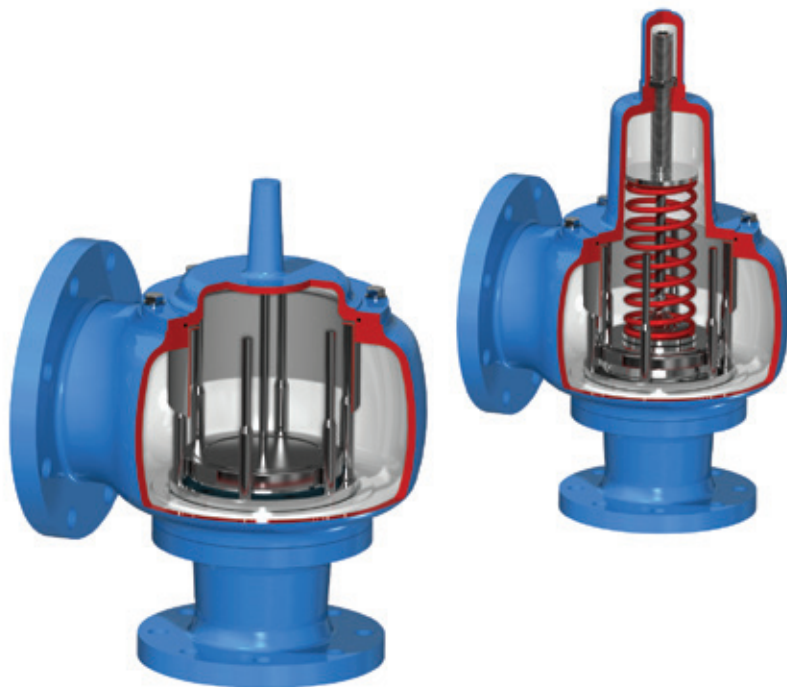




ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

High capacity weight or spring loaded pressure relief valves that pipe away to a closed header system. Designed to work closer to a tank's MAWP, increasing productivity, reducing emissions and product evaporation



FEATURES

- Increased flow capacities reduce the required valve size and the corresponding connections and piping costs.
- Fully open at 10% overpressure, enabling setting close to MAWP and minimizing tank emissions.
- Large body for increased capacity providing high flow performance for full conformance to API2000/ISO28300.
- Leakage rate of 0.5 scfh (0.015 Nm³ /hr) or less at 90% of setpoint.
- Weight or spring loaded models available.
- Choice of body materials.
- Modular design enables all components to be removed and replaced in-situ for quicker, simpler maintenance.
- Optional 'all-weather' coating prevents frozen condensate build-up and sticking of vital components in cold weather applications.

GENERAL APPLICATION

Type 4142 valves allow tanks to work closer to their MAWP thus increasing productivity, reducing emissions and product evaporation. Increased flow capacities reduce the valve's size, corresponding connections and piping costs in applications for storage tank farms, oil and gas production, the petroleum, pharmaceutical and chemical sectors.

TECHNICAL DATA

Materials:	Aluminum, carbon steel, stainless steel
Sizes:	2" x 3" to 12" x 14" (DN 50 x 80 to DN 300 x 350)
Pressure settings	
Weight loaded:	up to 1.5 psig (100 mbarg)
Spring loaded:	up to 15 psig (1 barg)
Certification:	ATEX 94/9 EC

ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

MODELS OVERVIEW

Type 4142 valves are high capacity, full lift pressure relief valves designed for use on atmospheric and low pressure storage tanks. Their primary function is to protect the tank from physical damage or permanent deformation caused by increases in internal pressure encountered in normal operations. On smaller tanks, the valves may also provide sufficient flow capacity for emergency venting.

The valves are fully open at 10% overpressure allowing the user to have a quicker acting valve that can be set closer to the tank's maximum allowable working pressure, reducing emission losses.

There are two pipe-away model variants:

Model 4142HF offers weight-loaded pressure relief.

Model 4142HFP, spring-loaded pressure relief.

APPLICATION

By controlling tank venting, Type 4142 pressure relief valves not only minimize emissions to the environment but also the loss of product to evaporation. When combined with a well-designed vapor recovery system, the loss can be cut to essentially zero. Their 'air-cushion' seating design keeps the valve sealed tightly until the pressure inside the tank approaches the valve setting.

They offer the option of a non-frosting and icing-resistant coating on the pallet perimeter, stem, guide posts seats which, along with the flexible PTFE seat insert, provides additional protection against pallets freezing closed.

TESTING

Each valve is tested for proper setting, for a leakage rate of less than 0.5 scfh (0.015 Nm³/hr) of air at 90% of the set point and for leak tightness at 75% of set point as required in API standard 2000.

SPECIFICATIONS

Available materials

- Aluminum with aluminum or stainless steel trim
- Carbon steel with stainless steel trim
- Stainless steel with stainless steel trim
- Special materials on application

Sizes, inches (DN)

- 2" x 3" (50 x 80)
- 3" x 4" (80 x 100)
- 4" x 6" (100 x 150)
- 6" x 8" (150 x 200)
- 8" x 10" (200 x 250)
- 10" x 12" (250 x 300)
- 12" x 14" (300 x 350)

Flanged connections –standard flange drilling

Aluminum body

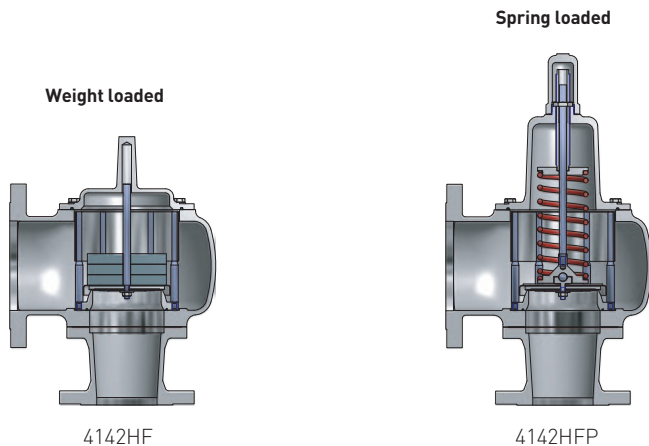
- Drilled to ANSI Class 150 dimensions (flat face)
- Drilled to DIN 2633 [PN 16] dimensions (flat face)

CS and SS body

- Drilled to ANSI Class 150 dimensions (raised or flat face)
- Drilled to Imperial DIN 2633 [PN 16] dimensions (raised or flat face)

Options

- PTFE coated trim to minimize ice build-up
- Stainless steel weights
- Steam jackets
- Proximity sensors to monitor valve opening and closing

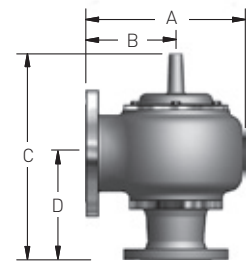


ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

DIMENSIONS (mm)

4142HF

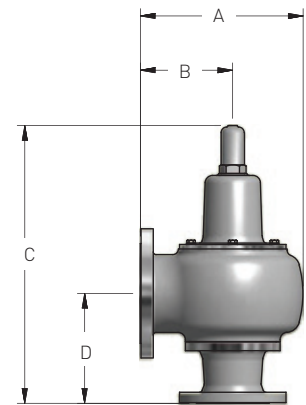
Size		A	B	C	D
Inches	DN				
2	50	253	153	329	156
3	80	323	193	392	190
4	100	352	200	458	238
6	150	435	245	592	298
8	200	592	330	742	371
10	250	730	410	854	422
12	300	854	480	961	465



4142HF

4142HFP

Size		A	B	C	D
Inches	DN				
2	50	253	153	452	156
3	80	323	193	518	190
4	100	352	200	601	238
6	150	435	245	832	298
8	200	592	330	1073	371
10	250	730	410	1298	422
12	300	854	480	1501	465



4142HFP

ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

SIZING

API 2000 - valve sizing (air)

Once the required air venting rates have been determined using data from the following pages or supplied by the customer, a calculation should be conducted to determine the required valve discharge area using the formula below. Once this area has been determined, select the first standard valve flow area above this.

Metric units:

$$A = \frac{R F_o}{12515 \times (P_{10} + A_t) \times K_{d_o} \times F_o \sqrt{\frac{K}{M \times T \times Z(K-1)} \left[\left(\frac{P_2 + A_t}{P_{10} + A_t} \right)^{\frac{2}{K}} - \left(\frac{P_2 + A_t}{P_{10} + A_t} \right)^{\frac{K+1}{K}} \right]}}$$

Where:

VR = Air venting requirements	Nm ³ /h Air
A = Required flow area of valve	cm ²
Kd = Coefficient of discharge (see page 7)	
P ₁ = Inlet flowing pressure (Set + over pressure - inlet pressure loss)*	Barg
P ₂ = Outlet pressure (Back pressure)	Barg
K = Ratio of specific heats	Air = 1.4
T = Temperature at valve inlet	273 deg K
M = Molecular weight	Air = 28.97
Z = Compressibility factor	Air = 1.0
A _t = Atmospheric pressure	1.013 bar
F = Over pressure factor (Use 1 for Type 4142 valves)	

* The inlet pressure loss is due to factors such as difficult inlet piping, flame arresters, etc. and must be less than overpressure.

ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

SIZING

TABLE OF FLOW COEFFICIENTS (Kd) - MODEL 4142HF

Size		Flow area (cm ²)	API connection	
Inches	DN		Pressure	
2	50	21.239	0.729	
3	80	46.568	0.729	
4	100	83.322	0.729	
6	150	186.264	0.729	
8	200	326.851	0.629	
10	250	510.702	0.574	
12	300	730.747	0.537	

MINIMUM SET PRESSURES – WEIGHT LOADED

Size		Aluminum			Stainless steel		
Inches	DN	V mbarg	L mbarg	H mbarg	V mbarg	L mbarg	H mbarg
2	50	1.04	2.42	4.87	2.38	5.91	9.70
3	80	0.84	1.74	4.36	1.84	3.98	8.46
4	100	0.90	1.64	4.48	1.93	3.63	8.90
6	150	0.96	1.60	6.33	1.92	3.90	13.37
8	200	1.10	1.30	13.00	2.50	3.80	20.00
10	250	1.10	1.20	14.00	2.50	3.50	22.00
12	300	1.10	1.20	14.00	2.50	3.20	24.00

NOTE

V = very low pressure pallet

L = low pressure pallet

H = high pressure pallet

MINIMUM SET PRESSURES – SPRING LOADED

Size		Aluminum				Stainless steel			
Inches	DN	V mbarg	L mbarg	H mbarg	Spring mbarg	V mbarg	L mbarg	H mbarg	Spring mbarg
2	50	1.04	2.42	4.87	N/A	2.38	5.91	9.70	70
3	80	0.84	1.74	4.36	N/A	1.84	3.98	8.46	70
4	100	0.90	1.64	4.48	N/A	1.93	3.63	8.90	70
6	150	0.96	1.60	6.33	N/A	1.92	3.90	13.37	70
8	200	1.10	1.30	13.00	N/A	2.50	3.80	20.00	70
10	250	1.10	1.20	14.00	N/A	2.50	3.50	22.00	70
12	300	1.10	1.20	14.00	N/A	2.50	3.20	24.00	70

NOTE

V = very low pressure pallet

L = low pressure pallet

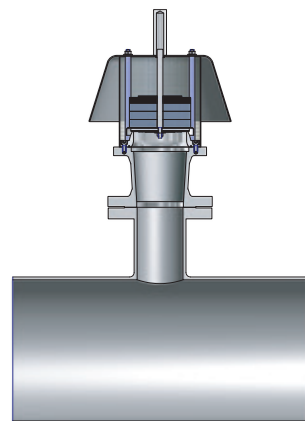
H = high pressure pallet

ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

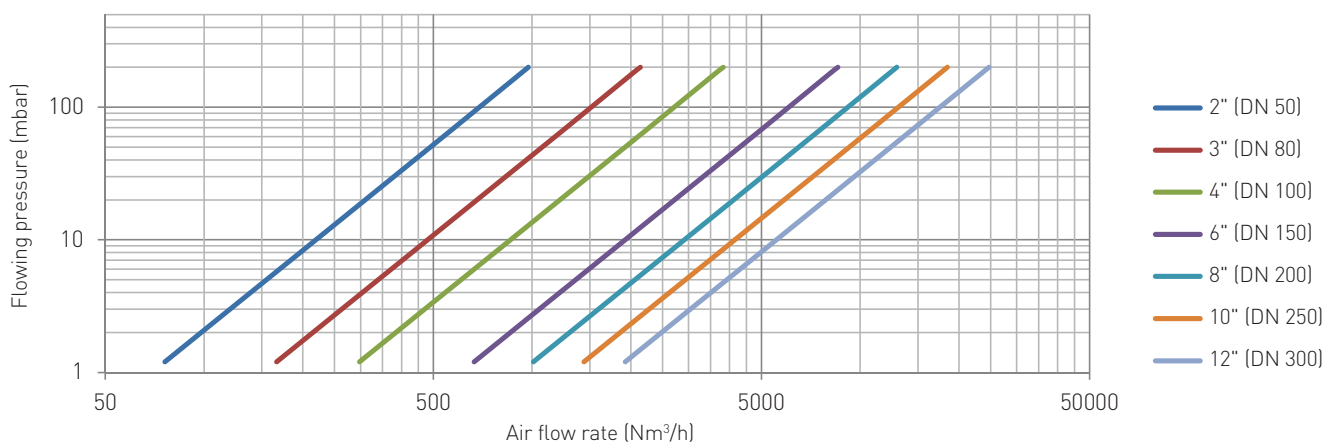
FLOW CAPACITIES

API 2000 connection

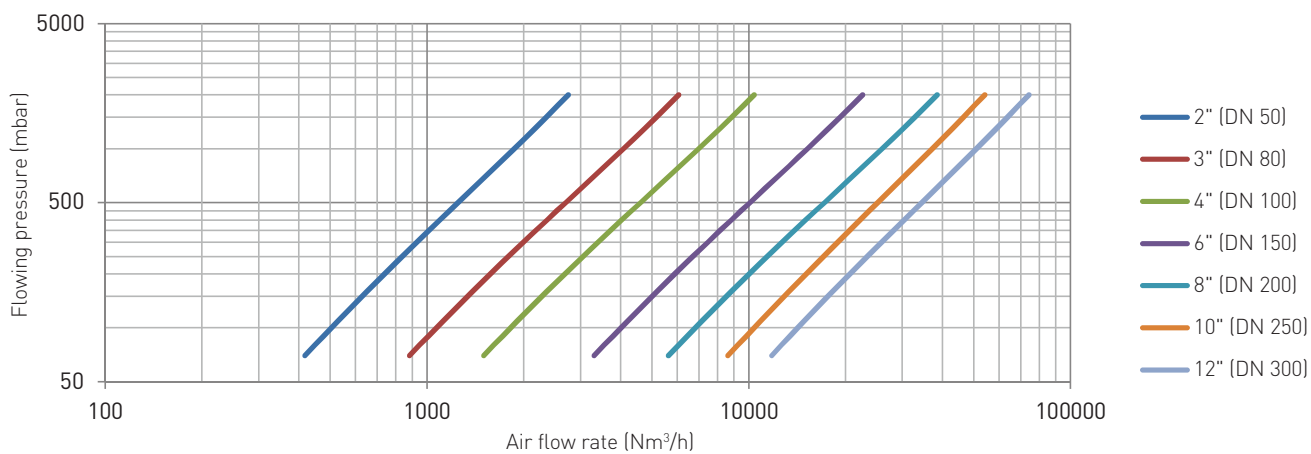
API connection testing requires a square-edge flange connection for capacity publishing. This setup mimics a typical tank connection with its inherent pressure drop/capacity.



4142HF
(ISO/API connection)



4142HFP
(ISO/API connection)

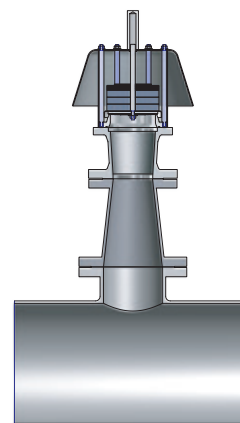


ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

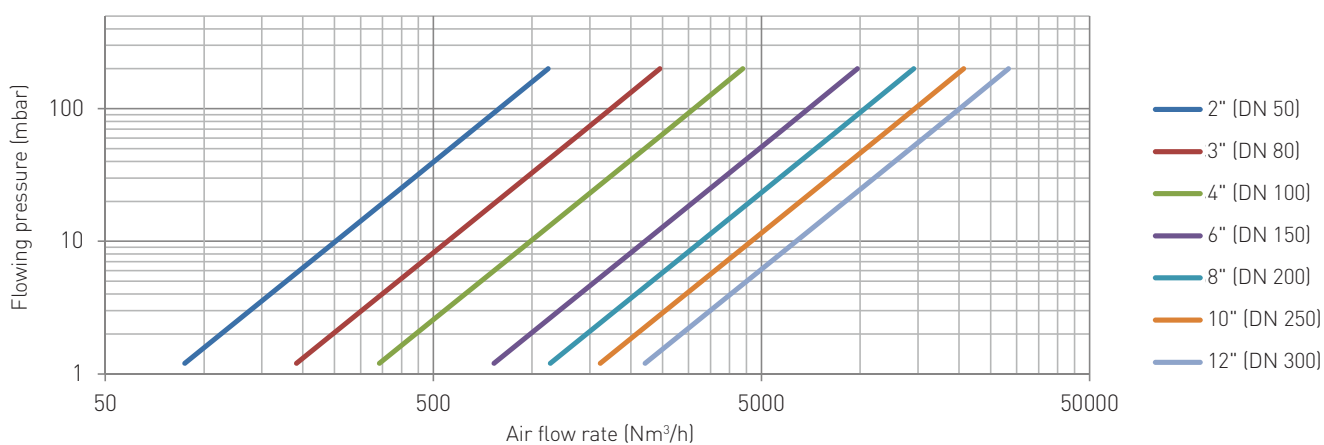
FLOW CAPACITIES

Conical reducer

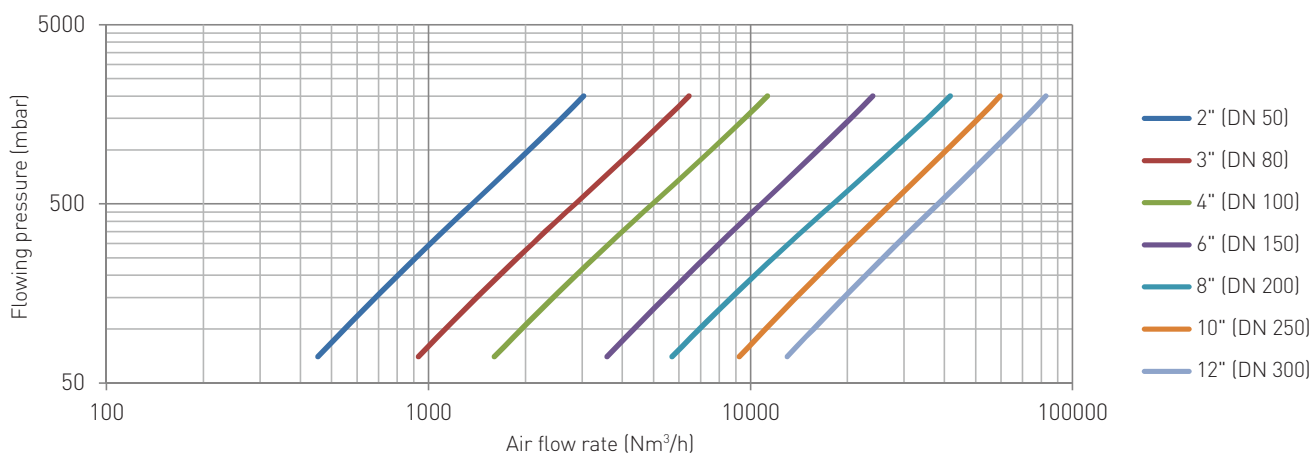
A conical reducer reduces the flow losses associated with the tank connection, providing the more accurate representation of pure valve performance. With this capacity, users can calculate their own tank connection losses and apply it to the valve flow.



4142HF
(Conical reducer)



4142HFP
(Conical reducer)



ANDERSON GREENWOOD TYPE 4142 PIPED AWAY PRESSURE RELIEF VALVES

SELECTION GUIDE

Example:	4142HF	04	H	1	1	S	T	F	F	B	N
Model											
4142HF											
4142HFP											
Tank connection											
02 2" (2" x 3")	04 4" (4" x 6")	08 8" (8" x 10")	12 12" (12" x 14")								
03 3" (3" x 4")	06 6" (6" x 8")	10 10" (10" x 12")									
Pressure load											
V Weight loaded – very low pressure pallet											
L Weight loaded – low pressure pallet											
H Weight loaded – high pressure pallet											
O Not applicable											
Body material											
1 Aluminum											
3 Carbon steel											
5 316 Stainless steel (CF8M)											
7 316L Stainless steel (CF3M)											
Trim (pallet/seat)											
1 AL pallets/AL seat											
2 316SS pallets/316SS seat											
3 316LSS pallets/316LSS seat											
All-weather code											
S Standard, no coating											
W PTFE coated winterization											
Insert											
T Carbon impregnated PTFE (standard for HP pallet)											
B PFA (standard for VLP and LP pallet)											
V FKM											
Flange drilling											
F ANSI 150 for imperial studs											
0 DIN PN10 for metric studs											
6 DIN PN16 for metric studs											
Flange face											
F Flat face											
R Raised face (not available for aluminum bodies)											
Soft Goods											
B Nitrile/NBR (standard)											
T PTFE											
V FKM											
Options											
N None (standard)	S Stainless steel weights	B Proximity switch									
H Purge holes	J Steam jackets										

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