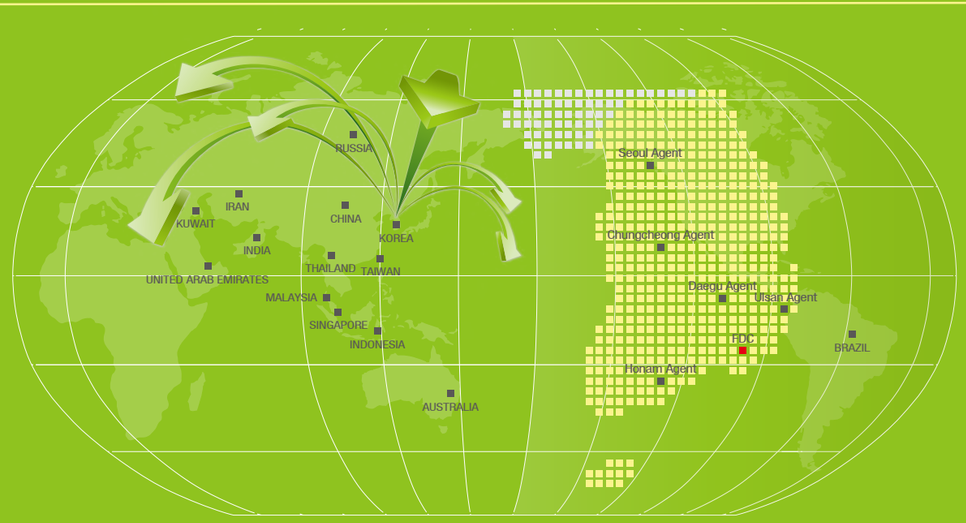
ISO 9001 : 2008 | ISO 14001 : 2004 | OHSAS 18001 | KOSHA | CE-PED | GOST | TR-CU | CE-ATEX | IEC-Ex | CSEL | Achilles | ASME UD | NBBI

FDC NETWORK



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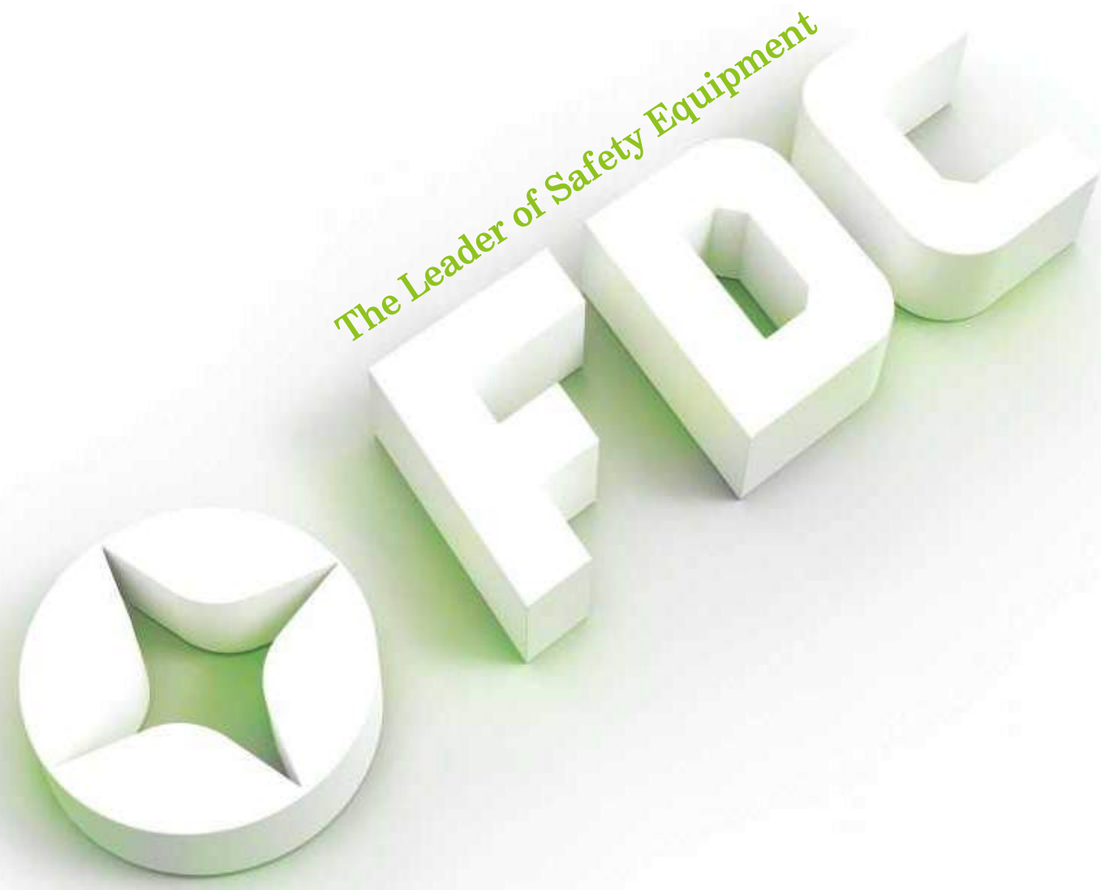
PRESSURE / / SAFETY DEVICES

RUPTURE DISC / EXPLOSION PANEL
N2 BLANKETING SYSTEM / EMERGENCY RELIEF HATCH



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2019 Edit. / EN ver.8

FDC Small but strong enterprise in the world!

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FDC™ FDC Co., Ltd.

CEO MESSAGE

FDC is a leading company that has succeeded in localization of Rupture Discs for the first time in Korea.
We are competing against excellent companies of the world on the basis of the know-how accumulated from production of Rupture Discs over the past 25 years. We manufacture the complete Rupture Discs in accordance with KS B ISO 4126/6718, KOSHA, ASME Code Sec. VIII and ISO-9001 : 2008 quality system.

We constantly research and develop new products to improve the quality so to enable us to protect our customer's cherished properties and lives from hazards such as explosions.

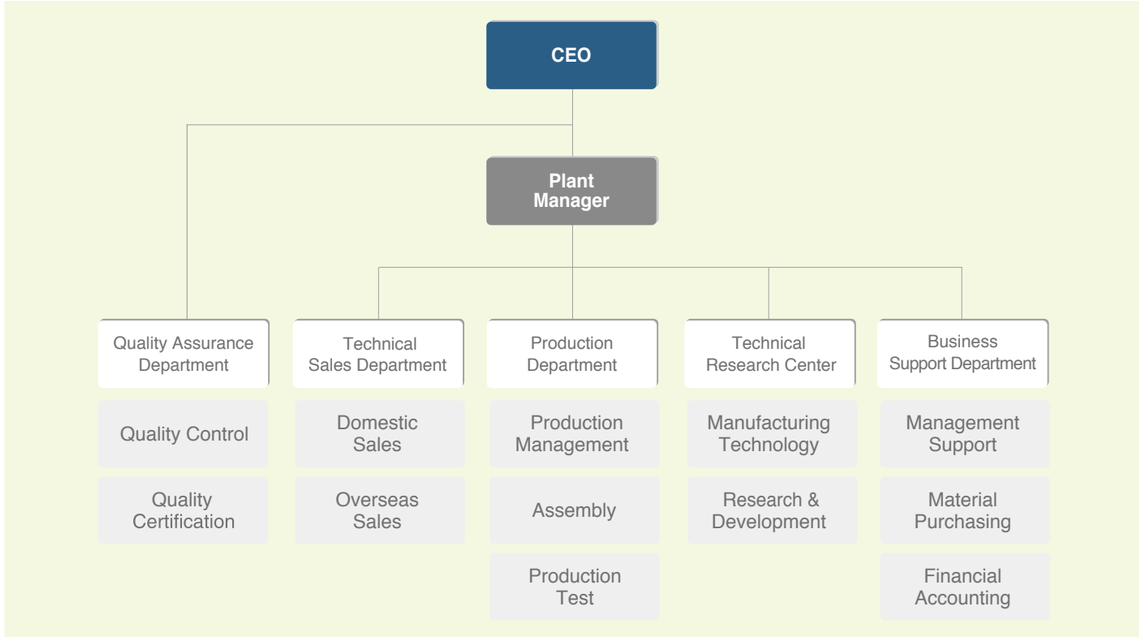
Our business includes Rupture Discs, Explosion Panels, N2 Blanketing System and Emergency Relief Hatch. These products have been applied to pressure safety devices in various fields including Low Pressure Storage Tank, Pressure Tank, Oil&Gas Plant, Industrial Power Plant, Reactors, Semiconductor Industry, Shipbuilding, Environmental Control Facility, Fire Extinguishing System, Vehicle Industry, Aerospace, Defense Industry, Steel Mills and so on. We are, in addition, involved in the National Defense Industrial Products development project and recognized the performance and the quality.

We will make it our highest priority that customer's safety and quality assurance, and do our best to be your good partner.

Chief Executive Officer
Yune Ha-won

99, Seobu-ro 1293beon-gil, Juchon-myeon, Gimhae-si, Gyeongsangnam-do, Korea

ORGANIZATION CHART



Building with proud HISTORY

2017	Registered as a class Q137 approved vendor of KHNP (Korea Hydro&Nuclear Power Co., Ltd) Approved vendor for NIGC, ICOFC, MAPNA
2016	Obtained ASME UD STAMP & NBBI Certificate, Approved vendor for NPCC
2015	Receives Total 90 KOSHA Certificates, Approved vendor for SABOC, Obtained TRCU Certificates
2014	Obtained CSEL (Special Equipment License) Certification in China Approved vendor for PETRONAS & Saipem Obtained CE ATEX & IEC EX certification(DUST) Registered Achilles FPAL Approved vendor for ADNOC GROUP (ADCO, ADMA-OPCO, ZADCO, ADGAS, FERTIL, BOROUGE), KNPC, KOC
2013	Registered a patent for KSRBK Model Approved vendor for TAKREER & FERTIL & Qatar Petroleum Obtained CE ATEX & IEC-Ex Certification(GAS) Obtained ISO 14001, OSHAS 18001 Certification Received 1 KOSHA Safety Type Certification Insured Products/Completed Operations Liability Coverage
2012	Obtained CE Mark(PED) Certification - EC Type - Examination(Module B) Received 69 KOSHA Safety Type Certification Registered as a spare part supplier to KHNP(Korea Hydro & Nuclear Power Co.,LTD.)
2011	Obtained CE Mark(PED) Certification - QA System(Module D) Obtained Russia 'GOST' Certification Received 6 KOSHA Safety Type Certification extra Selected as an INNO - BIZ
2010	Received 14 KOSHA Safety Type Certification extra Renamed to FDC Co.,LTD. Established R&D Center Won an excellence award from KOSHA Protection Device Quality Award Participated in Development Project of 20 Core Parts and Materials National Project of the Ministry of Knowledge Economy Selected as a Patent Star Company - Korean Intellectual Property Office/The Korea Chamber of Commerce & Industry Appointed as a promising small & medium enterprise for export - Small and Medium Business Administration Built up the room temperature test facility
2009	Received 45 KOSHA Safety Type Certification Developed Rupture Disc Size Calculation Program Participated in Development Project of Multi Pulse Rocket Propulsion System - Defense Acquisition Program Administration Registered as a protection device manufacturer(KOSHA) Product Liability Insurance - 300 million won
2008	Transferred to Fine Disc Co.,LTD.
2007	Proceeded Innovative Technology Development Project of small & medium business production environment
2006	Accomplished a Technical Development Project of building up the production system for Scored Type for industrial - academic cooperation with Inje University
2004	Succeeded in localization of Scored Type Rupture Disc
2003	Developed the ultra low pressure Rupture Disc Consulted on standardization of KS B ISO 6718/4162-2/4162-6
2002	Obtained ISO 9001 : 2000 Quality Assurance System Self - developed N2 Blanketing System
2000	Built up the production system of large size Rupture Disc
1999	Established Fine Disc as the Rupture Disk specialized company.

"FDC would like to jump into a leading position among the world's companies through providing of high quality products, continuous R&D and management innovation"

Registration Certificates

Intellectual Properties

Type Certification of Rupture Disc

KOSHA | CE-ATEX | IEC-EX | CSEL | CE-PED | GOST | ASME UD CERTIFICATE | NBBI CERTIFICATE | TRCU-COC

RUPTURE DISC

Introduction

1. What is a Rupture Disc?

- A Rupture Disc is a non-mechanical safety device to relief when it is occurred that excessive pressure is over the critical pressure in a pressure system

2. When is it required a Rupture Disc?

- In case of a rapid rise in pressure as a result of runaway reaction and so on
- In case that there is any concern that fixtures cause other safety device malfunction
- In case that any leakage is not permitted
- In case that it contains strong corrosive fluid
- In case that it requires large relieving capacity in an instant by polymerization and so on
- Severe conditions such as high or low temperature

3. Features

- Special material and structure (It is easy to select material and is economical) And there is no size limit
- Constant rupture performance and release all of fluid
- Instantaneous release of maximum capacity
- Extensive service environment (strong corrosive fluid, temperature, liquid, gas, powder, etc.)
- Zero Leakage
- Extension of safety valve life
- Possible to check the Piping of outlet during operating
- Extension of overhaul period
- Easy to handle and cost reduction

4. Applicable Code

- ASME Sec. Ⅷ Div.1
- ISO 4126-2~6
- API RP520
- KOSHA Safety Certification

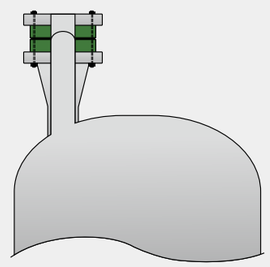
5. Materials of Rupture Disc - Holder / Disc / Accessory

- Stainless Steel (304SS, 316SS, 317SS, etc)
- Carbon Steel
- Duplex
- Aluminum
- Nickel, Inconel, Monel, Hastelloy, Titanium, Tantalium
- Graphite
- Teflon
- Maximum usable Temperature

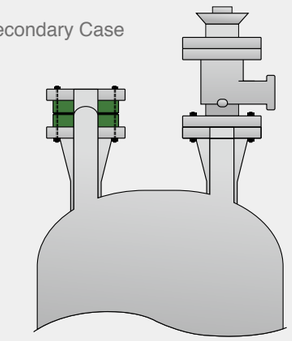
Teflon	200 ℃	Monel	483 ℃
Aluminum	120 ℃	Inconel	592 ℃
Stainless Steel	483 ℃	Hastelloy	483 ℃
Nickel	403 ℃	Graphite	371 ℃

6. Application of Rupture Disc

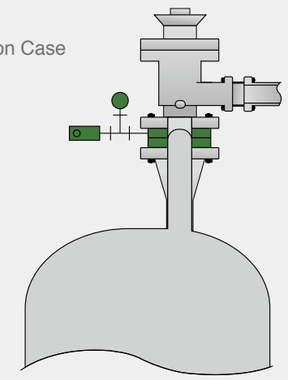
1) Primary Case



2) Secondary Case



3) Combination Case



4) External Fire Case

RUPTURE DISC

KOSHA Obligation Safety Certification

(Mandatory for Korea only)

1. What is 'Obligation Safety Certification'?

Regarding of manufacture protection devices and protective equipments of hazardous machinery and instrument, it is the system that prevents from industrial accident to produce, distribute and use safe and reliable products by attaching the certification mark to products meet the requirements of safety certification criteria and selling

▶ Korea Obligation Safety Certification Mark

2. Scope of Obligation Safety Certification

Scope of Rupture Discs which are used to protect pressure vessels from overpressure or high vacuum by gas or steam
(However, it is excepted when used for release a pressure of liquid or the setting value of rupture pressure is below 0.1MPag)

3. Main contents and Requirements of Obligation Safety Certification

- It shall be conducted a burst test under the same temperature as service condition
- When you apply for certification, it is required a certification of the same type separately if it is different to specification submitted
- It shall be certified, even if it is imported products

4. Relevant regulations

- Occupation safety and health acts
- Regulations for Occupation safety and health acts
- Implementing Regulations in Occupation safety and health acts
- Notification of Protection Device Obligation Safety Certification Criteria
- Notification for declaration of Safety Certification and Autonomy Safety Confirmation

5. Performance Criteria of Products

Burst test

Set Pressure	below 0.3MPag	0.3MPag and over
Allowable range of rupture Pressure	±0.015MPag	±5%

Leak test

Division		Soak time
Nominal diameter of rupture disc(mm)	50 and below	1 min
	above 50&100 and below	2 min
	above 100	5 min

* It shall be conducted a leak test under 90% of set pressure
* It shall be conducted a leak test under 50% of set pressure in case of Flat/Slotted Type.

6. Classification and Notation of the KOSHA Certification Type

Division in accordance with structure

Forward Dome type (C)	Single plate type (O)
	Composite type (C)
	Scored type or Slotted type (S)
Reverse Dome type(R)	Scored type or shear type (S)
	Knife blades type (K)
Flat type(F)	Replaceable type graphite rupture disc (R)
	Monoblock type graphite rupture disc (M)
	Slotted type rupture disc (S)
Other type (X)	Rupture discs produced depend on the manufacturers which are different than above.

Division in accordance with nominal diameter

Division of nominal diameter	I	II	III	IV	V
Range of nominal diameter(mm)	25 and below	above 25 & 50 and below	above 50 & 80 and below	above 80 & 100 and below	above 100

Division in accordance with nominal pressure

Division of nominal pressure	1	3	5	10	21	22
Range of rupture pressure(MPag)	1 and below	above 1&3 and below	above 3&5 and below	above 5&10 and below	above 10&21 and below	above 21

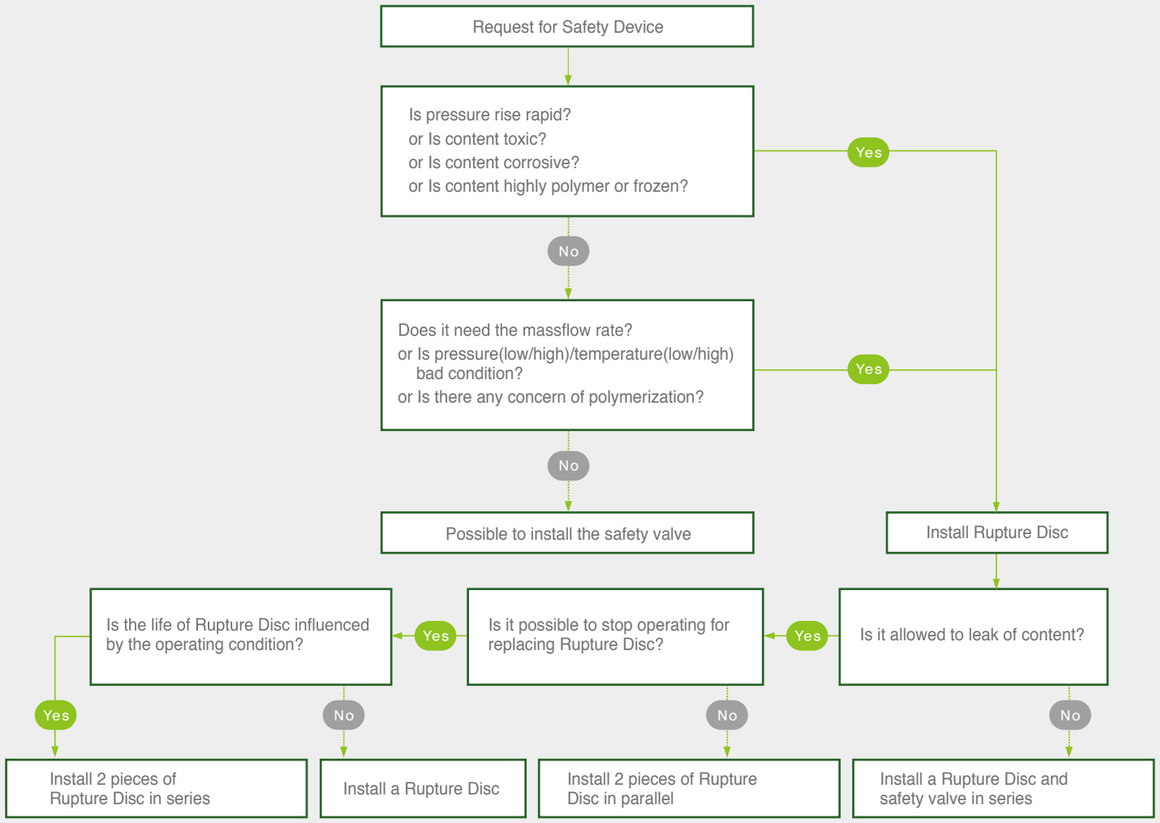
Notation of type

RS II 3

Structure Nominal Diameter Nominal pressure

RUPTURE DISC

SELECTION GUIDE



RUPTURE DISC

SELECTION MODEL

STEP1. Check the pressure vessel and process operating specification (Process Data)

- Material properties of the fluids used
  - Gas or Vapor : Mol weight, Specific heat ratio, Compressibility coefficient
  - Liquid : Specific gravity, Viscosity
- State of the fluids used : Gas, Vapor, Steam, Liquid, etc.
- Operating condition : Static, Pulsation(Oscillation), Cycle, etc.
- MAWP(Maximum Allowable Working Pressure or Design Pressure) of pressure vessel
- Maximum operating pressure and temperature
- Required Capacity
- Set pressure and set temperature of Rupture Disc for rupture
- Back pressure and Vacuum pressure
- Material (Holder/Disc/Accessory)
- Connection(Flange/Fitting) specification
- Installation type of Rupture Disc : Primary, Secondary, Combination, External Fire
- Calculation of operating ratio :
  Operating ratio = Maximum operating pressure/Minimum rupture pressure □ 100
  ※ Minimum rupture pressure = Set rupture pressure - Negative rupture tolerance

STEP2. Model & Accessory (by FDC)

STEP3. Calculation of size & rated flow capacity (by FDC)

RUPTURE DISC

SIZING

	ASME SECTION VIII DIV 1
Dry saturated steam	$A = \frac{W_T}{51.5KP}$ note) For pressure up to 1500psig apply the above equation, and for dry saturated steam pressures over 1500psig and up to 3200psig, the value of W_T, calculated by the above equation, shall be corrected by being multiplied by the following factor. $\left(\frac{0.1906P-1000}{0.2292P-1061}\right)$
Gas/Air	$A = \frac{W_T}{ckp\sqrt{\frac{m}{t}}}$
Liquid	$A = \frac{W_T}{2407 \cdot k \cdot \sqrt{(p-p_d)\cdot\omega}}$

	KS B ISO 4126
Gas/steam at critical flow	$A_0 = 3.469 \frac{q_m}{C\cdot\alpha}\sqrt{\frac{V_0}{p_0}}$ or $A_0 = \frac{q_m}{C\cdot\alpha\cdot p_0}\sqrt{\frac{t_0\cdot z_0}{m}}$ For the homogenized wet steam of 90% or more dryness $A_0 = 3.469 \frac{q_m\cdot\sqrt{x}}{C\cdot\alpha}\sqrt{\frac{V_0}{p_0}}$
Gas/steam at subcritical flow	$A_0 = 3.469 \frac{q_m}{C\cdot k_b\cdot\alpha}\sqrt{\frac{V_0}{p_0}}$ or $A_0 = \frac{q_m}{C\cdot k_b\cdot\alpha\cdot p_0}\sqrt{\frac{t_0\cdot z_0}{m}}$
Liquid	$A_0 = 0.621 \frac{W_T}{k_v\cdot\alpha\sqrt{\Delta p\cdot p}}$

W_T Mass flow rate (lb/hr)

A Practical outlet area in opening rupture disc (in^2)

P Whichever is greater in '(Set pressure × 1.10) + atmospheric pressure' or 'set pressure + 3psia + atmospheric pressure' (psia)

P_d Back pressure(pressure at outlet) (psia)

M Mol weight

T Absolute temperature at valve inlet,℉+ 460℉ (R)

C Constant for gas or steam based on specific heat ratio ($k=C_P / C_V$)

k	C	k	C	k	C
1.00	315	1.26	343	1.52	366
1.02	318	1.28	345	1.54	368
1.04	320	1.30	347	1.56	369
1.06	322	1.32	349	1.58	371
1.08	324	1.34	351	1.60	372
1.10	327	1.36	352	1.62	374
1.12	329	1.38	354	1.64	376
1.14	331	1.40	356	1.66	377
1.16	333	1.42	358	1.68	379
1.18	335	1.44	359	1.70	380
1.20	337	1.46	361	2.00	400
1.22	339	1.48	363	2.20	412
1.24	341	1.50	364	...	...

K Release coefficient (design coefficient, in general apply 0.62 for rupture disc and practical measure × 0.9 in real measurement, but it shall be less than 0.875.)

Z Compressibility coefficient related to P and T (if there is no available data, Z=1.0)

ω Specific weight of liquid under the condition for valve inlet (lb/ft^3)

A_o Minimum required flow cross sectional area (mm^2)

Q_m Mass Flow rate (kg/h)

C Function for isentropic exponent k (Refer to table 1. Physical properties of gas)

k	C	k	C	k	C	k	C
0.50	1.81	1.001	2.40	1.26	2.61	1.52	2.78
0.60	1.96	1.02	2.41	1.28	2.62	1.54	2.79
0.70	2.08	1.04	2.43	1.30	2.63	1.56	2.80
0.80	2.20	1.06	2.45	1.32	2.65	1.58	2.82
0.82	2.22	1.08	2.46	1.34	2.66	1.60	2.83
0.84	2.24	1.10	2.48	1.36	2.68	1.62	2.84
0.86	2.26	1.12	2.50	1.38	2.69	1.64	2.85
0.88	2.28	1.14	2.51	1.40	2.70	1.66	2.86
0.90	2.30	1.16	2.53	1.42	2.72	1.68	2.87
0.92	2.32	1.18	2.55	1.44	2.73	1.70	2.89
0.94	2.34	1.20	2.56	1.46	2.74	1.80	2.94
0.96	2.36	1.22	2.58	1.48	2.76	2.00	3.04
0.98	2.38	1.24	2.59	1.50	2.77	2.20	3.13

V_o Specific volume at practical release pressure and temperature (m^3/kg)

P_o Release pressure (bar)

α Release coefficient (In general, apply 0.62)

T_o Release temperature (K)

Z_o Compressibility coefficient at practical release pressure and temperature (If there is no available data, Z_o=1.0)

M Mol weight

X Dryness of wet steam

K_v Viscosity correction factor related to Reynold's number(Re) If the liquid viscosity is less than that of water at 20°C, k_V=1.0 (Refer to Table 2. Capacity correction factor for viscosity)

K_b Correction factor for reduction in the theoretical capacity as increase of the back pressure in subcritical flow (Refer to table 3. Capacity correction factor for back pressure)

R_e Reynold's number $R_e = 0.3134 \frac{Q_m}{\mu\sqrt{A_o}}$

μ Viscosity of the liquid

ΔP differential pressure released through rupture disc ($\Delta P = P_O - P_b$) (bar)

P_b Back pressure (pressure at outlet) (psia)

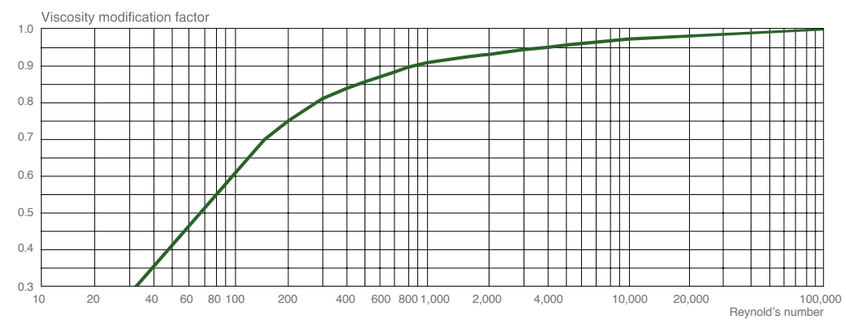
Table 1. Physical properties of gas

Name \ Physial property	Formula	Mol weight(M)	Adiabatic constant(K)	Name \ Physial property	Formula	Mol weight(M)	Adiabatic constant(k)
Acetylene	C_2H_2	26.04	1.26	n-Hexane	n-C_6H_{14}	86.18	1.06
Air	-	28.97	1.40	Hydrogen chloride	HCl	36.46	1.41
Ammonia	NH_3	17.03	1.31	Hydrogen	H_2	2.02	1.41
Argon	Ar	39.95	1.67	Hydrogen sulfide	H_2S	34.08	1.32
Butadiene	C_4H_6	54.09	1.113	Dichloro difluoro methane	CCl_2F_2	120.91	1.139
Benzene	C_6H_6	78.12	1.12	Methane	CH_4	16.04	1.31
iso-Butane	iso-C_4H_{10} or $CH(CH_3)_3$	58.12	1.10	Methyl alcohol	CH_3OH or CH_4O	32.04	1.20
n-Butane	n-C_4H_{10}	58.12	1.09	Methyl chloride	CH3Cl	50.49	1.20
Carbon disulfide	CS_2	76.14	1.21	Nitrogen	N_2	28.01	1.40
Carbon dioxide	CO_2	44.01	1.29	Nitrogen dioxide	NO2	44.01	1.30
Carbon monoxide	CO	28.01	1.40	n-Nonane	n-$CH_3(CH_2)_7CH_3$ or C_9H_{20}	128.26	1.04
Chlorine	Cl_2	70.91	1.36	Oxygen	O_2	32.00	1.40
Cyclohexane	C_6H_{12}	84.16	1.09	n-Pentane	n-$CH_3(CH_2)_3CH_3$ or C_5H_{12}	72.15	1.07
n-Decane	n-$C_{10}H_{22}$	142.29	1.03	n-Propane	n-$CH_3CH_2CH_3$ or C_3H_8	44.10	1.13
Ethane	C_2H_6	30.07	1.19	Water	H_2O	18.02	1.133
Ethyl alcohol	C_2H_5OH or C_2H_6O	46.07	-	Sulfur dioxide	SO_2 or O_2S	64.06	1.29
Ethylene	C_2H_4	28.05	1.24	Toluene	$C_6H_5CH_3$ or C_7H_8	92.15	1.09
Helium	He	4.00	1.66	Propylene	CH_3CHCH_2 or C_3H_6	42.08	1.15
n-Heptane	n-$CH_3(CH_2)_5CH_3$ or C_7H_{16}	100.21	1.05	Octane	$CH_3(CH_2)_6CH_3$ or C_8H_{18}	114.00	1.05

Table 2. Capacity correction factor for back pressure

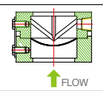
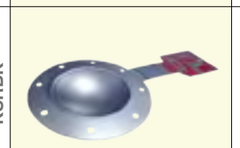
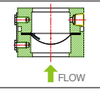
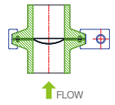
$\frac{P_b}{P_o}$	Isentropic exponent(k)																		
	0.4	0.5	0.6	0.7	0.8	0.9	1.001	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2
	Volume modification factor for back pressure																		
0.45																	1.000	0.999	0.999
0.50												1.000	1.000	0.999	0.999	0.996	0.994	0.992	0.989
0.55									0.999	1.000	0.999	0.997	0.994	0.991	0.987	0.983	0.979	0.975	0.971
0.60							1.000	0.999	0.997	0.993	0.989	0.983	0.978	0.972	0.967	0.961	0.955	0.950	0.945
0.65						0.999	0.995	0.989	0.982	0.974	0.967	0.959	0.951	0.944	0.936	0.929	0.922	0.915	0.909
0.70			0.999	0.999	0.993	0.985	0.975	0.964	0.953	0.943	0.932	0.922	0.913	0.903	0.895	0.886	0.879	0.871	0.854
0.75		1.000	0.995	0.983	0.968	0.953	0.938	0.923	0.909	0.896	0.884	0.872	0.861	0.851	0.841	0.832	0.824	0.815	0.808
0.80	0.999	0.985	0.965	0.942	0.921	0.900	0.881	0.864	0.847	0.833	0.819	0.806	0.794	0.783	0.773	0.764	0.755	0.747	0.739
0.82	0.992	0.970	0.944	0.918	0.894	0.872	0.852	0.833	0.817	0.801	0.787	0.774	0.753	0.752	0.741	0.732	0.723	0.715	0.707
0.84	0.979	0.948	0.917	0.888	0.862	0.839	0.818	0.799	0.782	0.766	0.752	0.739	0.727	0.716	0.706	0.697	0.688	0.680	0.672
0.86	0.957	0.919	0.884	0.852	0.800	0.779	0.759	0.742	0.727	0.712	0.700	0.688	0.677	0.667	0.667	0.658	0.649	0.641	0.634
0.88	0.924	0.881	0.842	0.809	0.780	0.755	0.733	0.714	0.697	0.682	0.688	0.655	0.644	0.633	0.624	0.615	0.606	0.599	0.592
0.90	0.880	0.831	0.791	0.757	0.728	0.703	0.681	0.662	0.645	0.631	0.617	0.605	0.594	0.584	0.575	0.566	0.558	0.551	0.544
0.92	0.820	0.769	0.727	0.693	0.664	0.640	0.619	0.601	0.585	0.571	0.559	0.547	0.537	0.527	0.519	0.511	0.504	0.497	0.490
0.94	0.739	0.687	0.647	0.614	0.587	0.565	0.545	0.528	0.514	0.501	0.489	0.479	0.470	0.461	0.453	0.446	0.440	0.434	0.428
0.96	0.628	0.579	0.542	0.513	0.489	0.469	0.452	0.438	0.425	0.414	0.404	0.395	0.387	0.380	0.373	0.367	0.362	0.357	0.352
0.98	0.426	0.422	0.393	0.371	0.353	0.337	0.325	0.314	0.305	0.296	0.289	0.282	0.277	0.271	0.266	0.262	0.258	0.254	0.251
1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 3. Capacity correction factor for viscosity



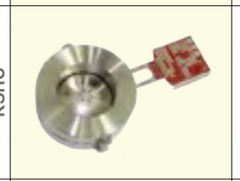
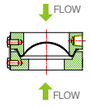
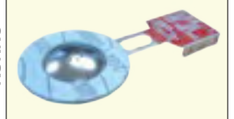
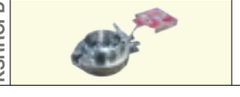
PRODUCTS LIST

RUPTURE DISC

	Model (Image)	Description	Holder or Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
REVERSE TYPE	KSRR	Reverse Dome Knife Type	KS Insert Flat Seat Knife Blades Single Type		1/2" ~ 48" (15A ~ 1200A) 1/4" ~ 4" (8A ~ 100A)	0.3 ~ 150 kg/㎠	No	Yes	No	Yes	No	90%
			KD Insert Flat Seat Knife Blades Double Type									
			BK Bolted Flat Seat Knife Blades Single Type									
	KSRRK	Reverse Dome Shear Type	FS Insert Flat Seat Single Type		1/2" ~ 24" (15A ~ 600A) 1/4" ~ 4" (8A ~ 100A)	0.35 ~ 30 kg/㎠	No	Yes	Yes	No	No	90%
			FD Insert Flat Seat Double Type									
			BF Bolted Flat Seat Single Type									
	KSRRKF	Reverse Dome Shear Type for Ferrule	FERRULE Ferrule Connection Type		1S~4S FERRULE	0.35 ~ 30 kg/㎠	No	Yes	Yes	No	No	90%
	KSRBKH	Reverse Dome Buckling Knife Type	BFS Insert Flat Seat Single Type for RBK		1/2" ~ 36" (15A ~ 900A) 1/4" ~ 4" (8A ~ 100A)	0.1 ~ 100 kg/㎠	No	Yes	Yes	No	No	90%
			BBF Bolted Flat Seat Single Type for RBK									
	KSRBK 	Reverse Dome Buckling Knife Type for Flange	RF Raised Face Flange Type		1/2" ~ 36" (15A ~ 900A)	0.1 ~ 100 kg/㎠	No	Yes	Yes	No	No	90%
			FF Flat Face Flange Type									
	KSRSR	Reverse Dome Scored Type	FS Insert Flat Seat Single Type		1/2" ~ 24" (15A ~ 600A) 1/4" ~ 4" (8A ~ 100A)	1.5 ~ 150 kg/㎠	No	Yes	Yes	No	No	90%
			BF Bolted Flat Seat Single Type									
	KSRSRF	Reverse Dome Scored Type for Ferrule	INSERT FLAT SINGLE TYPE		1" ~ 4" (25A ~ 100A)	6 ~ 10 (kg ~ ㎠)	No	Yes	Yes	Yes	No	90%

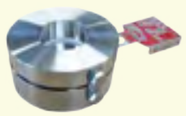
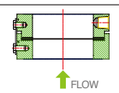
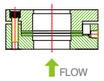
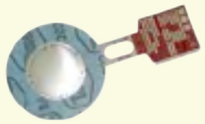
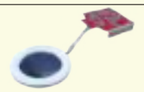
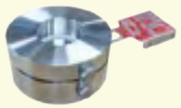
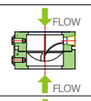
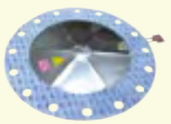
PRODUCTS LIST

RUPTURE DISC

	Model (Image)	Description	Holder or Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
												%
FORWARD TYPE	KSRSF	Forward Dome Scored Type	FS Insert Flat Seat Single Type		1/2" ~ 12" (15A ~ 300A) 1/4" ~ 4" (8A ~ 100A)	5 ~ 700 kg/㎠	No	Yes	Yes	No	No	80%
			BF Bolted Flat Seat Single Type									
	KSRST	Forward Dome Tension Flat Seat Type	FS Insert Flat Seat Single Type		1/2" ~ 48" (15A ~ 1200A)	15 ~ 1,500 kg/㎠	No	Yes	Yes	No	Yes	70%
	KSRCT	Forward Dome Tension Sloped Seat Type	SS Insert Sloped Seat Single Type		1/2" ~ 40" (15A ~ 1000A)	15 ~ 1,500 kg/㎠	Yes or No	Yes	Yes	No	Yes	70%
			SD Insert Sloped Seat Double Type									
COMPOSITE DOME TYPE	KSRC 	Composite Dome Sloped Seat Type	SS Insert Sloped Seat Single Type		1/2" ~ 40" (15A ~ 1000A)	Teflon Seal: 0.1 ~ 30 kg/㎠ Metal Seal: 1.0 ~ 560 kg/㎠	Yes	Yes	Yes	No	No	80%
			SD Insert Sloped Seat Double Type									
	KSRRCH	Composite Dome Flat Seat Type	FS Insert Flat Seat Single Type		1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 50 kg/㎠	Yes	Yes	Yes	No	No	80%
			FD Insert Flat Seat Double Type									
			BF Bolted Flat Seat Single Type		1/4" ~ 4" (8A ~ 100A)							
	KSRRCHD	Composite Dome Flat Seat Double Acting Type	INSERT FLAT SINGLE TYPE		1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 50 kg/㎠	Yes	Yes	Yes	No	No	80%
	KSRRC 	Composite Dome Flat Seat Type for Flange	RF Raised Face Flange Type		1/2" ~ 52" (15A ~ 1300A)	0.05 ~ 50 kg/㎠	Yes	Yes	Yes	No	No	80%
			FF Flat Face Flange Type									
	KSRRCF	Composite Dome Flat Seat Type for Ferrule	FERRULE Ferrule Connection Type		1S~4S FERRULE	0.3 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	80%
	KSRRCFD 	Composite Dome Flat Seat Double Acting Type for Ferrule	FERRULE Ferrule Connection Type		1S~4S FERRULE	0.3 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	80%

PRODUCTS LIST

RUPTURE DISC

	Model (Image)		Description	Holder or Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
													%
COMPOSITE FLAT TYPE	KSROH		Composite Flat Type	H Insert Flat Seat Single Type for RO		1/2" ~ 48" (15A ~ 1200A) 1/4" ~ 4" (8A ~ 100A)	0.05 ~ 35 kg/㎠	Yes	Yes	Yes	No	No	50%
				B Bolted Flat Seat Single Type for RO									
	KSRO		Composite Flat Type for Flange	RF Raised Face Flange Type		1/2" ~ 72" (15A ~ 1800A)	0.05 ~ 35 kg/㎠	Yes	Yes	Yes	No	No	50%
				FF Flat Face Flange Type									
	KSROF		Composite Flat Type for Ferrule	FERRULE Ferrule Connection Type		1S~4S FREEULE	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
	KSROHD		Composite Flat Double Acting Type	H Insert Flat Seat Single Type for RO		1/2" ~ 48" (15A ~ 1200A) 1/4" ~ 4" (8A ~ 100A)	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
				B Bolted Flat Seat Single Type for RO									
	KSROFD		Composite Flat Double Acting Type for Ferrule	FERRULE Ferrule Connection Type		1S~4S FREEULE	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
ULTRA LOW PRESSURE TYPE	KSRRL		Reverse Dome Knife Type - LP	LS Insert Flat Seat Single Type for RRL & RRLD		1/2" ~ 10" (15A ~ 250A)	0.01 ~ 1.0 kg/㎠ (100 ~ 10,000 mmAq)	Yes	Yes	No	No	No	50%
				LVS Insert Flat Seat Single Type for RRL & RRLD(Vacuum)									
	KSRRLD		Reverse Dome Knife Double Acting Type - LP	LS Insert Flat Seat Single Type for RRL & RRLD		1/2" ~ 10" (15A ~ 250A)	0.01 ~ 1.0 kg/㎠ (100 ~ 10,000 mmAq)	Yes	Yes	No	No	No	50%
				LVS Insert Flat Seat Single Type for RRL & RRLD(Vacuum)									
	KSROL		Composite Flat Type for Flange - LP	RF Raised Face Flange Type		4" ~ 32" (100A ~ 800A)	0.01 ~ 0.15 kg/㎠ (100 ~ 1,500 mmAq)	Yes	Yes	No	No	No	50%
				FF Flat Face Flange Type									

PRODUCTS LIST

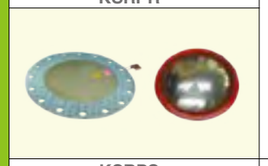
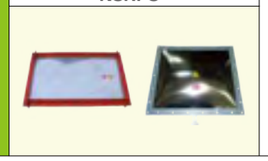
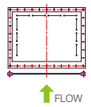
RUPTURE DISC

	Model		Description	Connection Type		
GRAPHITE DISC	KSRGM	Drawing	Mono Type	Inserted between Flange		
	KSRGI	Drawing	Inverted Type	Inserted between Flange		
	KSRGD	Drawing	Double Acting Type	Inserted between Flange		
FITTING CONNECTION TYPE		KSRRKV / KSRRKP / KSRRKU	Reverse Dome Shear Type	VCR	PLUG	UNION
	Image					
	Drawing					
		KSRSFV / KSRSFP / KSRSFU	Forward Dome Scored Type	Standard VCR Connector In/Outlet Standard Connetor	MFR Standard Screwed Connector Inlet Screwed Male or Female Outlet Screwed Male or Female	MFR Standard Union Connector In/Outlet Screwed Male or Female or Weld neck
	Image					
	Drawing					
		KSRSTV / KSRSTP / KSRSTU	Forward Dome Tension Type			
	Image					
	Drawing					
		KSRRCV / KSRRCP / KSRRCU	Composite Dome Flat Seat Type			
	Image					
	Drawing					
		KSWSRV				
	Image	Drawing	Reverse Dome Scored Type			

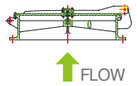
Model	Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
				Gas or Vapor	Liquid			
								%
KSRGM	1/2" ~ 24"	0.017 ~ 10 kg/㎠	Yes	Yes	Yes	No	Yes	90%
KSRGI	1/2" ~ 24"	0.017 ~ above 70 kg/㎠	Yes	Yes	Yes	No	Yes	90%
KSRGD	1-1/2" ~ 24"	0.017 ~ 0.49 kg/㎠	Yes	Yes	Yes	No	Yes	90%
KSRRKV	1/4" ~ 1" (8A ~ 25A)	4 ~ 50 kg/㎠	No	Yes	Yes	No	No	90%
KSRRKP KSRRKU	1/4" ~ 2" (8A ~ 50A)		No	Yes	Yes	No	No	90%
KSRSFV	1/4" ~ 1" (8A ~ 25A)	15 ~ 3,500 kg/㎠	No	Yes	Yes	No	No	90%
KSRSFP KSRSFU	1/4" ~ 2" (8A ~ 50A)		No	Yes	Yes	No	No	90%
KSRSTV	1/4" ~ 1" (8A ~ 25A)	15 ~ 3,500 kg/㎠	No	Yes	Yes	No	Yes	70%
KSRSTP KSRSTU	1/4" ~ 2" (8A ~ 50A)		No	Yes	Yes	No	Yes	70%
KSRRCV	1/4" ~ 1" (8A ~ 25A)	1.5 ~ 50 kg/㎠	Yes	Yes	Yes	No	No	80%
KSRRCP KSRRCU	1/4" ~ 2" (8A ~ 50A)		Yes	Yes	Yes	No	No	80%
KSWSRV	1/4" ~ 1" (8A ~ 25A)	10.5 ~ 355 kg/㎠	No	Yes	Yes	No	No	90%

PRODUCTS LIST

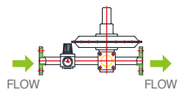
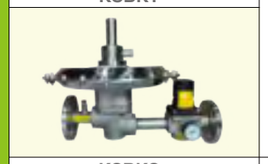
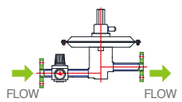
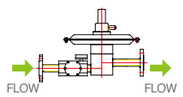
EXPLOSION PANEL

Model (Image)	Description	Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
KSRPR 	Round Flat Type Round Dome Type	RF Raised Face Flange Type		Max. Φ3600	0.01 ~ 0.5 kg/㎠ (100 ~ 5000 mmAq)	Yes	Yes	No	No	No	50%
		FF Flat Face Flange Type									
KSRPS 	Rectangular Flat Type Rectangular Dome Type	FF Flat Face Flange Type		1500 X 2000 mm	0.01 ~ 0.5 kg/㎠ (100 ~ 5000 mmAq)	Yes	Yes	No	No	No	50%

EMERGENCY RELIEF HATCH

Model (Image)	Description	Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
KSRH	Rupture Rod & Seal Type	Standard Flange		18" ~ 36" (450A ~ 900A)	150 ~ 5000 mmAq	N/A	Yes	N/A	N/A	N/A	N/A

N_2 BLANKETING SYSTEM

Model (Image)	Description	Connection Type	Drawing	Size	Set. Pressure	Vacuum Support Required	Available Service Phase: Gas or Vapor	Available Service Phase: Liquid	Spark	Fragment	Max Operating Ratio
KSBKL	Single Operating Type	Standard Flange or Screwed Piping		1/2" ~ 2"	12.5 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A
KSBKT 	Pilot Operating Type	Standard Flange or Screwed Piping		1/2" ~ 2"	20 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A
KSBKS	Pilot Operating Type	Standard Flange or Screwed Piping		1" ~ 2"	20 ~ 8000 mmAq	N/A	Yes	No	N/A	N/A	N/A

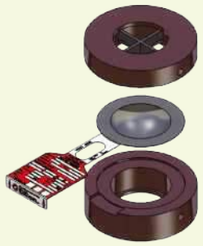
REVERSE TYPE

KSRR

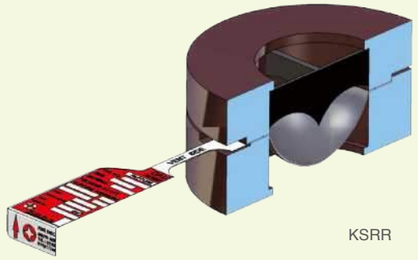
KSRR

KSRR (Reverse Dome Knife Type)

- Reversal structure ruptured by knife blade attached to upper holder while dome is inverted
- Mounted into FDC standard holder
- Ideal for counterpressure, vacuum and pulsation conditions
- Withstands full vacuum without vacuum support

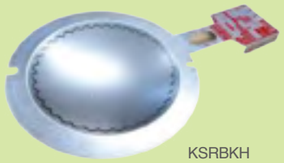


KSRR



KSRR

KSRBKH



KSRBKH

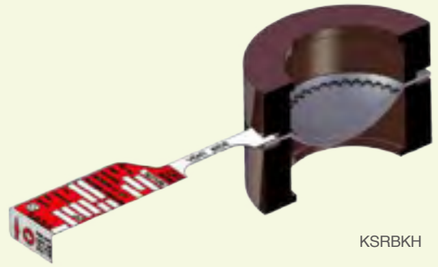
KSRBKH (Reverse Dome Buckling Knife Type)

- Ruptured while dome is sheared by Knife of Control Disc
- Mounted into FDC standard holder
- It consists of Control Disc and Seal Disc
- Easy to handle with strong impact resistance
- Precise rupture performance and excellent reliability
- Ideal for counterpressure, vacuum and pulsation conditions
- Withstands full vacuum without vacuum support

KSRBK (Reverse Dome Buckling Knife Type for Flange)

- Identical disc type with KSRBKH, but mounted directly between flanges without holder

KSRBKH



KSRBKH

KSRRK

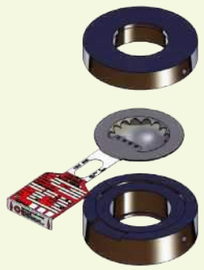
KSRRK

KSRRK (Reverse Dome Shear Type)

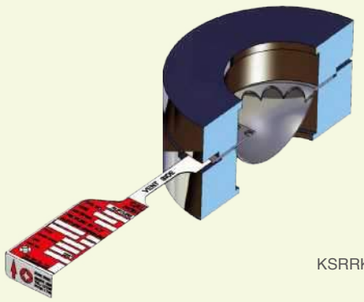
- Shearing structure ruptured by knife ring attached to disc while dome is inverted
- Mounted into FDC standard holder
- It is integrated with Disc and Knife
- Easier to handle than KSRR
- Ideal for counterpressure, vacuum and pulsation conditions
- Withstands full vacuum without vacuum support

KSRRKF (Reverse Dome Shear Type for Ferrule)

- KSRRK type disc designed for installation between ferrules



KSRRK



KSRRK

KSRSR

KSRSR

KSRSR

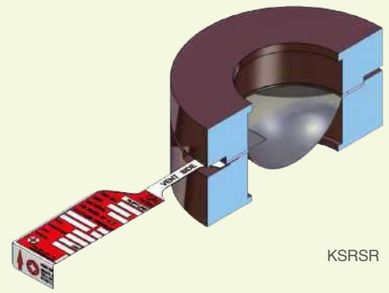
KSRSR (Reverse Dome Scored Type)

- Carved structure ruptured while inverted along with Scored Line processed precisely
- Mounted into FDC standard holder
- Designed for high pressure application
- Ideal for counterpressure, vacuum and pulsation conditions
- Withstands full vacuum without vacuum support

KSRSRF (Reverse Dome Scored Type for Ferrule)

- Identical disc type with KSRSR but mounted directly on the Ferrule Connection without holder

KSRSR



KSRSR

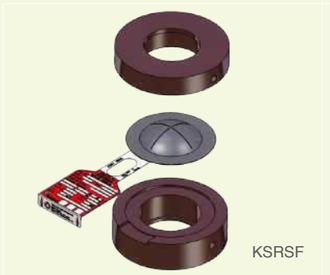
FORWARD TYPE

KSRSF

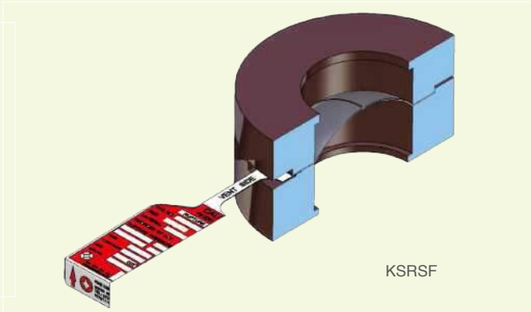
KSRSF

KSRSF (Forward Dome Scored Type)

- Carved structure with Scored Damage processed precisely ruptured by tension
- Mounted into FDC standard holder
- Designed for high pressure application
- Ideal for counterpressure, vacuum and pulsation conditions
- Withstands full vacuum without vacuum support



KSRSF



KSRSF

KSRST

KSRST

KSRCT

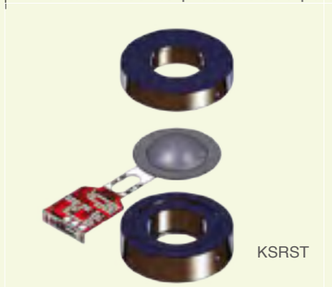
KSRCT

KSRST (Forward Dome Tension Flat Seat Type)

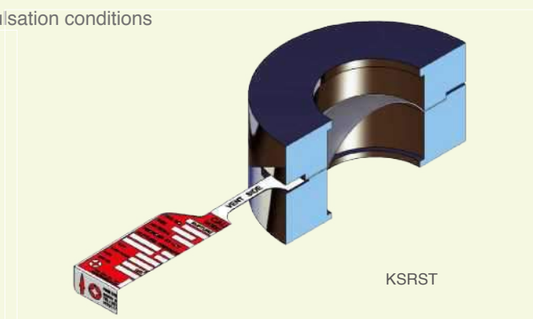
- Structure with disc ruptured by tensile strength
- Mounted into FDC standard holder
- Precise rupture performance and excellent reliability
- Designed for high/ultra high pressure application

KSRCT (Forward Dome Tension Sloped Seat Type)

- Consists of top disc, support disc and guide ring
- Identical feature with KSRST, but seat type is different
- mounted into FDC standard holder
- Ideal for counterpressure and pulsation conditions



KSRST



KSRST

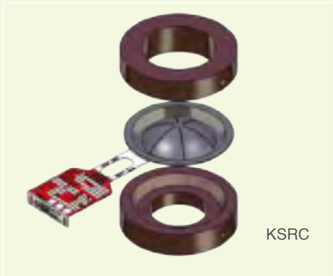
COMPOSITE DOME TYPE

KSRC

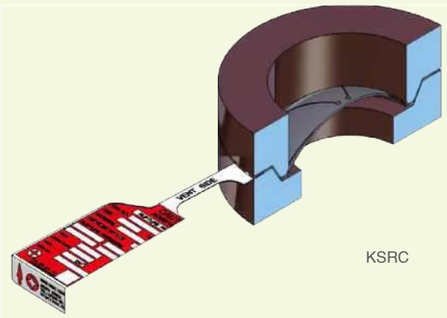
KSRC

KSRC (Composite Dome Sloped Seat Type)

- Composite/Dome structure ruptured by slit processed on Top disc
- Mounted into FDC standard holder
- It consists of Top disc, Seal disc and Vacuum disc
- Suitable for liquid or steam media environments
- Teflon or Metal seal is available
- Ideal for counterpressure, vacuum and pulsation conditions
- If required, vacuum support is available

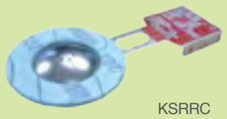


KSRC



KSRC

KSRRCH



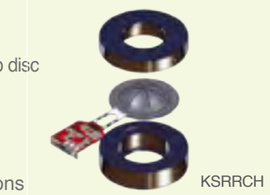
KSRRC

KSRRCF

KSRRCFD

KSRRCH (Composite Dome Flat Seat Type)

- Composite / Dome structure ruptured by slit processed on Top disc
- Mounted into FDC standard holder
- It consists of Top disc, Seal disc and Vacuum disc
- Suitable for liquid or steam media environments
- Teflon or Metal seal is available
- Ideal for counterpressure, vacuum and pulsation conditions
- If required, vacuum support is available



KSRRCH

KSRRCHD (Composite Dome Flat Seat Double Acting Type)

- KSRRCH type disk burst in one direction for overpressure and in the opposite direction for vacuum

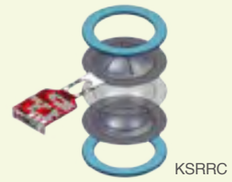
KSRRCH

KSRRC (Composite Dome Flat Seat Type for Flange)

- Identical disc type with KSRRCH, but mounted directly between flanges without holder

KSRRCF (Composite Dome Flat Seat Type for Ferrule)

- KSRRC type disc designed for installation between ferrules



KSRRC

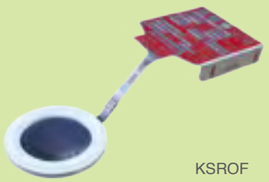
KSRRCFD (Composite Dome Flat Seat Double Acting Type for Ferrule)

- KSRRC type disc burst in one direction for overpressure and in the opposite direction for vacuum

COMPOSITE FLAT TYPE

KSROH

KSRO


KSROF

KSROHD

KSROFD

KSROH (Composite Flat Type)

- Composite/Flat structure ruptured by slit processed on Top disc
- Mounted into FDC standard holder
- It consists of Top disc, Seal disc and Vacuum disc
- Teflon or Metal seal is available
- Vulnerability to pulsation conditions
- If required, vacuum support is available

KSRO (Composite Flat Type for Flange)

- Identical disc type with KSROH, but mounted directly between flanges without holder

KSROF (Composite Flat Type for Ferrule)

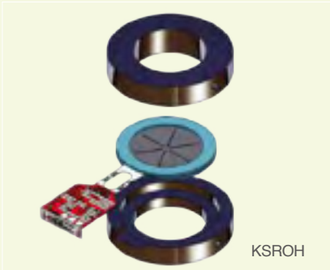
- KSRO type disc designed for installation between ferrules

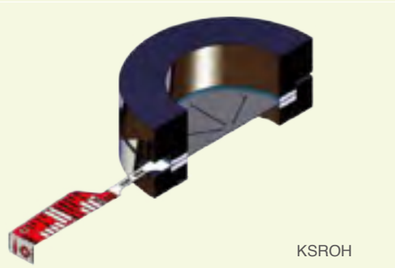
KSROHD (Composite Flat Double Acting Type)

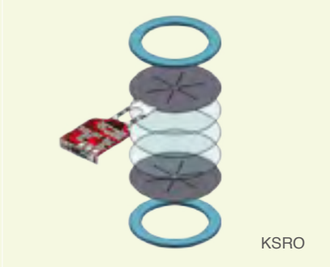
- KSROH type disc burst in one direction for overpressure and in the opposite direction for vacuum

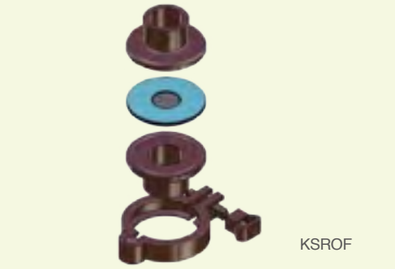
KSROFD (Composite Flat Double Acting Type for Ferrule)

- KSROF type disc burst in one direction for overpressure and in the opposite direction for vacuum


KSROH

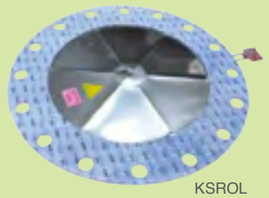

KSROH


KSRO


KSROF

ULTRA LOW PRESSURE TYPE

KSRRL


KSROL

KSRRL (Reverse Dome Knife Type - LP)

- Designed for ultra low pressure with minimum 100mmAq of set pressure
- Reversal structure ruptured by knife blade attached upper holder while dome is inverted
- Mounted into FDC standard holder
- it consists of Support disc, Disc seal and Vacuum support

KSRRLD (Reverse Dome Knife Double Acting Type - LP)

- KSRRL type disc burst in one direction for overpressure and in the other direction for vacuum

KSROL (Composite Flat Type for Flange - LP)

- It is used for ultra low pressure with minimum 100mmAq of set pressure
- Composite/Flat structure ruptured by slit processed on Setting disc
- It consists of Top disc, Setting disc, Seal disc and Vacuum disc
- Teflon or Metal seal is available

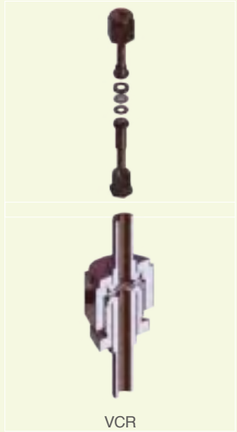
FITTING CONNECTION TYPE

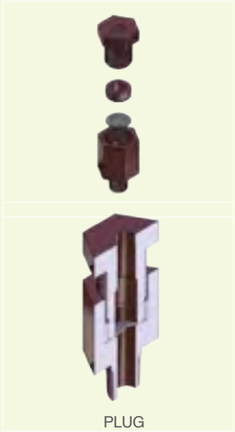
VCR

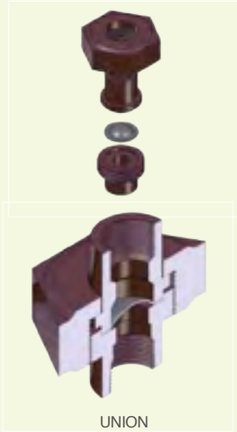
PLUG

UNION

- **KSRRKV / KSRRKP / KSRRKU** (Reverse Dome Shear Type for VCR/PLUG/UNION)
  - KSRRK disc for fitting connection
- **KSRSFV / KSRSFP / KSRSFU** (Forward Dome Scored Type for VCR/PLUG/UNION)
  - KSRSF disc for fitting connection
- **KSRSTV / KSRSTP / KSRSTU** (Forward Dome Tension Type for VCR/PLUG/UNION)
  - KSRST disc for fitting connection
- **KSRRCV / KSRRCP / KSRRCU** (Composite Dome Shear Type for VCR/PLUG/UNION)
  - KSRRC disc for fitting connection
- **KSWSRV** (Reverse Dome Scored Welding Type for VCR)
  - KSRSR disc for fitting connection

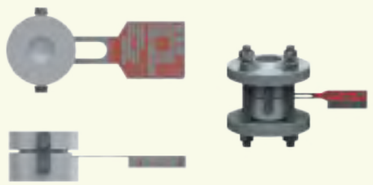
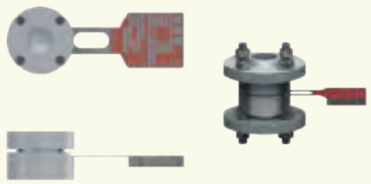
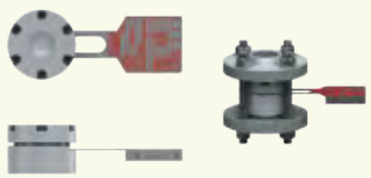
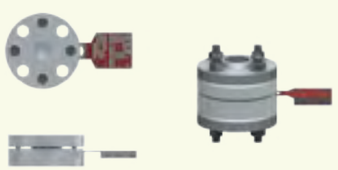

VCR


PLUG


UNION

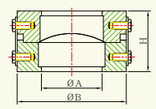
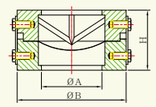
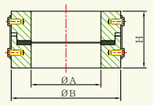
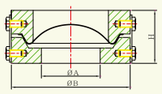
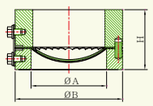
FDC'S RUPTURE DISC ASSEMBLY FOR FLANGE

HOLDER DESCRIPTION

HOLDER TYPE	IMAGE	FLANGE FACING	ASSEMBLY TYPE	FEATURES
PRE ASSEMBLY TYPE		▪ R.F ▪ F.F ▪ RJT ▪ T.G ▪ Male & Female Type	Side Link Plate	▪ FDC Standard ▪ Tightening : Stud Bolt / Nut의 Fastening force ▪ Simple Design & Low Cost
PRE ASSEMBLY TYPE		▪ R.F ▪ F.F	Pre Assembly Bolt	▪ FDC Standard ▪ Tightening : Stud Bolt / Nut의 Fastening force ▪ Simple Design & Low Cost
SEMI PRE TORQUE TYPE		▪ R.F ▪ F.F	Pre Torque Bolt	▪ FDC Standard ▪ Self Tightening ▪ Reasonable Cost
PRE TORQUE TYPE		▪ R.F ▪ F.F ▪ RJT ▪ T.G ▪ Male & Female Type	Pre Torque Bolt	▪ FDC Standard ▪ Self Tightening ▪ High Cost

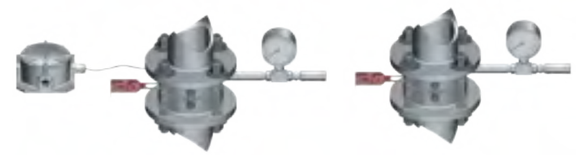
FDC'S RUPTURE DISC ASSEMBLY FOR FLANGE

HOLDER DIMENSION TABLE

HOLDER					
	FS TYPE	KS TYPE	H TYPE	SS TYPE	BFS TYPE
APPLICABLE RUPTURE DISC	KSRRK KSRSR KSRSF KSRST KSRRCH(D)	KSRR	KSROH(D)	KSRC KSRCT	KSRBKH

SIZE		ΦA		ΦB						H				
INCH	DN	FS/KS/SS/H	BFS	JIS 5K	JIS 10K	JIS 20K	ANSI 150 #	ANSI 300 #	ANSI 600 #	FS	KS	SS	BFS	H
1/2"	15	15	-	Φ48	Φ55	Φ55	Φ45	Φ51	Φ51	45	45	45	-	45
3/4"	20	20	34.5	Φ53	Φ60	Φ60	Φ54	Φ64	Φ64	45	45	45	45	45
1"	25	25	34.5	Φ63	Φ71	Φ71	Φ64	Φ70	Φ70	45	45	45	45	45
1 1/4"	32	32	-	Φ75	Φ81	Φ81	Φ73	Φ79	Φ79	45	45	45	45	45
1 1/2"	40	40	49.1	Φ80	Φ86	Φ86	Φ83	Φ93	Φ93	45	45	45	45	45
2	50	50	61.1	Φ90	Φ101	Φ101	Φ102	Φ108	Φ108	50	50	45	50	45
2 1/2"	65	65	77.1	Φ115	Φ121	Φ121	Φ121	Φ128	Φ128	55	55	50	55	45
3"	80	80	90	Φ126	Φ131	Φ137	Φ134	Φ146	Φ146	60	60	50	60	45
4"	100	100	115.4	Φ146	Φ156	Φ162	Φ172	Φ178	Φ189	65	65	50	65	45
5"	125	125	-	Φ181	Φ187	Φ200	Φ194	Φ213	Φ238	75	75	-	-	45
6"	150	150	166.6	Φ211	Φ217	Φ235	Φ220	Φ248	Φ263	75	75	50	75	45
8"	200	200	218	Φ257	Φ267	Φ280	Φ276	Φ304	Φ317	90	90	60	90	45
10"	250	250	-	Φ322	Φ330	Φ353	Φ338	Φ358	Φ397	110	110	60	-	45
12"	300	300	-	Φ367	Φ375	Φ403	Φ408	Φ419	Φ454	130	130	80	-	45
14"	350	350	-	Φ410	Φ420	Φ447	Φ447	Φ482	Φ488	130	130	90	-	-
16"	400	400	-	Φ470	Φ483	Φ507	Φ510	Φ536	Φ561	160	160	90	-	-
18"	450	450	-	Φ530	Φ538	Φ572	Φ546	Φ593	Φ609	180	180	100	-	-
20"	500	500	-	Φ580	Φ593	Φ627	Φ603	Φ651	Φ679	205	205	100	-	-
24"	600	600	-	Φ688	Φ697	Φ731	Φ714.5	Φ770.8	Φ787.2	235	235	150	-	-

The Rupture Disc assembly installed on the flanges



The Rupture Disc assembly without the flanges

GRAPHITE DISC

GRAPHITE DISC

GRAPHITE DISC Features

- Made from a single piece of graphite which is impregnated with phenolic resin
- Easy to install and maintain
- Installed directly between standard flanges without holders
- Excellent corrosion resistance

KSRGM

KSRGM

- Ideal for low and intermediate burst ratings
- Counterboard side of the disc contacts the process media
- In case of vacuum condition, vacuum supports are available for ratings below 25 psig
- Insulated Units are supplied armored with required insulation and gaskets for service above 221℃ to 371℃
- Armor is required for temperatures above 170℃

KSRGI

KSRGI

- Ideal for higher burst ratings
- Flat surface of the disc contacts the process media
- Armor is required for temperatures above 170℃
- TFE liner is available to extend corrosion resistance

KSRGD

KSRGD

- Setting two different pressures in the opposite directions (Double Acting Type)
- Optional liner is available to extend corrosion resistance
- Armor is required for temperatures above 170℃

Specification

Division	KSRGM	KSRGI	KSRGD
Standard	ASME Code sec Ⅷ KS B ISO 4126, API RP520, KOSHA CODE, FDC standard		
Size	1/2" ~ 24"		1-1/2" ~ 24"
Set. Pressure	0.017 ~ 10 kg/cm□	0.017 ~ above 70 kg/cm□	0.017 ~ 0.49 kg/cm□
Temperature	-179 ~ 371 ℃		-179 ~ 221℃
Material	Graphite		
Fragment	Yes		
Process Media	Gas, Vapor, Liquid		
Max. Operating Ratio	90%		
Spark	NO		
Option	Flouropolymer sintered, Vacuum Support, Insulation, Armor, Gasket,	Flouropolymer sintered, Armor, Liner, External Type Vacuum Support, Gasket	Flouropolymer sintered, Armor, Liner, Gasket

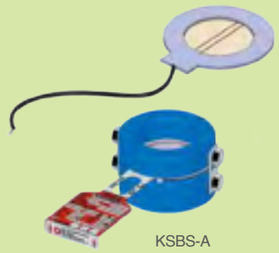
- Contact FDC for Set. Pressure details corresponding to each size

BURST SENSOR

BURST SENSOR

BURST SENSOR Features

- The Burst Sensor is a device indicating rupture disc activation.
- Upon rupture of the disc, alarm circuit is opened by the flowing media, and alarm system warns immediately.
- FDC Burst Sensor is usable over a wide range of temperatures and simply replaced along with the rupture disc.



KSBS-A

- GAS II 2G EX ib IIC T6 Gb
- DUST II 2D EX ib IIIC T135℃ Db

KSBS-A

- Installed on the vent side of Rupture Disc Holder.
- Consists of alarm strip combined with copper conductors and gasket attached on each side.
- Upon rupture of disc, sensor film is cut. As result of this, the flow of current is cut off and it instantaneously notifies rupture disc activation.
- Gasket Material: Non-asbestos, Teflon and Graphite etc.

- Electrical Specifications
  (Material with 1.5 meter extension cable)

Ui	Ii	Pi	Ci	Li
25.5 V	90 mA	0.63 W	0.01 nF	1.66μH

KSBS-B

- GAS II 2G EX ib IIC T6 Gb
- DUST II 2D EX ib IIIC T135℃ Db

KSBS-B

- Integrated directly into the rupture disc on the vent side
- Consists of alarm strip combined with copper conductors
- Upon rupture of disc, sensor film is cut. As result of this, the flow of current is cut off and it instantaneously notifies rupture disc activation.
- Electrical Specifications
  (Material with 1.5 meter extension cable)

Ui	Ii	Pi	Ci	Li
25.5 V	90 mA	0.63 W	0.01 nF	1.66μH

KSBS-C

- GAS II 2G EX ib IIC T6 Gb
- DUST II 2D EX ib IIIC T135℃ Db

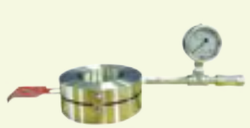
KSBS-C

- Integrated directly into the rupture disc on the vent side.
- Upon rupture of disc, sensor cable is cut. As result of this, the flow of current is cut off and it instantaneously notifies rupture disc activation.
- Electrical Specifications
  (Material with 1.5 meter extension cable)

Ui	Ii	Pi	Ci	Li
25.5 V	90 mA	0.63 W	0.02 nF	1.24μH

ACCESSORY

Pressure Gauge(P/G)	A measurement device which determines the pressure
Pressure Switch(P/S)	A device designed to monitor a process pressure and provide an output when a set pressure is reached
Excess Flow Valve(E.F.V)	A kind of check valve maintaining atmospheric pressure in the space between the rupture disc and the relief valve with a pressure gauge
Nipple, Tee, Plug, Reducer	Fitting for installation of P/G, P/S and E.F.V.
Stud Bolt & Nut	Tightening bolt & nut for In/Out Flange
Eye Bolt	A bolt which is attached to heavy holder so that ropes or cables are tied to it
Gasket	Sealing of In/Out Flange mating surface
J-Hook	J-shaped hooks installed at lower Holder
Jack Screw	It provides safe and easy installation of rupture discs by separating Inlet/Outlet flanges
Burst Sensor	A burst indicator providing instantaneous notification of rupture disc activation
Junction Box	Terminal box for connecting shield cable of burst sensor
Rain Hood	It protects Rupture Disc against foreign objects or rain inflow by installed onto downstream of the Rupture Disc exposed to the atmosphere
Heat Shield	Heat shield such as cerakwool and aerogel is attached to disc and helps disc to withstand the high temperature

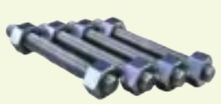

Rupture Disc Ass'y with P/G & E.F.V & Fitting

P/G

P/S

E.F.V

Reducer

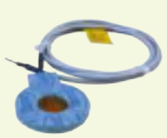

Stud Bolt & Nut

Eye Bolt

Gasket

J-Hook

Jack Screw


Burst Sensor

Junction Box

Rain Hood

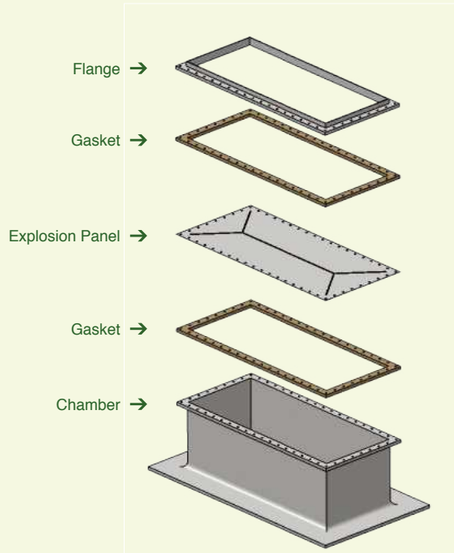
EXPLOSION PANEL

Explosion Panel Introduction

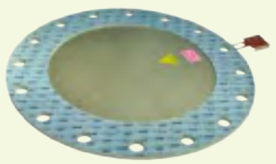
- Safety device for preventing equipments from damage by instantaneous release of pressure and flame which were increased in the process of deflagration before gas, powder, dust and other mixtures are progressed into detonation by ignition

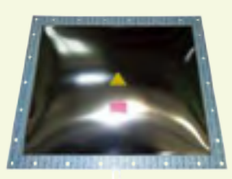
Explosion Panel Features

- **Applicable equipment** : Silo, Bag Filter, RTO, Bucket Elevator, Duct, Hopper, etc
- **Fluids** : Dust, Gas, Powder, Mixture
- **Code** : NFPA 68, KOSHA CODE
- **Advantages**
  - Prompt operating in low pressure and reduction of pressure
  - Fast release to minimize the damage caused by expansion gas
  - Design for prevention of leakage and fragments
  - Easy to replace and low maintenance cost
  - Possible to select any quantity and installation location depending on the vessel size and the type of contents



KSRPR(Dome Type)


KSRPR(Flat Type)


KSRPS(Dome Type)

KSRPS(Flat Type)

N2 BLANKETING SYSTEM

KSBKL

KSBKT

KSBKS

What is the N2 Blanketing System?

- Control device to maintain a constant pressure state by injecting N2 gas, that is, inert gas to upper room of the tank

Functions of N2 gas

- It reduces evaporation loss of the products to minimize the formation of vapor in the tank
- It removes explosive factors by controlling hazardous gas ingredients such as oxygen from vapor space in the tank
- It prevents products from damage by inflow of unnecessary moisture and air
- It prevents explosion by controlling electrostatic spark
- It promotes delivery rate of product by decreasing of discharging time of product
- It prevents the modification of tank by controlling vacuum in the tank

Type

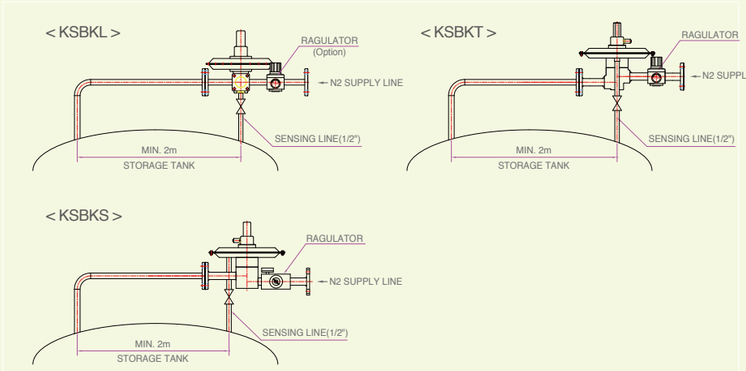
- KSBKL (Low capacity)
- KSBKT (High capacity)
- KSBKS (Ultra high capacity)

Flow Capacity (Rated Flow)

[Measure : Nm³/h]

Model	Inlet Pressure						
	1 barg	2 barg	3 barg	4 barg	5 barg	6 barg	7 barg
KSBKL	64.7	105.2	145.2	184.7	223.6	262	299.8
KSBKT	240.6	367.4	493.6	493.6	744.6	869.4	993.9
KSBKS	871.3	1316.9	1650.9	1891.8	2058	2168	2240.3

Installation- Layout



EMERGENCY RELIEF HATCH - KSRH

EMERGENCY RELIEF HATCH - KSRH

- A device for release the internal pressure with opening the cover by rupturing of tension rod when overpressure reaches more than allowable operating pressure by increasing of internal pressure of vessel
- Unlike general emergency venting device, it sets the required pressure by tension rod, and because it uses sealing diaphragm, it has excellent sealing capacity compared with the existing weight type, oil seal type and spring type
- Also, in case of oil seal type it has somewhat lower reliability because its setting pressure is not uniform by the difference of oil viscosity depending on temperature

Features

- Excellent sealing capacity and any leakage is not permitted
- Diaphragm is built in for sealing
- Available on LNG ship and ground tank mainly
- Possible to lower set pressure
- Maintenance cost is low because it is possible to reset by replacing some parts after rupturing