

Type HS-IMO2

High Velocity Vent in a patented non-hammering execution

High velocity pressure/vacuum relief vent type HS-IMO2 is the result of more than twentyfive years experience with high velocity vents. It features a purely weight loaded construction designed to take advantage of a "delayed" blow down whereby hammering is eliminated and flame arresting capability ensured. It combines the best of modulating valves and full-lift valves.



*High velocity pressure/vacuum relief vent
type HS-IMO2*

During IMO's test round in 1992 it was concluded that hammering renders high velocity vents unsafe in that flame may pass and cause tank explosion. Type HS-IMO2 provides active protection from fire and explosion regardless of pipe configuration. It operates in freezing conditions without heating arrangements, although this is an option for certain applications. The vent complies with IMO MSC/Circ.677, API-standard 2000 and most recent U.S. leakage rules. Tests have been conducted by the Danish Maritime Administration on each size of each model as required. Effectively, no ship installation will take place unless the specific vent has been tested under conditions identical to those onboard in regard of pipe length/diameter, pressure drop, and flow rate, to establish that the efflux velocity constantly is high enough to prevent the passage of flame. The vent's "delayed" blow-down reduces vapor loss during low filling rates (and due to sloshing) until venting takes place at full rate when vapor loss is less important. The upper sealing arrangement (metal-to-metal and in a self-adjusting special execution) improves leakage by allowing enhanced guidance of moving parts and reduced internal friction. This is of particular interest for high vapor pressure applications.

From a practical point of view, the most interesting feature is the large net clearance through the valve. This eliminates vulnerability to deposits, sod, and condensate. In practice, the valve does not care whether the inside is covered with a thick layer of residue. Not only does this improve safety and maintenance cost, but it also allows the choice of materials to depend on cargo compatibility only. As an example, opting for a stainless steel valve for a crude tanker would not make sense.

- Features of type HS-IMO2
- Complies with latest IMO, VECS and Hydrocarbon emission regulations
- Ideal for zero-emission upgrade
- Only one moving part in each unit
- Automatic self-closing checklifts
- Simple, rigid design and construction
- Available in materials compatible with any cargo. Employs no soft seals
- Protects crew from exposure at all times without manual adjustment
- System design engineering available for IMO MSC/Circ.731, Master's Loading Chart
- Fixed set-point providing practically 100% accuracy
- Available for any pipe configuration
- Lowest possible leakage rates and emission noise
- Lowest possible maintenance requirements (all wearing parts are replaceable)
- Self-draining to tank

Options: See specification

High velocity pressure/ vacuum relief vent

Specifications

Type: HS-IM02
Dimensions: See drawing No. 2374 and 2376
Settings: See certification
Accuracy: ± 1%
Ice layer: 20 mm
Capacities: Up to 16,000 Nm³/hr. See certified curves*
Max. pipe length/pressure drop:** See certification
Efflux velocity: Constantly above 30 m/sec
Self-closing checklifts: Yes (full travel)
Pressure drop in excess of set-pressure: When modulation yes. The pressure drop is less than set-pressure at operational rate.
Valve type: Delayed full-lift valve.
Materials: Cast iron, nodular cast iron, bronze, stainless steel, SMO-trim.
Net clearance: 10-25 mm

Nominal sizes:

ND50-400***

Options:

Ports for flushing, Zero-emission kit, combination with gas-freeing unit GFC/GFB, solid internals, heating jacket, cranking tool, sideways inlet, desiccator, proximity switches, emission control, water restraining device for vacuum unit, drain valve for pipe.

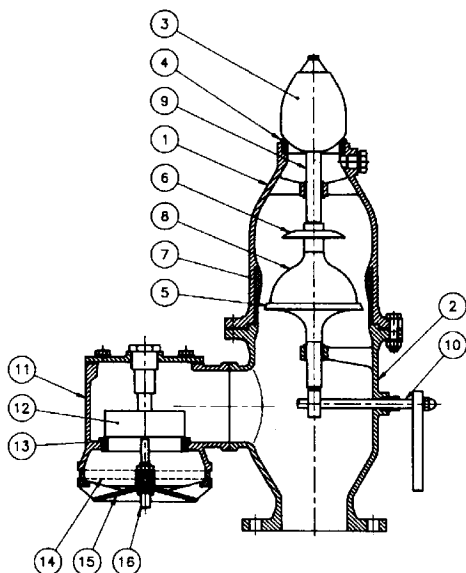
Certification

Certified by the Danish Government's Maritime Administration according to IMO MSC/Circ. 677 for gas groups II A, II B-1, II B-2 and II B-3. Approved for ADNR vessels and by U.S.C.G. for VECs. Complies with emission requirements for Californian waters. Installation to be in accordance with IMO MSC/Circ. 731 and maximum allowable vent pipe lengths approved by the Danish Maritime Administration.

* Because of adjusting the blow down to fit the particular installation, each specific vent has its own flow curve which takes into account the actual pressure drop across the boosting elements. Special curves are available for vents with flushing ports and/or zero-emission kits.

** Maximum safe pipe length to avoid hammering depends on diameter and pressure drop, i.e., flow rate.

***Nominal sizes do not reflect capacity. Ask for specific and certified performance data.



Type HS IM02

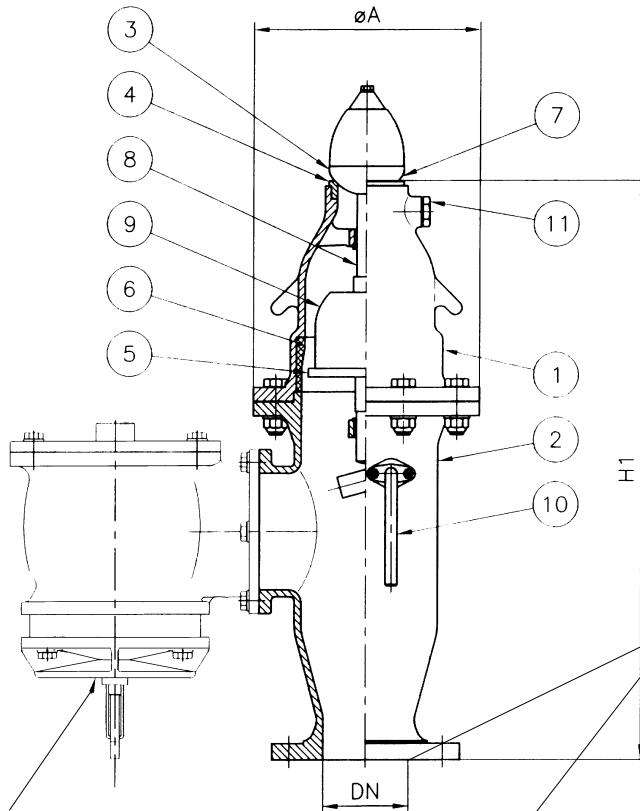
Available with any connection and in any material requested. Please ask for detail drawing and performance data sheets for any specific model and type.

Item	Description
1	House
2	Adapter
3	Pressure disc
4	Pressure seat
5	Booster
6	Booster
7	Sleeve
8	Weight loading
9	Stem
10	Check lift
11	Vacuum house
12	Vacuum disc
13	Vacuum seat
14	Filter element
15	Venting cover
16	Check lift

drwg. no.: 2374	page 1 of 6
date: 980219	drwg.: -
model: -	scale: -
drw. rev.: 19	material: -

Type HS-IM02, HSE-IM02, HSM-IM02

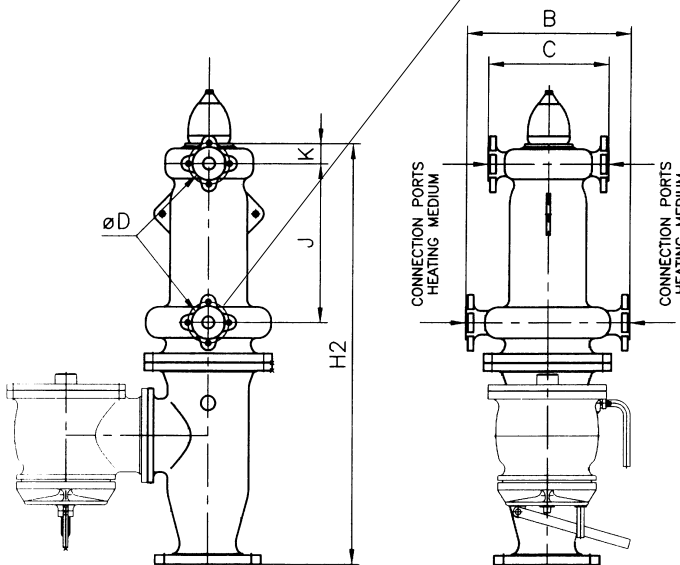
High velocity valve



Vacuum unit
Drawing only schematic. Refer to separate drawing

Approved in accordance with IMO MSC/Circ. 677. Service restrictions must be observed in regards of cargo type, vent pipe length, coefficient of resistance and diameter. Please refer to certified flow curves for each size of each type as per Circ. 677.

• Flange standard according to ISO 2084 PN 10 unless otherwise specified



Heating arrangement option

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

drwg. no.:	2374 page 2 of 6
date:	980219
model:	-
drw. rev.:	19
drwg.:	-
scale:	-
material:	-

Type HS-IM02, HSE-IM02, HSM-IM02 *High velocity valve*

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

HS-IM02-2374-I-090-82-95-250-150-1455-160	150	6	315	770						
HS-IM02-2374-I-090-68-105-250-150-950-205	150	6	310	750						
HS-IM02-2374-I-090-68-105-250-150-975-135	150	6	310	665						
HS-IM02-2374-N-065-68-105-250-125-945-135	125	5	265	665						
HS-IM02-2374-N-065-68-105-250-125-1070-116	125	5	265	630						
HS-IM02-2374-N-065-68-350-700-100-1300-135	100	4	265	867						
HS-IM02-2374-N-065-68-350-700-100-1300-135	100	4	265	867						
HS-IM02-2374-N-065-68-105-250-100-1050-135	100	4	265	672						
HS-IM02-2374-N-065-68-200-250-100-710-135	100	4	265	672						
HS-IM02-2374-N-065-68-105-250-100-910-116	100	4	310	626						
HS-IM02-2374-N-065-68-105-250-100-910-90	100	4	310	630						
HS-IM02-2374-N-065-60-100-250-100-810-116	100	4	260	600						
HS-IM02-2374-N-065-60-100-250-100-795-90	100	4	260	600						
HS-IM02-2374-N-065-50-100-250-100-590-160	100	4	225	680						
HS-IM02-2374-N-065-50-350-700-100-1015-116	100	4	225	820						
HS-IM02-2374-N-065-50-350-700-100-1020-90	100	4	225	820						
HS-IM02-2374-N-065-50-100-250-100-585-90	100	4	225	575						
HS-IM02-2374-N-065-50-100-250-100-605-0	100	4	225	500						
HS-IM02-2374-N-065-68-105-250-80-1070-116	80	3	265	626						
HS-IM02-2374-N-065-68-100-250-80-925-90	80	3	310	630						
HS-IM02-2374-N-065-60-100-250-80-810-90	80	3	260	600						
HS-IM02-2374-N-065-50-350-700-80-1110-116	80	3	225	827						
HS-IM02-2374-N-065-50-100-250-80-545-116	80	3	225	577						
HS-IM02-2374-N-065-50-350-700-80-1060-90	80	3	225	820						
HS-IM02-2374-N-065-50-100-250-80-600-90	80	3	225	570						
HS-IM02-2374-N-065-35-100-250-80-305-50	80	3	180	392						
HS-IM02-2374-N-065-50-100-250-65-610-90	65	2 1/2	225	570						
HS-IM02-2374-N-065-50-100-250-65-595-90	65	2 1/2	225	570						
HS-IM02-2374-N-065-50-100-250-65-570-50	65	2 1/2	225	440						
HS-IM02-2374-N-065-35-100-250-65-300-50	65	2 1/2	180	385						
HS-IM02-2374-N-065-50-350-700-50-1165-116	50	2	225	827						
HS-IM02-2374-N-065-50-100-250-50-535-116	50	2	225	577						
HS-IM02-2374-N-065-50-350-700-50-1165-90	50	2	225	827						
HS-IM02-2374-N-065-50-100-250-50-495-90	50	2	225	577						
HS-IM02-2374-N-065-50-100-250-50-630-50	50	2	225	450						
HS-IM02-2374-N-065-35-100-250-50-315-50	50	2	180	385						
Code No.	DN	DN	°A	H1	H2	J	K	B	C	°D
	mm	inch	mm	mm	mm	mm	mm	mm	mm	mm

drwg. no.:	2374	drwg.:	-
	page 3 of 6		
date:	980219	scale:	-
model:	-	material:	-
drw. rev.:	19		

Type HS-IM02, HSE-IM02, HSM-IM02

High velocity valve

HS-IM02-2374-I-090-225-105-175-350-8900-0	350	14	670	1350						
HS-IM02-2374-I-090-200-100-175-350-7000-250	350	14	600	1170						
HS-IM02-2374-I-090-164-100-200-250-7575-250	250	10	475	870						
HS-IM02-2374-I-090-150-100-200-250-5250-250	250	10	475	870						
HS-IM02-2374-I-090-150-100-200-250-5220-205	250	10	475	870						
HS-IM02-2374-I-090-150-100-200-250-5300-160	250	10	475	870						
HS-IM02-2374-I-090-150-100-200-200-6360-205	200	8	475	870						
HS-IM02-2374-I-090-150-100-200-200-4050-205	200	8	475	870						
HS-IM02-2374-I-090-150-100-200-200-4220-160	200	8	475	870						
HS-IM02-2374-I-090-100-105-250-200-2260-205	200	8	355	840						
HS-IM02-2374-I-090-100-105-250-200-2300-116	200	8	355	755						
HS-IM02-2374-I-090-125-105-250-175-3580-180	175	7	420	875						
Code No.	DN	DN	°A	H1	H2	J	K	B	C	°D
	mm	inch	mm	mm	mm	mm	mm	mm	mm	mm

Parts list

Item	Description	Spec. 1	Spec. 2	Spec. 3
1	House	Stainless steel	Cast iron	Cast iron
2	Adapter	Stainless steel	Cast iron	Cast iron
3	Pressure disc	Stainless steel	Stainless steel	Bronze
4	Pressure seat	Stainless steel	Stainless steel	Bronze
5	Variable booster	Stainless steel	Stainless steel	Stainless steel
6	Variable sleeve *	Stainless steel	Stainless steel	Bronze
7	Variable outlet	Stainless steel	Stainless steel	Bronze
8	Stem	Stainless steel	Stainless steel	Stainless steel
9	Weight loading	Stainless steel	Stainless steel	Stainless steel
10	Check lift, self-closing	Stainless steel	Stainless steel	Stainless steel
11	Flushing port, optional	Stainless steel	Stainless steel	Stainless steel

*Optional: Bronze or stainless steel sleeve along booster plate stroke line

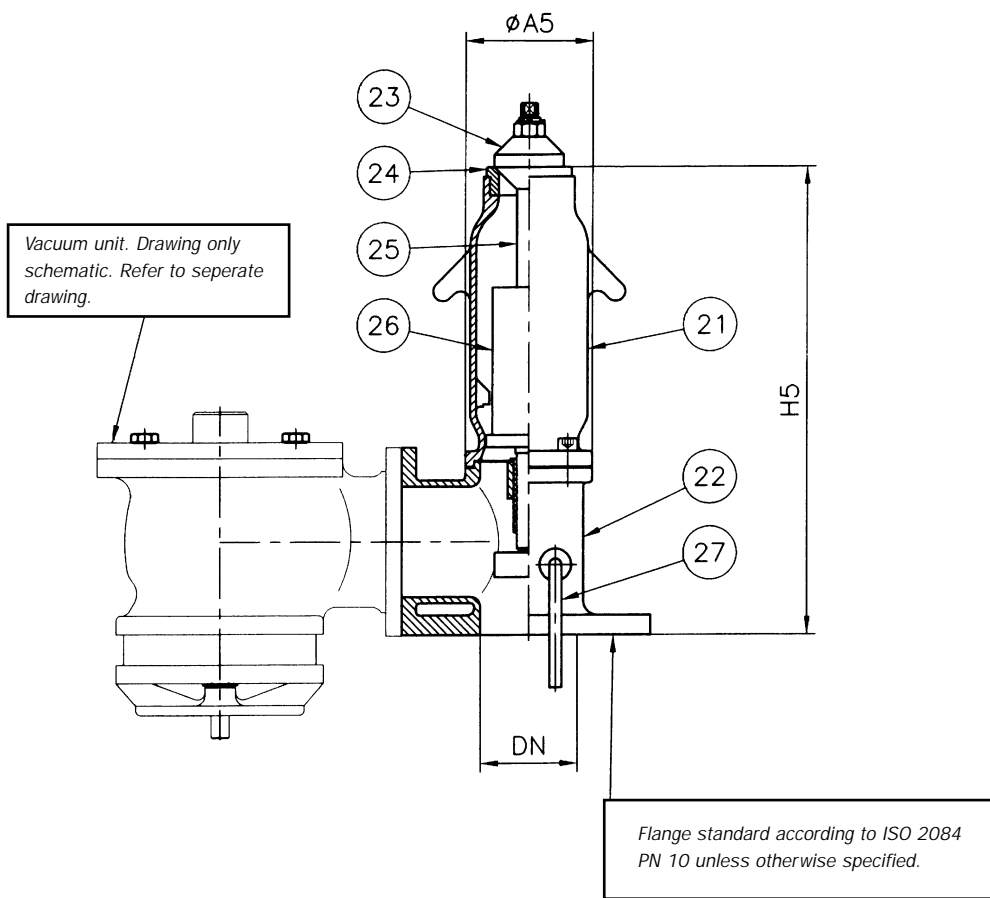
This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

drwg. no.:	2374	drwg.:	-
	page 4 of 6		
date:	980219	scale:	-
model:	-	material:	-
drw. rev.:	19		

Type HS-IM02, HSE-IM02, HSM-IM02

High velocity valve

HSE-IM02-2374-N-065-50-100-200-80-770-90	80	3	140	375
HSE-IM02-2374-N-065-35-350-600-80-725-90	80	3	140	475
Code No.	DN	DN	∅A5	H5
	mm	inch	mm	mm



Parts list

Item	Description	Spec. 1
21	House	Stainless steel
22	Adapter	Stainless steel
23	Pressure disc	Stainless steel
24	Pressure seat	Stainless steel
25	Stem	Stainless steel
26	Weight loading	Stainless steel
27	Check lift	Stainless steel

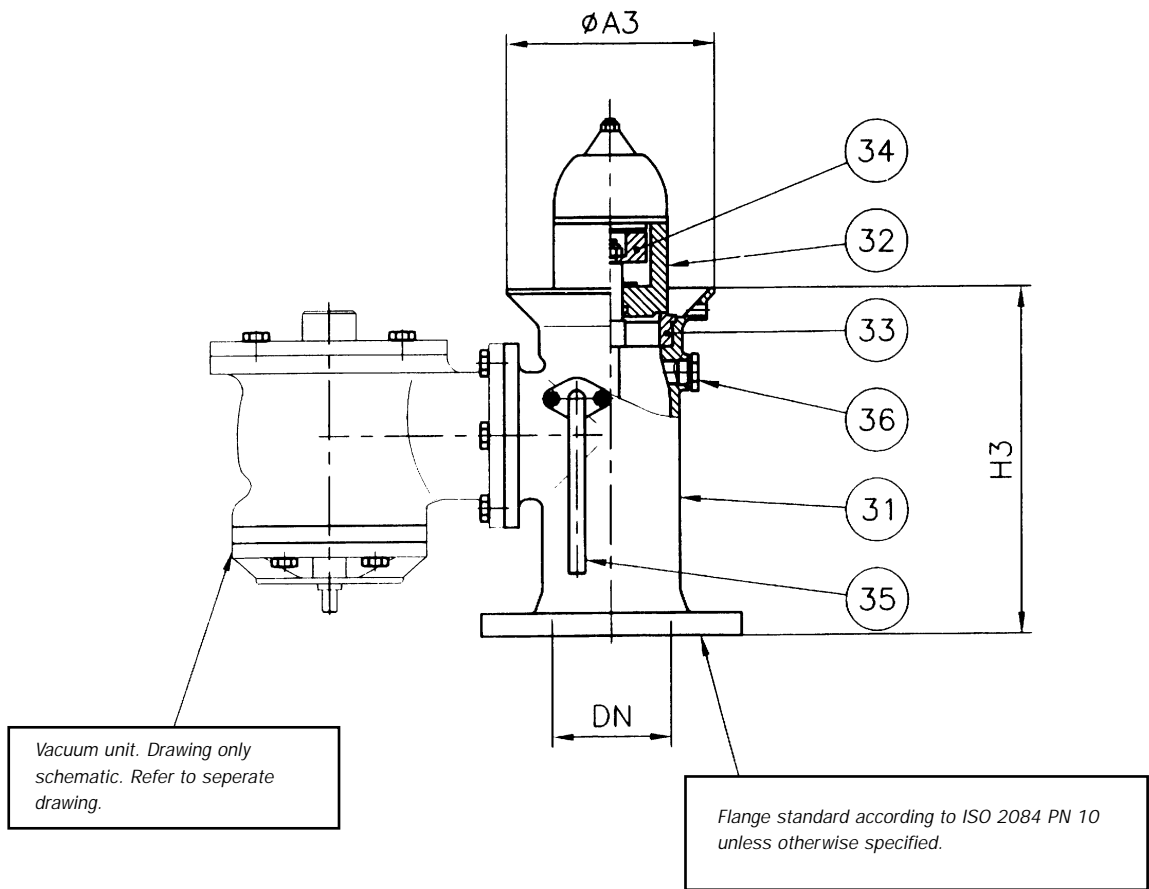
This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

drwg. no.:	2374	drwg.:	-
	page 5 of 6	date:	980219
model:	-	scale:	-
drw. rev.:	19	material:	-

Type HS-IM02, HSE-IM02, HSM-IM02

High velocity valve

HSM-IM02-2374-N-065-80-100-250-100-2145-90	100	4	175	290
Code No.	DN	DN	°A3	H3
		mm	inch	mm



Parts list

Item	Description	Spec. 1	Spec. 2
31	House	Stainless steel	Cast iron
32	Pressure disc/weight loading	Stainless steel	Stainless steel
33	Pressure seat	Stainless steel	Stainless steel
34	Blowdown control magnet	PTFE encapsulated	PTFE encapsulated
35	Check lift, self-closing	Stainless steel	Stainless steel
36	Flushing port, optional	Stainless steel	Stainless steel

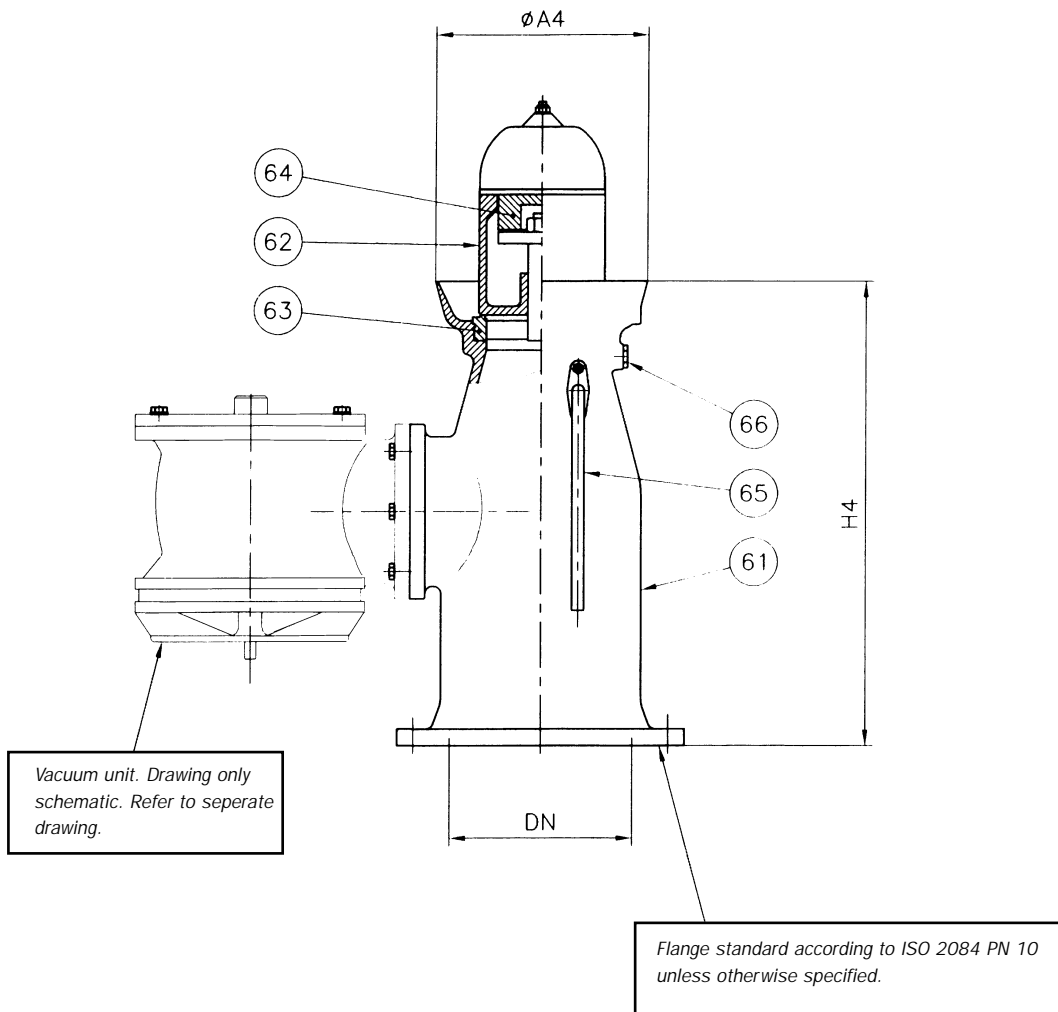
This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

drwg. no.:	2374
	page 6 of 6
date:	980219
model:	-
drw. rev.:	19
material:	-

Type HS-IM02, HSE-IM02, HSM-IM02

High velocity valve

HSM-IM02-2374-I-090-155-100-200-200-6565-180	200	8	295	660
Code No.	DN	DN	°A4	H4
	mm	inch	mm	mm



Parts list

Item	Description	Spec. 1	Spec. 2
61	House	Stainless steel	Cast iron
62	Pressure disc/weight loading	Stainless steel	Stainless steel
63	Pressure seat	Stainless steel	Stainless steel
64	Blowdown control magnet		
65	Check lift, self-closing	Stainless steel	Stainless steel
66	Flushing port, optional	Stainless steel	Stainless steel

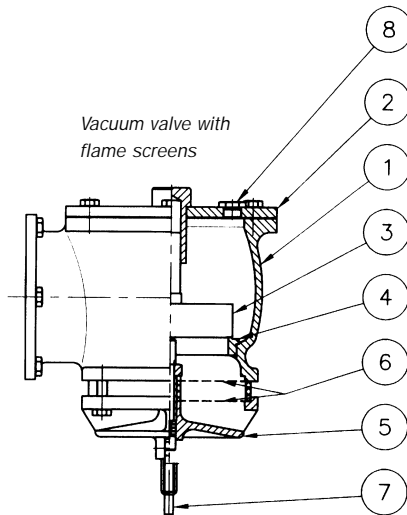
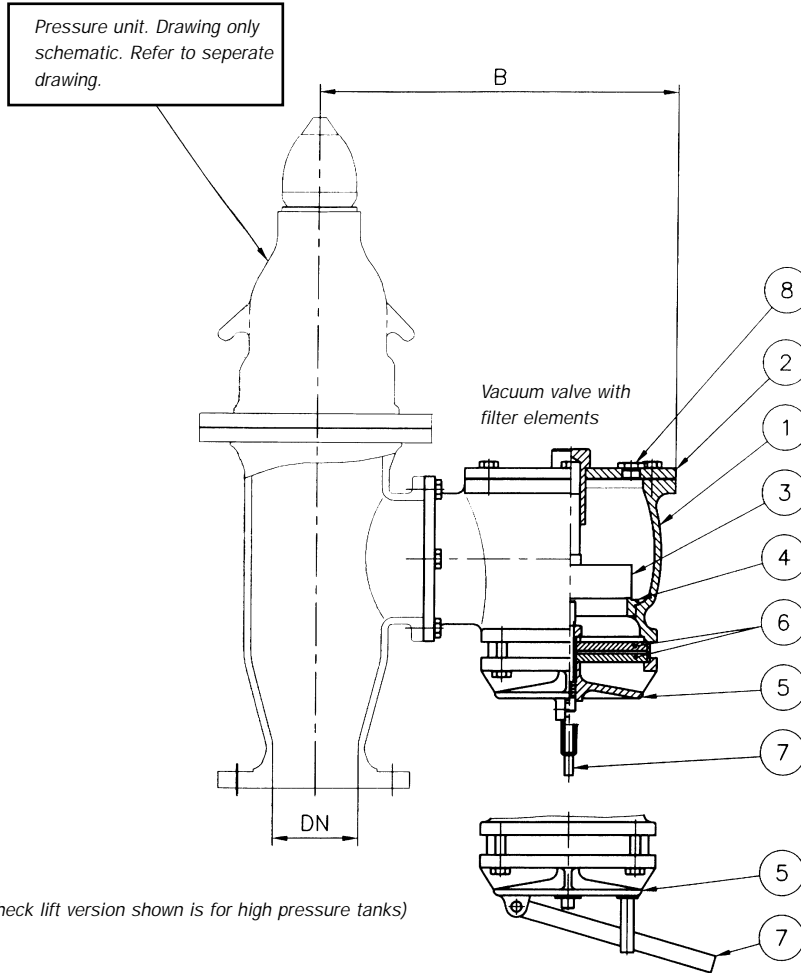
This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

drwg. no.:	2376
	page 1 of 6
date:	981209
model:	scale:
drw. rev.:	12
	material:

Type IMO2-VAC

Vacuum valve

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.



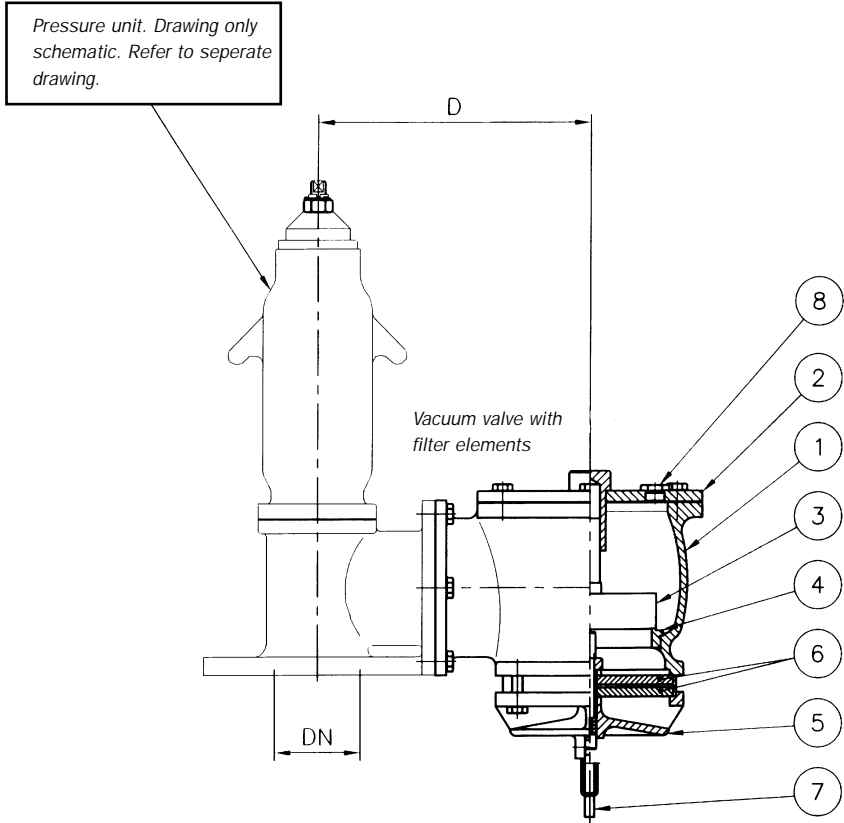
Approved in accordance with IMO MSC/Circ. 677. Please refer to certified flow curves for each size of each type as per Circ. 677.

drwg. no.: 2376	page 3 of 6
date: 981209	drwg.: -
model: -	scale: -
drw. rev.: 12	material: -

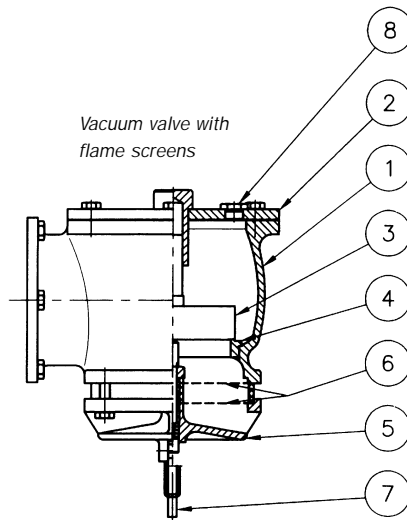
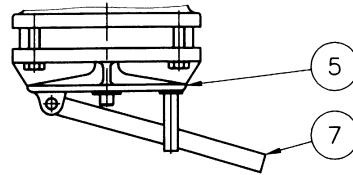
Type IMO2-VAC

Vacuum valve

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.



(Check lift version shown is for high pressure tanks)



Approved in accordance with IMO MSC/Circ. 677. Please refer to certified flow curves for each size of each type as per Circ. 677.

drwg. no.:	2376 page 4 of 6
date:	981209
model:	-
drw. rev.:	12
drwg.:	-
scale:	-
material:	-

Type IM02-VAC

Vacuum valve

IM02-VAC-2376-090-90-35-35-80-500-50E	80	3	355
IM02-VAC-2376-065-90-35-35-80-420-50E	80	3	355
IM02-VAC-2376-090-90-35-35-80-495-36E	80	3	355
IM02-VAC-2376-065-90-35-35-80-425-36E	80	3	355
Code No.	DN mm	DN inch	D mm

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

Parts list

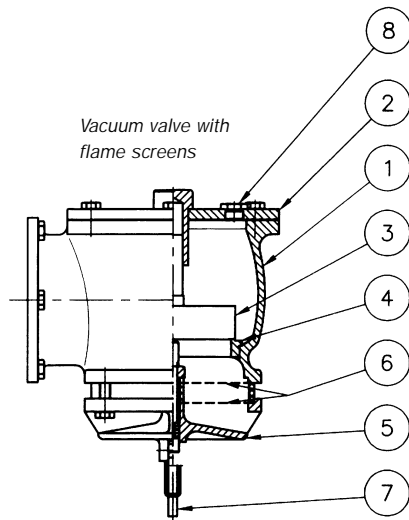
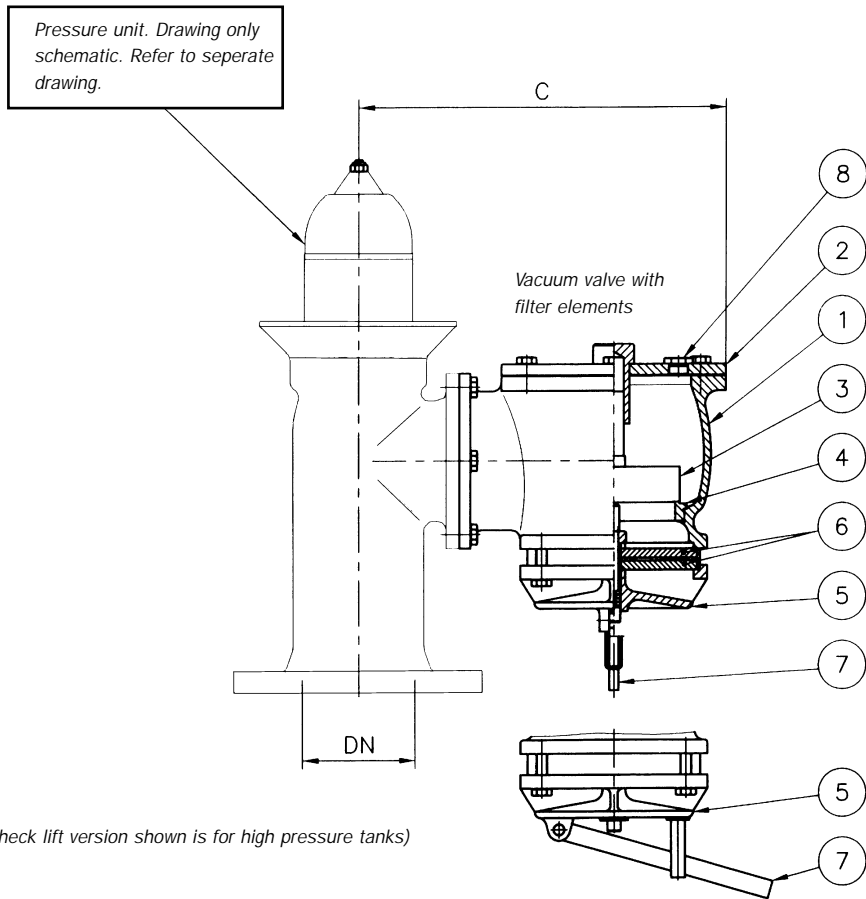
Item	Description	Spec. 1	Spec. 2	Spec. 3
1	House	Stainless steel	Cast iron	Cast iron
2	Cover	Stainless steel	Steel	Steel
3	Vacuum disc	Stainless steel	Stainless steel	Bronze
4	Pressure seat	Stainless steel	Stainless steel	Bronze
5	Net cover	Stainless steel	Stainless steel	Bronze
6	Filter element/ flame screen	Stainless steel	Stainless steel	Stainless steel
7	Check lift, self-closing	Stainless steel	Stainless steel	Stainless steel
8	Flushing port, optional	Stainless steel	Stainless steel	Stainless steel

drwg. no.:	2376
	page 5 of 6
date:	981209
model:	scale:
drw. rev.:	material:
12	-

Type IMO2-VAC

Vacuum valve

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.



Approved in accordance with IMO MSC/Circ. 677. Please refer to certified flow curves for each size of each type as per Circ. 677.

drwg. no.:	2376 page 6 of 6
date:	981209
model:	-
drw. rev.:	12
drwg.:	-
scale:	-
material:	-

Type IM02-VAC

Vacuum valve

This drawing is for guidance only. Other sizes, materials, flange standards, settings, and versions are available. Request a specific quotation or approval drawing before implementing data.

IM02-VAC-2376-090-180-35-35-200-2900-155	200	8	560
IM02-VAC-2376-090-116-35-35-150-1210-106	150	6	400
IM02-VAC-2376-090-90-35-35-100-685-80	100	4	340
IM02-VAC-2376-065-90-35-35-100-480-80	100	4	340
Code No.	DN mm	DN inch	C mm

Parts list

Item	Description	Spec. 1	Spec. 2	Spec. 3
1	House	Stainless steel	Cast iron	Cast iron
2	Cover	Stainless steel	Steel	Steel
3	Vacuum disc	Stainless steel	Stainless steel	Bronze
4	Vacuum seat	Stainless steel	Stainless steel	Bronze
5	Net cover	Stainless steel	Stainless steel	Bronze
6	Filter element/ flame screen	Stainless steel	Stainless steel	Stainless steel
7	Check lift, self-closing	Stainless steel	Stainless steel	Stainless steel
8	Flushing port, optional	Stainless steel	Stainless steel	Stainless steel