Shand & Jurs Co.

A COGNESENSE BRAND

94645

Pilot Operated Relief Valve (Vacuum Diaphragm Pilot)

The Shand & Jurs® Model 94645 Pilot Operated Relief Valve is designed for storage tanks intentionally operated near a controlled vacuum setpoint, such as blanketed, vapor-managed, or pump-out systems. These installations require vacuum relief to restore pressure predictably, prevent structural stress, and maintain stable tank conditions.

A diaphragm pilot senses tank vacuum and remains sealed until the setpoint is reached, then vents loading pressure from the main valve chamber to fully open the primary seat. As internal pressure recovers, loading pressure is restored, and the valve reseats tightly. Because the main seat remains closed during normal operation, the valve responds only when required and returns the tank to a stable pressure condition with minimal blowdown.

This controlled vacuum response stabilizes tank operation while reducing routine air ingress and vapor release. Relief capacity is determined in accordance with API 2000.



Key Features

Diaphragm sensing pilot

The pilot senses tank vacuum directly and keeps the main valve closed until the defined vacuum setpoint is reached, preventing premature air entry.

Pressure-loaded main seat

The main valve remains tightly closed during normal breathing conditions, so routine pressure changes do not cause unnecessary opening.

Pilot chamber venting

When the vacuum reaches the setpoint, the loading pressure is removed from the main valve chamber, allowing rapid full-lift opening.

Automatic reseating

As tank pressure recovers, loading pressure is restored to reseat the valve promptly and prevent extended inflow.

External adjustment

The pilot setpoint and blowdown can be tuned to match the operating pressure band required by the tank system.

Backflow prevention

The valve remains closed under positive tank pressure conditions, preventing unintended vapor discharge paths.

Benefits

OPENING ONLY AT A DEFINED VACUUM

Maintains predictable tank pressure during pump-out and prevents unnecessary air ingress.

IMMEDIATE FULL-LIFT RESPONSE

Protects the tank from deformation during rapid liquid withdrawal events.

TIGHT RESEAL AFTER RELIEF.

Reduces oxygen entry that can accelerate product degradation or corrosion.

BUBBLE-TIGHT SEALING

Prevents routine air ingress between vacuum events.

CONTROLLED AIRFLOW PATH

Prevents nuisance operation caused by transient pressure fluctuations.

MINIMAL ROUTINE LEAKAGE

Translates into thousands of dollars in annual product retention per tank, depending on volatility and operating conditions.

Available Options

Backflow preventer

Ensures the valve remains closed under positive tank pressure.

External blowdown adjustment

Allows field tuning of the operating pressure band between 5% and 20%.

Stainless steel construction

Provides corrosion resistance for aggressive vapor environments.

Elastomer diaphragm selections

Allows compatibility with specific stored products.

ATEX

Supports installation in classified hazardous areas.

Field test connection

Allows set pressure verification without removing the valve from service.

Key Performance Data

Parameter	Value
Device Type	Pilot-operated vacuum relief valve.
Pilot Type	Diaphragm sensing
Valve Sizes	2”×3”, 3”×4”, 4”×6”, 6”×8”, 8”×10”, 10”×12”, 12”×16”
Vacuum Setting Range	−0.11 psig to −5.0 psig (discrete ranges available)
Temperature Range	−40°F (−40°C) to +400°F (+204°C). Material and diaphragm dependent- specify at time of order.
Blowdown	5–20% (adjustable)
Operation	Snap-action full lift
Mounting	Tank nozzle
Flange Connection	ANSI 150
Body Materials	Aluminum, Carbon Steel, or 316 Stainless Steel
Diaphragm Materials	FEP, FKM, NBR
Pressure Protection	Backflow capable
Service	Vapor/gas vacuum relief
Sizing Basis	API 2000

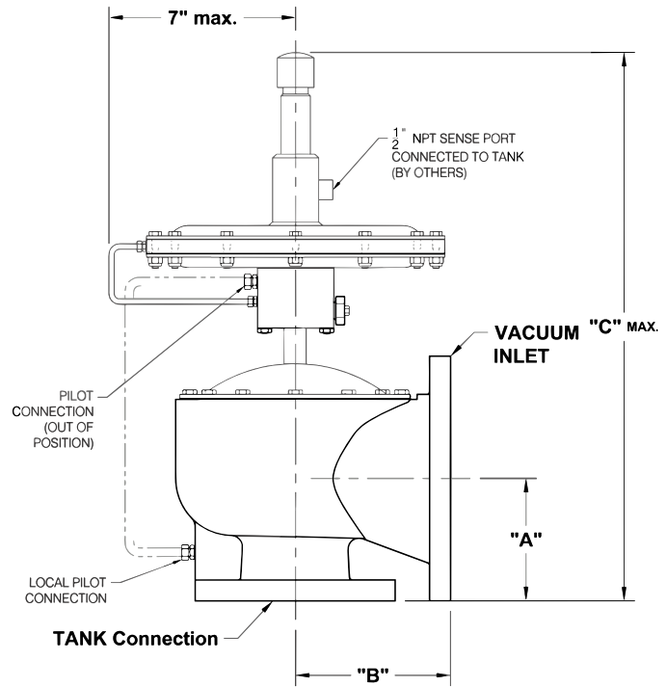
Flow Capacities (SCFM Vacuum, 60°F)

Inlet Size / Vacuum	2”	3”	4”	6”	8”	10”	12”
.11 psig	77	174	295	660	1228	1721	2835
.18 psig	99	223	378	845	1573	2204	3630
.36 psig	140	316	536	1199	2231	3126	5148
.54 psig	172	388	658	1472	2740	3838	6322
1.0 psig	236	532	901	2017	3753	5259	8662
5.0 psig	555	1251	2120	4743	8827	12368	20371

Valve Size

Valve Size	Approximate Dimensions in Inches				
	A	B	C	Weight (Al.)	SS/STL
2” x 3”	3.75	5.0	21.0	24 lbs.	81 lbs.
3” x 4”	4.5	5.8	22.5	28 lbs.	105 lbs.
4” x 6”	5.5	7.0	25.0	38 lbs.	147 lbs.
6” x 8”	6.75	9.3	28.0	63 lbs.	228 lbs.
8” x 10”	8.0	11.0	30.0	90 lbs.	315 lbs.
10” x 12”	9.5	12.5	33.0	123 lbs.	426 lbs.
12” x 16”	11.75	14.25	40.0	200 lbs.	600 lbs.

Dimensions



Model Number Selection

The model number will consist of a base number 94645 followed by 8 digit numbers. These digits will represent 6 option tables.

94645 - A - B - CD - E - F - G - H

Ordering Information

Specify:

1. Model 94645 Pilot Operated Vacuum Relief Valve
2. Body Material
3. Valve and Inlet Size
4. Seal Material and Set Point
5. Accessories
6. CE for Ordinary EU Locations use Table F1
7. ATEX Certification for II 1 G Ex h IIB T1...T6 Ga EU Locations

Table A - Material & Flange

Option A	Material
0	Aluminum 150lb. ANSI-FF
1	Carbon Steel ANSI-FF
2	Carbon Steel ANSI-RF
3	316SS ANSI-FF
4	316SS ANSI-RF

Table B - Valve Size

Option B	(Inlet, X Outlet)
2	2 x 3
3	3 x 4
4	4 x 6
5	6 x 8
6	8 x 10
7	10 x 12
8	12 x 16

Table CD - Pressure Setting Ranges

Option CD	01	02	03	04	05	06	07	08	09
Range From	0.11	.25	.35	.5	.75	1.0	2.0	2.5	4.0
Range To	.25	.35	.5	.75	1.0	2.0	2.5	4.0	5.0

ATEX Models Limited to Table CD Options 01-09

Table E - Valve Size

Option E	Material
2	2” Valve
3	3” Valve
4	4” Valve
5	6” Valve
6	8” Valve
7	10” Valve
8	12” Valve

Table F - Main Body Diaphragm

Option F	Material
A	FEP
B	FKM
C	NBR

Table G - Certification

Option G	Description
0	Standard
1	ATEX

Table H - Accessories

Option H	Description
0	None
1	Backflow Preventer (BP) & Vacuum Preventer (VP)

Summary

The 94645 is chosen when controlling tank vacuum is necessary rather than simply breaking it. Its pilot-operated design reliably restores pressure, safeguards the structure during pump-out, and reduces routine air ingress and emissions in regulated storage service.

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This document is for information purposes only. All designs subject to change. Certified dimensions, specifications, and performance data available upon request