FRP pallet assemblies match the body resin material.

Pallet Diaphragms: Standard seal material is FEP. Also available in FKM, EPDM, and BUNA-N.

STANDARD/GENERAL SPECIFICATIONS

Gaskets: Expanded PTFE for FEP seal materials. Gasket materials match the seal materials for BUNA-N, EPDM, and FKM.

Vacuum Protection Screen: Replaceable 4x4 welded mesh screen in 304 stainless steel to prevent obstructions to vacuum relief flow path. FRP vents use polyethylene mesh material.

Set Point Accuracy: Vacuum setpoints are calibrated to be within +/-2% of customer requested setting across the range of available settings. Exceeds API Bulletin 2521.

Seat Leakage: Meets or exceeds current edition of API Standard 2000.

Calibration Certificate: Calibration certificates are issued standard with every line item demonstrating acceptable set point accuracy and seat leakage rates.

Painting: All carbon steel surfaces are epoxy coated VCI blue per Cashco specification S-1777. Flange mating surfaces, threaded holes, and corrosion resistant parts are excluded. Non-coated surfaces have lubricant applied for corrosion prevention.

Flange Studs: 304 stainless steel studs supplied for threaded holes in connection flange. UNC threaded studs are supplied for Class 150 threaded holes. Metric studs are supplied for PN10 and PN16 threaded holes. Flange bolting is not supplied for remaining thru holes in connection flange or with FRP body materials.

OPTION SPECIFICATIONS

Vacuum Flame Screen: Replaceable 30x30 mesh screen in 304 stainless steel. Used to help prevent ignition of internal vapors through the vacuum relief port.This option replaces the standard vacuum protection screen.

Sizing Report: Formal report documenting tank inbreathing requirements and vent performance per customer application. Displacement flow requirements and vent performance are in accordance with the current edition of API Standard 2000.

NACE MR0175: Internal wetted portions meet NACE standard MR0175 when exterior of the vent is not directly exposed to a sour gas environment, buried, insulated, or otherwise denied direct atmospheric exposure. For use with carbon steel or 316 stainless steel body materials only.

Oxygen Cleaning: All components oxygen cleaned, bagged, and tagged in accordance to Cashco specification S-1134. Must select 316 stainless steel body materials and stainless steel loading weights.

ATEX 2014/34/EU: Declaration of Conformity and appropriate nameplate markings available. Must be requested at time of order. See Model 3300 IOM for more details.

PED 2014/68/EU: Sound Engineering Practice (SEP) certificate available for pressures up to 0.5 barg. Must be requested at time of order.

50 PSIG (3.4 Barg) Back Pressure: Special design configuration where higher tank pressures above 2 psig (0.13 Barg) may cause damage to normal trim. Includes heavy duty pressure and vacuum covers, pallet, and special seat ring for use with o-ring seals in place of diaphragms. Pnuematically tested per Cashco specification S-1812 in addition to normal function testing and calibration. See TABLES 4(c) and 4(d) for min/max range of vacuum set points. Not available with aluminum or FRP body construction.

TABLE 1 - MATERIALS OF CONSTRUCTION					
COMPONENT MATERIALS	BODY MATERIALS				
	ALUM	CS	316 SST	DERAKANE 470	HETRON 800
BODY COVERS	ALUM	CS	316 SST	DERAKANE 470	HETRON 800
SEAT RINGS	ALUM, 316 SST	316 SST	316 SST	DERAKANE 470	HETRON 800
PALLET ASSEMBLIES	PC[1], 316 SST	PC[1], 316 SST	PC[1], 316 SST	DERAKANE 470	HETRON 800
VACUUM PALLET GUIDES	316 SST	316 SST	316 SST	DERAKANE 470	HETRON 800
FLANGE STUDS	304 SST	304 SST	304 SST	N/A	N/A
FASTENERS	316 SST	316 SST	316 SST	316 SST, ALLOY C276	316 SST, ALLOY C276
PALLET WEIGHTS	CS[2], SST	CS[2], SST	CS[2], SST	DERAKANE 470[3]	HETRON 800[3]
SCREENS	304 SST	304 SST	304 SST	POLYETHYLENE	POLYETHYLENE

1 - Polycarbonate pallet material may be used for settings less than 0.5 oz/in^2. All other parts are 316 SST.
2 - Carbon steel pallet weights are epoxy coated per Cashco specification S-1777.
3 - FRP encapsulated carbon steel utilizes same resin as body.

TABLE 2 - PRESSURE/TEMPERATURE RATINGS				
BODY MATERIAL	MAWP		Temperature	
	PSI	(BAR)	°F	(°C)
Aluminum	15	(1)	-325/+250	(-198/+121)
Carbon Steel [2]	15/50	(1/3.4)	-20/+400	(-28/+204)
316 Stainless Steel [2]	15/50	(1/3.4)	-325/+400	(-198/+204)
Derakane 470 [1]	2	(0.14)	N/A	
Hetron 800 [1]	2	(0.14)	N/A	

[1] Temperature limits vary based on resin material, media, concentration, and storage temperature. Consult factory for more information.
[2] MAWP determined by standard or 50 PSIG Back Pressure configurations.

TABLE 3(a) - DIAPHRAGM TEMPERATURE LIMITS		
Material	°F	(°C)
FEP	-400/+400	(-240/+204)
BUNA-N	-40/+250	(-40/+121)
EPDM	-40/+225	(-40/+107)
FKM	-20/+400	(-28/+204)

TABLE 3(b) - O-RING TEMPERATURE LIMITS (50 PSI BACK PRESSURE OPTION)		
Material	°F	(°C)
FEP ENCAPSULATED FKM	-15/+400	(-26/+204)
BUNA-N	-20/+250	(-28/+121)
EPDM	-70/+250	(-56/+121)
FKM	0/+400	(-17/+204)

TABLE 4(a) - SET POINT LIMITS (oz/in²)				
Size (NPS)	Metallic Vents		FRP Vents	
	MIN[1]	MAX[2]	MIN	MAX
2"	0.27	34.5	0.5	8
3"	0.22	36.6	0.5	8
4"	0.18	38.2	0.5	8
6"	0.25	32.9	0.5	8
8"	0.25	39.2	0.5	8
10"	0.23	32.5	0.5	8
12"	0.23	36.3	0.5	8

TABLE 4(b) - SET POINT LIMITS (mBar)				
Size (DIN)	Metallic Vents		FRP Vents	
	MIN[1]	MAX[2]	MIN	MAX
DN50	1.2	149	2	34
DN80	0.9	158	2	34
DN100	0.8	165	2	34
DN150	1.1	142	2	34
DN200	1.1	169	2	34
DN250	1.0	140	2	34
DN300	1.0	156	2	34

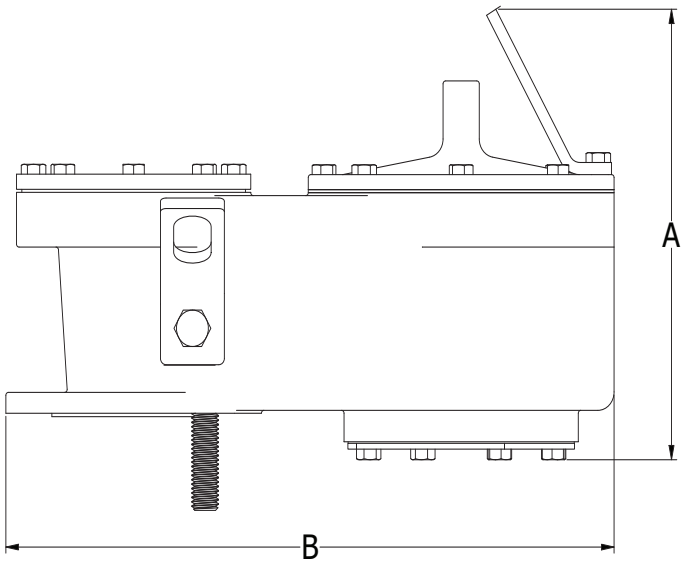
TABLE 4(c) - SET POINT LIMITS (oz/in²) 50 PSIG BACK PRESSURE OPTION		
Size (NPS)	MIN	MAX [2]
2"	1.7	34.5
3"	1.6	36.6
4"	2.1	38.2
6"	2.0	32.9
8"	1.9	39.2
10"	2.6	32.5
12"	3.9	36.3

TABLE 4(d) - SET POINT LIMITS (mBar) 3.4 BARG BACK PRESSURE OPTION		
Size (NPS)	MIN	MAX [2]
DN50	7.3	149
DN80	6.9	158
DN100	9.0	165
DN150	8.6	142
DN200	8.2	169
DN250	11.2	140
DN300	16.8	156

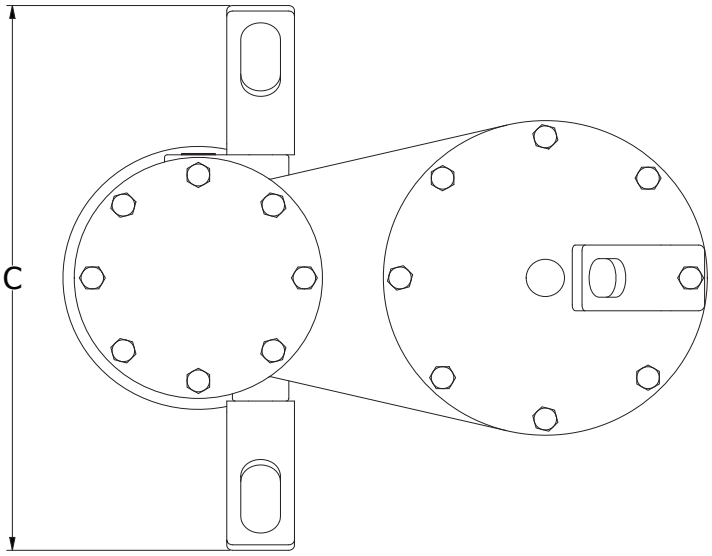
NOTES:

1) MIN set points may utilize polycarbonate pallet material at factory discretion.
2) MAX set points may utilize extended covers at factory discretion.

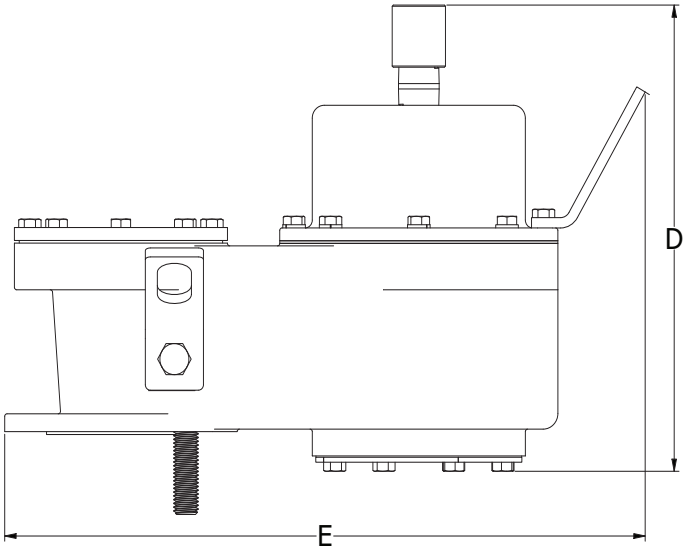
DIMENSIONS
Aluminum, Carbon Steel & Stainless Steel Body



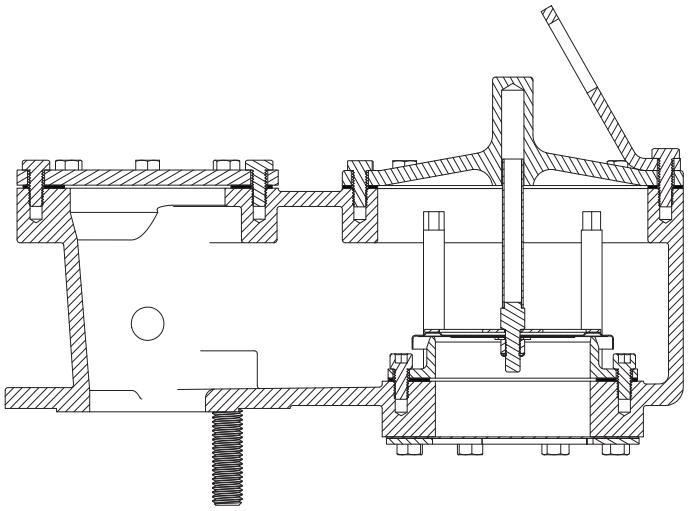
Standard Configuration - Front View



Standard Configuration - Top View



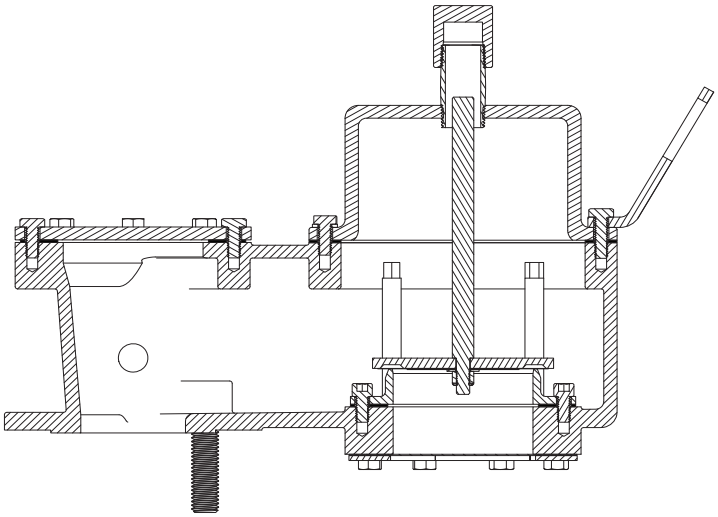
Extended Configuration



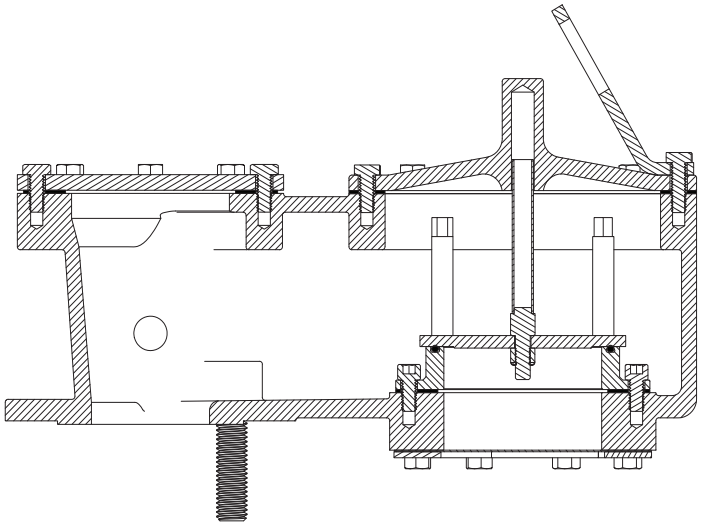
Standard Configuration - Section View

DIMENSIONS CONT.

Aluminum, Carbon Steel & Stainless Steel Body



Extended Cover - Section View

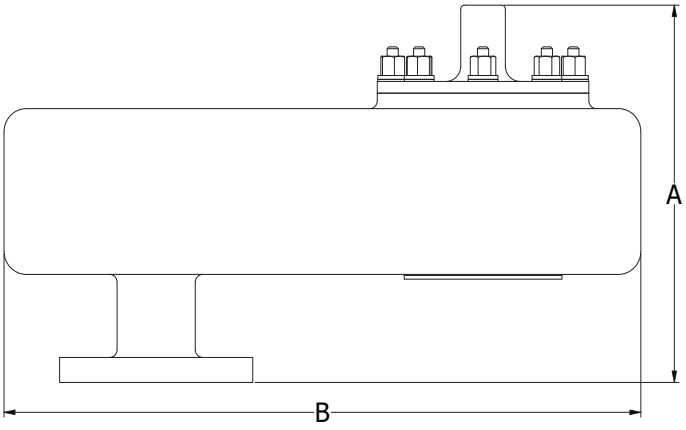


50 PSIG Back Pressure - Section View

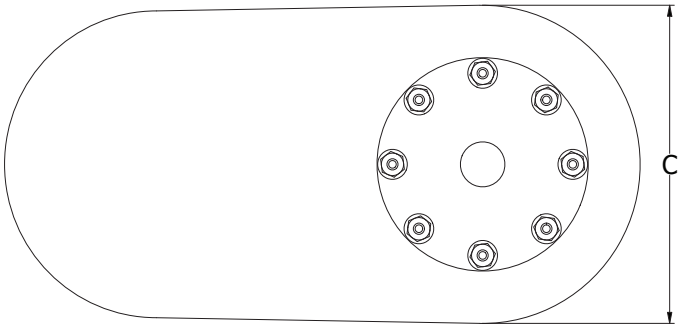
Aluminum, Carbon Steel & Stainless Steel Body									
SIZE (NPS)	DIMENSIONS (in.)					WEIGHT* (lbs)			
						STANDARD COVER		EXTENDED COVER	
	A	B	C	D	E	ALUM	CS/SST	ALUM	CS/SST
2"	9 1/4	14 1/4	12 7/16	11 1/4	16 9/16	14	42	16	47
3"	10 1/4	16 1/16	14 1/16	13 1/8	18 3/8	20	57	21	60
4"	11 1/8	20 7/8	16 1/4	14 1/4	23	30	87	33	97
6"	13 11/16	24 9/16	16 13/16	13 3/8	24 13/16	42	122	48	141
8"	16 1/4	30 1/4	24 5/8	19 11/16	30 1/4	63	185	74	215
10"	18	35 9/16	25 7/16	22 1/2	35 9/16	86	250	101	294
12"	21 3/16	40 3/16	28 1/2	26 9/16	40 3/16	126	368	149	436

Aluminum, Carbon Steel & Stainless Steel Body									
SIZE (DIN)	DIMENSIONS (mm)					WEIGHT* (kg)			
						STANDARD COVER		EXTENDED COVER	
	A	B	C	D	E	ALUM	CS/SST	ALUM	CS/SST
DN50	235	362	316	286	421	7	19	7	21
DN80	260	408	357	333	467	9	26	9	27
DN100	283	530	413	362	584	14	39	15	44
DN150	348	624	427	340	630	19	55	22	64
DN200	413	768	625	500	768	29	84	33	98
DN250	457	903	646	572	903	39	113	46	133
DN300	538	1021	724	675	1021	57	167	68	198

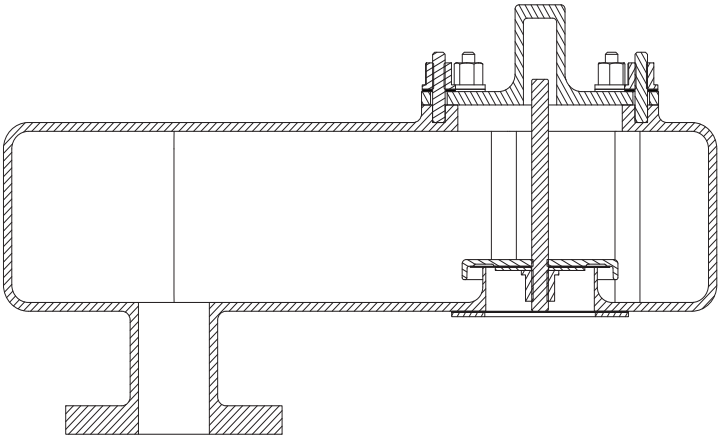
DIMENSIONS
Corrosion Resistant Fiberglass (FRP) Body



Standard Configuration - Front View



Standard Configuration - Top View



FRP - Section View

FRP Construction				
SIZE (NPS)	DIMENSIONS (in.)			WEIGHT* (lbs)
	A	B	C	
2"	12 1/4	21 7/16	10 5/8	17
3"	12 1/4	21 7/16	10 5/8	18
4"	14 3/8	29 5/8	14 1/4	30
6"	15	29 1/8	14 1/4	33
8"	18	39 1/2	19	57
10"	18 3/8	39 1/2	19	61
12"	19 11/16	42 7/8	20	72
SIZE (DIN)	DIMENSIONS (mm)			WEIGHT* (kgs)
	A	B	C	
DN50	311	545	270	8
DN80	311	545	270	8
DN100	365	752	362	14
DN150	381	740	362	15
DN200	457	1003	483	26
DN250	467	1003	483	28
DN300	500	1089	508	33

* Estimated weight based on minimum set points. Weight will increase with higher set points and packaging.

3300 Series PRODUCT CODE 10/01/21

3 3	POS 3	POS 4	POS 5	C	POS 7	0	POS 9	POS 10	POS 11	POS 12	0	0	0	0	0	0

POSITION 3 - FLANGE CONNECTION		
STANDARD CONFIGURATION	ASME 150	A
	PN16	B
	PN10	C
50 PSIG (3.4 BARG) BACK PRESSURE CONFIGURATION	ASME 150	D
	PN16	E
	PN10	F

POSITION 4 - FLANGE SIZE	
INCH (DIN)	CODE
2" (DN50)	2
3" (DN80)	3
4" (DN100)	4
6" (DN150)	6
8" (DN200)	8
10" (DN250)	A
12" (DN300)	B

POSITION 5 - BODY/SEAT RING MATERIAL		
BODY MATERIAL	SEAT MATERIAL	CODE
Aluminum	Aluminum	1
Aluminum	316 Stainless Steel	4
Carbon Steel	316 Stainless Steel	5
316 Stainless Steel	316 Stainless Steel	6
Derakane 470 w/ SST Studs	Derakane 470	D
Derakane 470 w/ Hast C Studs	Derakane 470	E
Hetron 800 w/ SST Studs	Hetron 800	F
Hetron 800 w/ Hast C Studs	Hetron 800	G

POSITION 7 - SEAL MATERIAL	
FEP (Std)	A
BUNA-N	B
EPDM	D
FKM	F

POSITION 9 - VACUUM PALLET CONFIGURATION		
Set Point Range		CODE
oz/in²	mBar	
MIN - 0.49	MIN - 2.11	1
0.50 - 0.74	2.12 - 3.19	2
0.75 - 7.99	3.20 - 34.4	3
8.00 - MAX	34.5 - MAX	4
See Table 4 for MIN and MAX vacuum set points.		

POSITION 10 - WEIGHT MATERIAL	
Epoxy Coated Carbon Steel	0
Stainless Steel	S
FRP Encapsulated Steel	E

POSITION 11 - VACUUM SCREEN	
Standard Screen	0
Flame Screen	F

POSITION 12 - CLEANING METHOD	
Standard Cleaning	0
Oxygen Cleaning	M

*** For information on ATEX see pages 12 & 13 on the IOM.**

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