

# PETROCHEMICAL STORAGE TANK

## SAFETY & PROTECTION

# КАТАЛОГ

Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81

Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16

Казахстан (7273)495-231

Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13

Таджикистан (992)427-82-92-69

Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

Единый адрес для всех регионов: [kcs@nt-rt.ru](mailto:kcs@nt-rt.ru) || <https://kspc.nt-rt.ru/>



# Our Vision

is to be the **PREFERRED GLOBAL SUPPLIER** of tank safety & protection equipment solutions and services for the petrochemical industry.

# Our Value

is in delivering reliable equipment that guarantees system uptime and help our customers **BOOST PRODUCTIVITY AND PROFITABILITY.**

# Our Strategy

is built around **WORKING IN PARTNERSHIP WITH OUR CUSTOMERS** to devise intelligent, innovative and cost-effective solutions.





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# TANK SAFETY & PROTECTION DEVICE

## SECTION 1\_BREATHER VALVE

**PRESSURE VACUUM RELEIF VALVE**

**PRESSURE RELEIF VALVE**

**VACUUM RELEIF VALVE**



**Breather Valve** is designed manufactured and tested according to the API 2000 code, these valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapor.

### KSBB/BS



P6

### KSBG/GS



P8

### KSBBJ/BJS



P10

### KSPR/PS



P12

### KSBD/DS



P14

### KSVR/VS



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### KSVB



P18

### KSBJ



P20






## SECTION 1.1\_KSBB/BS

# PRESSURE VACUUM RELIEF VALVE VENT TO ATMOSPHERE


### INTRODUCTION

 **The model KSBB and KSBS** pressure vacuum valves are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code, these valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapor.

### Setting Pressure

KSBB Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSBS Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

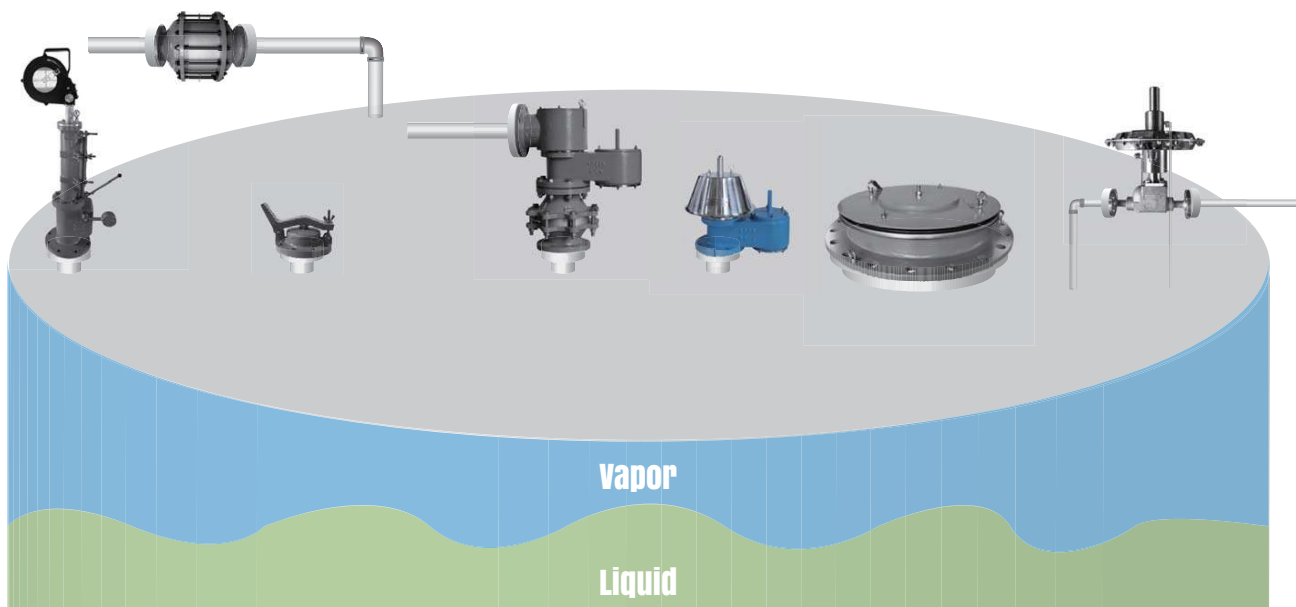
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges  
(Different connections available on request)

 **Rules & Certifications** API 2000 & FM factory mutual approval

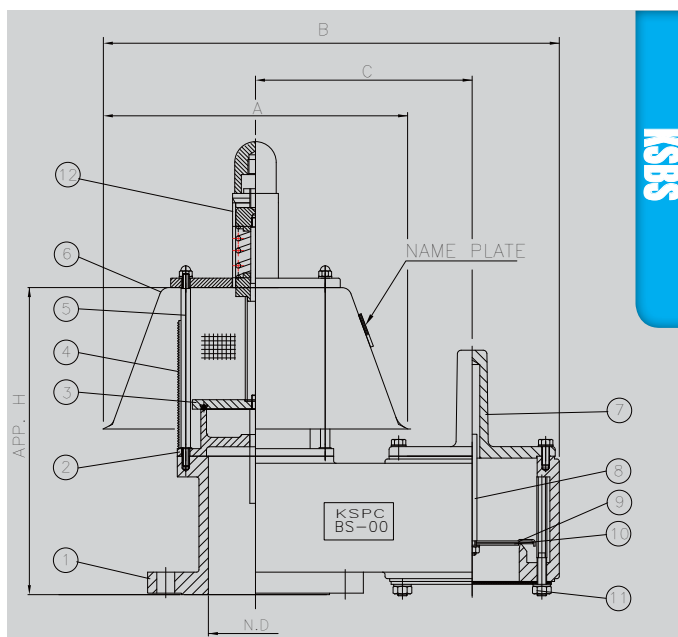
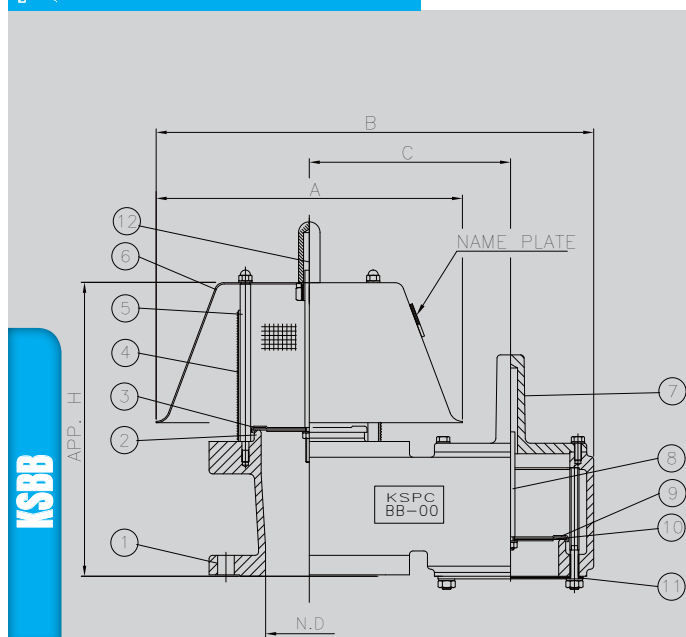
 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	250	294	324	440	476	544	620	685
B	359	446	485	627	742	861	978	1125
C	165	206	230	283	348	406	466	542
Approx. H	271	304	327	398	449	509	558	567

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

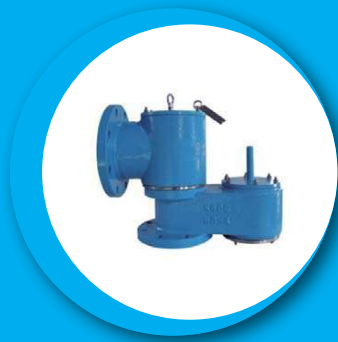
ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BIRD SCREEN		SS304	SS304	SS304	SS316L
5	PRESS. GUIDE POST		SS304	SS304	SS304	SS316L
6	WEATHER HOOD		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM STEM		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304	SS304	SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
12	STEM GUIDE		SS304	SS304	SS304	SS316L
12.1	PALLET WEIGHT		COATED CS OR SS			
13	SPRING		SS304	SS304	SS304	SS316L



Section 1.1  
KSBB/BS

KSBS






## SECTION 1.2\_KSBG/GS

# PRESSURE VACUUM RELIEF VALVE WITH PIPE AWAY


### INTRODUCTION

 **The model KSBG and KSGS** pressure vacuum valves are an advanced design for pipe away applications. Designed, manufactured and tested according to the API 2000 code, these valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSBG Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSGS Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

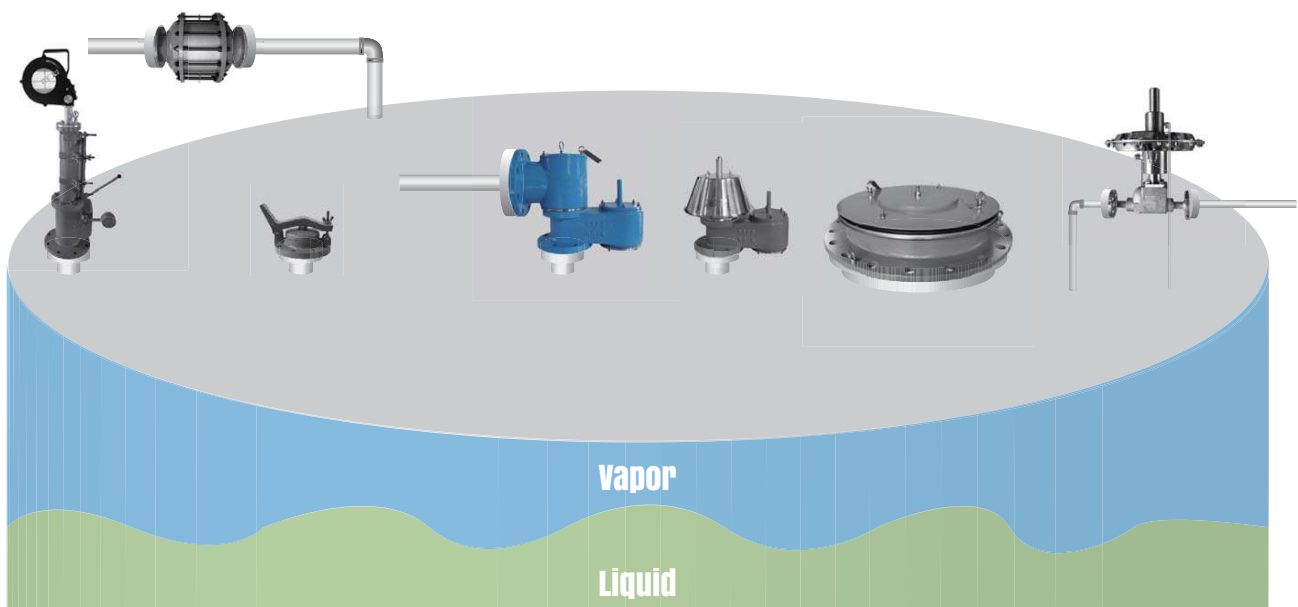
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

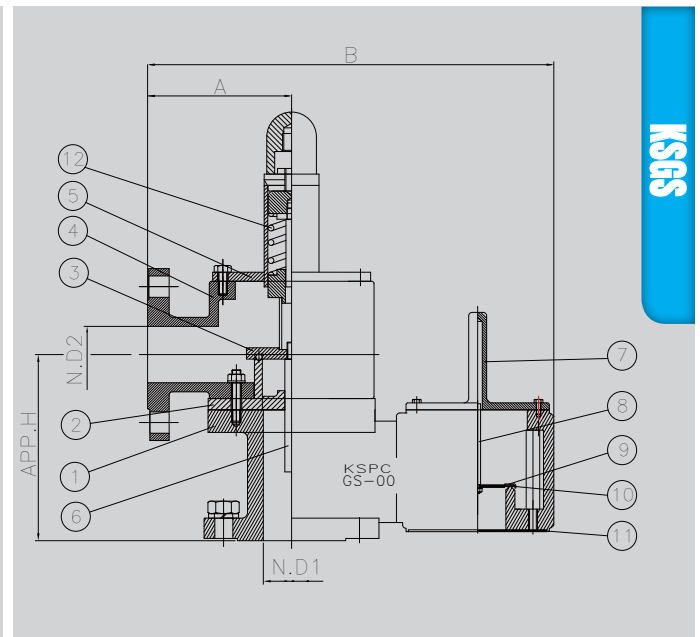
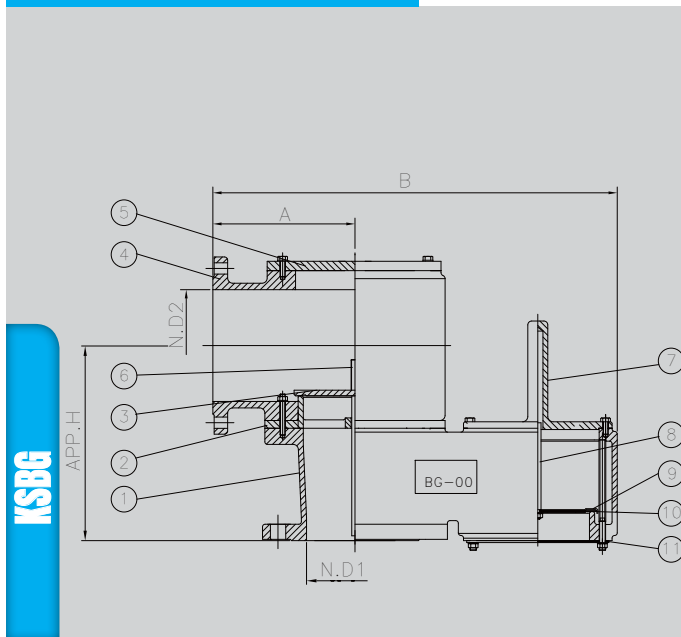
 **Rules & Certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2" X 2"	3" X 3"	4" X 4"	6" X 6"	8" X 8"	10" X 10"	12" X 12"	14" X 14"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	50	80	100	150	200	250	300	350
A	132	171	184	223	258	279	329	415
B	366	470	507	630	762	868	997	1197
Approx. H	165	204	227	282	338	387	449	483
SIZE	2" X 3"	3" X 4"	4" X 6"	6" X 8"	8" X 10"	10" X 12"	12" X 14"	14" X 16"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	80	100	150	200	250	300	350	400
A	142	172	189	228	258	290	343	420
B	376	471	512	635	762	879	1011	1211
Approx. H	186	214	252	307	363	412	474	523

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
5	PRESSURE COVER		ALUMINUM	C.S	SS304	SS316L
6	PRESSURE STEM		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM STEM		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304	SS304	SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
11.1	PALLET WEIGHT		COATED CS OR SS			
12	SPRING		SS304	SS304	SS304	SS316






## SECTION 1.3\_KSBBJ/BJJS


# PRESSURE VACUUM RELIEF VALVE WITH STEAM JACKET


### INTRODUCTION

 **The model KSBBJ and KSBJS** pressure vacuum valves are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code, these valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSBBJ Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSBJS Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

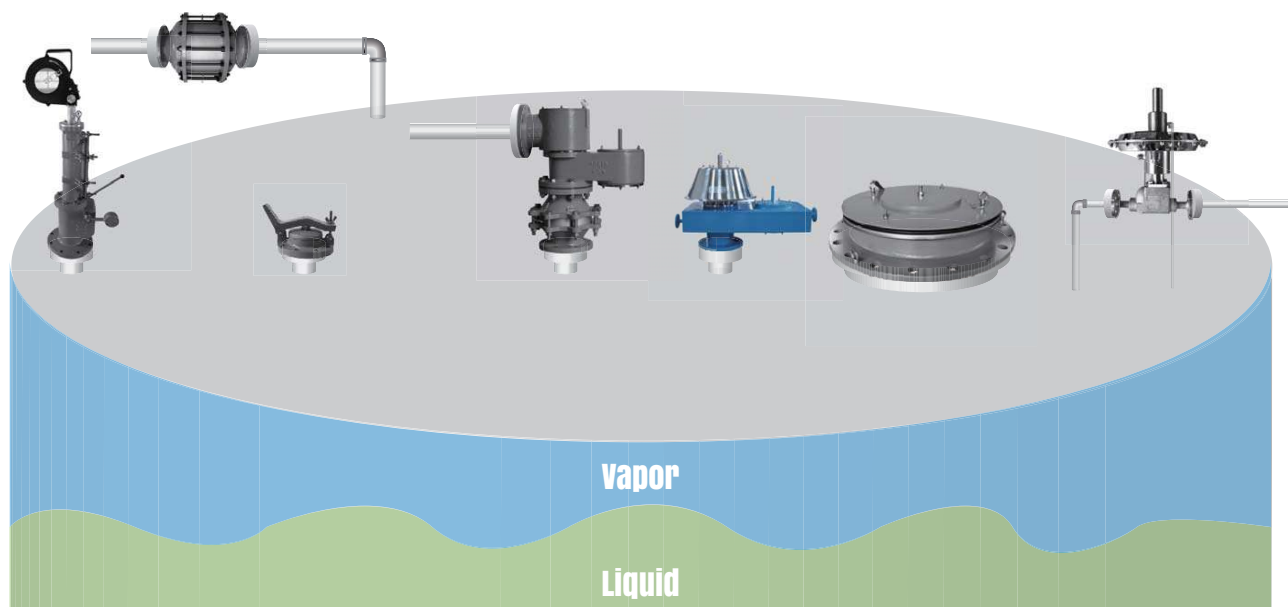
 **Body Materials** Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

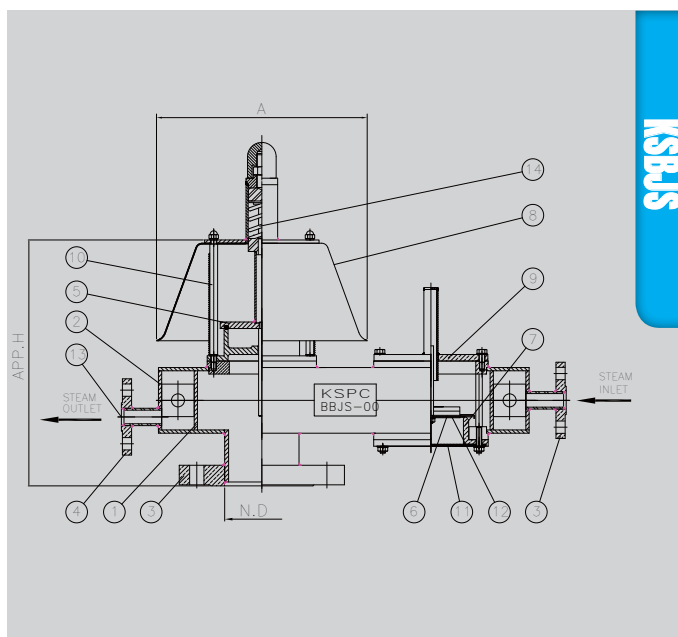
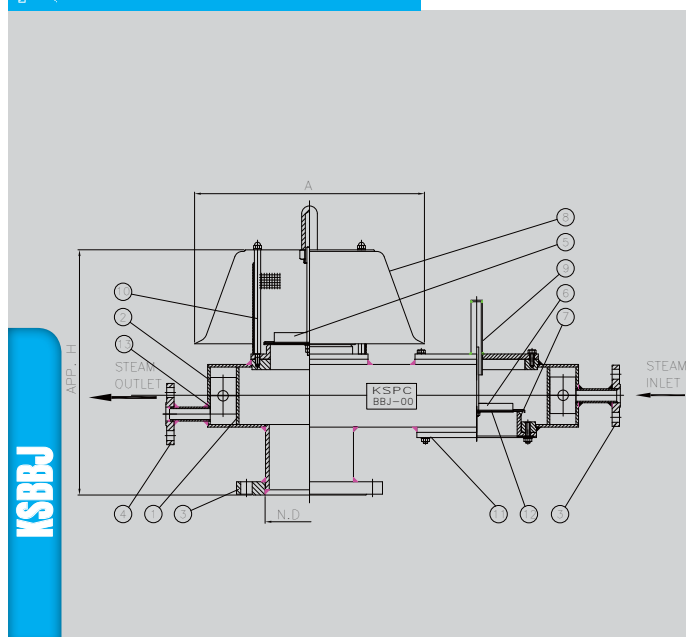
 **Rules & Certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"
N.D	50	80	100	150	200	250	300
A	250	294	324	440	476	544	620
Approx. H	370	384	390	430	475	525	580

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	C.S	SS304	SS316
		TRIM	SS304	SS304	SS316L
1	BODY		C.S	SS304	SS316L
2	JACKET		SS304	SS304	SS316L
3	FLANGE(INLET)		SS304	SS304	SS316L
4	FLANGE(OUTLET)		SS304	SS304	SS316L
5	PRESSURE DISC		SS304	SS304	SS316L
6	VACUUM DISC		SS304	SS304	SS316L
7	VACUUM SEAT		A351-CF8	A351-CF8	A351-CF8M
8	WEATHER HOOD		C.S	SS304	SS316L
9	VACUUM COVER		SS304	SS304	SS316L
10	PRESSURE SCREEN		SS304	SS304	
11	VACUUM SCREEN		SS304	SS304	SS316L
12	DIAPHRAGM		TEFLON		
13	STEAM LINE		SS304	SS304	SS316L
13.1	PALLET WEIGHT		COATED CS OR SS		
14	SPRING		SS304	SS304	SS316






## SECTION 1.4\_KSPR/PS

# PRESSURE RELIEF VALVE VENT TO ATMOSPHERE


### INTRODUCTION

 **The model KSPR and KSPS** pressure valves are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code. Utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSPR Weight Loaded model	Min. 20 mmW.C ~ Max. 700 mmW.C
KSPS Spring Loaded model	Min. 700 mmW.C ~ Max. 9,000 mmW.C

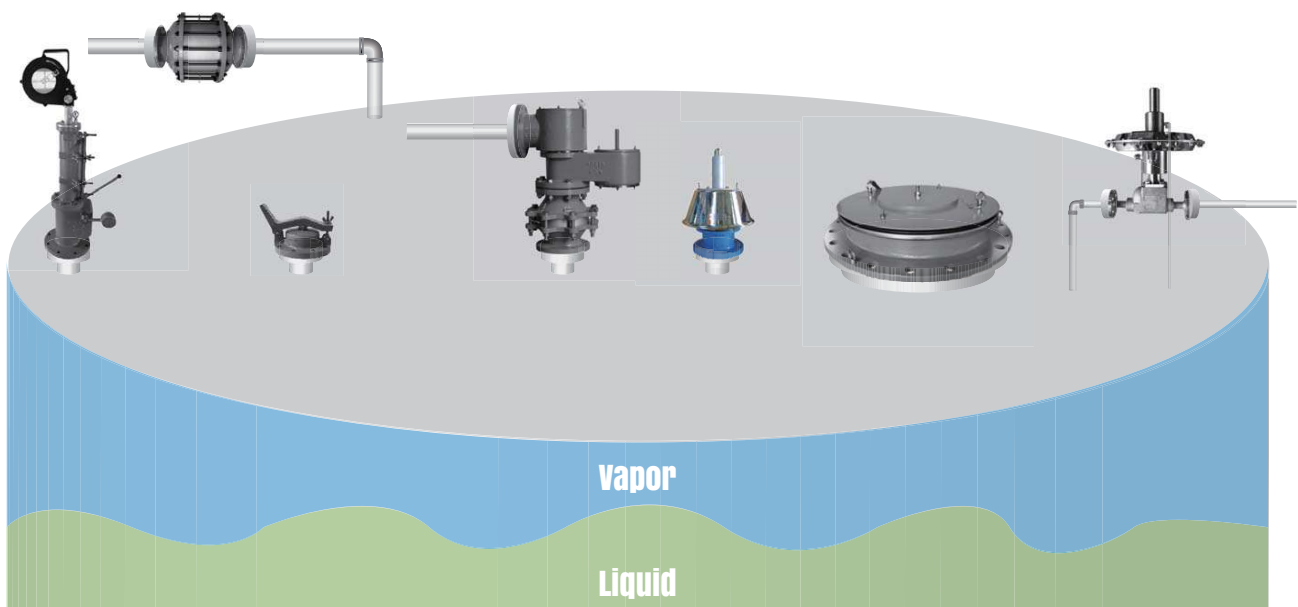
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

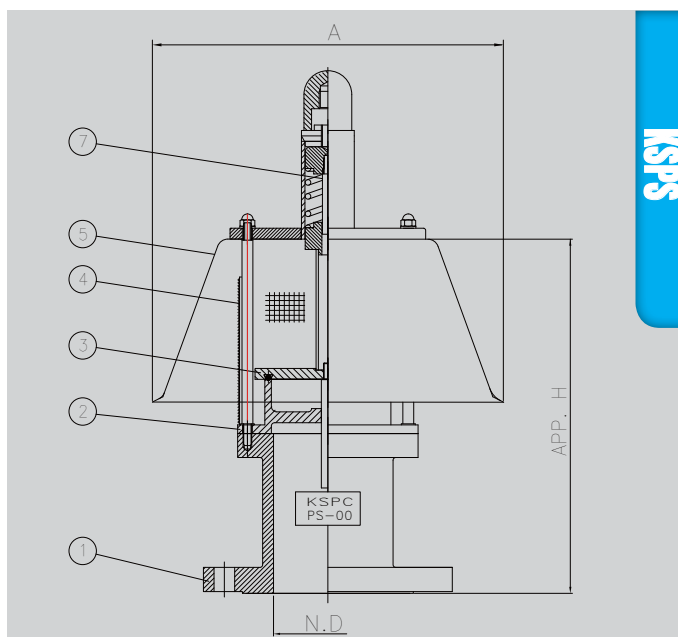
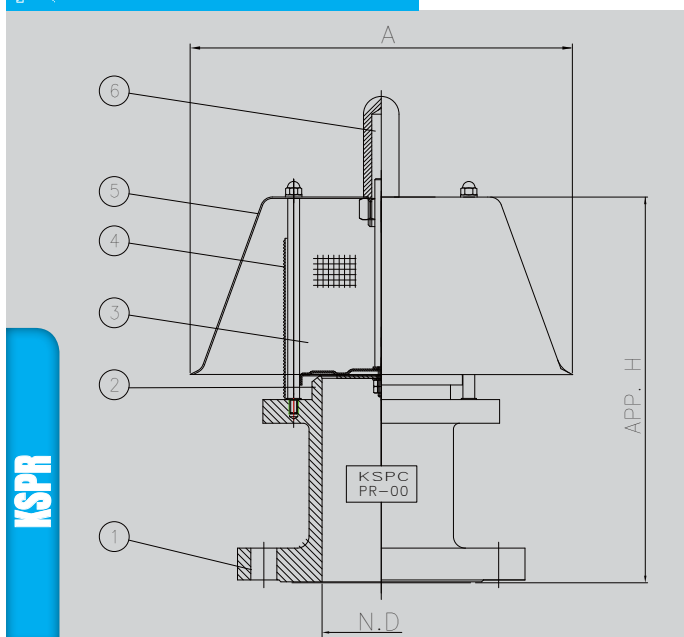
 **Rules & certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	250	294	324	440	476	544	620	685
Approx. H	270	294	338	368	388	417	442	462

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BIRD SCREEN		SS304	SS304	SS304	SS316L
5	WEATHER HOOD		SS304	SS304	SS304	SS316L
6	PRESSURE STEM GUIDE		SS304	SS304	SS304	SS316L
6.1	DIAPHRAGM		TEFLON			
6.2	PALLET WEIGHT		COATED CS OR SS			
7	SPRING		SS304	SS304	SS304	SS316





## SECTION 1.5\_KSBD/DS

# PRESSURE RELIEF VALVE WITH PIPE AWAY

### INTRODUCTION

**The model KSBD and KSDS** pressure valves are an advanced design for pipe away applications. Designed, manufactured and tested according to the API 2000 code. Utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSBD Weight Loaded model	Min. 20 mmW.C ~ Max. 700 mmW.C
KSDS Spring Loaded model	Min. 700 mmW.C ~ Max. 9,000 mmW.C

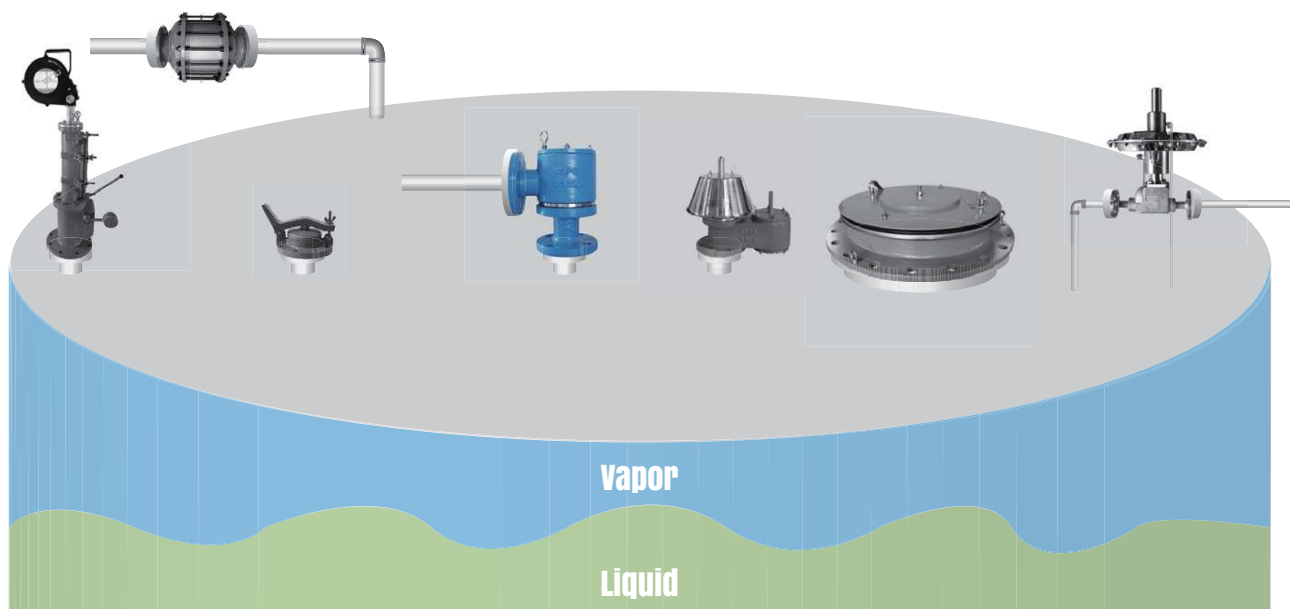
**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

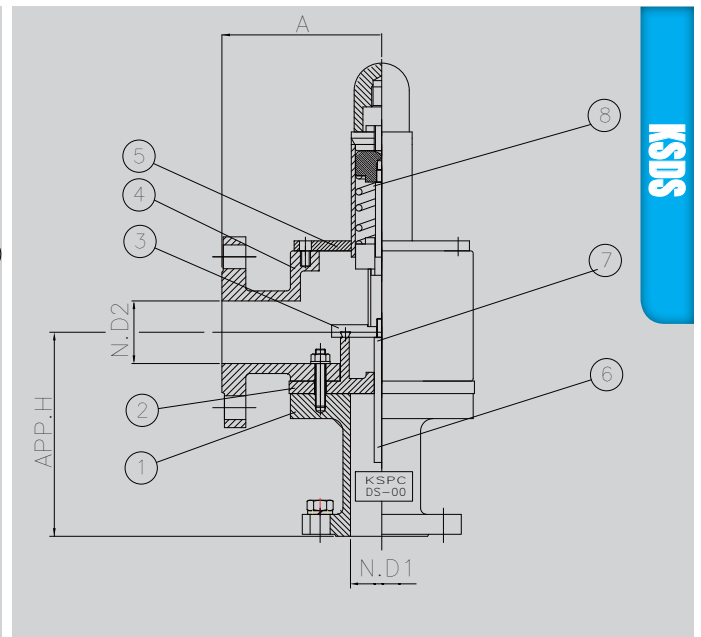
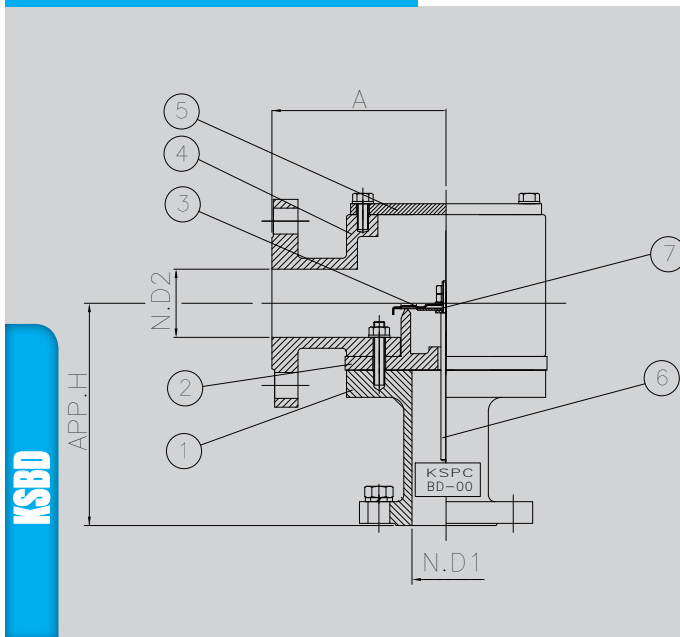
**Rules & certifications** API 2000

**Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2" X 2"	3" X 3"	4" X 4"	6" X 6"	8" X 8"	10" X 10"	12" X 12"	14" X 14"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	50	80	100	150	200	250	300	350
A	132	171	184	223	258	279	329	415
Approx. H	167	197	236	264	288	317	345	370
SIZE	2" X 3"	3" X 4"	4" X 6"	6" X 8"	8" X 10"	10" X 12"	12" X 14"	14" X 16"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	80	100	150	200	250	300	350	400
A	142	172	189	228	258	290	343	420
Approx. H	188	207	261	289	313	342	370	395

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
5	PRESSURE COVER		ALUMINIUM	C.S	SS304	SS316L
6	PRESSURE STEM		SS304	SS304	SS304	SS316L
10	DIAPHRAGM		SS304	SS304	SS304	SS316L
11.1	PALLET WEIGHT		COATED CS OR SS			
12	SPRING		SS304	SS304	SS304	SS316





# SECTION 1.6\_KSVR/VS

## VACUUM RELIEF VALVE

### INTRODUCTION

**The model KSVR and KSVS** are designed, manufactured and tested according to the API 2000 code. Utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSVR Weight Loaded model	Min. - 25 mmW.C ~ Max. - 430 mmW.C
KSVS Spring Loaded model	Min. - 430 mmW.C ~ Max. - 9,000 mmW.C

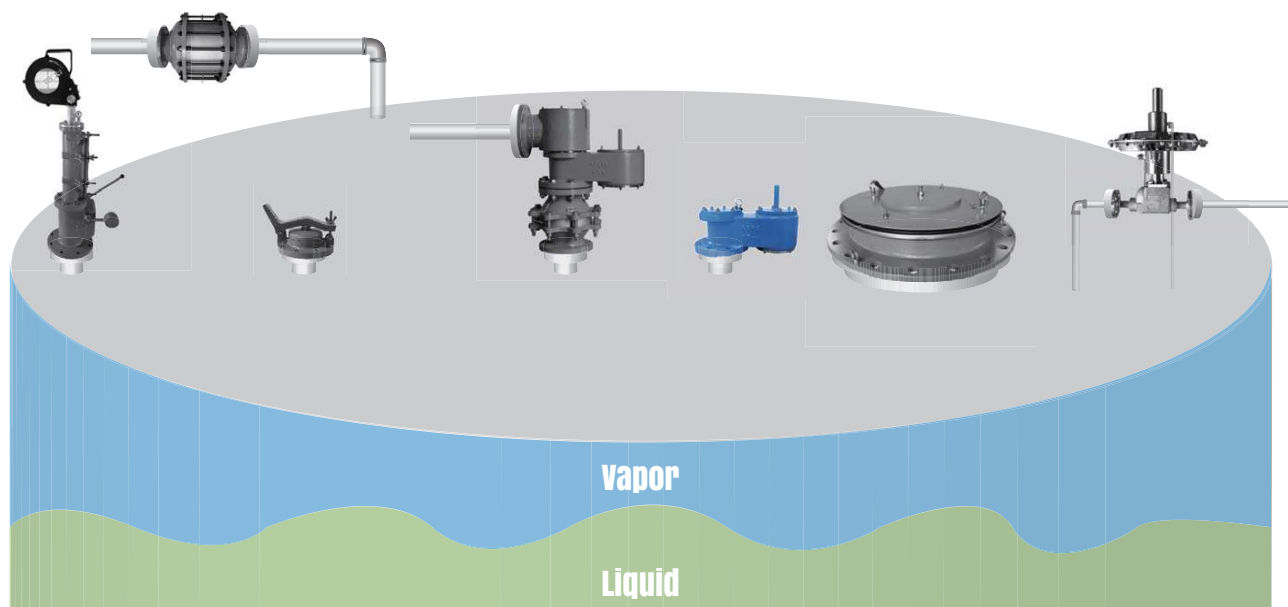
**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

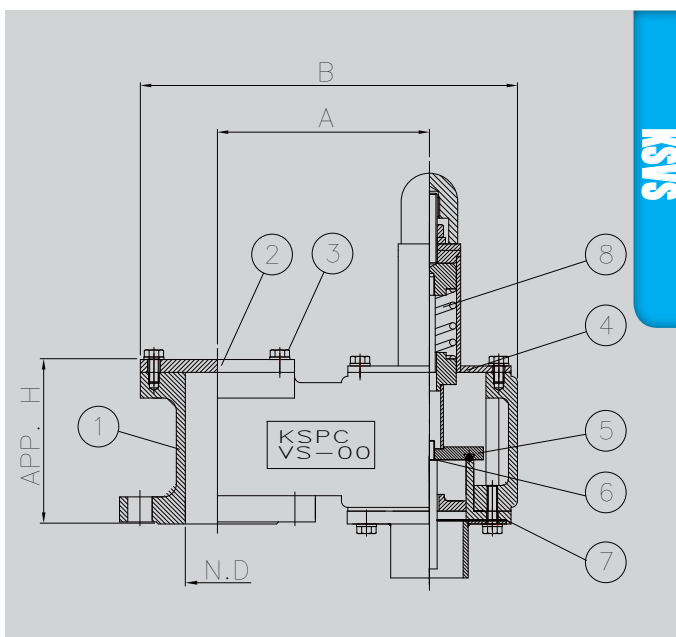
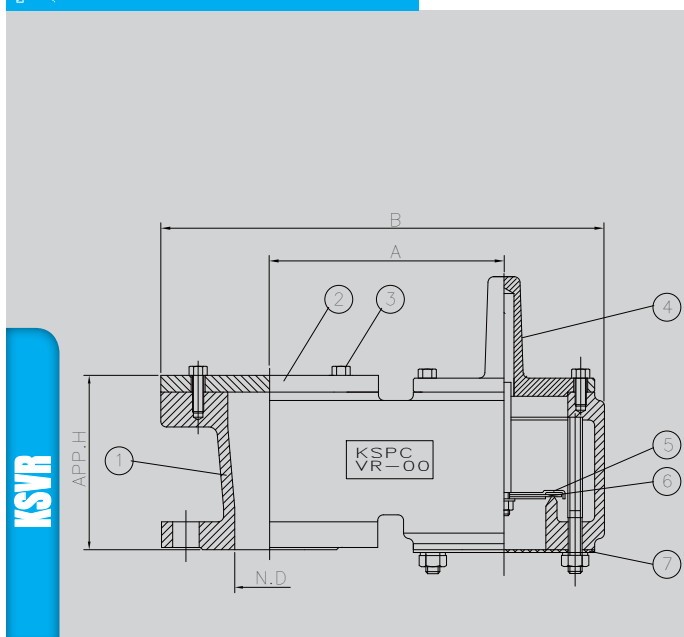
**Rules & certifications** API 2000

**Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	165	206	230	283	348	406	466	542
B	297	379	410	523	647	755	858	1016
Approx. H	128	146	159	184	215	240	274	283

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE COVER		ALUMINIUM	C.S	SS304	SS316L
3	STUD BOLT		SS304	SS304	SS304	SS316L
4	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
5	VACUUM DISC		SS304	SS304	SS304	SS316L
6	DIAPHRAGM		TEFLON			
7	VACUUM SCREEN		SS304	SS304	SS304	SS316L
7.1	PALLET WEIGHT		COATED CS OR SS			
7	SPRING		SS304	SS304	SS304	SS316



## SECTION 1.7\_KSVB

# VACUUM RELIEF VALVE

### INTRODUCTION

**The model KSVB** is designed, manufactured and tested according to the API 2000 code. Utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

KSVB Spring Loaded model

Min. - 20 mmW.C ~ Max. - 9,000 mmW.C

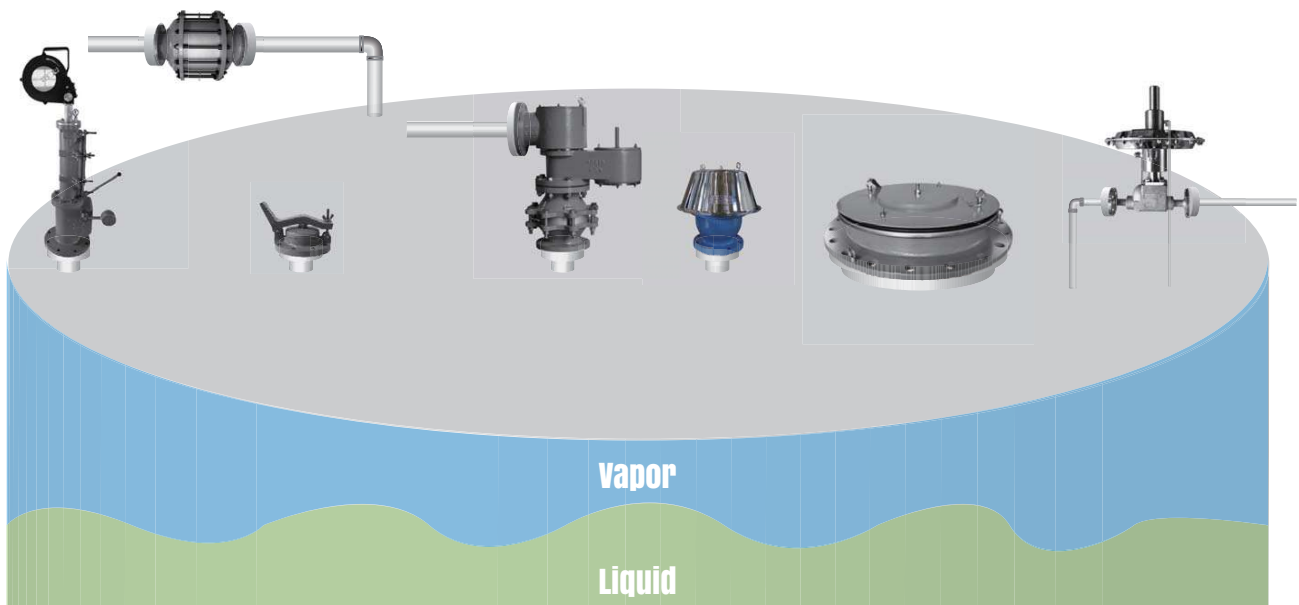
**Body Materials** Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

**Rules & Certifications** API 2000

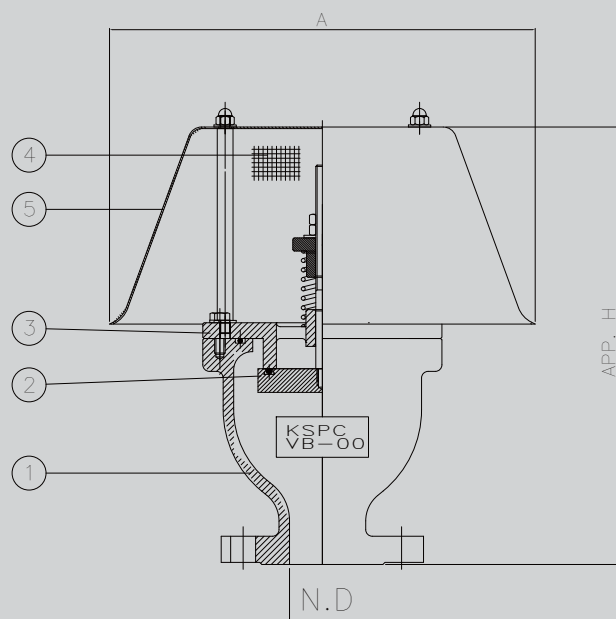
**Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION





## K OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	324	440	440	440	476	544	620	685
Approx. H	333	380	395	405	430	480	510	580

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL


ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	VACCUM STEM		SS304	SS304	SS304	SS316L
3	VACUUM DISC		SS304	SS304	SS304	SS316L
4	VACUUM SEAT		A351-CF8	A351-CF8	A351-CF8	A351-CF8M
5	WEATHER HOOD		SS304	SS304	SS304	SS316L
6	BRID SCREEN		SS304	SS304	SS304	SS316L
7	SPRING		SS304	SS304	SS304	SS316




## SECTION 1.8\_KSBJ


# AIR RELEASE VALVE

### INTRODUCTION

 **The model KSBJ** is designed to release accumulated air pockets from the system, while pressured pipelines. Air pockets increase energy consumption because pumping operation will be at higher water heads to overcome pressured air. **KSBJ** has function to protect high shock and surge pressure, water hammer and liquid overflow from fresh or sea water pipelines.

**KSBJ** air release valve can provide low cost insurance to protect expensive maintenance cost of pipelines and pump systems.

 **Body Materials** Carbon Steel, SS304, SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 25 ~ DN 300 with ANSI 150lb flanges as standard  
(Different connections available on request)

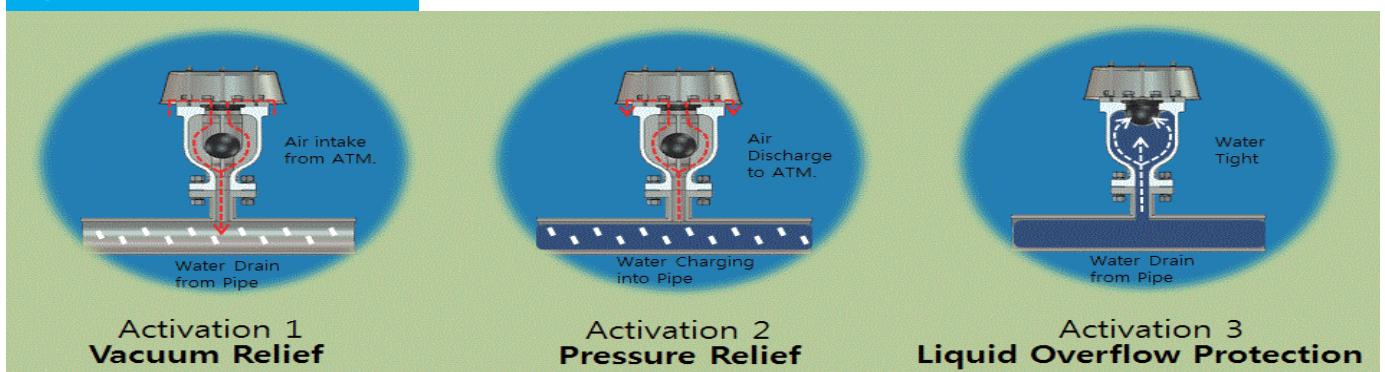
 **Rules & certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

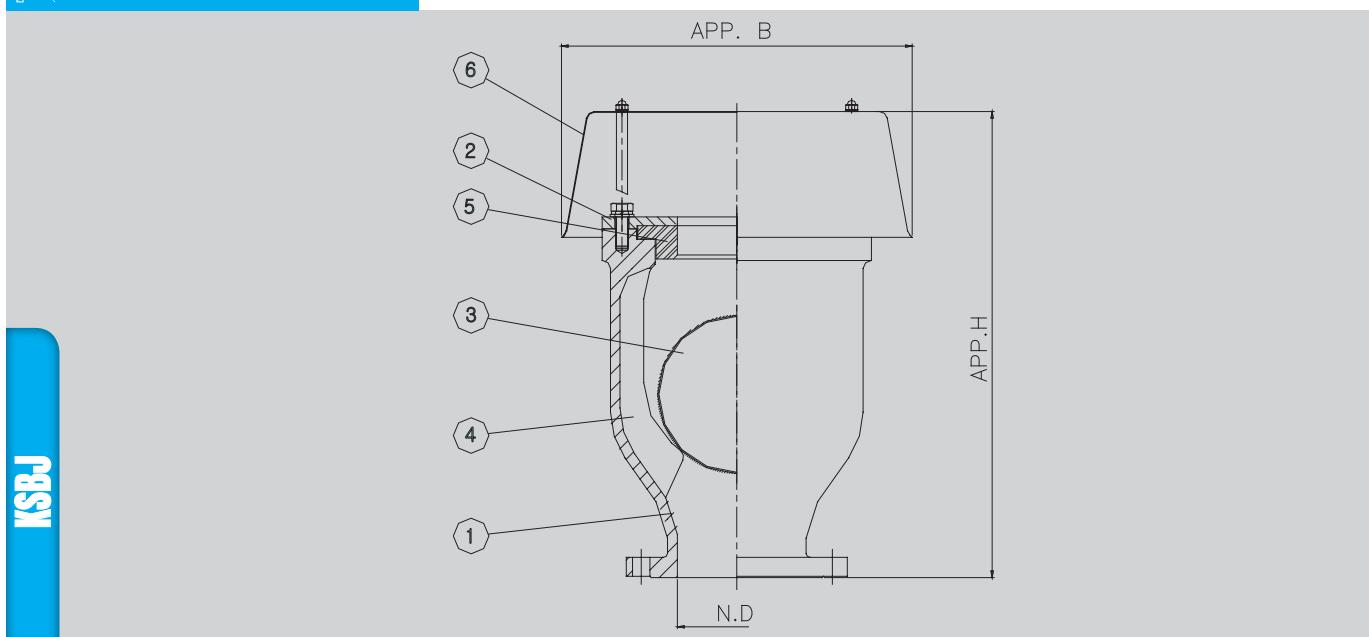
### APPLICATION



### OPERATION PRINCIPLE



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	1/2"	1"	2"	3"	4"	6"	8"	10"
N.D	15	25	50	80	100	150	200	250
Approx. B	163	163	288	288	342	440	512	512
Approx. H	245	247	360	380	405	588	658	680

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	C.S	SS304	SS316
			SS304	SS304	SS316L
1	BODY		A216-WCB	A351-CF8	A351-CF8M
2	COVER		SS304	SS304	SS316L
3	FLOATER		SS304	SS304	SS316L
4	FLOATER GUIDE		SS304	SS304	SS316L
5	GASKET		NBR	NBR	NBR
6	HOOD		SS304	SS304	SS316L
7	SPRING		SS304	SS316	SS316L



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# TANK SAFETY & PROTECTION DEVICE

## SECTION 2\_BREATHING VALVE WITH FLAME ARRESTER

**PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER**

**PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER**

**PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER**

**Breather Valve with Flame Arrester** is designed manufactured and tested according to API 2000 code, BS7244, and EN12874, these valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapor.

## KSBBFI/BSFI



P24

## KSBGFH/GSFH



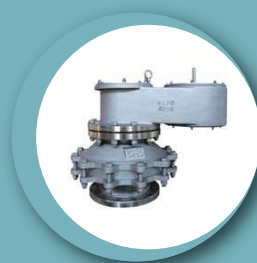
P26

## KSBBFH/BSFH



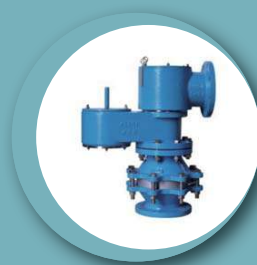
P28

## KSVRFI/VSFI



P30

## KSBGFI/GSFI



P32



## SECTION 2.1\_KSBBFI/BSFI

# PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER

### INTRODUCTION

**The model KSBBFI and BSFI** pressure vacuum valves with flame arrester are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code, BS7244, and EN12874. These valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

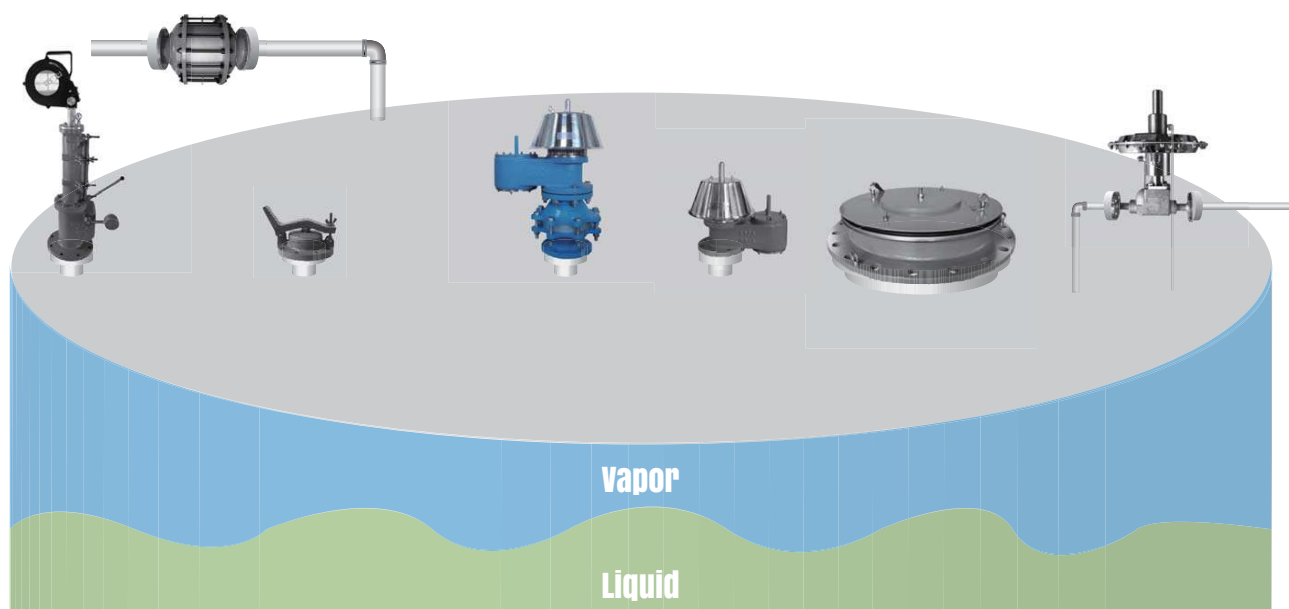
KSBBFI Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSBSFI Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

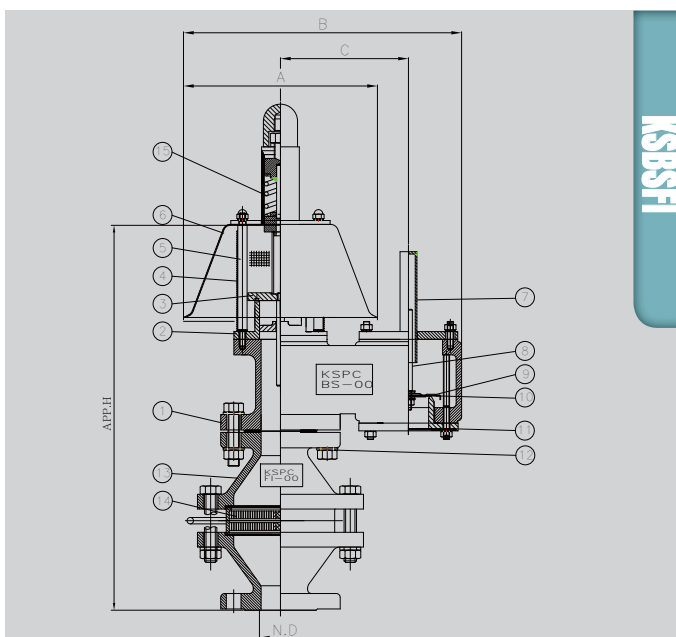
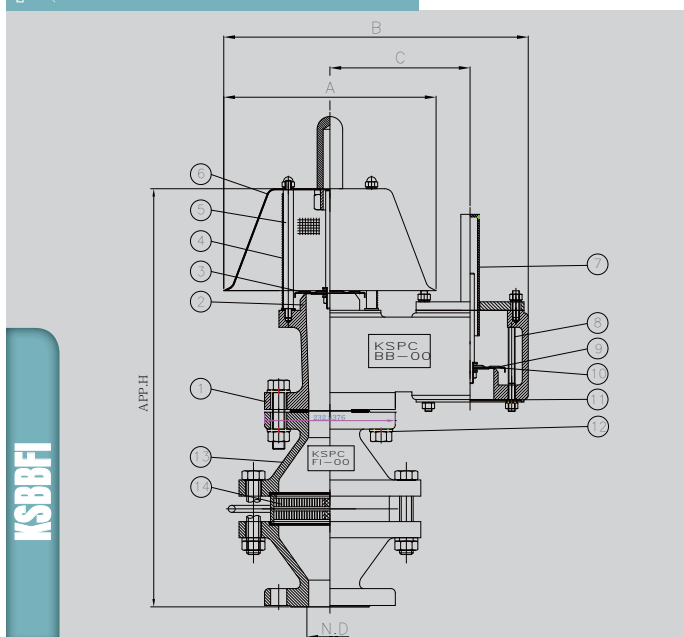
**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

**Rules & Certifications** API 2000, BS7244 & EN12874  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups available as additional extras)

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	250	294	324	440	476	544	620	685
B	359	446	485	627	742	861	978	1125
C	165	206	230	283	348	406	466	542
Approx. H	505	558	589	724	791	873	1012	1053

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BIRD SCREEN		SS304	SS304	SS304	SS316L
5	PRESSURE GUIDE POST		SS304	SS304	SS304	SS316L
6	WEATHER HOOD		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM GUIDE POST		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304		SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
12	BOLT/NUT		A193-B7 / A194-2H OR SS			
13	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
13.1	PALLET WEIGHT		COATED CS / SS			
14	ELEMENT		SS316L			
15	SPRING		SS304	SS304	SS304	SS316 ? L

KSBSFI

Section 2.1  
KSBBFI/BSFI





## SECTION 2.2\_KSBBFH/BSFH

# PRESSURE VACUUM RELEIF VAVLE WITH FLAME ARRESTER

### INTRODUCTION

**The model KSBBFH and BSFH** pressure vacuum valves with flame arrester are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code, BS7244, and EN12874. These valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapors.

### Setting Pressure

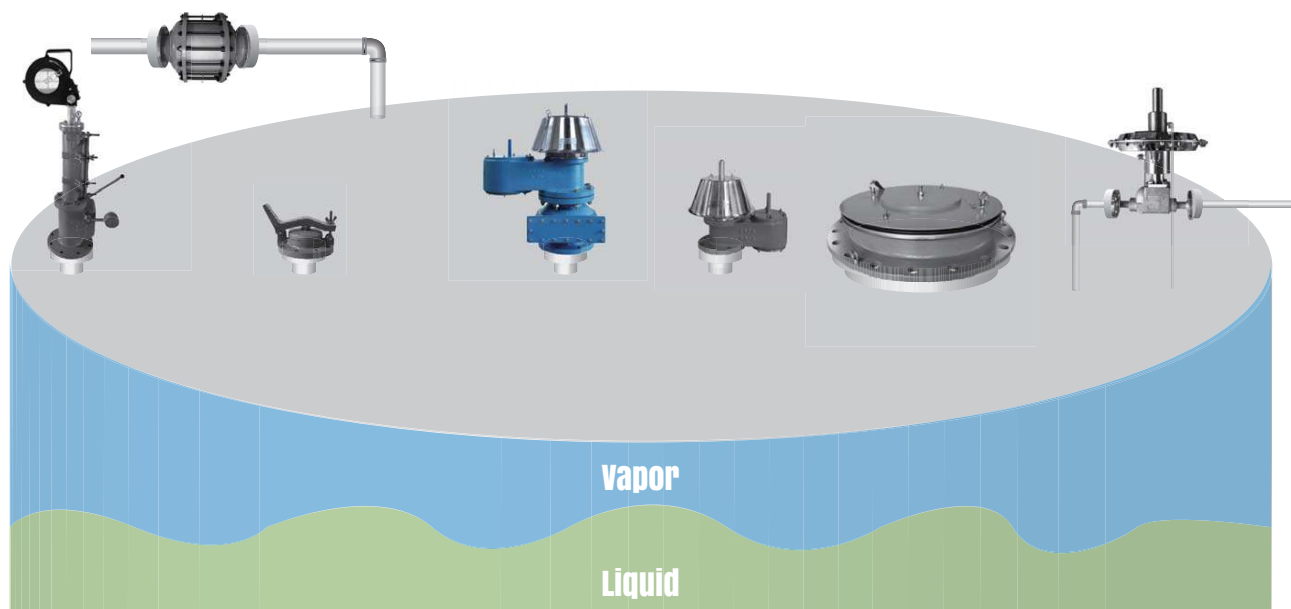
KSBBFH Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSBSFH Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

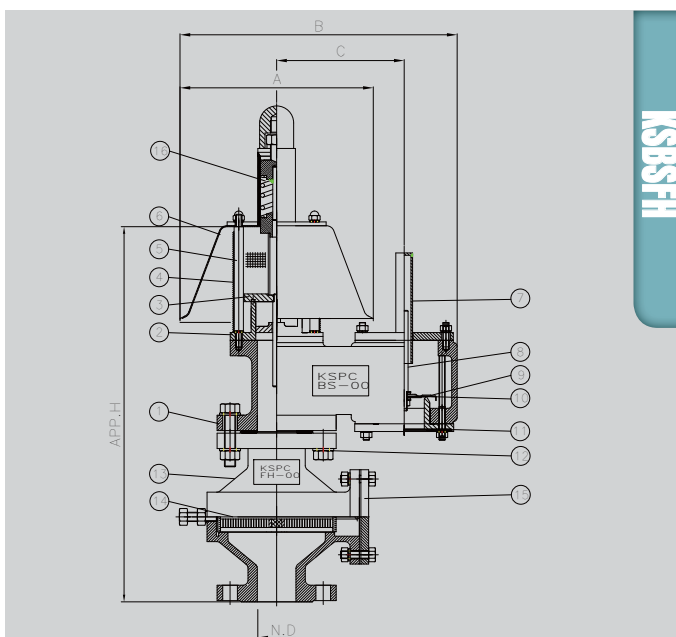
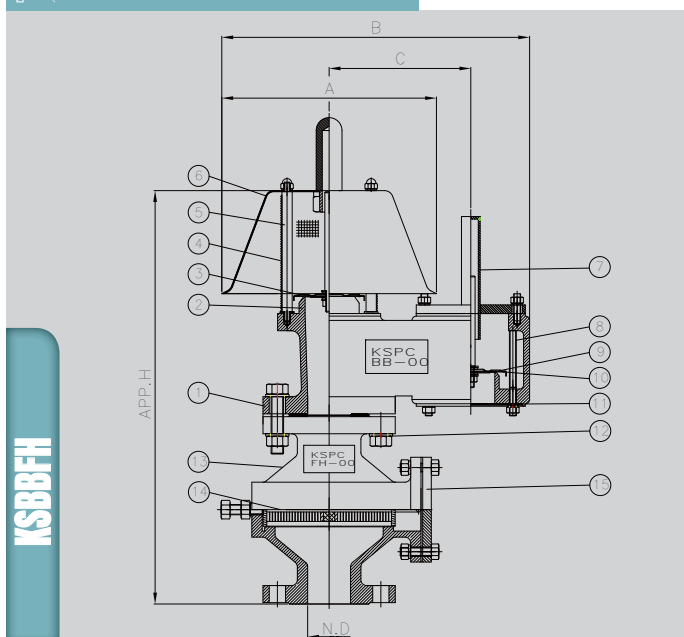
**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

**Rules & certifications** API 2000, BS7244, EN12874 & FM factory mutual approval  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups available as additional extras)

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	250	294	324	440	476	544	620	685
B	359	446	485	627	742	861	978	1125
C	165	206	230	283	348	406	466	542
Approx. H	485	544	589	692	754	863	928	1132

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BIRD SCREEN		SS304	SS304	SS304	SS316L
5	PRESSURE GUIDE POST		SS304	SS304	SS304	SS316L
6	WEATHER HOOD		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM GUIDE POST		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304		SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
12	BOLT/NUT		A193-B7 / A194-2H OR SS			
13	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
13.1	PALLET WEIGHT		COATED CS / SS			
14	ELEMENT		SS316L			
15	SPRING		SS304	SS304	SS304	SS316L

KSBSFH

Section 2.2  
KSBBFH/BSFH



## SECTION 2.3\_KSBGFI/GSFI

# PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER

### INTRODUCTION

**The model KSBGFI and GSFI** pressure vacuum valves with flame arrester are an advanced design for vent to Pipe away applications. Designed, manufactured and tested according to the API 2000 code, BS7244, and EN12874. These valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapors.

### Setting Pressure

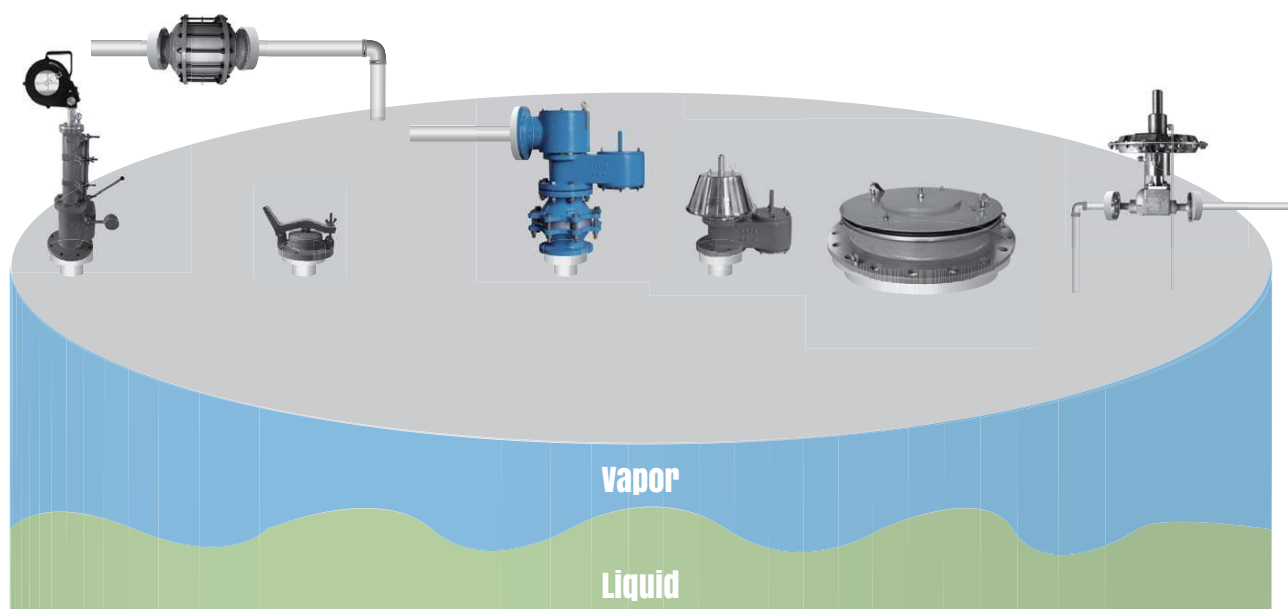
KSBGFI Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSGSFI Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

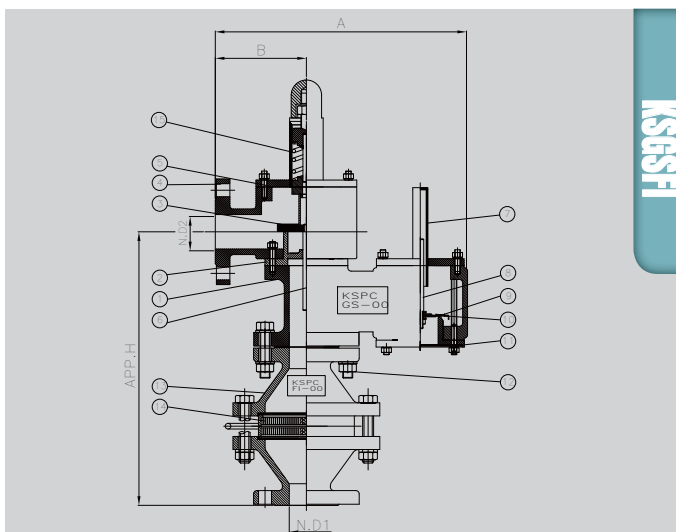
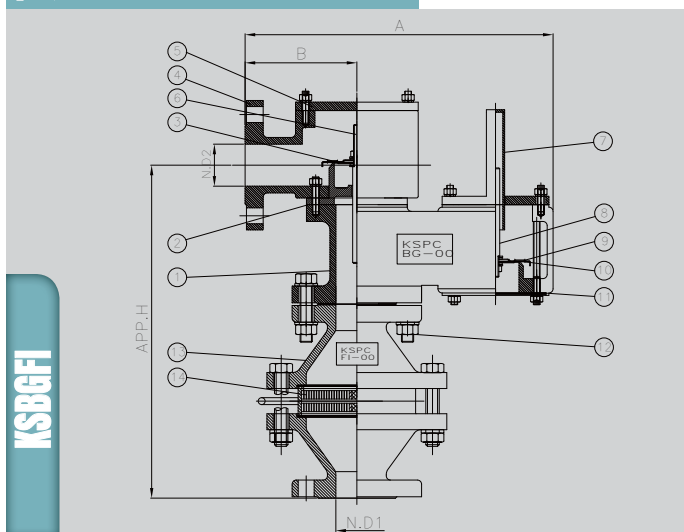
**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

**Rules & certifications** API 2000, BS7244 & EN12874  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups available as additional extras)

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

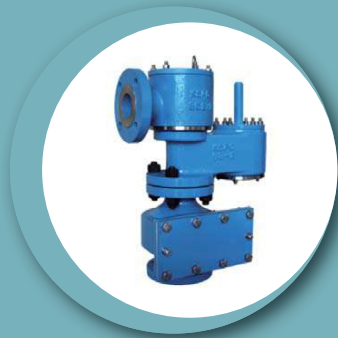
SIZE	2" X 2"	3" X 3"	4" X 4"	6" X 6"	8" X 8"	10" X 10"	12" X 12"	14" X 14"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	50	80	100	150	200	250	300	350
A	366	470	507	630	762	868	997	1197
B	132	171	184	223	258	279	329	415
Approx. H	399	458	489	609	680	751	903	969
SIZE	2" X 3"	3" X 4"	4" X 6"	6" X 8"	8" X 10"	10" X 12"	12" X 14"	14" X 16"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	80	100	150	200	250	300	350	400
A	376	471	512	635	762	879	1011	1211
B	142	172	189	228	258	290	343	420
Approx. H	420	468	514	633	705	776	928	1009

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
5	PRESSURE COVER		B26-319.F	SS304	SS304	SS316L
6	PRESSURE STEM		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM STEM		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304		SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
12	BOLT/NUT		A193-B7 / A194-2H OR SS			
13	BODY-3		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
14	ELEMENT		SS316L			
15	SPRING		SS304	SS304	SS304	SS316






## SECTION 2.4\_KSBGFH/GSFH


# PRESSURE VACUUM RELIEF VALVE WITH FLAME ARRESTER


### INTRODUCTION


 **The model KSBGFH and GSFH** pressure vacuum valves with flame arrester are an advanced design for vent to Pipe away applications. Designed, manufactured and tested according to the API 2000 code, BS7244, and EN12874. These valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapors.

### Setting Pressure

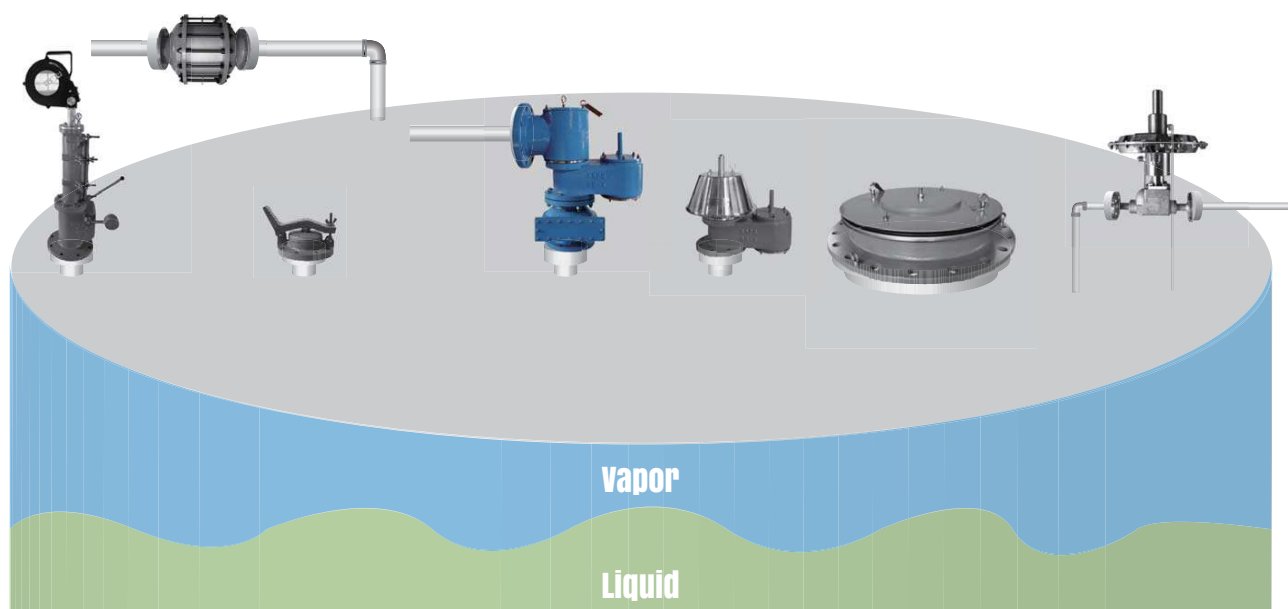
KSBGFH Weight Loaded model	Min. +/- 20 mmW.C ~ Max. + 700/- 430 mmW.C
KSGSFH Spring Loaded model	Min. + 700/- 430 mmW.C ~ Max. +/- 9,000 mmW.C

 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

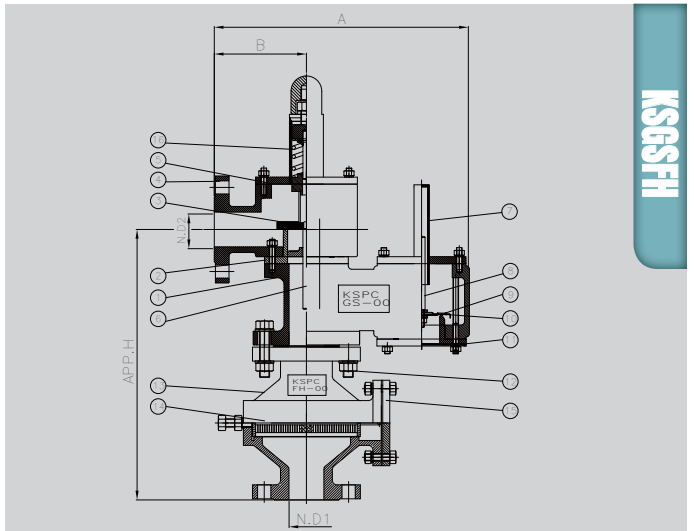
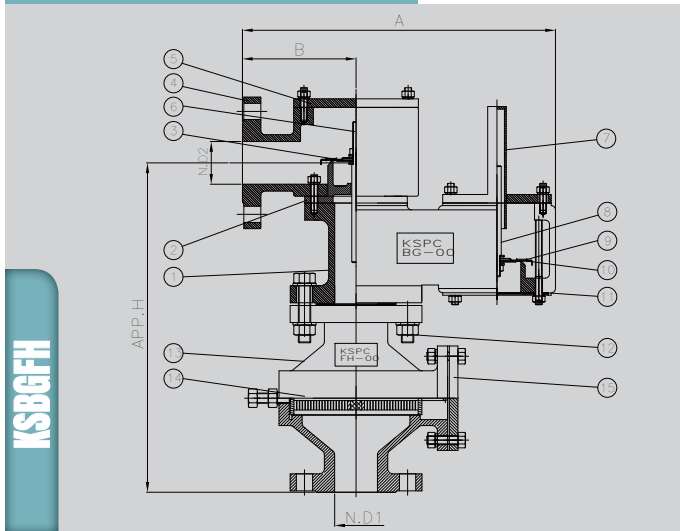
 **Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

 **Rules & certifications** API 2000, BS7244, EN12874 & FM factory mutual approval  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups available as additional extras)

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

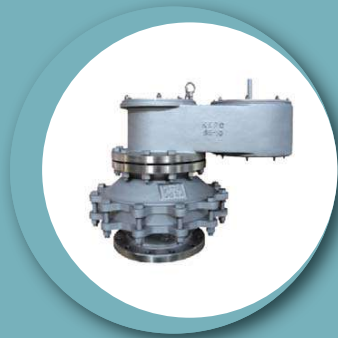
SIZE	2" X 2"	3" X 3"	4" X 4"	6" X 6"	8" X 8"	10" X 10"	12" X 12"	14" X 14"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	50	80	100	150	200	250	300	350
A	366	470	507	630	762	868	997	1197
B	132	171	184	223	258	279	329	415
Approx. H	379	444	489	576	643	941	819	1048
SIZE	2" X 3"	3" X 4"	4" X 6"	6" X 8"	8" X 10"	10" X 12"	12" X 14"	14" X 16"
N.D 1	50	80	100	150	200	250	300	350
N.D 2	80	100	150	200	250	300	350	400
A	376	471	512	635	762	879	1011	1211
B	142	172	189	228	258	290	343	420
Approx. H	400	454	512	601	668	767	844	1088

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316L
4	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
5	PRESSURE COVER		B26-319.F	SS304	SS304	SS316L
6	PRESSURE STEM		SS304	SS304	SS304	SS316L
7	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
8	VACUUM STEM		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304		SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM SCREEN		SS304	SS304	SS304	SS316L
12	BOLT/NUT		A193-B7 / A194-2H OR SS			
13	BODY-3		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
14	ELEMENT		SS316L			
15	ELEMENT COVER		ALUMINIUM	C.S	SS304	SS316L
16	SPRING		SS304	SS304	SS304	SS316

KSBGFH



## SECTION 2.5\_KSVRFI/VSFI

# VACUUM RELIEF VALVE WITH FLAME ARRESTER

### INTRODUCTION

**The model KSVRFI and VSFI** vacuum relief valve with flame arrester are an advanced design for vent to atmosphere applications. Designed, manufactured and tested according to the API 2000 code, BS7244, and EN12874. These valves utilize the latest technologies to provide protection against positive or vacuum over pressure and prevent air intake, evaporative losses of product and help to contain odorous and potentially explosive vapours.

### Setting Pressure

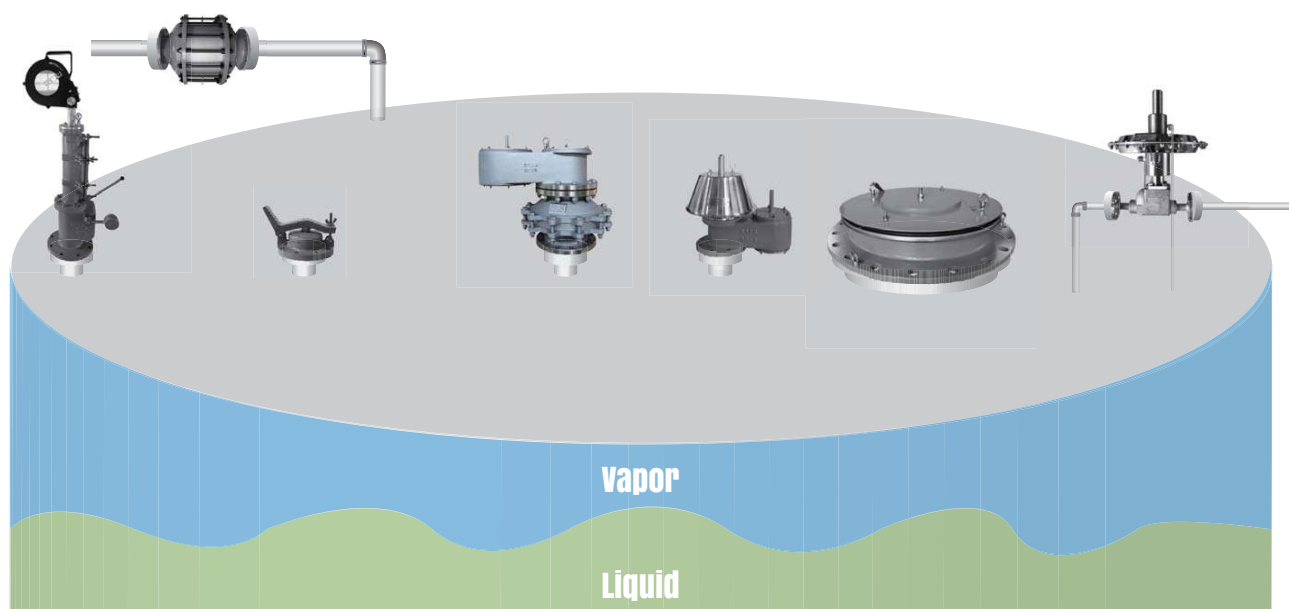
KSVRFI Weight Loaded model	Min. -20 mmW.C ~ Max. - 430 mmW.C
KSVSFI Spring Loaded model	Min. - 430 mmW.C ~ Max. - 9,000 mmW.C

**Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

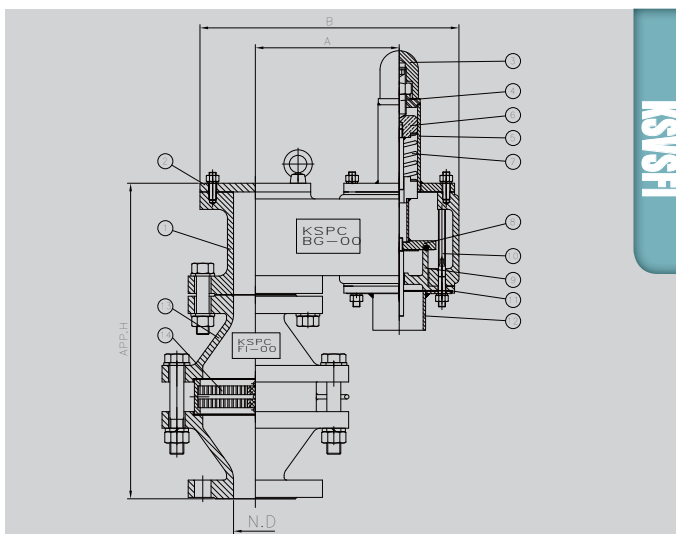
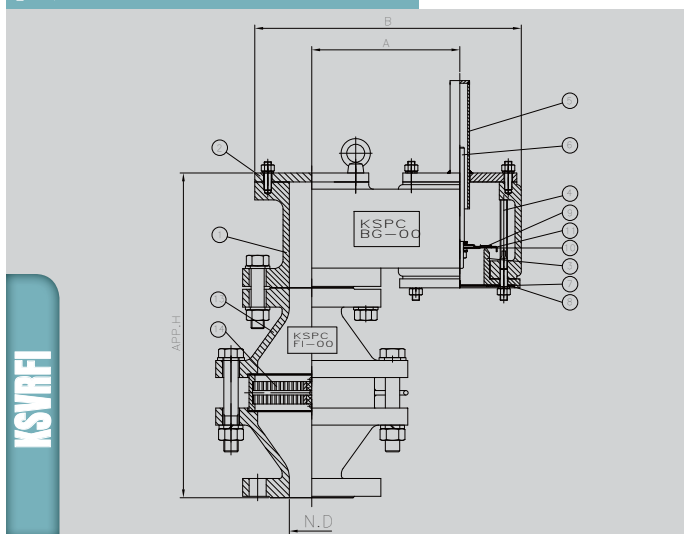
**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges as standard  
(Different connections available on request)

**Rules & Certifications** API 2000, BS7244 & EN12874  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups available as additional extras)

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	165	206	230	283	348	406	466	542
B	297	379	397	523	647	755	858	1016
Approx. H	362	400	421	510	557	604	728	769

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE COVER		B26-319.F	SS304	SS304	SS316L
3	VACUUM SEAT		SS304	A216-WCB	A351-CF8	A351-CF8M
4	VACUUM GUIDE		SS304	SS304	SS304	SS316L
5	VACUUM COVER		B26-319.F	C.S	SS304	SS316L
6	VACUUM STEM		SS304	SS304	SS304	SS316L
7	VACUUM SCREEN		SS304	SS304	SS304	SS316L
8	VACUUM SCREEN PLATE		SS304	SS304	SS304	SS316L
9	VACUUM DISC		SS304	SS304	SS304	SS316L
10	DIAPHRAGM		TEFLON			
11	VACUUM DISC PLATE		SS304	SS304	SS304	SS316L
12	VACUUM STEM GUIDE		SS304	SS304	SS304	SS316L
13	BODY-2		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
14	ELEMENT		SS316L			
15	ELEMENT COVER		ALUMINIUM	C.S	SS304	SS316L
16	SPRING		SS304	SS304	SS304	SS316

KSVRFI

KSVRFI

Section 2.5  
KSVRFI/ASFI

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# TANK SAFETY & PROTECTION DEVICE

## SECTION 3\_FLAME ARRESTER

**FLAME ARRESTER FOR EXPLOSION PROOF IN-LINE**

**FLAME ARRESTER FOR DETONATION PROOF IN-LINE**

**FLAME ARRESTER FOR EXPLOSION PROOF END-LINE**



**Flame Arrester** is designed, manufactured, tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. The units are passive devices with no moving parts. They prevent the propagation of flame from the exposed side of the unit to the protected side by the use of a 316L stainless steel crimped metal ribbon type flame cell element.

**KSFI**



**P36**

**KSFH**



**P38**

**KSFL**



**P40**

**KSFTFH**



**P42**

**KFD**



**P44**

**KSFD**



**P46**

**KSFLD**



**P48**

**KSFE**



**P50**

**KSFF**



**P52**



## SECTION 3.1\_KSFI

# FLAME ARRESTER EXPLOSION PROOF IN-LINE

### INTRODUCTION

**The model KSFI** inline flame arrester is designed, manufactured, tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. The units are passive devices with no moving parts. They prevent the propagation of flame from the exposed side of the unit to the protected side by the use of a 316L stainless steel crimped metal ribbon type flame cell element. This construction produces a matrix of uniform opening that are carefully constructed to quench the flame by absorbing the heat.

### Operating Temperature @ Pressure

KSFI / DN 15 ~ DN 600

+ 60°C (=140°F) @ 1.1 bar abs

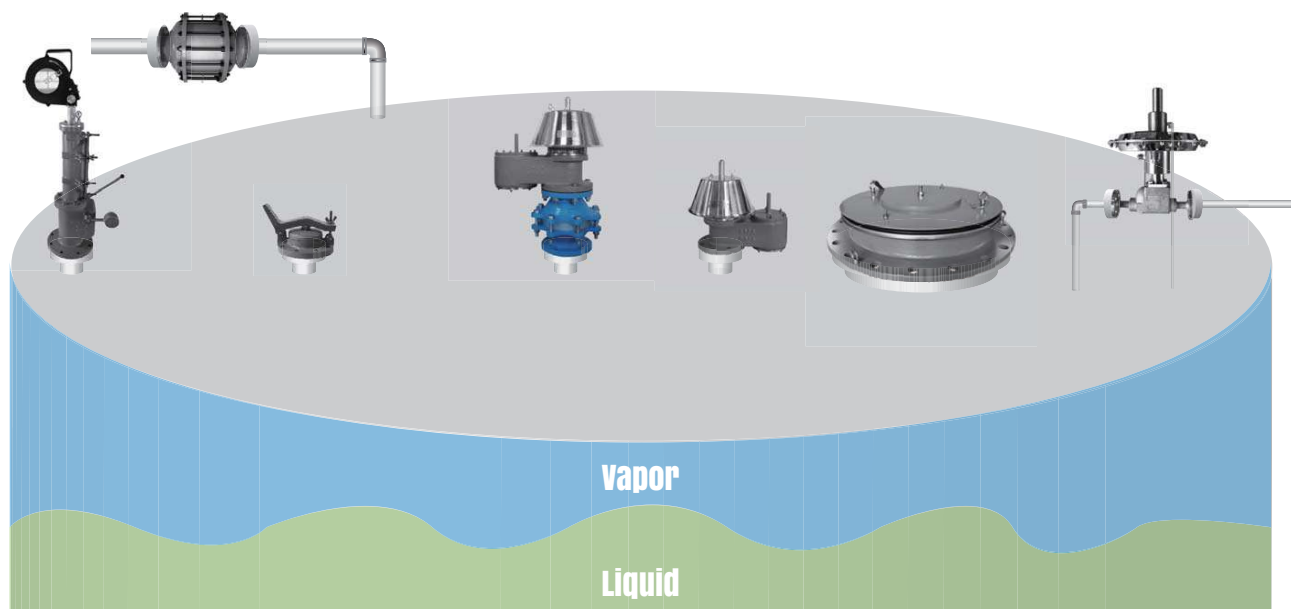
**Body Materials** Aluminium, Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

**Sizes range** DN 15 ~ DN 600 with ANSI 150lb flanges (Different connections available on request)

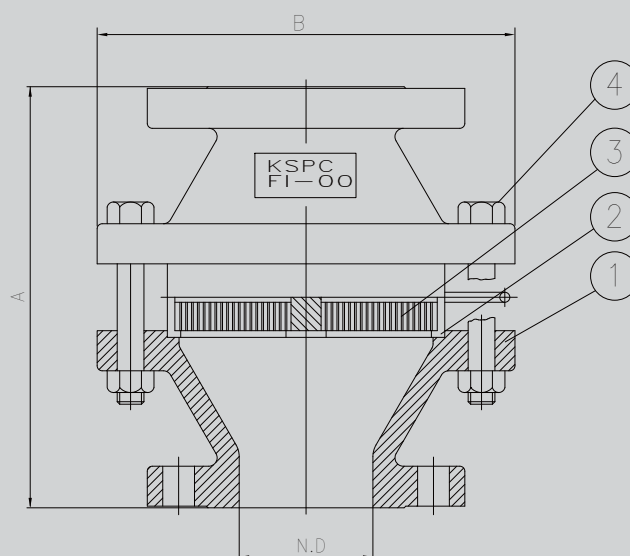
**Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases (Other gas groups all available as extras)

**optimum / Optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	½"	1"	1 ½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	20"	24"
N.D	15	25	40	50	80	100	150	200	250	300	350	400	500	600
A	223	229	230	234	254	262	326	342	364	454	486	511	540	650
B	155	155	214	214	251	300	385	450	600	680	745	850	1000	1230

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	ALUMINIUM	C.S	S.S
1	BODY	CAST ALUMINIUM	CAST or WELDED C.S	S.S
2	ELEMENT RING	SS304	SS304	SS304 OR SS316L
3	ELEMENT	SS316L		
4	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S		
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE

- ⚠ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ⚠ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ⚠ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ⚠ The gaskets should be inspected and replaced if necessary.



## SECTION 3.2\_KSFH

# FLAME ARRESTER EXPLOSION PROOF IN-LINE

### INTRODUCTION

**The model KSFH** inline flame arrester is designed, manufactured, tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. The units are passive devices with no moving parts. They prevent the propagation of flame from the exposed side of the unit to the protected side by the use of a 316L stainless steel crimped metal ribbon type flame cell element. This construction produces a matrix of uniform opening that are carefully constructed to quench the flame by absorbing the heat.

### Operating Temperature @ Pressure

KSFH / DN 50 ~ DN 350

+ 60 °C (=140°F) @ 1.1 bar abs

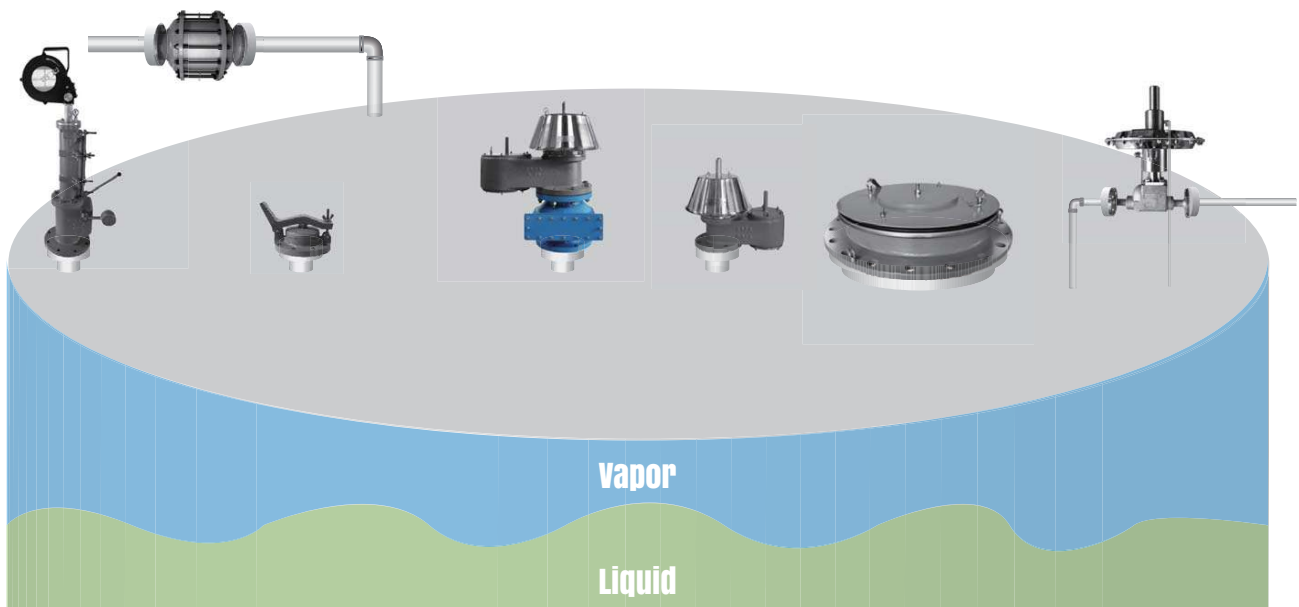
**Body Materials** Aluminium, Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

**Sizes range** DN 50 ~ DN 350 with ANSI 150lb flanges(Different connections available on request)

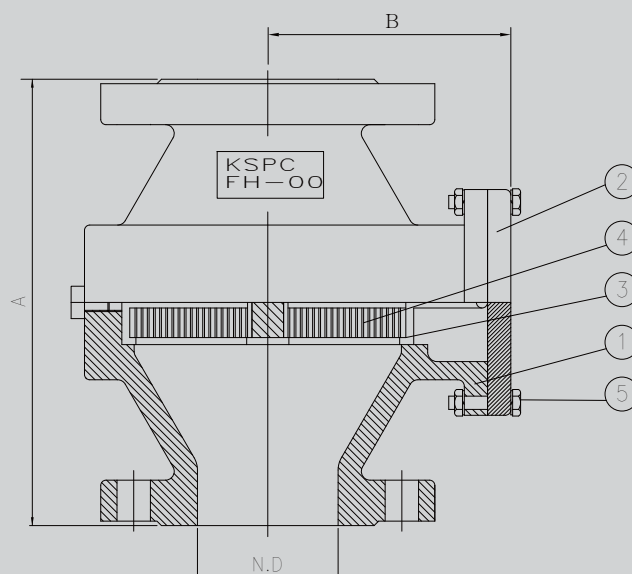
**Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

**optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"	14"
N.D	50	80	100	150	200	250	300	350
A	214	240	262	294	305	354	370	565
B	124	144	163	188	220	310	317	393

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	ALUMINIUM	C.S	S.S
1	BODY	CAST ALUMINIUM	CAST or WELDED C.S	S.S
2	COVER	ALUMINIUM	C.S	S.S
3	ELEMENT RING	SS304	SS304	SS304 OR SS316L
4	ELEMENT	SS316L		
5	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S		
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE

- ❗ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ❗ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ❗ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ❗ The gaskets should be inspected and replaced if necessary.





## SECTION 3.3\_KSFL

# FLAME ARRESTER EXPLOSION PROOF IN-LINE

### INTRODUCTION

**The model KSFL** inline flame arrester is designed, manufactured, tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. The units are passive devices with no moving parts. They prevent the propagation of flame from the exposed side of the unit to the protected side by the use of a 316L stainless steel crimped metal ribbon type flame cell element. This construction produces a matrix of uniform opening that are carefully constructed to quench the flame by absorbing the heat.

### Operating Temperature @ Pressure

KSFL / DN 50 ~ DN 300

+ 60 °C (=140°F) @ 1.1 bar abs

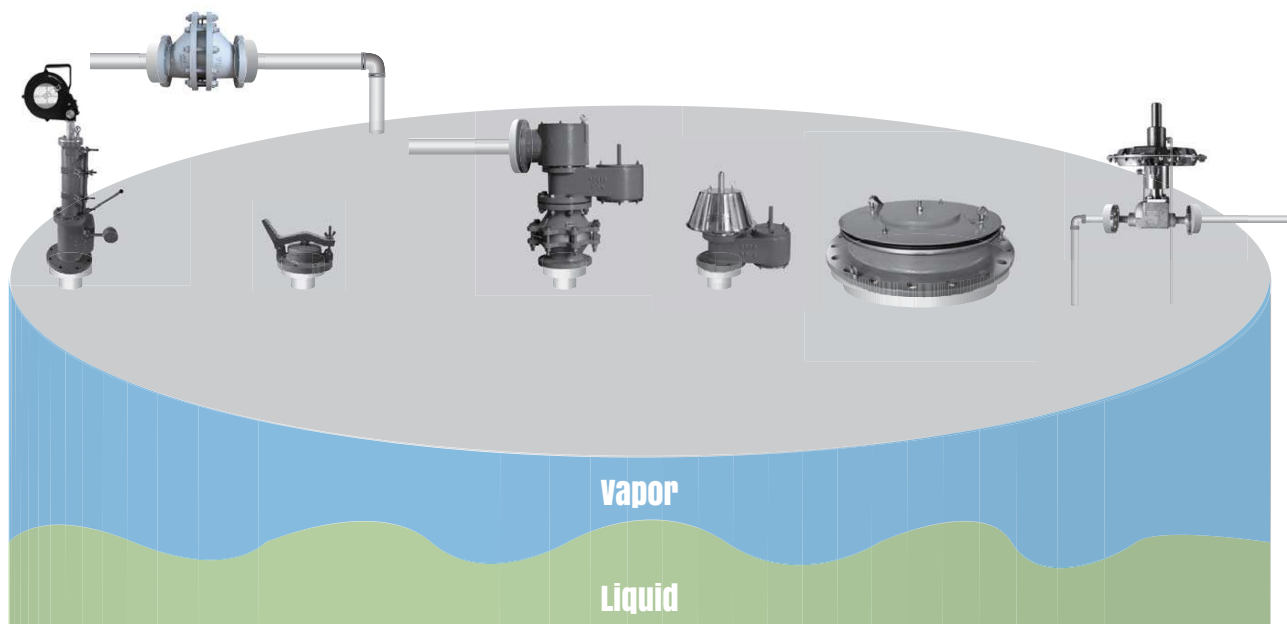
**Body Materials** Aluminium, Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

**Sizes range** DN 50 ~ DN 300 with ANSI 150lb flanges(Different connections available on request)

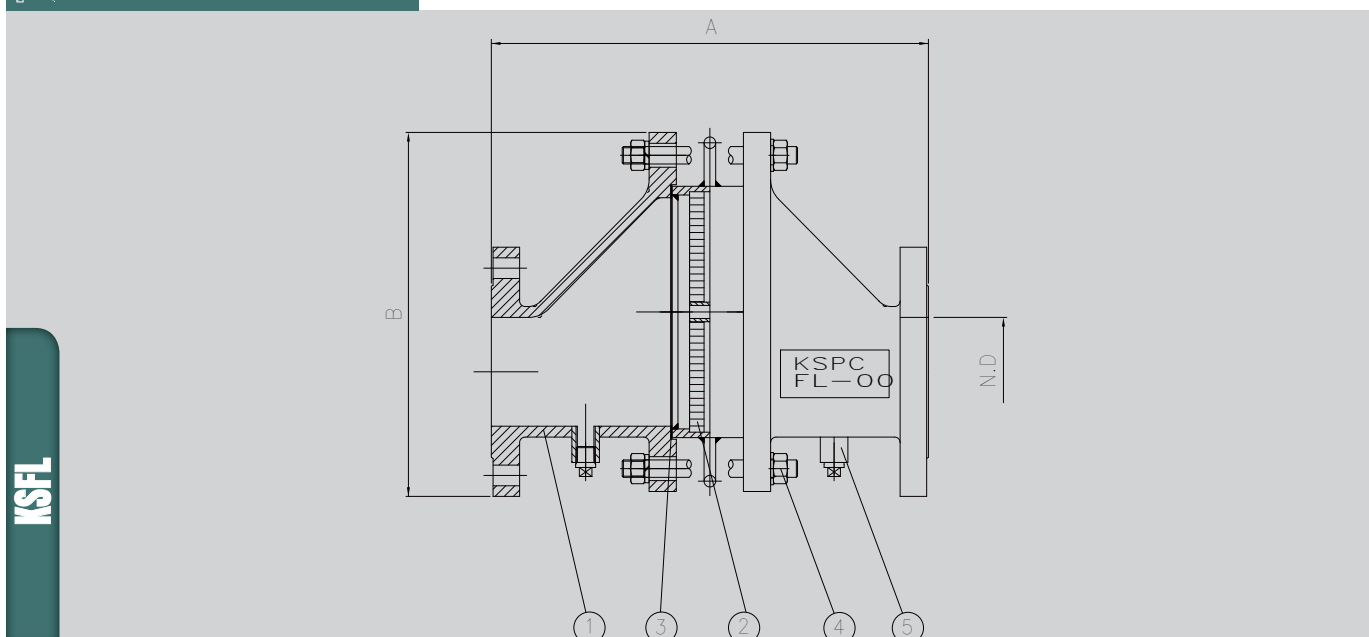
**Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

**optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"
N.D	50	80	100	150	200	250	300
A	396	430	492	522	592	770	810
B	247	276	335	399	485	639	705

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	ALUMINIUM	C.S	S.S
1	BODY	CAST ALUMINIUM	CAST or WELDED C.S	S.S
2	ELEMENT RING	SS304	SS304	SS304 OR SS316L
3	ELEMENT	SS316L		
4	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S		
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ⚠ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ⚠ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ⚠ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ⚠ The gaskets should be inspected and replaced if necessary.



## SECTION 3.4\_KSFTFH

# FLAME TRAP EXPLOSION PROOF IN-LINE


### INTRODUCTION

 **The model KSFTFH** flame trap ass'y of KSPC is composed of KSPC Model **KSFH** flame arrester and quick closing valve, automatically, in according to a rise temperature of heat. Generally, it's installed to pipe line in front of gas line from each holder and digester. Also, it's prevent igniter to install in using gas equipment line. Flame Trap is designed to protect as a from explosion of propagation of flame.


### Fuse Activating Temperature / time

KSFTFH / DN 25 ~ DN 300

+ 127 °C (=260°F) within 15 seconds

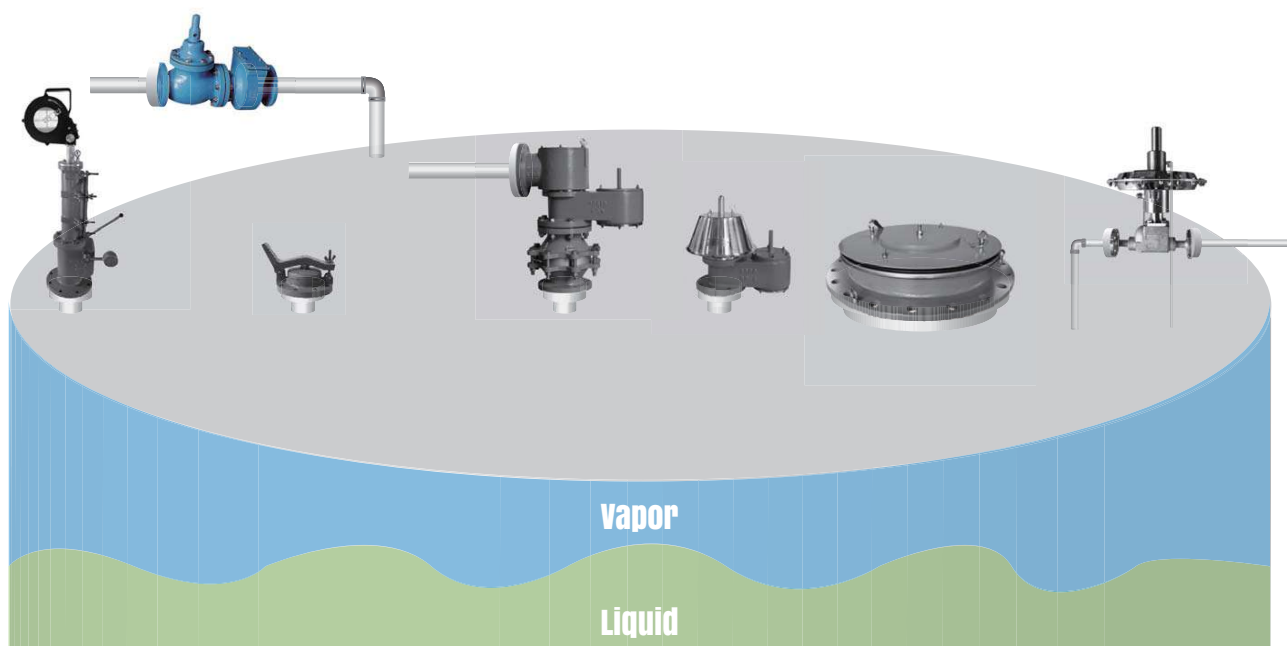
 **Body Materials** Aluminium, Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

 **Sizes range** DN 25 ~ DN 300 with ANSI 150lb flanges(Different connections available on request)

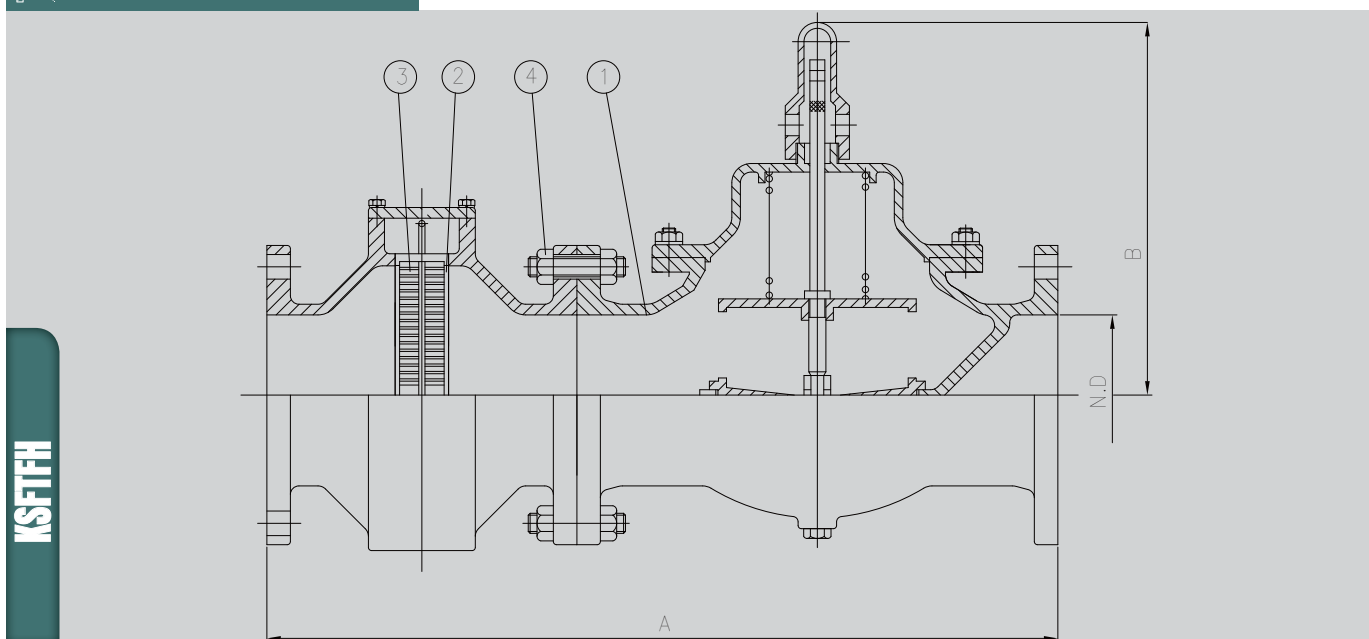
 **Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

 **optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	1"	2"	3"	4"	6"	8"	10"	12"
N.D	25	50	80	100	150	200	250	300
A	350	416	481	595	695	798	989	1048
B	140	185	210	254	345	392	420	524

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	ALUMINIUM	C.S	S.S
1	BODY	CAST ALUMINIUM	CAST or WELDED C.S	S.S
2	ELEMENT RING	SS304	SS304	SS304 OR SS316L
3	ELEMENT	SS316L		
4	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S		
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ⚠ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ⚠ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ⚠ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ⚠ The gaskets should be inspected and replaced if necessary.



## SECTION 3.5\_KFD

# FLAME ARRESTER DETONATION PROOF IN-LINE


### INTRODUCTION

 **The model KFD** inline detonation flame arrester is designed, manufactured and tested according to API 2000, British Standard Specification Code BS7244, EN 12874 / ISO 16852 & USCG, IMO MSC/Circ.677. **KFD** detonation flame arresters provide protection against flame propagation in piping systems that are manifolded or have long runs. The arresters are designed to stop an ignited flammable vapor mixture traveling at subsonic or supersonic vapor velocities. They are also designed to protect against continuous burning against the SS316L flame cell for a specific period.


### Operating Temperature @ Pressure

KFD / DN 15 ~ DN 300

+ 60°C (=140°F) @ 1.1 bar abs

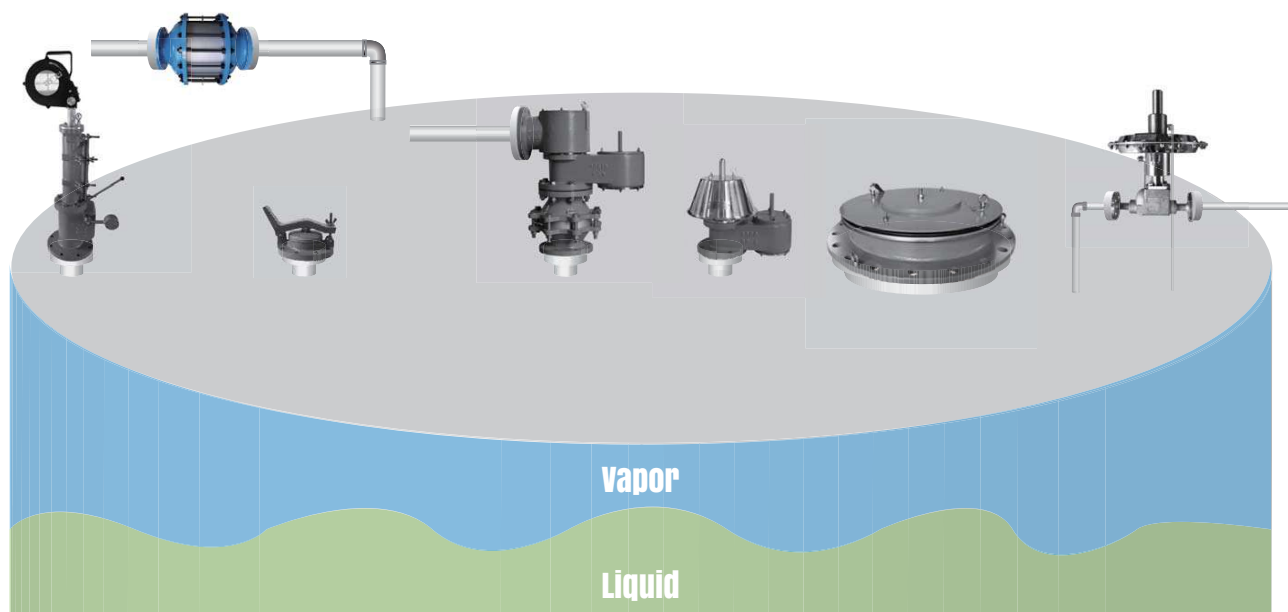
 **Body Materials** Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

 **Sizes range** DN 15 ~ DN 300 with ANSI 150lb flanges(Different connections available on request)

 **Rules & Certifications** API 2000, BS7244, EN 12874/ISO 16852, and USCG, IMO MSC/Circ.677  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

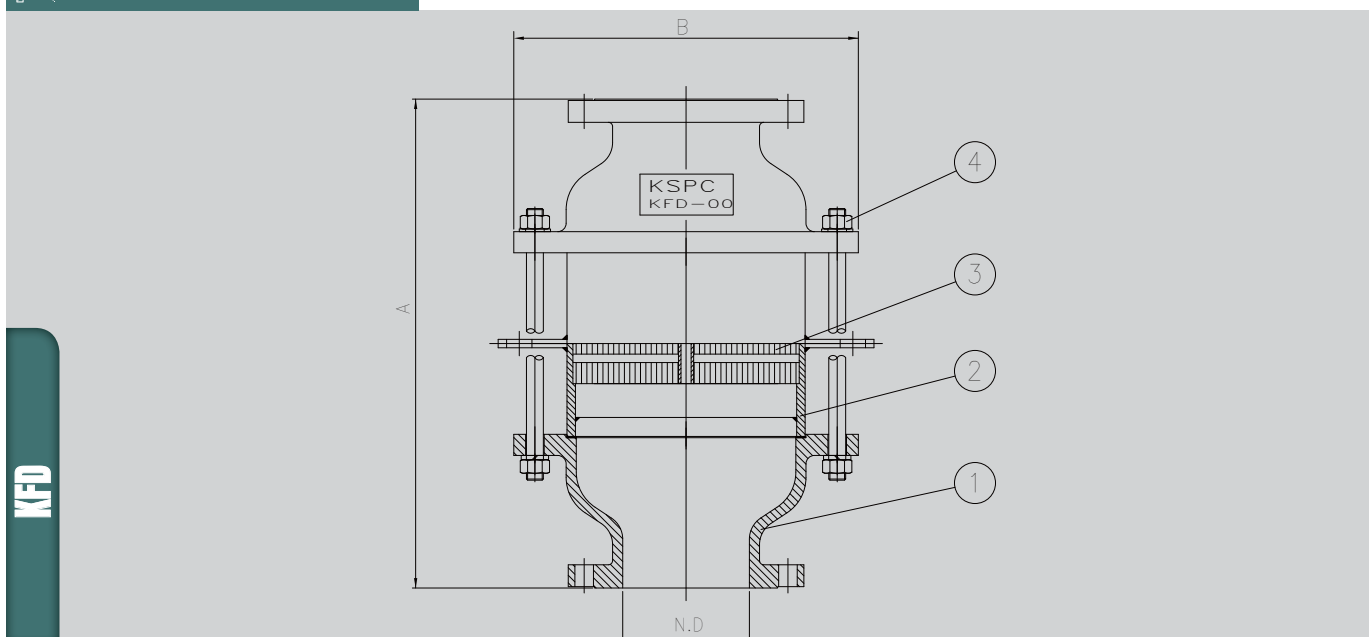
 **optimum / Optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	1/2"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"
N.D	15	25	40	50	80	100	150	200	250	300
A	360	364	373	375	435	502	577	657	765	818
B	180	200	245	245	270	324	408	570	670	740

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	C.S	S.S
1	BODY	CAST or WELDED C.S	S.S
2	ELEMENT RING	SS304	SS304 OR SS316L
3	ELEMENT	SS316L	
4	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S	
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.	

**NOTE** C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ⚠ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ⚠ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ⚠ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ⚠ The gaskets should be inspected and replaced if necessary.



## SECTION 3.6\_KSFD

# FLAME ARRESTER DETONATION PROOF IN-LINE

### INTRODUCTION


 **The model KSFD** inline detonation flame arrester is designed, manufactured and tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. **KSFD** detonation flame arresters provide protection against flame propagation in piping systems that are manifolded or have long runs. The arresters are designed to stop an ignited flammable vapor mixture traveling at subsonic or supersonic vapor velocities. They are also designed to protect against continuous burning against the SS316L flame cell for a specific period.

### Operating Temperature @ Pressure

KSFD / DN 25 ~ DN 150	+ 90 °C (=194°F) @ 1.2 bar abs
KSFD / DN 200 ~ DN 400	+ 90 °C (=194°F) @ 1.1 bar abs

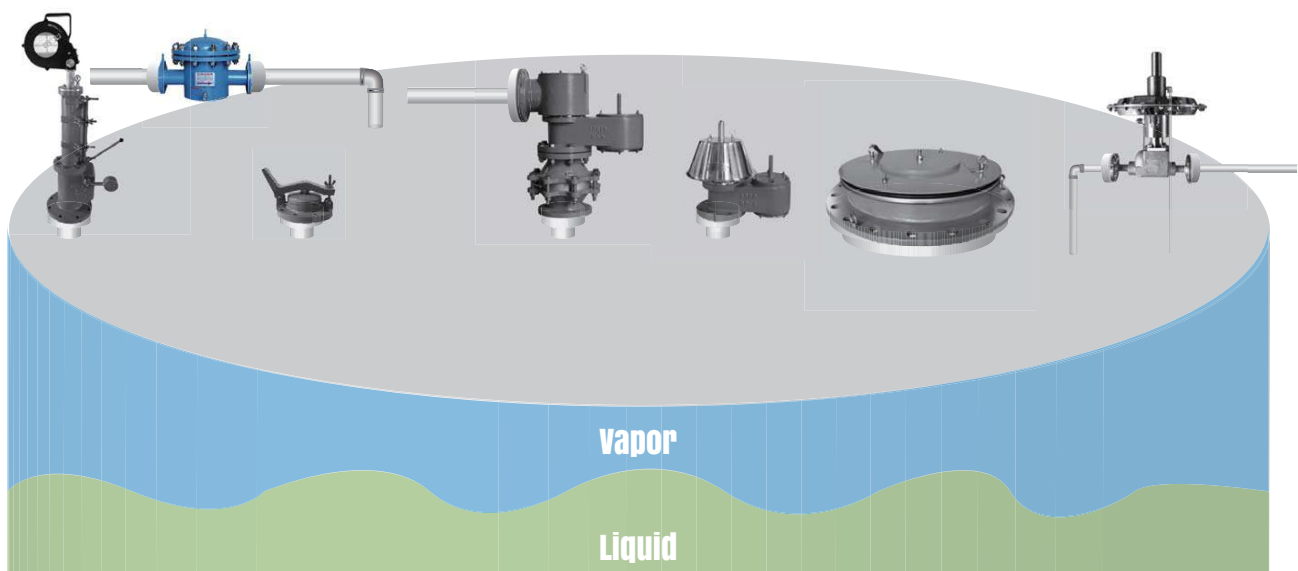
 **Body Materials** Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

 **Sizes range** DN 25 ~ DN 400 with ANSI 150lb flanges(Different connections available on request)

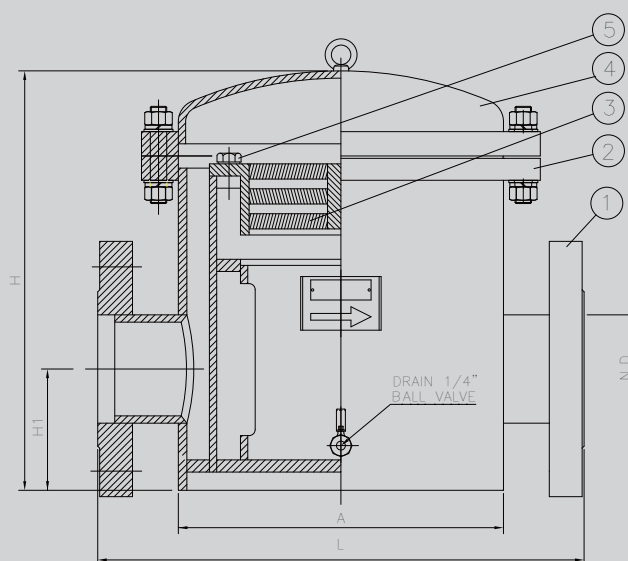
 **Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

 **optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	1"	1 ½"	2"	3"	4"	6"	8"	10"	12"	14"	16"
N.D	25	40	50	80	100	150	200	250	300	350	400
A	216	216	216	267	356	406	508	610	711	812	914
L	450	450	450	530	640	720	830	960	1080	1200	1320
H	325	325	325	340	405	495	560	660	760	845	970
H1	95	95	95	110	125	170	190	220	260	275	302

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	C.S	S.S	S.S
1	BODY	WELDED C.S	WELDED SS304	WELDED SS316
2	ELEMENT RING	SS304	SS304	SS316L
3	ELEMENT	SS316L		
4	COVER	C.S	SS304	SS316L
5	STUD BOLT/NUT	S.S		
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ⚠ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ⚠ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ⚠ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ⚠ The gaskets should be inspected and replaced if necessary.



## SECTION 3.7\_KSFLD

# FLAME ARRESTER DETONATION PROOF IN-LINE


### INTRODUCTION

 **The model KSFLD** inline detonation flame arrester is designed, manufactured and tested according to API 2000, British Standard Specification Code BS7244, and EN 12874 / ISO 16852. The units are passive devices with no moving parts. The KSFLD detonation flame arresters provide protection against flame propagation in piping systems that are manifolded or have long runs. The arresters are designed to stop an ignited flammable vapor mixture traveling at subsonic or supersonic vapor velocities. They are also designed to protect against continuous burning against the 316LSS flame cell for a specific period.


### Operating Temperature @ Pressure

KSFLD / DN 50 ~ DN 300

+ 60 °C (=140 °F) @ 1.1 bar abs

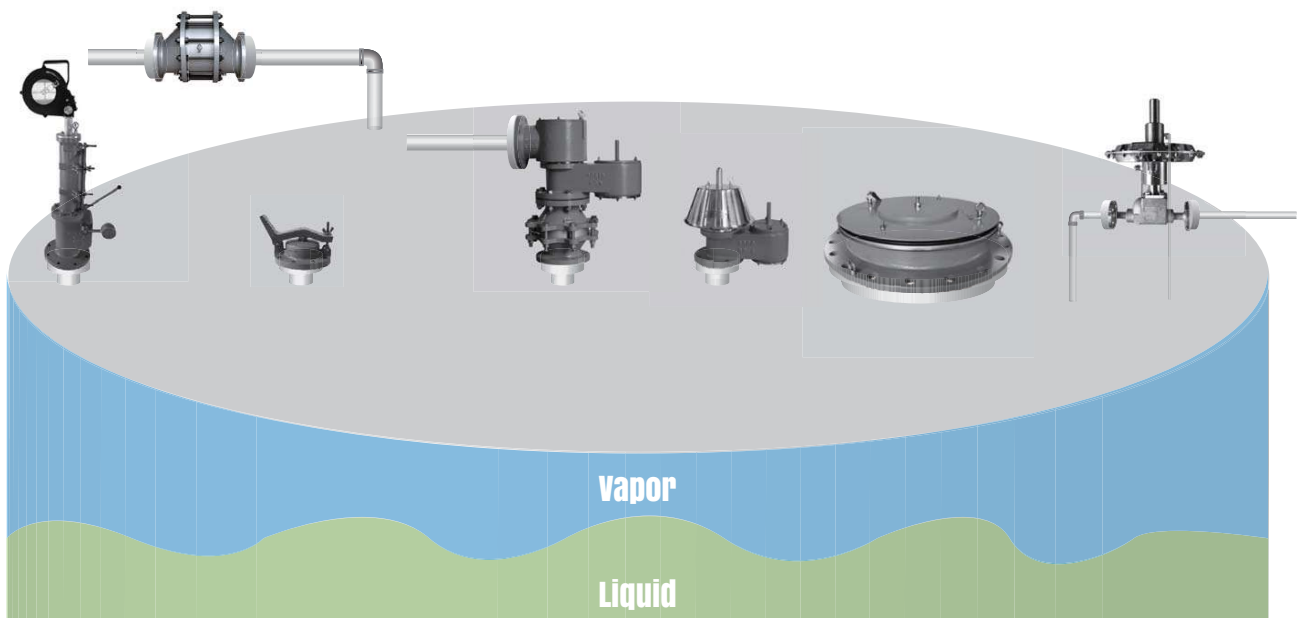
 **Body Materials** Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 300 with ANSI 150lb flanges(Different connections available on request)

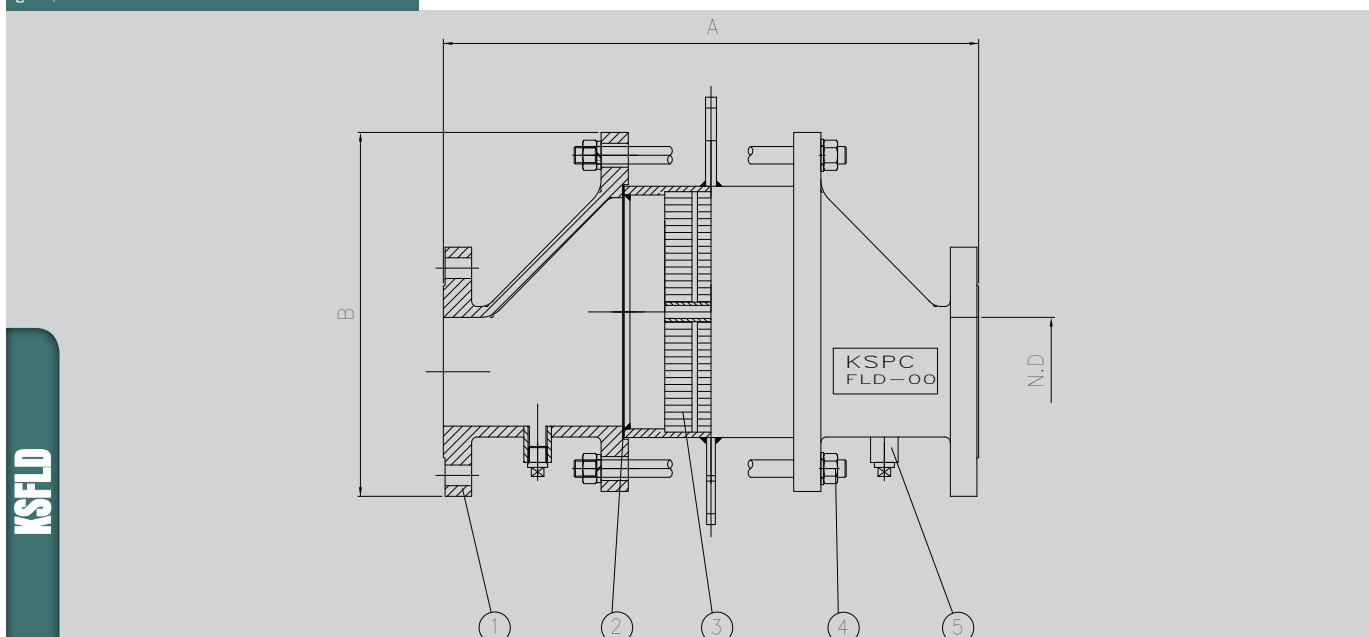
 **Rules & Certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

 **optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"
N.D	50	80	100	150	200	250	300
A	396	430	492	522	592	770	810
B	247	276	335	399	485	639	705

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	C.S	S.S
1	BODY	CAST or WELDED C.S	S.S
2	ELEMENT RING	SS304	SS304 OR SS316L
3	ELEMENT	SS316L	
4	STUD BOLT/NUT	A193-B7 / A194-2H OR S.S	
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.	

**NOTE** C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ❗ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ❗ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ❗ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ❗ The gaskets should be inspected and replaced if necessary.



## SECTION 3.8\_KSFE

# FLAME ARRESTER EXPLOSION PROOF END-LINE


### INTRODUCTION


 **The model KSFE** flame arrester are designed, manufactured and tested according to API2000, BS7244 (British Standard Specification), and EN 12874 / ISO 16852. The units allow free venting in combination with flame protection for vertical vent applications. They prevent flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon 316LSS flame cells.


### Operating Temperature @ Pressure

KSFE / DN 50 ~ DN 300

+ 90 °C (=194°F) @ 1.1 bar abs

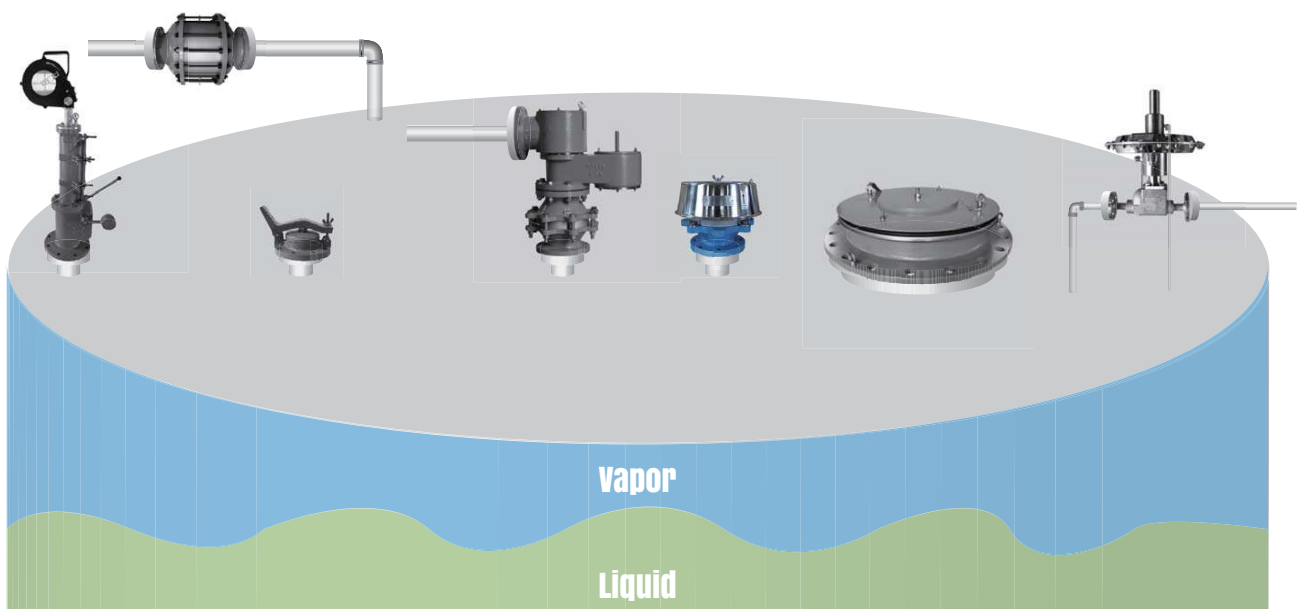
 **Body Materials** Aluminium, Nodular Iron, Cast Steel, SS304, SS316, SS316L with various trims  
(Different materials available on request)

 **Sizes range** DN 50 ~ DN 300 with ANSI 150lb flanges(Different connections available on request)

 **Rules & certifications** API 2000, BS7244, and EN 12874 / ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

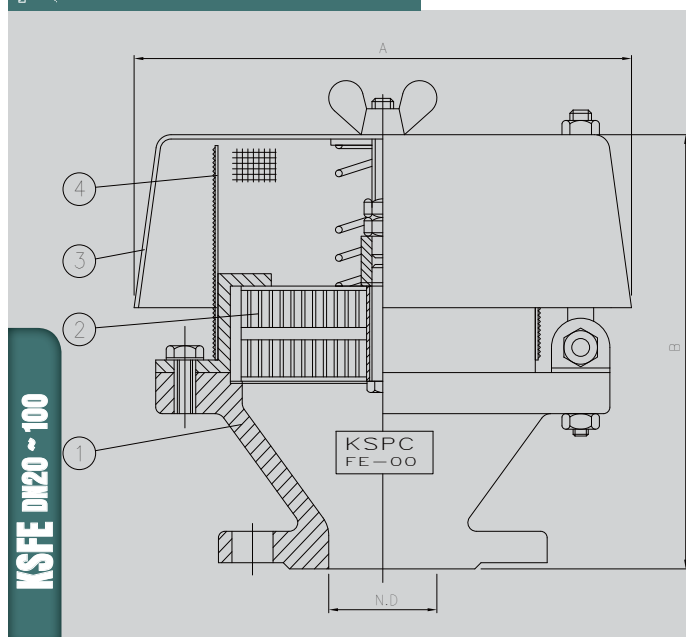
 **optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type

### APPLICATION

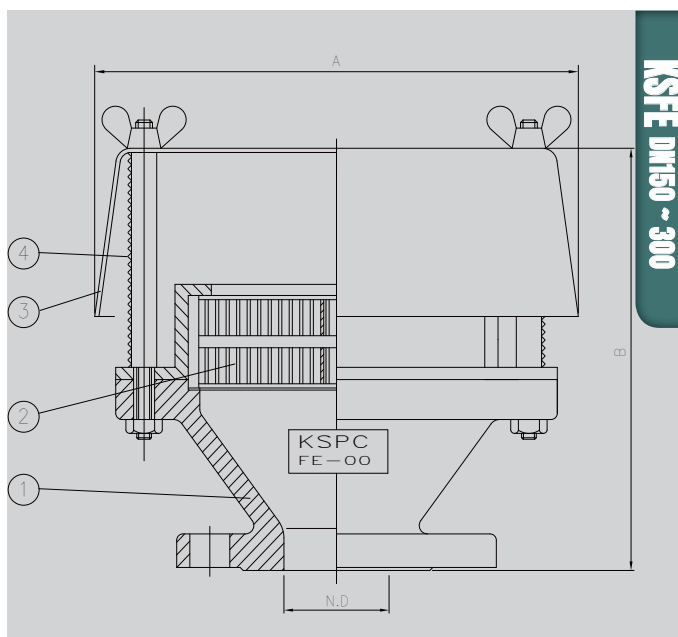




## OUTLINE DRAWING



KSFE DI120 ~ 100



KSFE DI150 ~ 300

## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"
N.D	50	80	100	150	200	250	300
A	234	288	342	444	512	658	733
B	226	237	240	337	345	357	401

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	ALUMINIUM	C.S	S.S
1	BODY	CAST ALUMINIUM	CAST or WELDED C.S	S.S
2	ELEMENT	SS316L		
3	WEATHER HOOD	S.S	S.S	S.S
4	BIRD SCREEN	S.S	S.S	S.S
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

## MAINTENANCE


- ❗ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ❗ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ❗ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ❗ The gaskets should be inspected and replaced if necessary.




## SECTION 3.9\_KSFF


# FLAME ARRESTER EXPLOSION PROOF END-LINE

### INTRODUCTION

 **The model KSFF** is designed, manufactured, tested according to API 2000 & BS 7244 / ISO 16852. Installed in the end of nozzle of the several kinds of the flammable low pressure storage tank (the ignition point below 65°C) with easy coupling, it is the explosion proof and deflagration proof which blocks the influx of flame ignited externally into the tank.

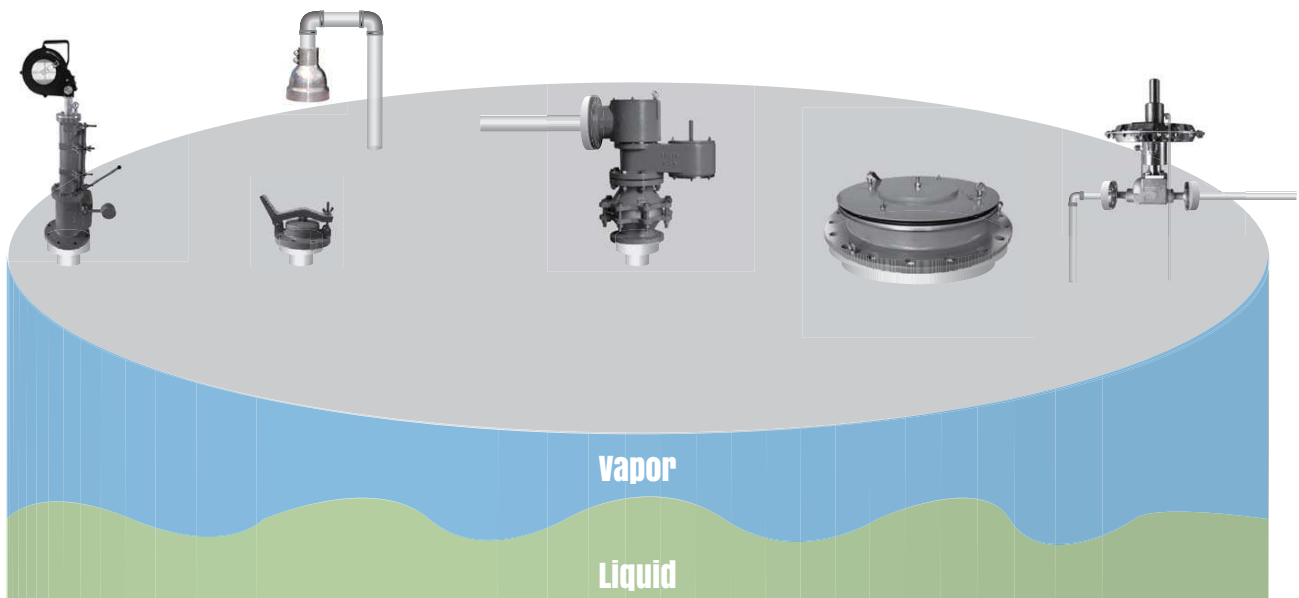
 **Body Materials** Stainless Steel with various trims(Different materials available on request)

 **Sizes range** DN 25 ~ DN 100 with ANSI 150lb flanges(Different connections available on request)

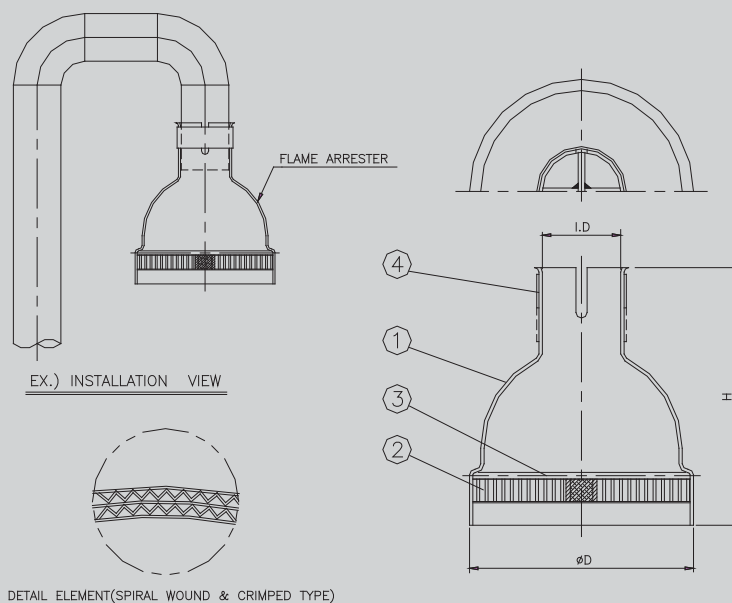
 **Rules & certifications** API 2000, BS7244, and ISO 16852  
Flame cell : NEC group D or IEC IIA Gases(Other gas groups all available as extras)

 **optimum / optional Design & Arrangments** Stem Jacket type, Steam Tracing type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	½"	¾"	1"	1 ¼"	1 ½"	2"	2 ½"	3"	4"
N.D	15	20	25	32	40	50	65	80	100
I.D	27	27	35	44	49	61	77	90	115
D	100	100	100	100	100	100	169	169	207
H	115	115	115	115	115	115	170	170	210

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	SS304	SS316	SS316L
1	BODY	SS304	SS316	SS316L
2	ELEMENT	SS316L	SS316L	SS316L
3	ROUND BAR	SS304	SS304	S.S
4	BEND	SS304	SS304	S.S
STANDARD PAINTING		IN-OUT SIDE EPOXY 150 MICRON WITHOUT S.S & AL PART.		

**NOTE** S.S – Stainless Steel

## MAINTENANCE

- ❗ Periodic inspection and maintenance is required. The cell assembly can be removed for cleaning purposes.
- ❗ Cleaning can be accomplished by dipping the entire cell assembly into an appropriate solvent.
- ❗ Care should be taken not to damage the cell openings as such deformations hamper the flow through the cell.
- ❗ The gaskets should be inspected and replaced if necessary.

# TANK SAFETY & PROTECTION DEVICE

## SECTION 4\_EMERGENCY VENT COVER

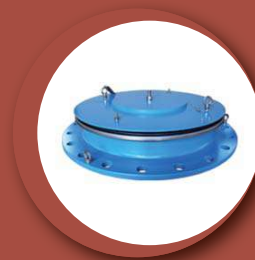
**EMERGENCY PRESSURE RELIEF VENT COVER**

**EMERGENCY PRESSURE VACUUM RELIEF VENT COVER**

**EMERGENCY PRESSURE RELIEF VENT COVER**

**Emergency Vent Cover** is designed to provide emergency pressure relief for storage tanks when exposed to overpressures that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers also provide quick easy access for tank inspection and maintenance.

## KSEP



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## KSES



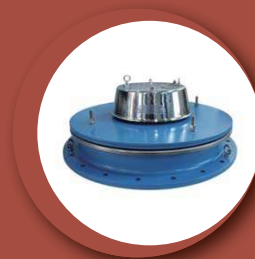
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## KSESV



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## KSEV



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## KSEVK



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## KSEPK

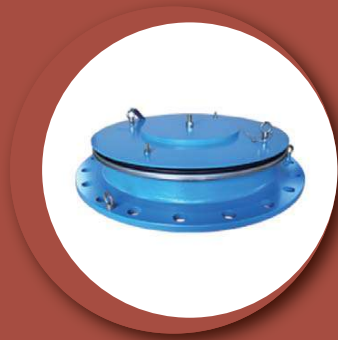


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## KSEPR/EPS




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## SECTION 4.1\_KSEP


# EMERGENCY VENT COVER PRESSURE RELIEF


### INTRODUCTION

 **The model KSEP** is designed to provide emergency pressure relief for storage tanks when exposed to overpressures that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers also provide quick easy access for tank inspection and maintenance.

### Setting Pressure

KSEP Permanent Setting	Min. 50 mmW.C ~ Max. 700 mmW.C
------------------------	--------------------------------

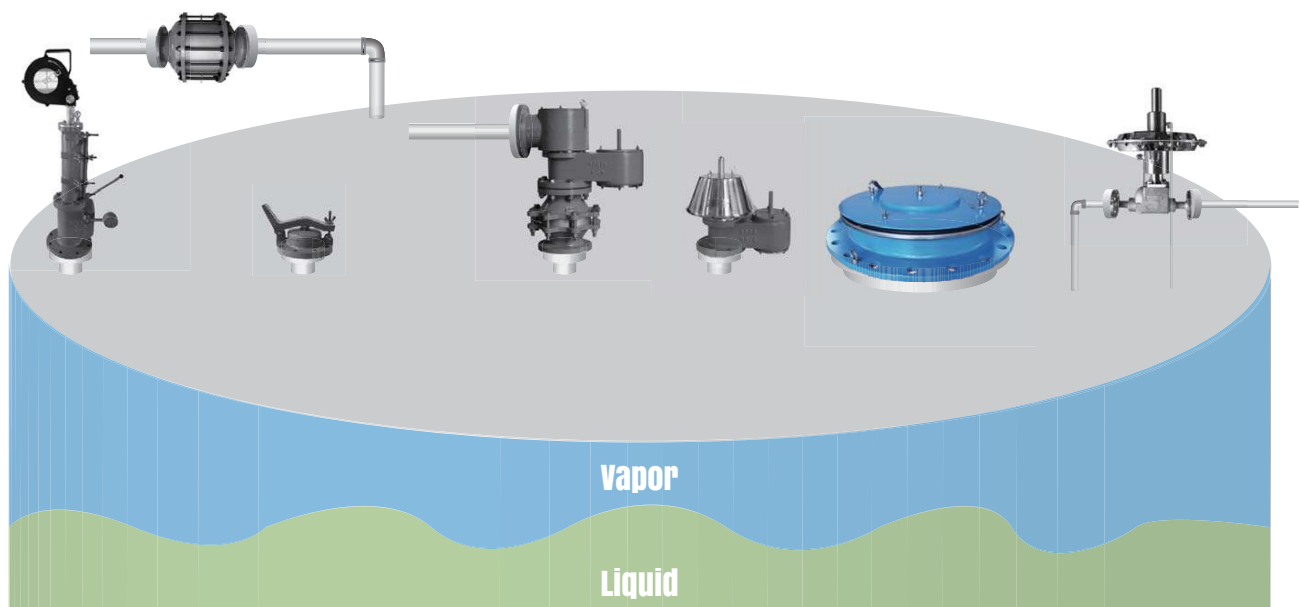
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

 **Rules & Certifications** API 2000

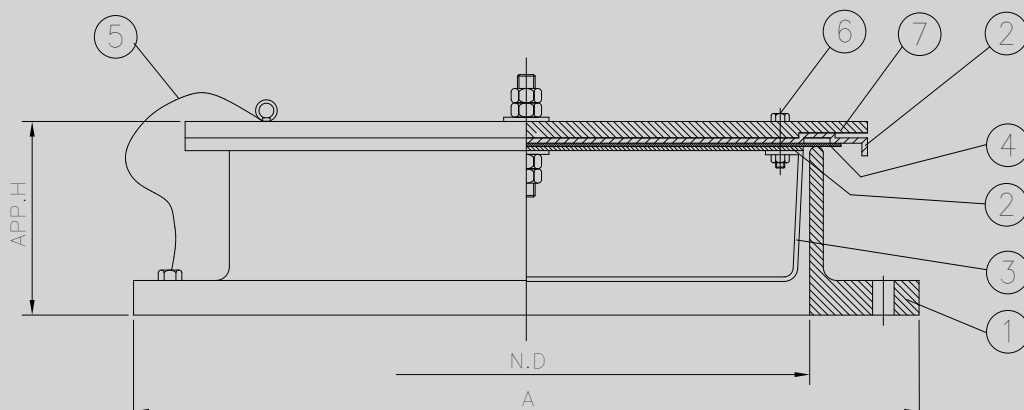
 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	115	115	115	115
	MAX.	150	165	180	200

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	COVER & PLATE		SS304	SS304	SS304	SS316L
3	GUIDE		SS304	SS304	SS304	SS316L
4	DIAPHRAGM		TEFLON			
5	EARTH WIRE		SS304	SS304	SS304	SS304
6	HEX BOLT/NUT		SS304	SS304	SS304	SS304
7	LOADING WEIGHT		C.S OR S.S			


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.2\_KSES

# EMERGENCY VENT COVER PRESSURE RELIEF


### INTRODUCTION

 **The model KSES** is designed to provide emergency pressure relief for storage tanks when exposed to overpressures that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized.

### Setting Pressure

KSES Permanent Setting	Min. 700 mmW.C ~ Max. 9,050 mmW.C
------------------------	-----------------------------------

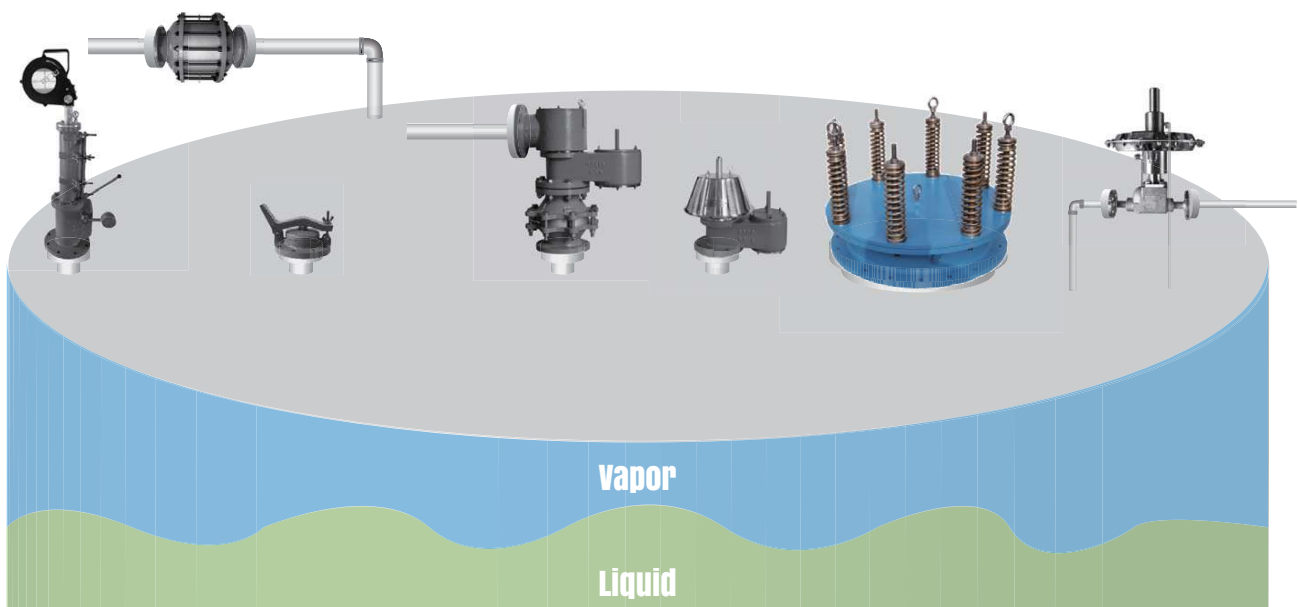
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

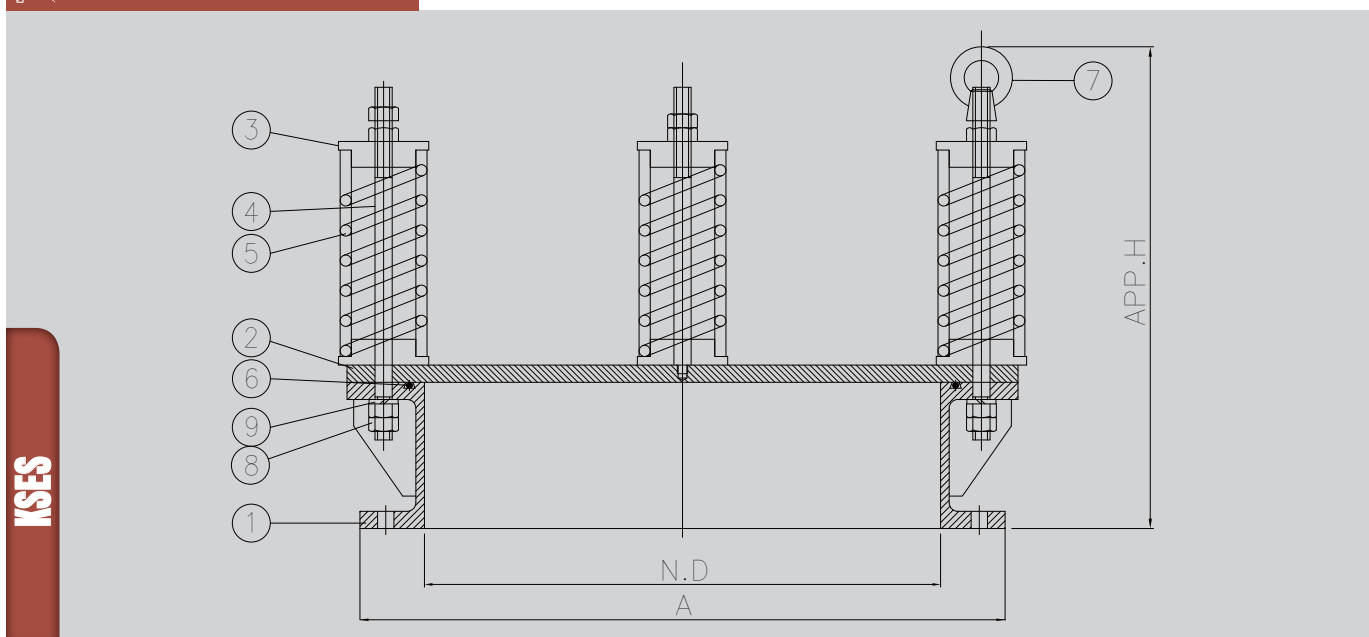
 **Rules & Certifications** API 2000

 **Optimum / optional Design & Arrangments** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	320	320	320	320
	MAX.	550	550	550	550

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	COVER(DISC)		C.S	C.S	SS304	SS316L
3	SPRING PAD		SS304	SS304	SS304	SS304
4	SPRING STEM		SS304	SS304	SS304	SS304
5	SPRING		SS304	SS304	SS304	SS304
6	O-RING		VITON OR REQUIRED			
7	LIFTING EYE BOLD		SS304	SS304	SS304	SS304
8	HEX NUT		SS304	SS304	SS304	SS304
9	SPRING WASHER		SS304	SS304	SS304	SS304


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.3\_KESV

# EMERGENCY VENT COVER PRESSURE VACUUM RELIEF


### INTRODUCTION

 **The model KESV** is designed to provide emergency pressure vacuum relief for storage tanks when exposed to overpressures and overvacuum that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized.

### Setting Pressure

KESV Permanent Setting	Min. + 700/ - 20 mmW.C ~ Max. + 9,500/ - 700 mmW.C
------------------------	--

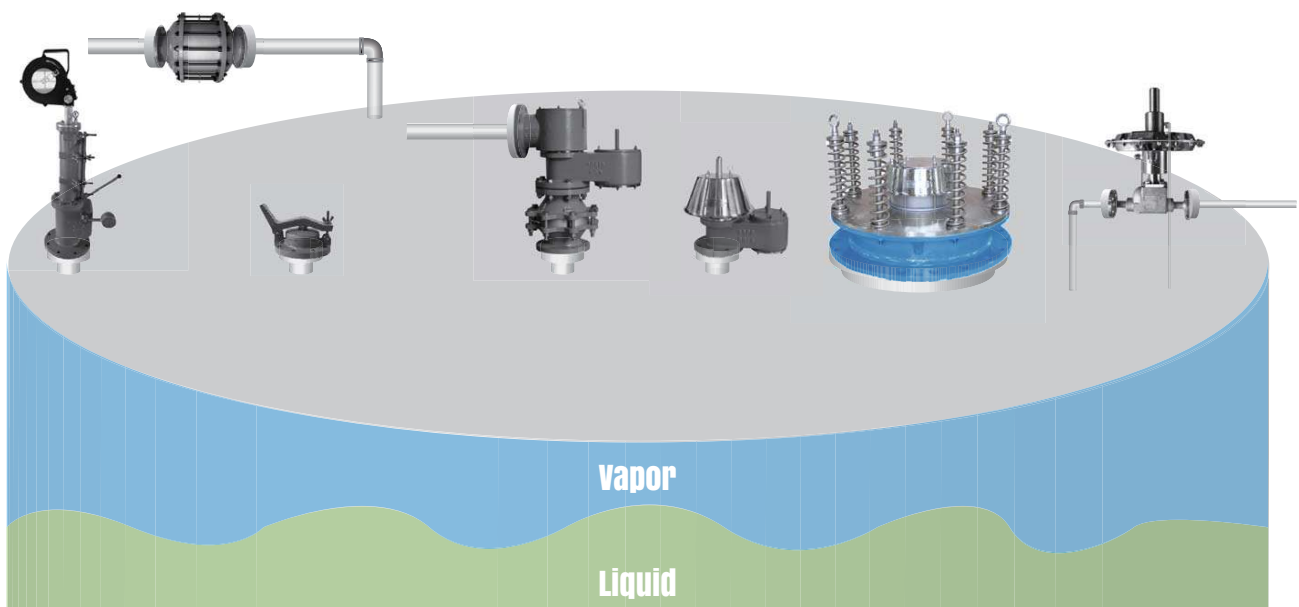
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

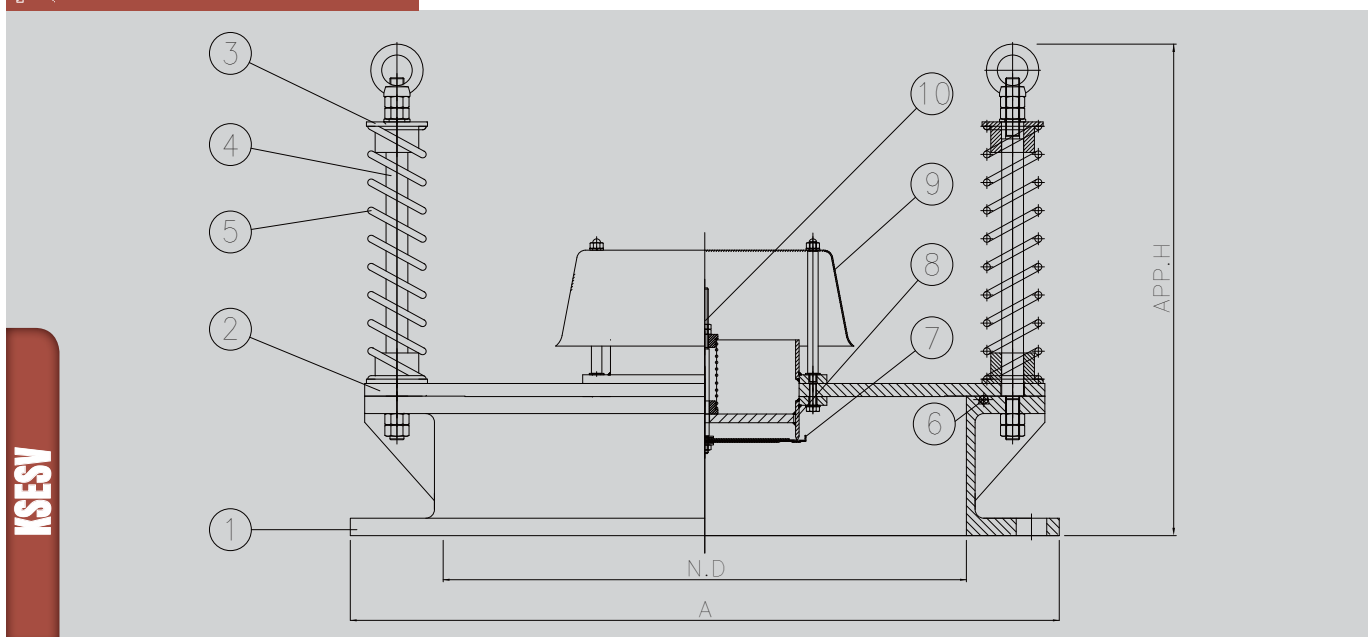
 **Rules & Certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	320	320	320	320
	MAX.	550	550	550	550

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	COVER(DISC)		C.S	C.S	SS304	SS316L
3	SPRING PAD		SS304	SS304	SS304	SS304
4	SPRING STEM		SS304	SS304	SS304	SS304
5	SPRING		SS304	SS304	SS304	SS304
6	O-RING		VITON OR REQUIRED			
7	DISC		SS304	SS304	SS304	SS316L
8	VACUUM SEAT		SS304	SS304	SS304	SS316L
9	HOOD		SS304	SS304	SS304	SS316L
10	VACUUM STEM		SS304	SS304	SS304	SS316L


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.4\_KSEV

# EMERGENCY VENT COVER PRESSURE VACUUM RELIEF


### INTRODUCTION

 **The model KSEV** is designed to provide emergency pressure vacuum relief for storage tanks when exposed to over pressures and over vacuum that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers also provide quick easy access for tank inspection and maintenance.

### Setting Pressure

KSEV Permanent Setting	Min. + 50/ - 25 mmW.C ~ Max. + 700/ - 700 mmW.C
------------------------	---

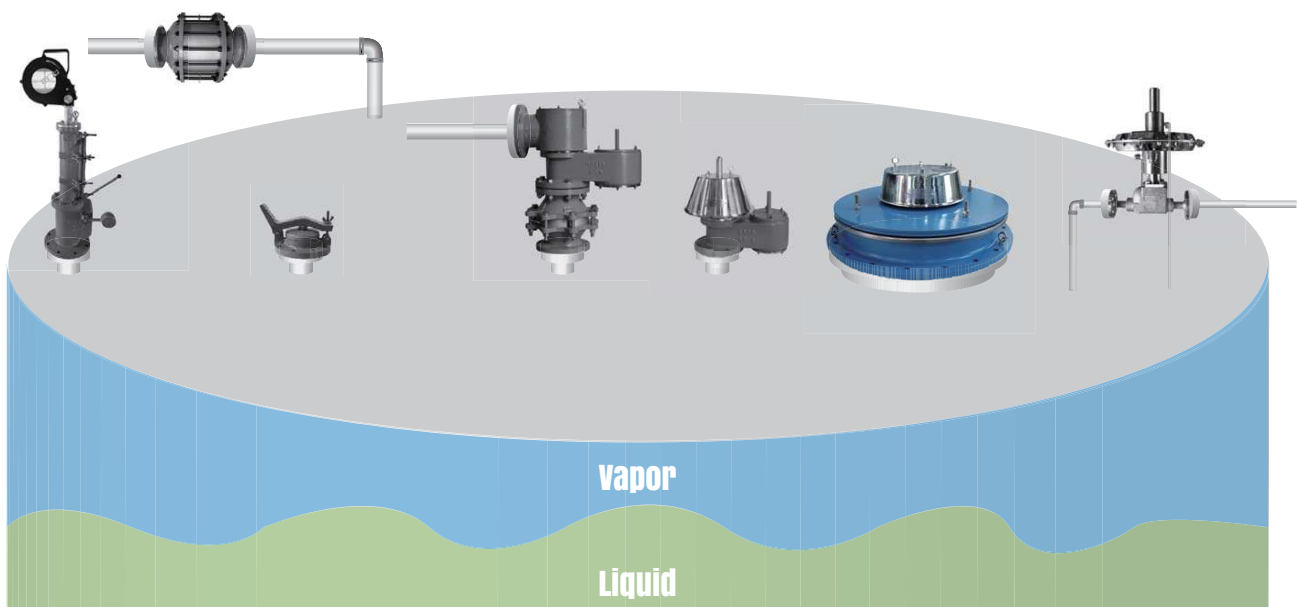
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

 **Rules & Certifications** API 2000

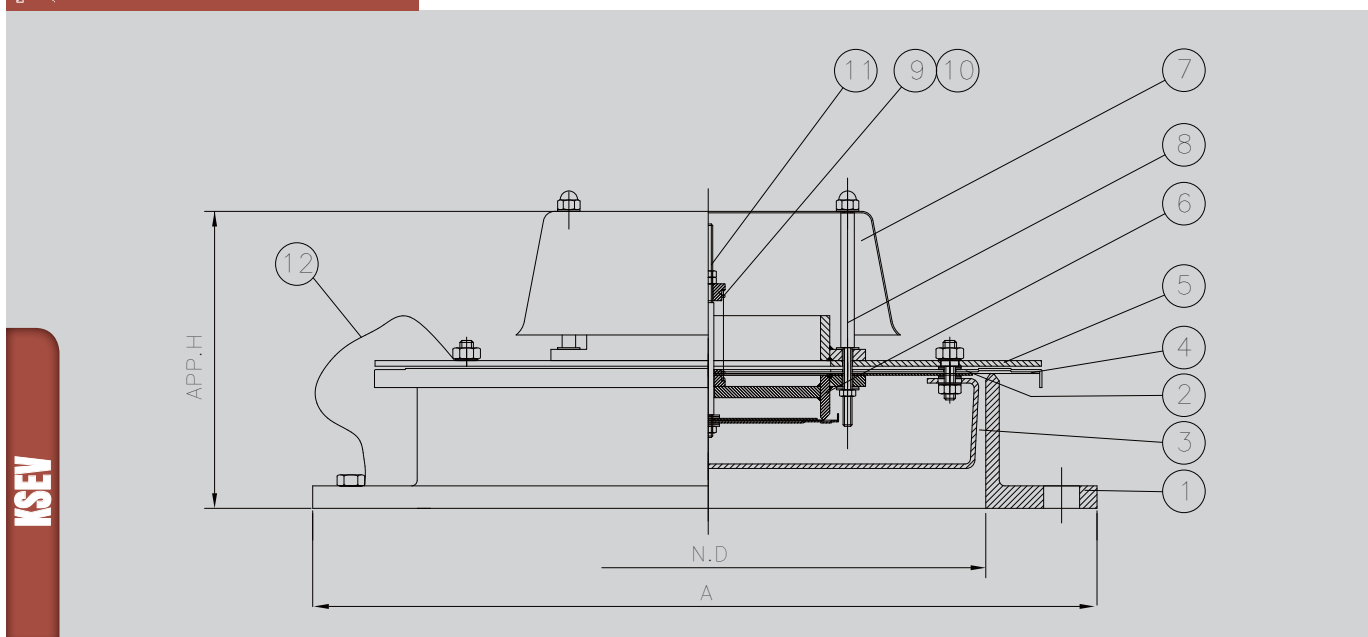
 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	250	250	250	250
	MAX.	270	270	270	270

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	DISC & PLATE		SS304	SS304	SS304	SS316L
3	GUIDE		SS304	SS304	SS304	SS316L
4	DIAPHRAGM		TEFLON			
5	LOADING WEIGHT		C.S OR S.S			
6	VACUUM DISC & SEAT		SS304	SS304	SS304	SS316L
7	SCREEN		SS304	SS304	SS304	SS316L
8	VACUUM COVER SUPPORT		SS304	SS304	SS304	SS316L
9	SPRING		SS304	SS304	SS304	SS316L
10	SPRING GUIDE		SS304	SS304	SS304	SS316L
11	VACUUM STEM		SS304	SS304	SS304	SS316L
12	EARTH WIRE		SS304	SS304	SS304	SS304


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.5\_KSEVK

# HINGED EMERGENCY VENT COVER PRESSURE VACUUM RELIEF


### INTRODUCTION

 **The model KSEVK** is designed to provide emergency pressure vacuum relief for storage tanks when exposed to over pressures and over vacuum that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers can also be easily lifted open, providing a large, unobstructed passage for rapid entry and quick easy access to the tank for tank inspection and maintenance.

### Setting Pressure

KSEVK Permanent Setting	Min. + 50/ - 25 mmW.C ~ Max. + 700/ - 700 mmW.C
-------------------------	---

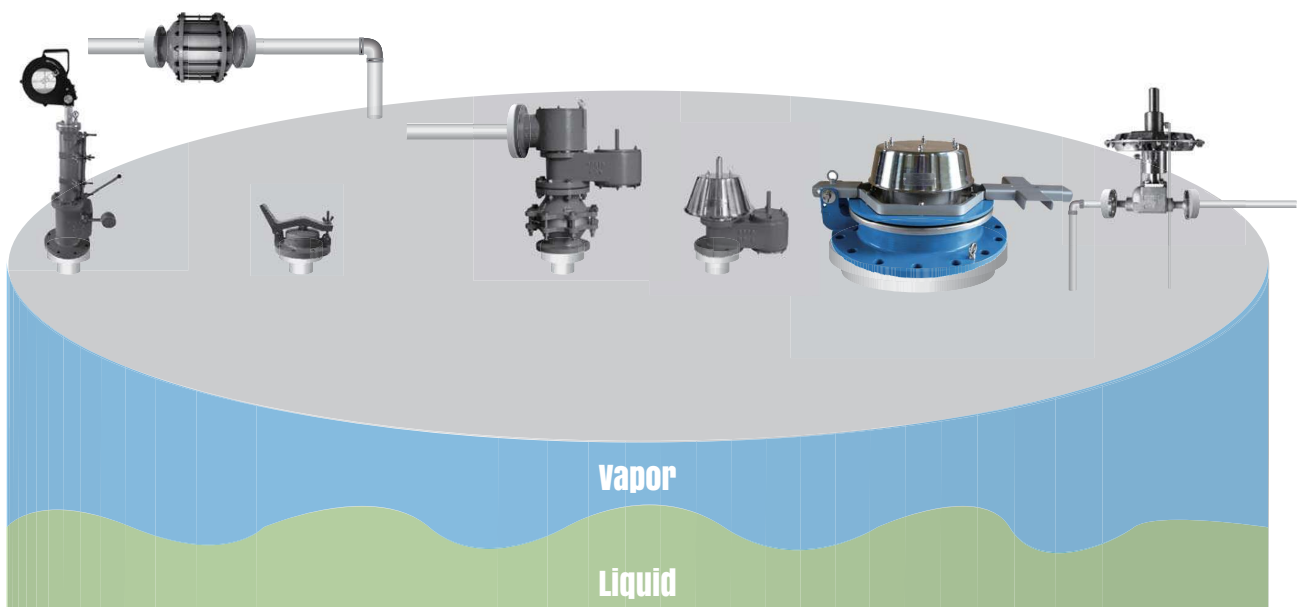
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

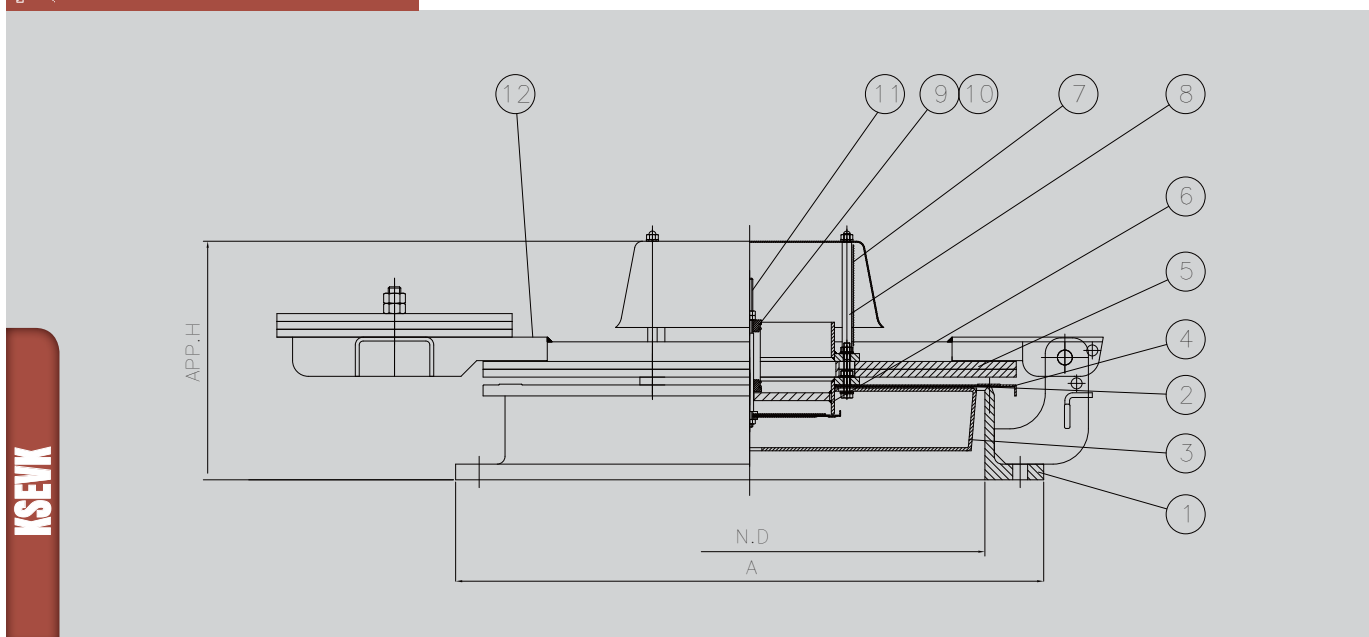
 **Rules & certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	350	375	400	450
	MAX.	420	445	470	520

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	DISC & PLATE		SS304	SS304	SS304	SS316L
3	GUIDE		SS304	SS304	SS304	SS316L
4	DIAPHRAGM		TEFLON			
5	LOADING WEIGHT		C.S			
6	VACUUM DISC & SEAT		SS304	SS304	SS304	SS316L
7	SCREEN		SS304	SS304	SS304	SS316L
8	VACUUM COVER SUPPORT		SS304	SS304	SS304	SS316L
9	SPRING		SS304	SS304	SS304	SS316L
10	SPRING GUIDE		SS304	SS304	SS304	SS316L
11	VACUUM STEM		SS304	SS304	SS304	SS316L
12	HINGE		C.S	C.S	SS304	SS304


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.6\_KSEPK


# HINGED EMERGENCY VENT COVER PRESSURE RELIEF


### INTRODUCTION

 **The model KSEPK** is designed to provide emergency pressure relief for storage tanks when exposed to overpressures that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers also provide quick easy access for tank inspection and maintenance.

### Setting Pressure

KSEPK Permanent Setting	Min. 50 mmW.C ~ Max. 700 mmW.C
-------------------------	--------------------------------

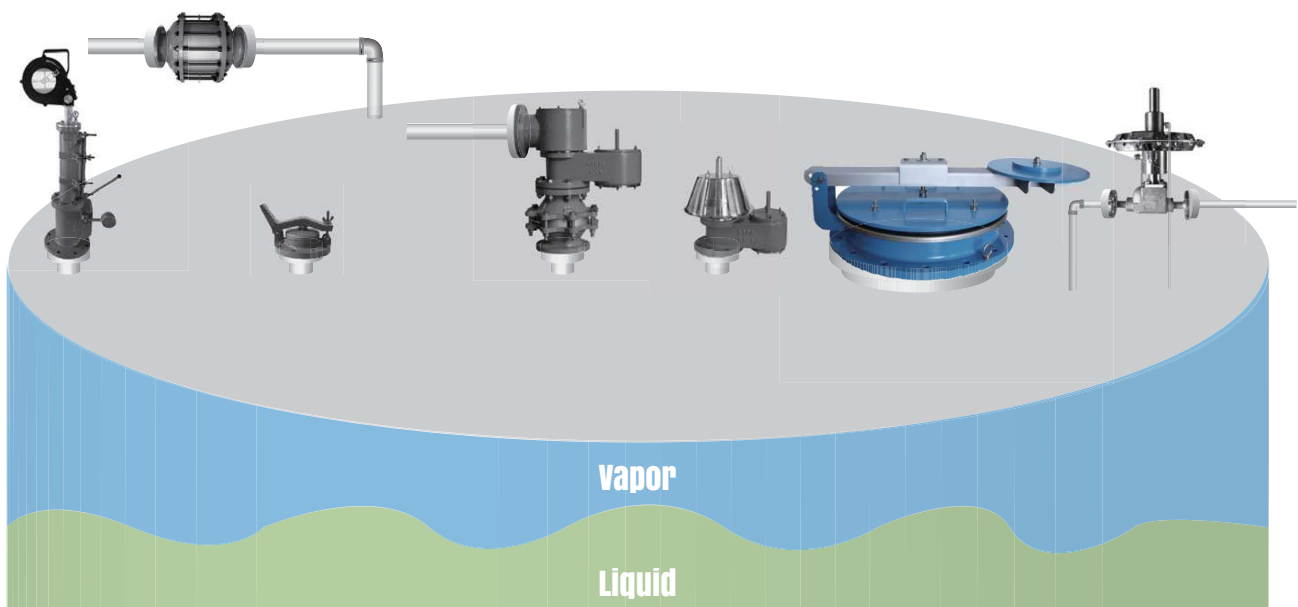
 **Body Materials** Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

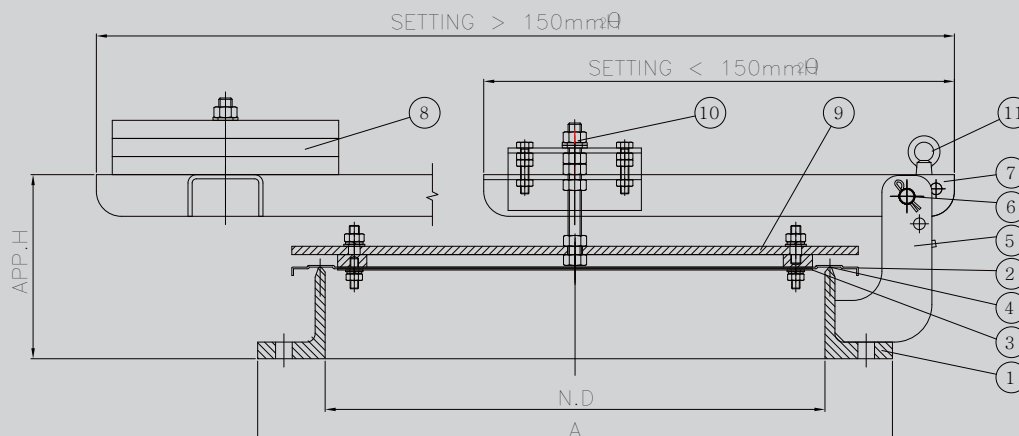
 **Rules & Certifications** API 2000

 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE		16"	18"	20"	24"
N.D		400	450	500	600
A	API 650	597	635	660	762
	ANSI 150#	597	635	700	815
Approx. H	MIN.	210	210	210	210
	MAX.	260	260	260	260

**NOTE** CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST (STD : API650).

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	DISC		SS304	SS304	SS304	SS316L
3	DISC PLATE		SS304	SS304	SS304	SS316L
4	DIAPHRAGM		TEFLON			
5	HINGE		ALUMINIUM	C.S	SS304	SS304
6	HINGE PIN		SS304	SS304	SS304	SS304
7	ARM		C.S	C.S	SS304	SS304
8	LOADING WEIGHT		C.S OR S.S			
9	BASE RING		C.S OR S.S			
10	BOLT/NUT		SS304	SS304	SS304	SS304
11	LIFTING EYE NUT		SS304	SS304	SS304	SS304


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 4.7\_KSEPR/PS

# EMERGENCY VENT COVER PRESSURE RELIEF


### INTRODUCTION

 **The model KSEPR/PS** is designed to provide emergency pressure relief for storage tanks when exposed to overpressures that are not handled by standard tank vents. These vents provide the capacity to meet API standard 2000 for emergency venting due to fire exposure when properly sized. These covers also provide quick easy access for tank inspection and maintenance.

### Setting Pressure

KSEPR Permanent Setting	Min. 20 mmW.C ~ Max. 700 mmW.C
KSEPS Permanent Setting	Min. 70 mmW.C ~ Max. 9,000 mmW.C

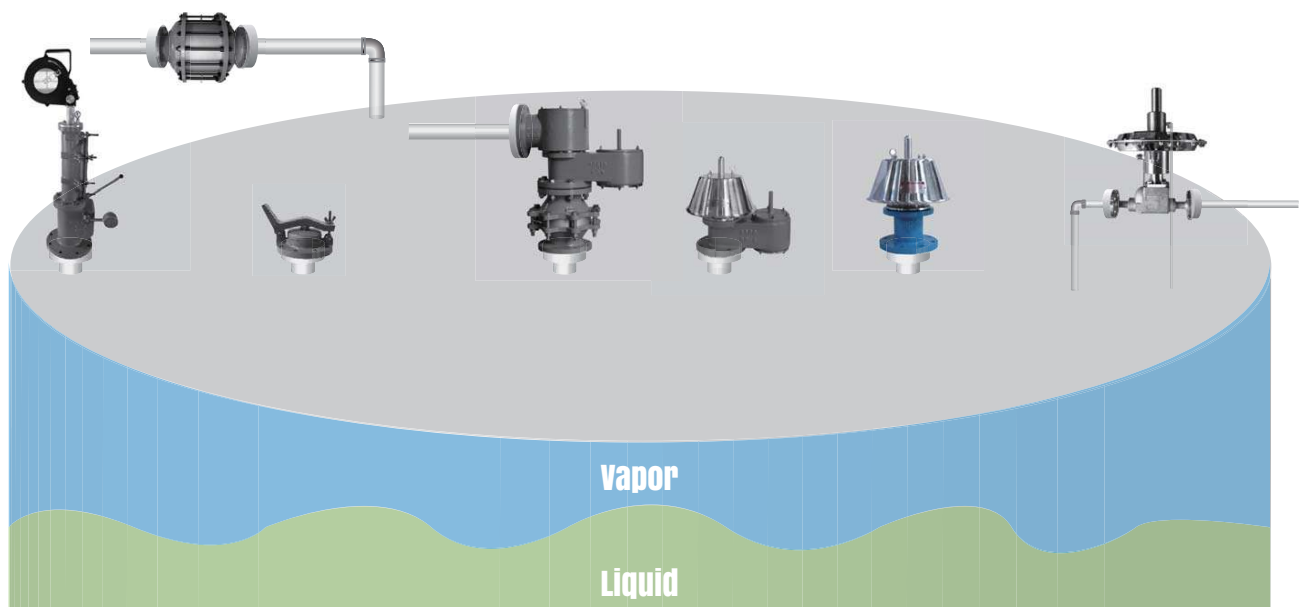
 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims  
(Different materials available on request)

 **Sizes range** DN 400, 450, 500 and DN 600 with ANSI 150lb or API 650 flanges  
(Different connections available on request)

 **Rules & Certifications** API 2000

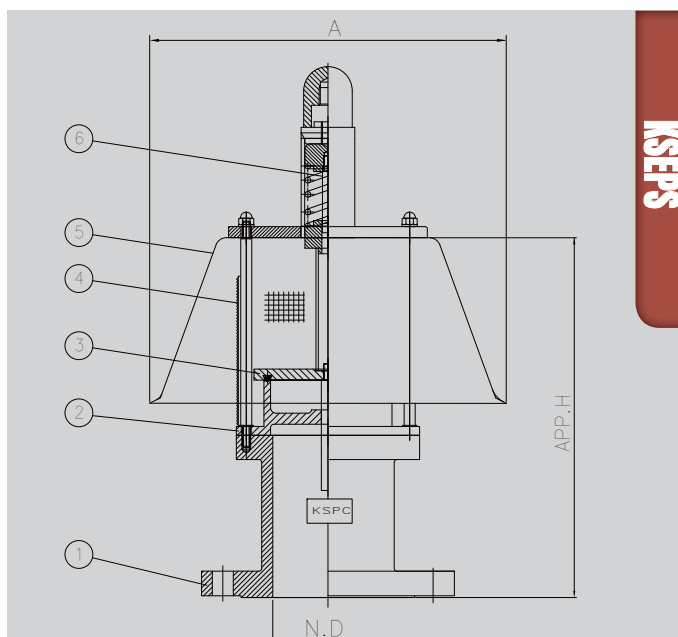
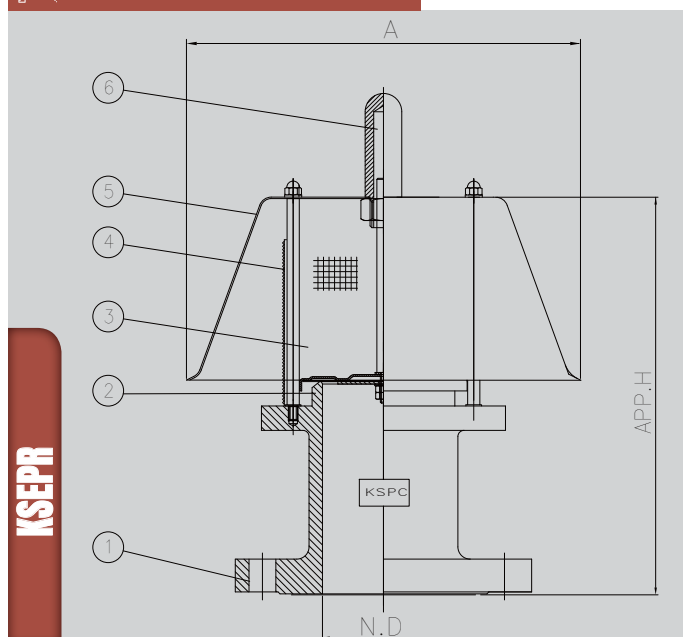
 **Optimum / optional Design & Arrangements** Stem Jacket type, Steam Tracing type, Proximity type, Teflon Coating/Lining type

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	2"	3"	4"	6"	8"	10"	12"
N.D	50	80	100	150	200	250	300
A	250	294	324	440	476	544	620
Approx. H	270	302	344	381	400	435	456

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316L
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PRESSURE SEAT		B26-319.F	A351-CF8	A351-CF8	A351-CF8M
3	PRESSURE DISC		SS304	SS304	SS304	SS316
4	BIRD SCREEN		SS304	SS304	SS304	SS316
5	WEATHER HOOD		SS304	SS304	SS304	SS316
6	PRESSURE STEM GUIDE		SS304	SS304	SS304	SS316
6.1	DIAPHRAGM		TEFLON			
6.2	PALLET WEIGHT		COATED CS OR SS			
7	SPRING		SS304	SS304	SS304	SS316

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

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# **TANK SAFETY & PROTECTION DEVICE**

## **SECTION 5\_GAUGE HATCH COVER**

### **GAUGE HATCH COVER**

### **GAUGE HATCH COVER WITH PRESSURE RELIEF**

### **SLOT DIPPING DEVICES**

**Gauge Hatch Cover** is designed, manufactured and tested according to the KSPC standard code. This product is to provide quick access for product gauging, temperature measurement or sampling. It is installed on the tank roofs of roof flanges. The hatch covers are self closing and foot pedal have an inclined tread for added safety.

## KSGH



P72

## KSGE



P74

## KSSD



P76

## KSSD-A




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## SECTION 5.1\_KSGH

### GAUGE HATCH COVER UNDER $0.03 \text{ kg/cm}^2$

#### INTRODUCTION


 **The model KSGH**, the sampling and gauging hatch Cover, is designed, manufactured and tested according to the KSPC standard code. **KSGH** is made to take the fluid samples from the storage tank, to measure the temperature, and to take test of the stored fluids. **KSGH** is used under  $0.03 \text{ kg/cm}^2$  pressure of storage tank.

#### Operating Pressure

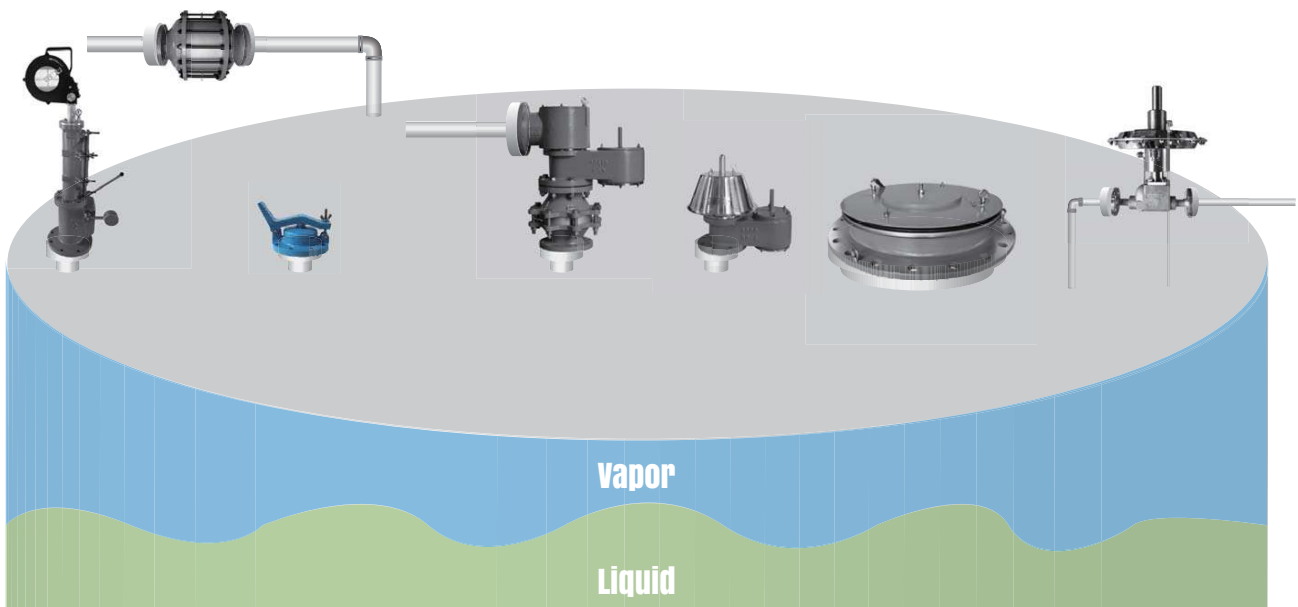
KSGH model	$0.03 \text{ kg/cm}^2$
------------	------------------------

 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims

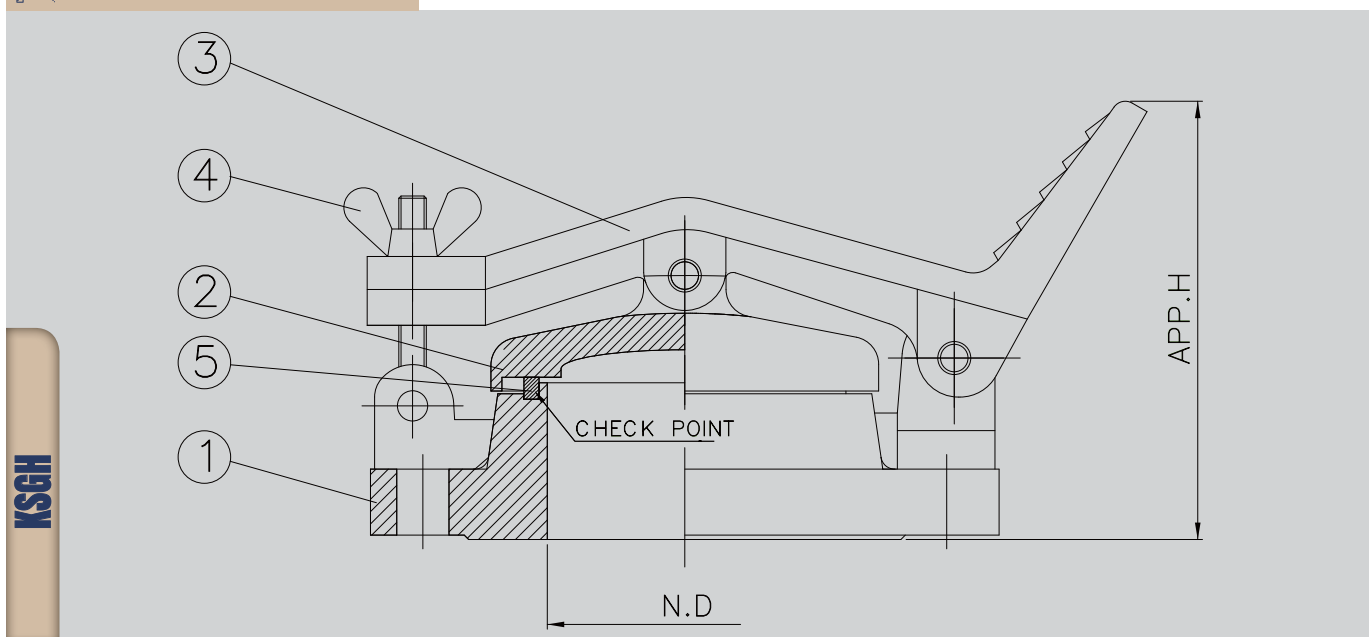
 **Sizes range** DN 80 ~ DN 300 with ANSI 150lb flanges (Other connection all available)

 **Rules & Certifications** designed, manufactured and tested according to the KSPC standard code.

#### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	4"	6"	8"	10"	12"
N.D	100	150	200	200	300
A	324	440	476	544	620
Approx. H	344	381	400	435	456

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	COVER		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
3	PADDLE		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
4	PIN		SS304	SS304	SS304	SS316
7	SEAL GASKET		TEFLON			


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 5.2\_KSGE

# GAUGE HATCH COVER PRESSURE RELIEF

### INTRODUCTION


 **The model KSGE**, the sampling and gauging hatch Cover, is designed, manufactured and tested according to the KSPC standard code. **KSGE** is made to take the fluid samples from the storage tank, to measure the temperature, and to take test of the stored fluids.

### Operating Pressure

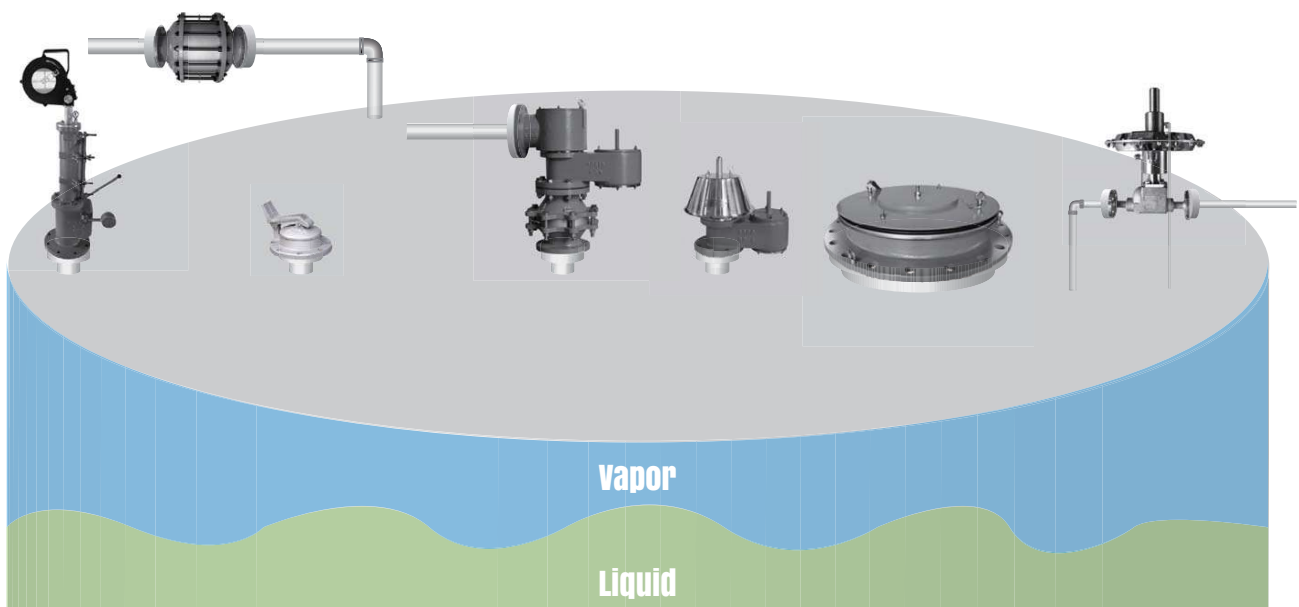
KSGE model	0.01 kg/cm <sup>2</sup>
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 **Body Materials** Aluminium, Carbon Steel, SS304 and SS316 with various trims

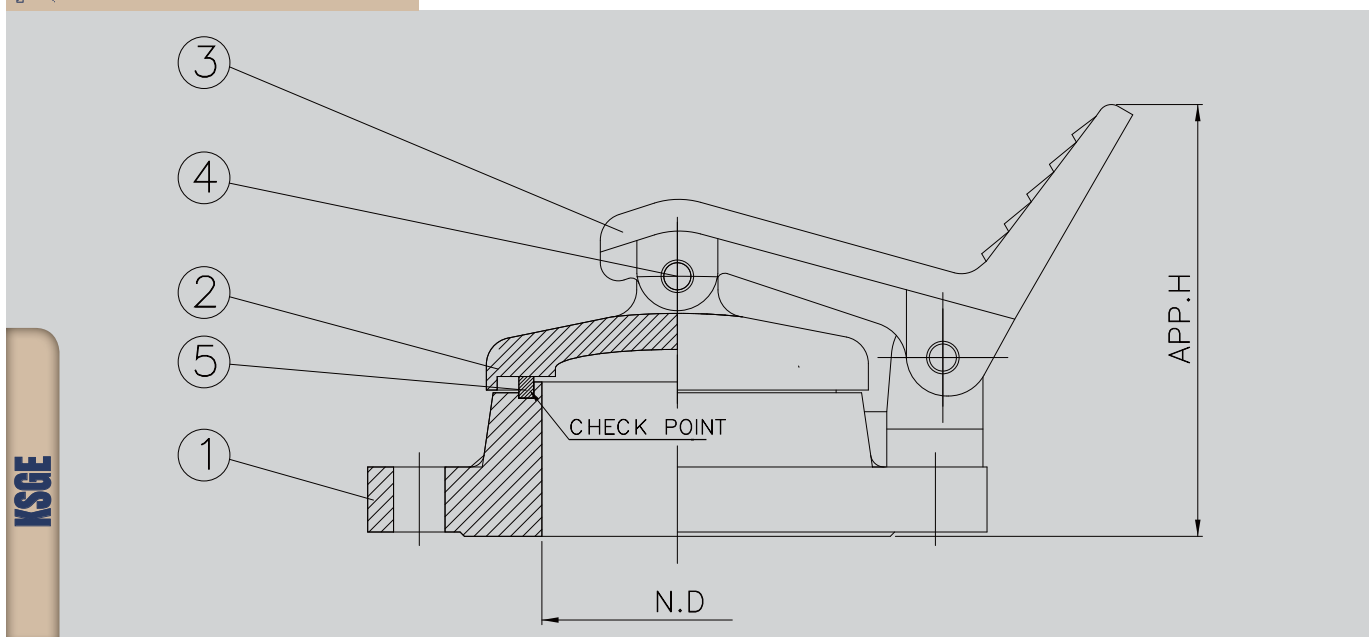
 **Sizes range** DN 80 ~ DN 300 with ANSI 150lb flanges (Other connection all available)

 **Rules & certifications** designed, manufactured and tested according to the KSPC standard code.

### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	3"	4"	6"	8"	10"	12"
N.D	80	100	150	200	250	300
Approx. H	150	160	187	206	229	252

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY TRIM	ALUMINIUM	C.S	SS304	SS316
			SS304	SS304	SS304	SS316
1	BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	COVER		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
3	PADDLE		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
4	PIN		SS304	SS304	SS304	SS316
7	SEAL GASKET		TEFLON			

**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel






## SECTION 5.3\_KSSD

### SLOT DIPPING DEVICES

#### INTRODUCTION

 **The model KSSD** is designed for gauging the height of liquid levels, measuring the depth of water bottoms, taking temperature, and taking sample of liquids held in storage tank, without relieving pressure within the tank. It avoids the loss of valuable vapors, and exposing the gauger to excessive fumes. Quick opening valve unit is opened and closed simply by moving a lever through a 90° arc.

A by-pass is provided to equalize in the tank and sampling chamber unit, if this should be necessary for easy opening. The window in the top cover of the gauging unit can be provided with an inside wiper, to insure clear vision of the gauge taper, and to permit the taking of accurate reading.

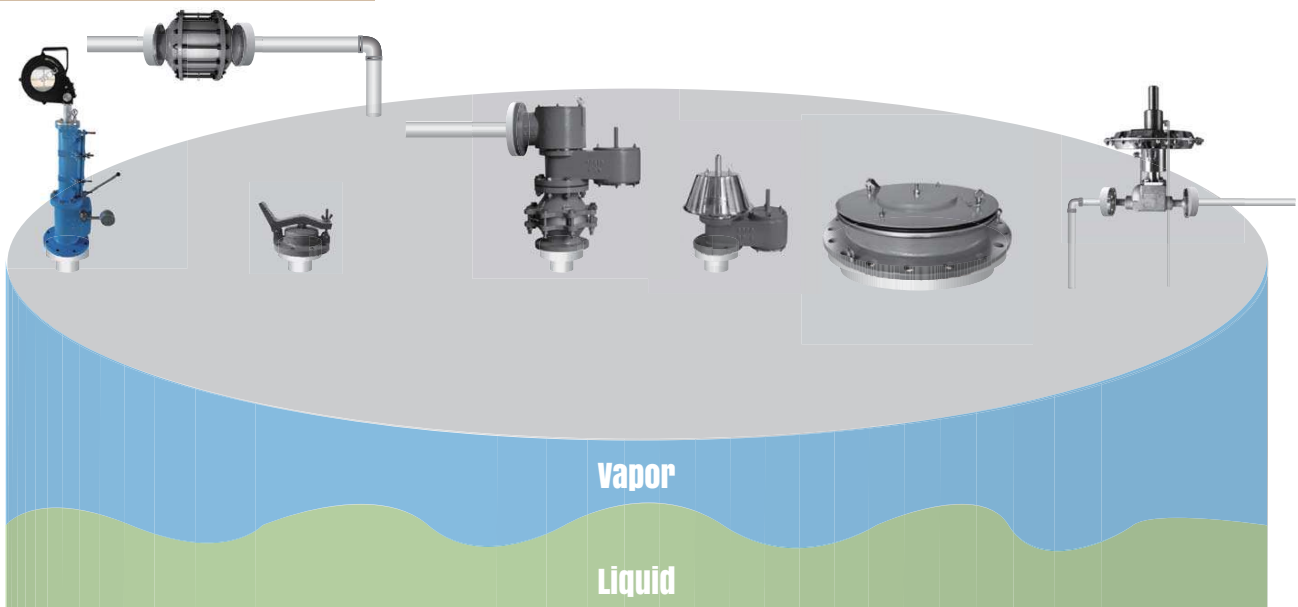
#### Installation

- 1 Mount the KSSD Series Sampling Device on 4" or 8" flange roof nozzle.
- 2 Attach the gauging bob or sampling bottle to the swivel snap inside the sampling chamber unit.
- 3 Check the distance from the bottom of the bob to a point above the snap on the tape to make certain a correct reading is obtained.

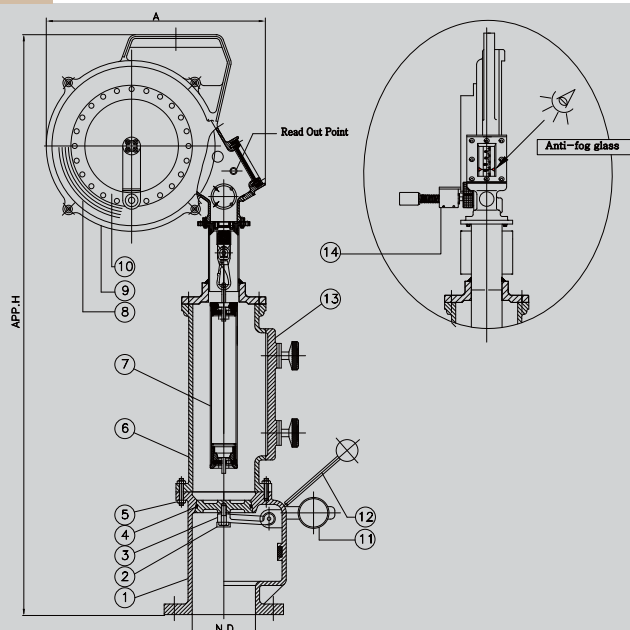
#### Operation

- 1 Mount the Gauging the depth of the product.
- 2 Taking a sample at any level.
- 3 Measuring the depth of water bottom.
- 4 Measuring the product temperature.

#### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	4"	6"	8"	10"	12"
N.D	100	150	200	250	300
A	346	346	346	346	346
Approx. H	1330	1335	1340	1345	1350

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304	SS316
		TRIM	SS304	SS304	SS304	SS316
1	LOWER(?) BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
2	PALLET ARM STOPPER		TEFLON	TEFLON	TEFLON	TEFLON
3	PALLET ARM		SS304	SS304	SS304	SS304
4	PALLET		A5052	A5052	A5052	A5052
5	STUD BOLT		SS304	SS304	SS304	SS304
6	UPPER BODY		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
7	SAMPLING BOTTLE		SS304	SS304	SS304	SS304
8	SCALE		NYLON + PTFE COAT			
9	SCALE ROLLER BODY		B26-356-T6			
10	SCALE ROLLER		B26-356-T6			
11	COUNTER WEIGHT		A283-C			
12	PALLET OPERATING HANDLE		SS304	SS304	SS304	SS304
13	PALLET WEIGHT		B26-319.F	A216-WCB	A351-CF8	A351-CF8M
14	HANDLE ASS'Y		SS304	SS304	SS304	SS304


**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel



## SECTION 5.4\_KSSD-A

### SLOT DIPPING DEVICES

#### INTRODUCTION


 **The model KSSD-A** is designed for gauging the height of liquid levels, measuring the depth of water bottoms, taking temperature, and taking sample of liquids held in storage tank, without relieving pressure within the tank. It avoids the loss of valuable vapors, and exposing the gauger to excessive fumes. Quick opening valve unit is opened and closed simply by moving a lever through a 90° arc.

A by-pass is provided to equalize in the tank and sampling chamber unit, if this should be necessary for easy opening. The window in the top cover of the gauging unit can be provided with an inside wiper, to insure clear vision of the gauge taper, and to permit the taking of accurate reading.

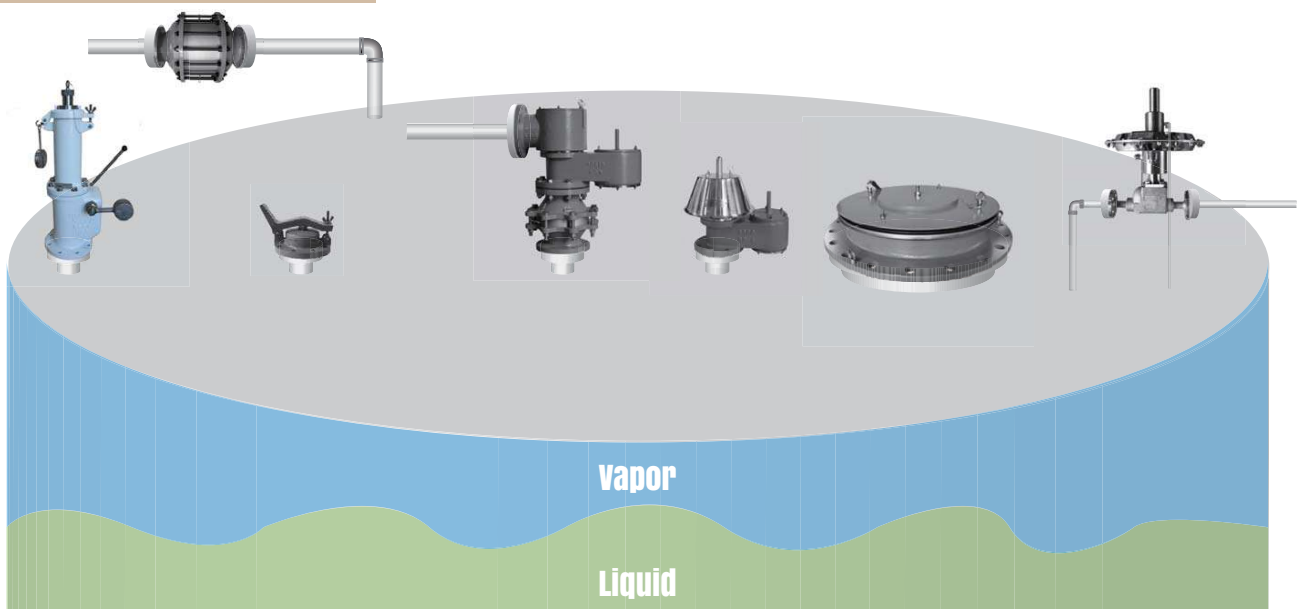
#### Installation

- 1 Mount the KSSD-A Series Sampling Device on 4" or 8" flange roof nozzle.
- 2 Attach the gauging bob or sampling bottle to the swivel snap inside the sampling chamber unit.
- 3 Check the distance from the bottom of the bob to a point above the snap on the tape to make certain a correct reading is obtained.

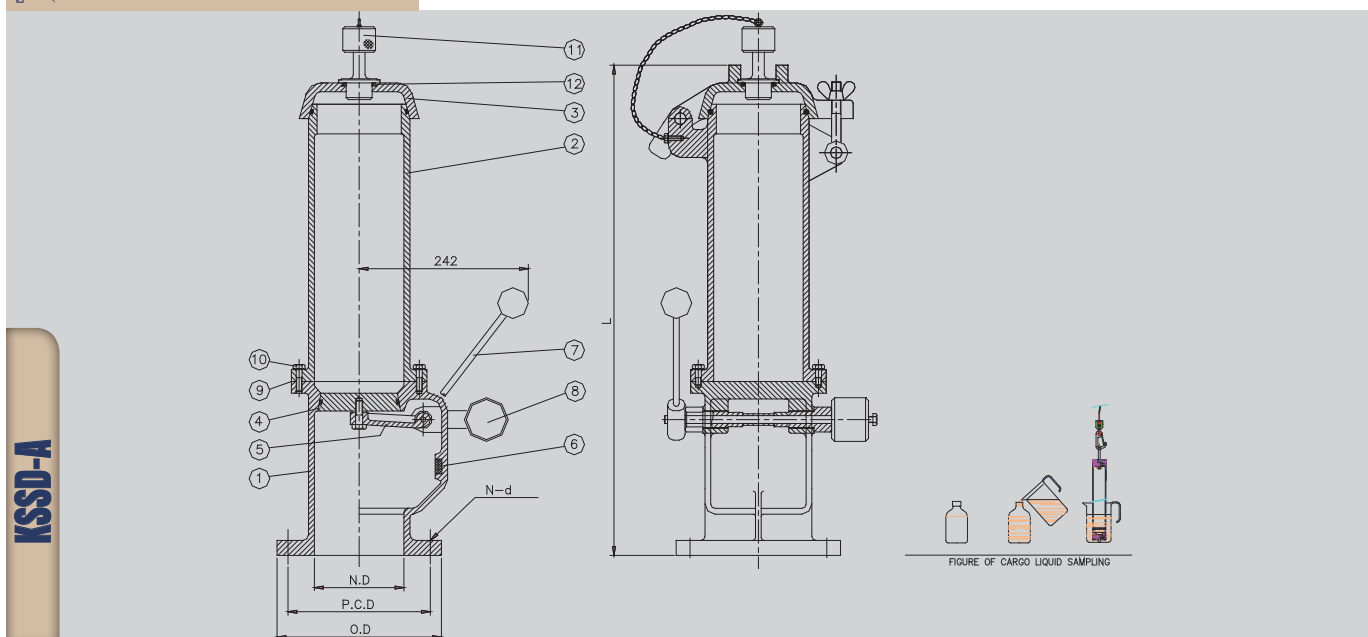
#### Operation

-  1 Mount the Gauging the depth of the product.
- 2 Taking a sample at any level.
- 3 Measuring the depth of water bottom.
- 4 Measuring the product temperature.

#### APPLICATION



## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	4"	6"	8"	10"	12"
N.D	100	150	200	250	300
PCD	190.5	241.3	298.4	361.9	431.8
OD	229	279	343	406	483
Approx. H	800	800	805	807	810
N - d	8 - 19	8 - 22	8 - 22	12 - 25	12 - 25

**NOTE** Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## COMPONENT MATERIAL

ITEM NO	COMPONENT	BODY	ALUMINIUM	C.S	SS304
		TRIM	SS304	SS304	SS304
1	UPPER BODY		B26-319.F	A216-WCB	A351-CF8
2	LOWER BODY		B26-319.F	A216-WCB	A351-CF8
3	CAP		B26-319.F	A216-WCB	A351-CF8
4	PALLET		SS304	SS304	SS304
5	PALLET ARM		SS304	SS304	SS304
6	PALLET ARM STOPPER		N.B.R	N.B.R	N.B.R
7	PALLET HANDLE		SS304	SS304	SS304
8	COUNTER WEIGHT		A216-WCB	A216-WCB	A351-CF8
9	GASKET		NON-ASBESTOS	NON-ASBESTOS	NON-ASBESTOS
10	HEX BOLT		SS304	SS304	SS304
11	SEAL PLUG		SS304	SS304	SS304
12	PLUG SEATING		N.B.R	N.B.R	N.B.R

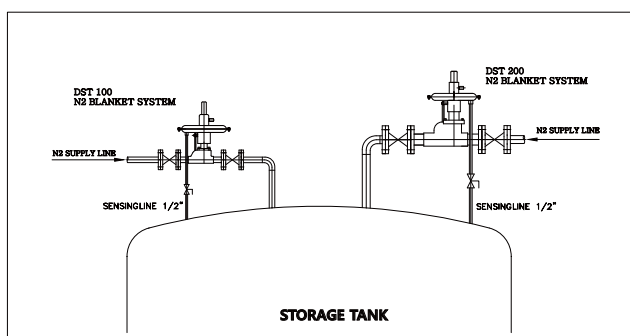
**NOTE** AL – Aluminium, C.S – Carbon Steel, S.S – Stainless Steel

# TANK SAFETY & PROTECTION DEVICE

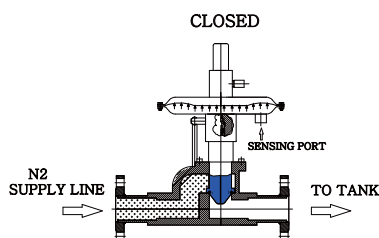
## SECTION 6\_N<sup>2</sup> BLANKETING VALVE

### N<sup>2</sup> BLANKETING VALVE

#### NORMAL INSTALLATION

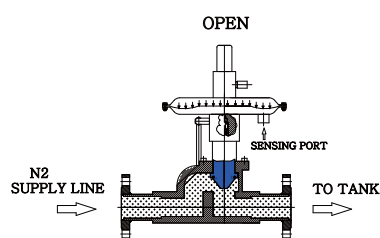


- 1** Surly clean the pipeline to completely remove the foreign bodies in it.
- 2** Check weather the inlet pressure is matched to the recommended pressure.
- 3** It is recommended to use of appropriate lifting jig for preventing the damage.
- 4** Flange connects the inlet and outlet of controller, in general Controller is installed in suit of The flow direction and rate indicated on main body.
- 5** Blanketing is connected to tank or vessel with a distant at least 1.5m from the Sensing Line.
- 6** Sending line should be always open for securing the monitor of the interior pressure of tank.



#### CLOSED POSITION

This occurs when the tank pressure satisfied or exceed the set pressure of the Tank Internal pressure.  
The pilot will close and there is no flow out of the pilot.



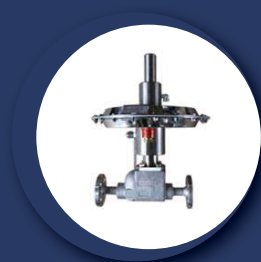
#### OPEN POSITION

When the tank pressure below set point by pumping out or thermal effect.  
The pilot will open and there is flow out of the pilot.

**N<sup>2</sup> Blanketing Valve** helps gas pressure to maintain in constant state in the vapor space of storage Tanks.  
When liquid run out from storage vessel or vacuum state take place because of temperature dropping, N<sup>2</sup> Blanket gas controller has a ability of control desired pressure within the fixed limits.

## DST-100

## DST-200



### CALCULATION REQUIREMENT

The calculation requirement of N<sup>2</sup> blanketing Valve have two factors, one is inbreathing due to Liquid (=Product) movement out of the tank and send is inbreathing due to contraction of the vapors/ because of weather changes.

API STD 2000 6th Edition, Calculation for Highest requirements with no flame arrester for Inert-gas-Blanketing (Refer Annex F Guidance for inert-as Blanketing of tanks for flashback protection)

A.INPUT	VALUE	UNIT
Tank Diameter. D	23.25	m
Tank Height or Length. H	12.6	m
Tank Volume. Vtk	5349	m <sup>3</sup> Use maximum capacity
Pump-Out Rate. Vpe	350.0	m <sup>3</sup> /h B
Latitude	23	° Below 42°
Avg. Storage Temp.	25	°C >=25 °C
VP range	Vp >= Hexane	
Ins. Thickness. lin	0	m
Insulation Type	-	
Selected Thermal Cond. of Insulation. Ain. s	0	W/m-K
Inside heat transfer coefficient. h	4	W/m2-K (Typical value for tank: 4 W/m2-K)
Total surface area. Atts	668	m <sup>2</sup>
Insulated surface area. Ainp	0	m <sup>2</sup> (Enter 0 if tank uninsulated)
B.CALCULATIONS	VALUE	UNIT
C-Factor	6.5	
Reduction factor. Ri	61.00	
Volume of Reserve Inlet Gas	641.93	m <sup>3</sup>
Required Flow Rate	1,673.42	Nm <sup>3</sup> /h Calculated



# SECTION 6.1\_DST-100 / DST-200

## N<sup>2</sup> BLANKETING VALVE

### INTRODUCTION

**The model DST-100 and DST-200**, N<sup>2</sup> Blanket gas controller, helps gas pressure to maintain in constant state in the vapor space of storage Tanks. When liquid run out from storage vessel or vacuum state take place because of temperature dropping, N<sup>2</sup> Blanket gas controller has a ability of control desired pressure within the fixed limits.

Besides above subjects, prevents air and humidity from entering into storage vessel, So it can preserve products, and also protect from a fire. It protects the tank from explosion by restricting spark. It prevents the outflow of fluid by evaporation.

### Blanketing Capacity

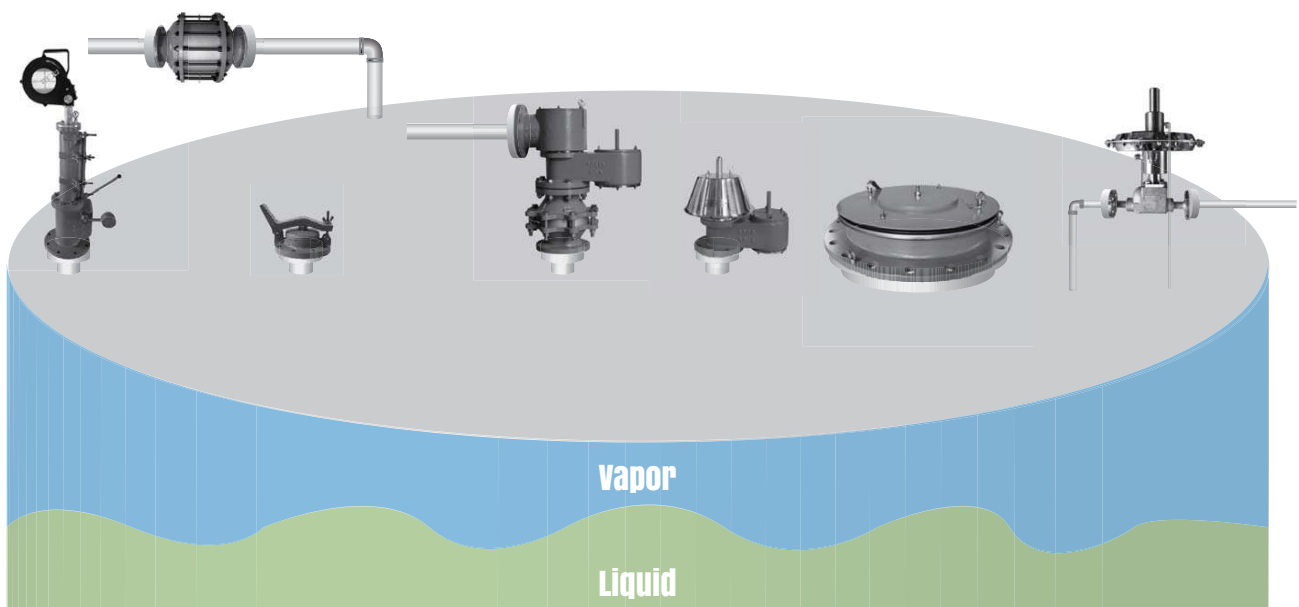
DST-100 (DN 15 ~ DN 25)	Min. 179 ~ Max. 1060 Nm <sup>3</sup> /hr for Nitrogen
DST-200 (DN 40 ~ DN 50)	Min. 465 ~ Max. 2760 Nm <sup>3</sup> /hr for Nitrogen

**Body Materials** SS304 and SS316 with various trims

**Sizes range** DN 15, 20, 25, 40, 50 with ANSI 150lb flanges (Other connection all available)

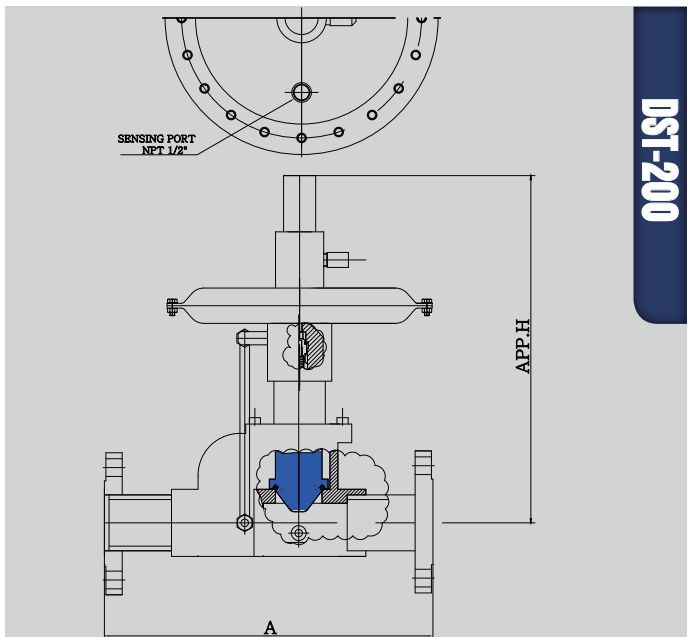
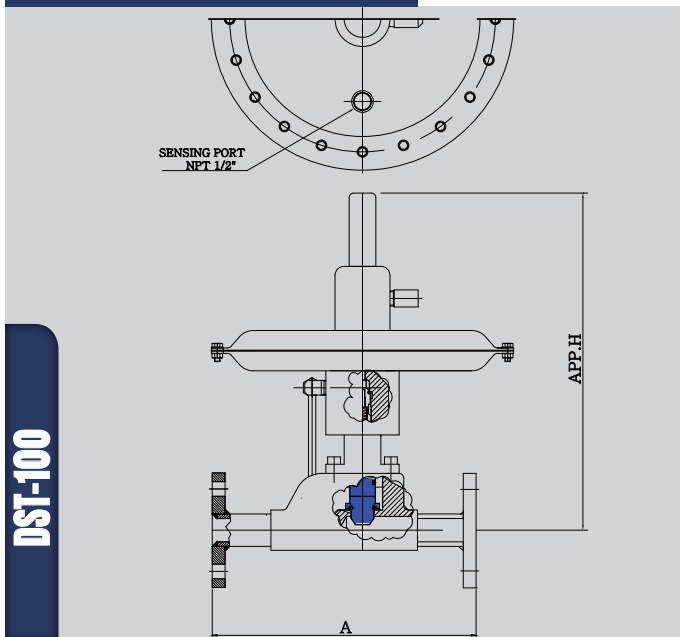
**Rules & Certifications** API 2000 6<sup>th</sup> Edition - "Calculation for Highest requirements with no flame arrester for Inert-gas-Blanketing"

### APPLICATION





## OUTLINE DRAWING



## DIMENSION TABLE

SIZE	DST-100			DST-200	
	1/2"	3/4"	1"	1 1/2"	2"
N.D	15	20	25	40	50
A	290	290	290	340	340
Approx. H	355	355	355	415	415

NOTE Standard Connection(ANSI 150LB flange) and JIS or different types are available upon request.

## CAPACITY TABLE

INLET PRESSURE		1.5	2	2.5	3	3.5	4	4.5	5	6	6.5
Capacity in Nm <sup>3</sup> /hr for Nitrogen	DST 100 (1/2" ~ 1")	179	230	260	295	335	387	435	460	545	570
	DST 200 (1 1/2" ~ 2")	465	595	630	745	875	1005	1140	1280	1411	1460
INLET PRESSURE		7	7.5	8	8.5	9	9.5	10	11	12	13
Capacity in Nm <sup>3</sup> /hr for Nitrogen	DST 100 (1/2" ~ 1")	595	645	690	720	750	800	853	945	1000	1060
	DST 200 (1 1/2" ~ 2")	1546	1680	1780	1870	1950	2085	2220	2355	2490	2760

## GENERAL SPECIFICATION

MODEL	DST-100	DST-200
SIZE	1/2" ~ 1"	1" ~ 2"
SET PRESSURE	30 ~ 5000mmW.C	
CONNECTION	FNPT / ANSI 150# & 300#, Etc	
MATERIAL	SS304, SS316, Etc.	
USED GAS	N2 (Nitrogen)	
SENSING PORT	NPT 1/2"	

## TECHNICAL SPECIFICATION

SET PRESSURE		MINIMUM INLET PRESSURE	TEMP.
1.2 ~ 1.4" W.C	1.3 ~ 3.1 psi	22 psi (1.5 kg/cm <sup>2</sup> G)	-20 to +149 °C
3.5 ~ 10" W.C	2.3 ~ 3.5 psi		
8 ~ 18" W.C	3.0 ~ 6.0 psi		

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