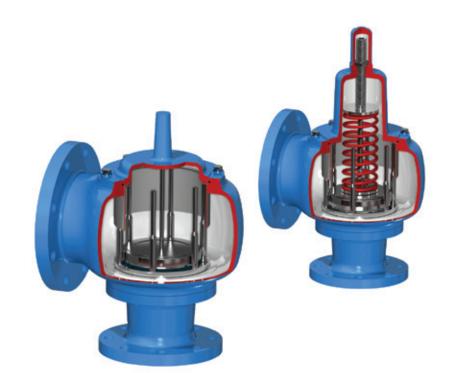


High capacity weight or spring loaded pressure relief valves that pipe away to a closed header system. Designed to work closer to a tank's MAWP, increasing productivity, reducing emissions and product evaporation



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: Spring loaded: Certification:	up to 1.5 psig (100 mbarg) up to 15 psig (1 barg) ATEX 94/9 EC

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 welldesigned 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 $(0.015 \text{ Nm}^3/\text{hr})$ 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

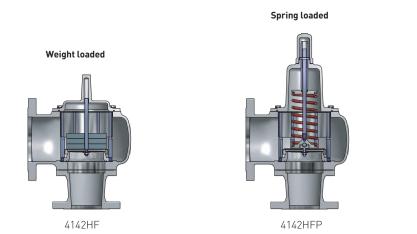
Drilled to ANSI Class 150 dimensions (flat face) Drilled to DIN 2633 [PN 16] dimensions (flat face)

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)

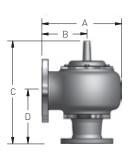
Options

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



DIMENSIONS (mm)

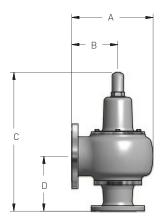
4142HF					
Size					
Inches	DN	Α	В	С	D
2	50	253	153	329	156
3	80	323	193	392	190
4	100	352	200	458	238
6	150	435	245	592	298
8	200	592	330	742	371
10	250	730	410	854	422
12	300	854	480	961	465



4142HF

4142HFP

Size					
Inches	DN	Α	В	С	D
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

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:

Δ =	RFo	
A-	12515 x (P _{1o} + At) x K _{do} x Fo $\sqrt{\frac{K}{MxTxZ(K-T)}}$	$\frac{1}{-1} \left[\left(\frac{P_2 + At}{P_{10} + At} \right) \frac{2}{K} - \left(\frac{P_2 + At}{P_{10} + At} \right) \frac{K+1}{K} \right]$

Where:	
VR = Air venting requirements	Nm³/h Air
A = Required flow area of valve	cm ²
Kd = Coefficient of discharge (see page 7)	
P ₁ = Inlet flowing pressure	Barg
(Set + over pressure – inlet pressure loss)*	
P ₂ = Outlet pressure	Barg
(Back pressure)	
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
At = 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.

SIZING

TABLE OF FLOW COEFFICIENTS (Kd) - MODEL 4142HF

Size		Flow area	API connection	Conical reducer
Inches	DN	(cm²)	Pressure	Pressure
2	50	21.239	0.729	0.864
3	80	46.568	0.729	0.814
4	100	83.322	0.729	0.831
6	150	186.264	0.729	0.768
8	200	326.851	0.629	0.708
10	250	510.702	0.574	0.644
12	300	730.747	0.537	0.617

MINIMUM SET PRESSURES – WEIGHT LOADED

Size		Aluminum							
		v	L	н	v	L	н		
Inches	DN	mbarg	mbarg	mbarg	mbarg	mbarg	mbarg		
2	50	1.04	2.42	4.87	2.38	5.91	9.70		
3	80	V L mbarg mbarg		4.36	1.84	1.84 3.98			
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							
		V	L	Н	Spring	V	L	н	Spring				
Inches	DN	mbarg	mbarg	mbarg	mbarg	mbarg	mbarg	mbarg	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

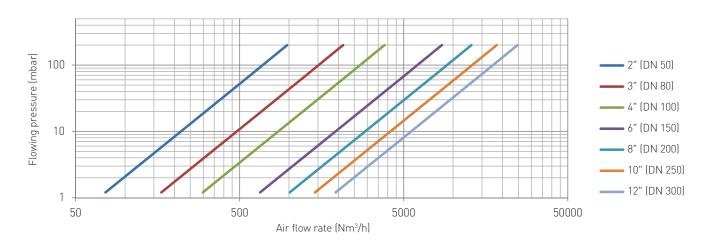
H = high pressure pallet

FLOW CAPACITIES

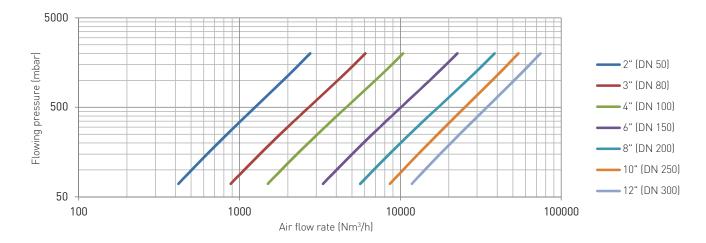
API 2000 connection

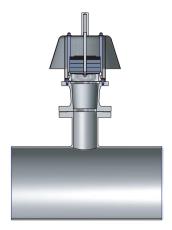
API connection testing requires a square-edge flange connection for capacity publishing. This setup mimics a typical tank connection with its inherent pressure drop/capacity.

4142HF (ISO/API connection)



4142HFP (ISO/API connection)



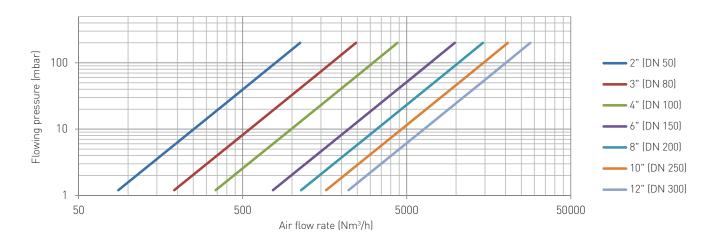


FLOW CAPACITIES

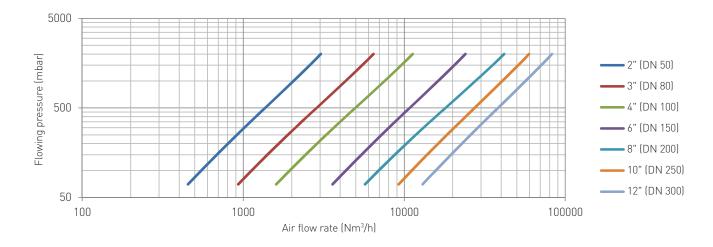
Conical reducer

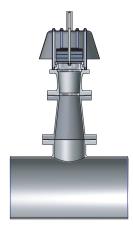
A conical reducer reduces the flow losses associated with the tank connection, providing the more accurate representation of pure valve performance. With this capacity, users can calculate their own tank connection losses and apply it to the valve flow.

4142HF (Conical reducer)



4142HFP (Conical reducer)





xa	mple:									4142HF	04	н	1	1	S	т	F	F	В	
loc	del																			
14	2HF																			
14	2HFP																			
	k connection																			
	2" (2" x 3")		4" (4" x 6")		8" (8" x 10")		12"	[12″ x 14″]												
	3" (3" x 4")	06	6" (6" x 8")	10	10" (10" x 12"															
e	ssure load																			
	Weight loade				-															
	Weight loade																			
	Weight loade		n pressure pal	let																
	Not applicabl	.e																		
od	ly material																			
	Aluminum																			
	Carbon steel																			
	316 Stainless	steel (CF8M)																	
	316L Stainles	s steel	(CF3M)																	
rin	n (pallet/seat)																			
	AL pallets/AL	seat																		
	316SS pallets																			
	316LSS palle	ts/316L	SS seat																	
ll-	weather code																			
	Standard, no	~																		
1	PTFE coated	winteri	zation																	
ise	ert																			
	Carbon impre				HP pallet)															
	PFA (standar	d for VL	.P and LP pall	let)																
	FKM																			
lar	nge drilling																			
	ANSI 150 for	imperia	l studs																	
	DIN PN10 for	metric	studs																	
	DIN PN16 for	metric	studs																	
lar	nge face																			
	Flat face																			
	Raised face (r	not avai	lable for alum	ninum	bodies)															
oft	t Goods																			
	Nitrile/NBR (standaı	-d)																	
	PTFE																			
	FKM																			
pti	ions																			
I.	None (standa	rd)		S	Stainless ste	el weig	hts	В	Pro	oximity switch	h									
	Purge holes			J	Steam jacket	5														

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