PRESSURE
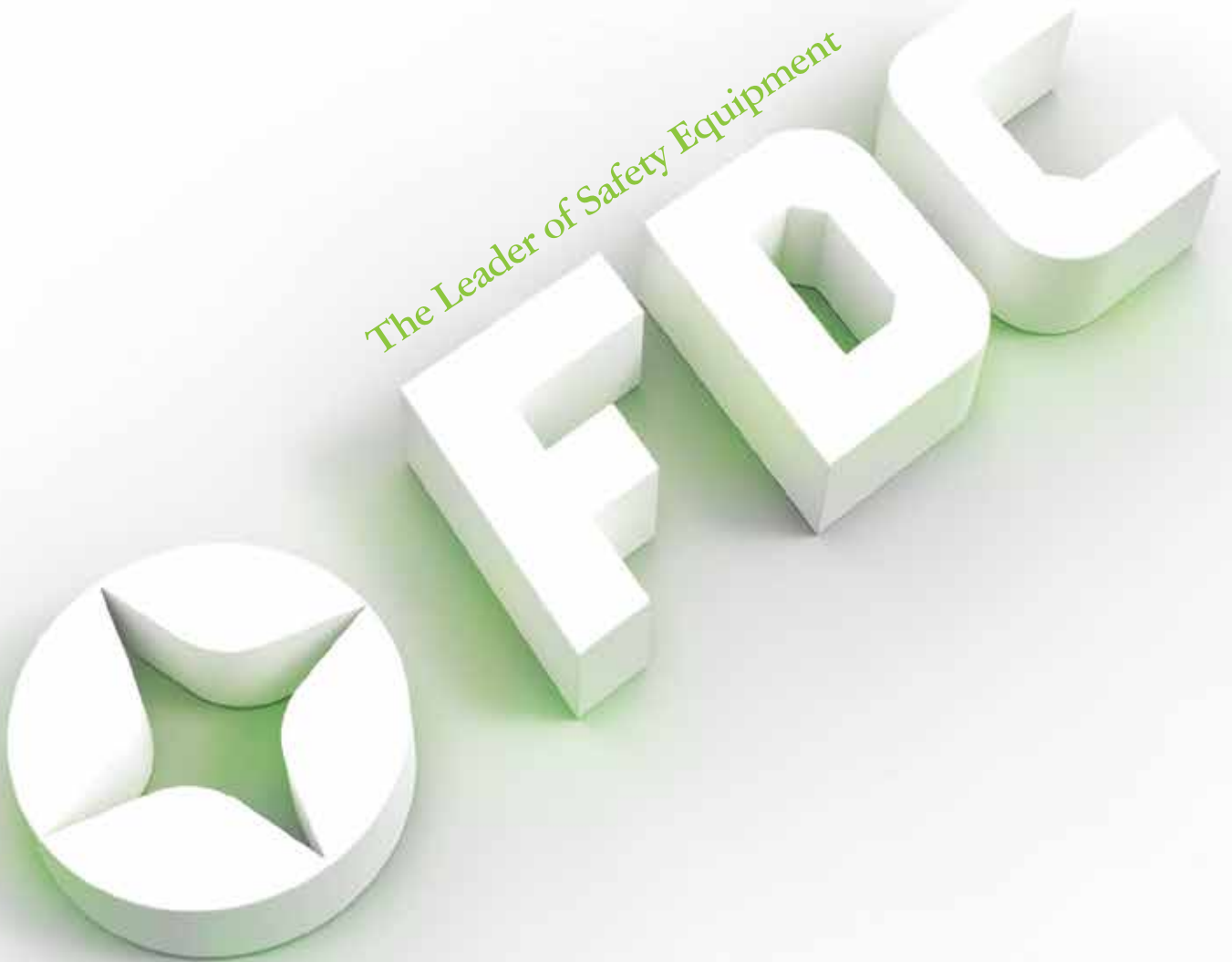# SAFETY DEVICES

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

The Leader of Safety Equipment

FDC

www.finedisc.co.kr

2015 Edit. / EN ver.6

FDC Small but strong
enterprise in the world!

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 device in various fields including low pressure storage tank, pressure tank, industrial plants, reactors and ships. 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.

We will keep nation's pride in the pressure safety device field, through Rupture Discs manufactured by FDC.
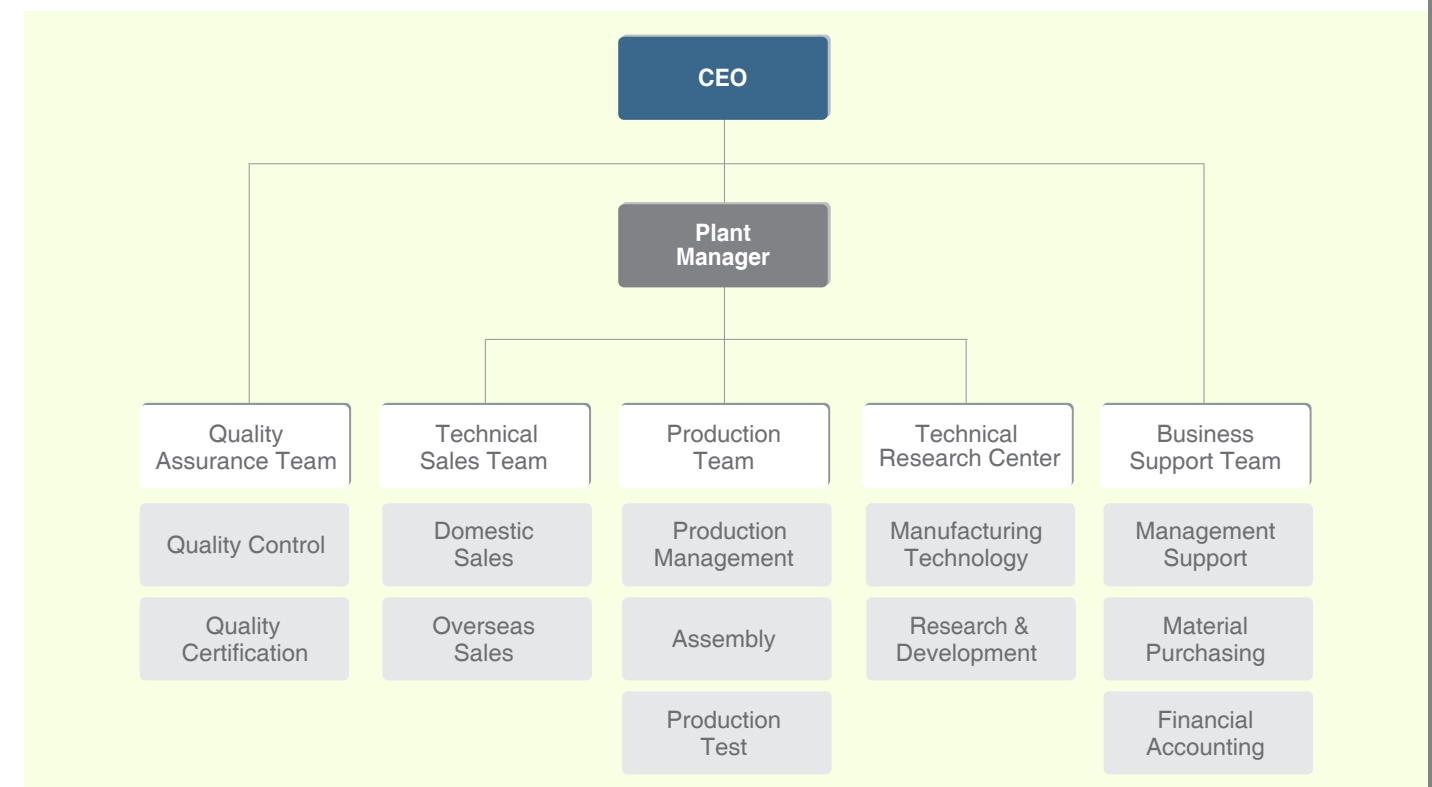
Chief Executive Officer
Yune Ha-won

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

ORGANIZATION CHART

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                          CEO
                           |
                       Plant
                      Manager
   ┌──────────┬───────────┬──────────┬──────────┐
Quality    Technical   Production  Technical   Business
Assurance  Sales Team  Team        Research    Support Team
Team                               Center

Quality    Domestic    Production  Manufacturing  Management
Control    Sales       Management  Technology     Support

Quality    Overseas    Assembly    Research &     Material
Certification Sales                 Development     Purchasing

                       Production                  Financial
                       Test                        Accounting
```

Building with proud HISTORY

Year	Event
2015	Approved vendor for ZADCO, KNPC, KOC and SEC
2014	Obtained CSEL (Special Equipment License) Certification in China Approved vendor for PETRONAS & Saipem Obtained CE ATEX & IEC EX certification(DUST) Registered Achilles FPAL
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	Disaffiliation of Fine Disc focused on Rupture Disc
1995	Developed a Rupture Disc Test Program in cooperation with KIMM(Korea Institute of Machinery & Materials)
1991	Established Rupture Disc Unit in KOREA STEEL POWER Co.,Ltd.

"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 |

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 6718
- 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

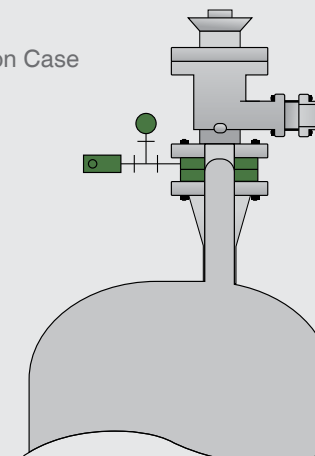| Teflon	200 ℃	Monel	483 ℃
Aluminum	120 ℃	Inconel	592 ℃
Stainless Steel	483 ℃	Hastelloy	483 ℃
Nickel	403 ℃	Graphite	371 ℃

6. Application of Rupture Disc

1) Primary Case
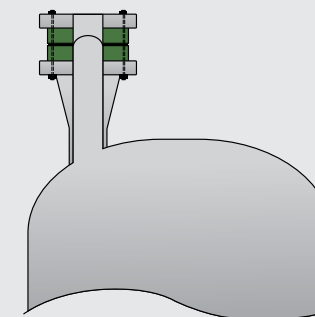
2) Secondary Case
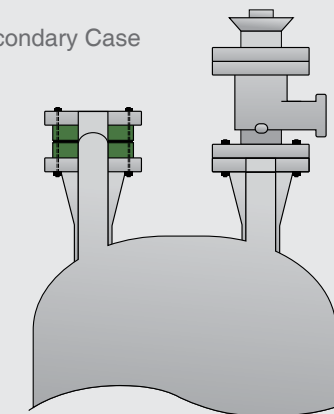
3) Combination Case

4) External Fire Case

KOSHA Obligation Safety Certification

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

KC s

▶ 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
* In case of Flat/Slotted Type, it shall be conducted a leak test under 50% of set pressure

6. Classification and Notation of the KOSHA Certification Type

Division in accordance with structure	Rupture disc of dome type (C)	Single plate type (O)				
		Composite type (C)				
		Carved type or cutout type (S)				
	Rupture disc of inverted dome type(R)	Carved type or shearing type (S)				
		Self-knife type (K)				
	Rupture disc of flat type(F)	Exchanger type graphite rupture disc (R)				
		Monoblock type graphite rupture disc (M)				
		Cutout 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

```
┌─────────────────────────────┐
│   Request for Safety Device  │
└─────────────────────────────┘
                │
                ▼
┌─────────────────────────────┐
│ Is pressure rise rapid?      │───── Yes ──┐
│ or Is content toxic?         │            │
│ or Is content corrosive?     │            │
│ or Is content highly polymer │            │
│    or frozen?                │            │
└─────────────────────────────┘            │
                │ No                        │
                ▼                           │
┌─────────────────────────────┐            │
│ Does it need the massflow    │            │
│ rate?                        │───── Yes ──┤
│ or Is pressure(low/high)/    │            │
│   temperature(low/high)      │            │
│   bad condition?             │            │
│ or Is there any concern of   │            │
│   polymerization?            │            │
└─────────────────────────────┘            │
                │ No                        │
                ▼                           ▼
┌──────────────────────┐       ┌──────────────────────┐
│ Possible to install  │       │  Install Rupture Disc │
│ the safety valve     │       └──────────────────────┘
└──────────────────────┘                   │
```

| Is the life of Rupture Disc influenced by the operating condition? | ← Yes ← | Is it possible to stop operating for replacing Rupture Disc? | ← Yes ← | Is it allowed to leak of content? |

- Yes → Install 2 pieces of Rupture Disc in series
- No → Install a Rupture Disc
- No → Install 2 pieces of Rupture Disc in parallel
- No → Install a Rupture Disc and safety valve in series

RUPTURE DISC
SELECTION MODEL

STEP 1. 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

STEP 2. Model & Accessory (by FDC)

STEP 3. Calculation of size & rated flow capacity (by FDC)

RUPTURE DISC
SIZING

ASME SECTION VIII DIV 1	
Dry saturated steam	$A = \dfrac{W_T}{51.5KP}$ 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. $\left(\dfrac{0.1906P\text{-}1000}{0.2292P\text{-}1061} \right)$
Gas/Air	$A = \dfrac{W_T}{CKP\sqrt{\dfrac{M}{T}}}$ (for air, C=356)
Liquid	$A = \dfrac{W_T}{2407 \cdot K \cdot \sqrt{(P\text{-}P_d)\cdot \omega}}$

KS B ISO 4126	
Gas/steam at critical flow	$A_0 = 3.469 \dfrac{Q_m}{C \cdot \alpha} \sqrt{\dfrac{\mathcal{V}_0}{P_0}}$ or $A_0 = \dfrac{Q_m}{C \cdot \alpha \cdot P_0} \sqrt{\dfrac{T_0 \cdot Z_0}{M}}$ For the homogenized wet steam of 90% or more dryness $A_0 = 3.469 \dfrac{Q_m \cdot \sqrt{x}}{C \cdot \alpha} \sqrt{\dfrac{\mathcal{V}_0}{P_0}}$
Gas/steam at subcritical flow	$A_0 = 3.469 \dfrac{Q_m}{C \cdot K_b \cdot \alpha} \sqrt{\dfrac{\mathcal{V}_0}{P_0}}$ or $A_0 = \dfrac{Q_m}{C \cdot K_b \cdot \alpha \cdot P_0} \sqrt{\dfrac{T_0 \cdot Z_0}{M}}$
Liquid	$A_0 = 0.621 \dfrac{W_T}{K_v \cdot \alpha \sqrt{\varDelta P \cdot p}}$

W_T Mass flow rate   (lb/hr)

A Practical outlet area in opening rupture disc   (in²)

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, °F + 460°F   (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/ft³)

A_0 Minimum required flow cross sectional area   (mm²)

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

$\mathcal{V}_0$ Specific volume at practical release pressure and temperature   (m³/kg)

P_0 Release pressure   (bar)

α Release coefficient (In general, apply 0.62)

T_0 Release temperature   (K)

Z_0 Compressibility coefficient at practical release pressure and temperature (If there is no available data, Z_0=1.0)

M Mol weight

x Dryness of wet steam

K_b 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)

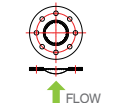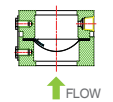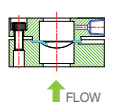K_v Correction factor for reduction in the theoretical capacity as increase of the back pressure in subcritical flow (Refer to table 3. Capacity correction factor for back pressure)

R_e Reynold's number $R_e = 0.3134 \dfrac{Q_m}{\mu \sqrt{A_0}}$

μ Viscosity of the liquid

$\varDelta P$ differential pressure released through rupture disc   (bar)
 ($\varDelta P = P_0 \text{-} P_b$)

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	$n\text{-}C_6H_{14}$	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	$iso\text{-}C_4H_{10}$ or $CH(CH_3)_3$	58.12	1.10	Methyl alcohol	CH_3OH or CH_4O	32.04	1.20
n-Butane	$n\text{-}C_4H_{10}$	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	$n\text{-}CH_3(CH_2)_7CH_3$ 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	$n\text{-}CH_3(CH_2)_3CH_3$ or C_5H_{12}	72.15	1.07
n-Decane	$n\text{-}C_{10}H_{22}$	142.29	1.03	n-Propane	$n\text{-}CH_3CH_2CH_3$ 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	$n\text{-}CH_3(CH_2)_5CH_3$ or C_7H_{16}	100.21	1.05	Octane	$CH_3(CH_2)_6CH_3$ or C_8H_{18}	114.00	1.05
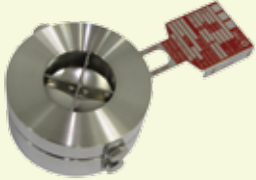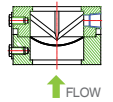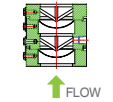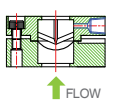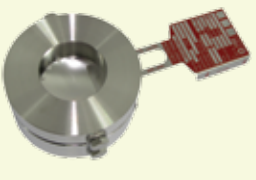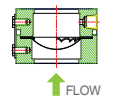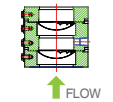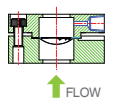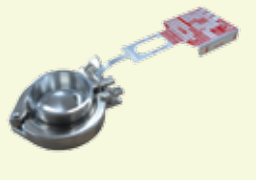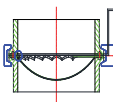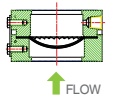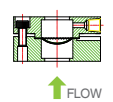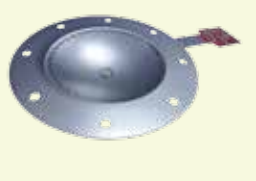
Table 2. Capacity correction factor for back pressure

$\dfrac{P_b}{P_0}$	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	1.000	0.999	0.999	0.996	1.000	0.999	0.999
0.50									0.999	0.997	0.994	0.991	0.987	0.983	0.979	0.994	0.992	0.989	
0.55							1.000	0.999	0.989	0.983	0.978	0.972	0.967	0.961	0.975	0.979	0.975	0.971	
0.60						0.999	0.995	0.982	0.974	0.967	0.959	0.951	0.944	0.936	0.929	0.955	0.950	0.945	
0.65				0.999	0.999	0.993	0.985	0.964	0.953	0.943	0.932	0.922	0.913	0.903	0.895	0.886	0.922	0.915	0.909
0.70			0.999	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	0.879	0.871	0.854
0.75	0.999	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

Viscosity modification factor vs Reynold's number

PRODUCTS LIST

RUPTURE DISC — REVERSE TYPE

Model (Image)	Description	Holder or Connection Type	Drawing
KSRR	Reverse Dome Knife Type	**KS** — Insert Flat Seat Knife Blades Single Type	FLOW
		KD — Insert Flat Seat Knife Blades Double Type	FLOW
		BK — Bolted Flat Seat Knife Blades Single Type	FLOW
KSRRK	Reverse Dome Shear Type	**FS** — Insert Flat Seat Single Type	FLOW
		FD — Insert Flat Seat Double Type	FLOW
		BF — Bolted Flat Seat Single Type	FLOW
KSRRKF	Reverse Dome Shear Type for Ferrule	**FERRULE** — Ferrule Connection Type	FLOW
KSRBKH	Reverse Dome Buckling Knife Type	**BFS** — Insert Flat Seat Single Type for RBK	FLOW
		BBF — Bolted Flat Seat Single Type for RBK	FLOW
KSRBK	Reverse Dome Buckling Knife Type for Flange	**RF** — Raised Face Flange Type	FLOW
		FF — Flat Face Flange Type	FLOW
KSRSR	Reverse Dome Scored Type	**FS** — Insert Flat Seat Single Type	FLOW
		BF — Bolted Flat Seat Single Type	FLOW

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			%
1/2" ~ 48" (15A ~ 1200A) / 1/4" ~ 4" (8A ~ 100A)	0.3 ~ 150 kg/cm²	No	Yes	No	Yes	No	90%
1/2" ~ 24" (15A ~ 600A) / 1/4" ~ 4" (8A ~ 100A)	0.35 ~ 30 kg/cm²	No	Yes	Yes	No	No	90%
1S~4S FERRULE	0.35 ~ 30 kg/cm²	No	Yes	Yes	No	No	90%
1/2" ~ 36" (15A ~ 900A) / 1/4" ~ 4" (8A ~ 100A)	0.1 ~ 100 kg/cm²	No	Yes	Yes	No	No	90%
1/2" ~ 36" (15A ~ 900A)	0.1 ~ 100 kg/cm²	No	Yes	Yes	No	No	90%
1/2" ~ 24" (15A ~ 600A) / 1/4" ~ 4" (8A ~ 100A)	1.5 ~ 150 kg/cm²	No	Yes	Yes	No	No	90%

PRODUCTS LIST

RUPTURE DISC

	Model (Image)	Description	Holder or Connection Type	Drawing
FORWARD TYPE	KSRSF	Forward Dome Scored Type	**FS** — Insert Flat Seat Single Type	FLOW
			BF — Bolted Flat Seat Single Type	FLOW
	KSRST	Forward Dome Tension Flat Seat Type	**FS** — Insert Flat Seat Single Type	FLOW
	KSRCT	Forward Dome Tension Sloped Seat Type	**SS** — Insert Sloped Seat Single Type	FLOW
			SD — Insert Sloped Seat Double Type	FLOW
COMPOSITE DOME TYPE	KSRC	Composite Dome Sloped Seat Type	**SS** — Insert Sloped Seat Single Type	FLOW
			SD — Insert Sloped Seat Double Type	FLOW
	KSRRCH	Composite Dome Flat Seat Type	**FS** — Insert Flat Seat Single Type	FLOW
			FD — Insert Flat Seat Double Type	FLOW
			BF — Bolted Flat Seat Single Type	FLOW
	KSRRC	Composite Dome Flat Seat Type for Flange	**RF** — Raised Face Flange Type	FLOW
			FF — Flat Face Flange Type	FLOW
	KSRRCF	Composite Dome Flat Seat Type for Ferrule	**FERRULE** — Ferrule Connection Type	FLOW
	KSRRCFD	Composite Dome Flat Seat Double Acting Type for Ferrule	**FERRULE** — Ferrule Connection Type	FLOW

Size	Set. Pressure		Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio %
				Gas or Vapor	Liquid			
1/2" ~ 12" (15A ~ 300A)	5 ~ 700 kg/cm²		No	Yes	Yes	No	No	80%
1/4" ~ 4" (8A ~ 100A)								
1/2" ~ 48" (15A ~ 1200A)	15 ~ 1,500 kg/cm²		No	Yes	Yes	No	Yes	70%
1/2" ~ 40" (15A ~ 1000A)	15 ~ 1,500 kg/cm²		Yes or No	Yes	Yes	No	Yes	70%
1/2" ~ 40" (15A ~ 1000A)	Teflon Seal 0.1 ~ 30 kg/cm²	Metal Seal 1.0 ~ 560 kg/cm²	Yes	Yes	Yes	No	No	80%
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 50 kg/cm²		Yes	Yes	Yes	No	No	80%
1/4" ~ 4" (8A ~ 100A)								
1/2" ~ 52" (15A ~ 1300A)	0.05 ~ 50 kg/cm²		Yes	Yes	Yes	No	No	80%
1S~4S FERRULE	0.3 ~ 15 kg/cm²		Yes	Yes	Yes	No	No	80%
1S~4S FERRULE	0.3 ~ 15 kg/cm²		Yes	Yes	Yes	No	No	80%

PRODUCTS LIST

RUPTURE DISC

|	Model (Image)	Description	Holder or Connection Type	Drawing
COMPOSITE FLAT TYPE	KSROH	Composite Flat Type	**H** — Insert Flat Seat Single Type for RO	FLOW
			B — Bolted Flat Seat Single Type for RO	FLOW
	KSRO	Composite Flat Type for Flange	**RF** — Raised Face Flange Type	FLOW
			FF — Flat Face Flange Type	FLOW
	KSROF	Composite Flat Type for Ferrule	**FERRULE** — Ferrule Connection Type	FLOW
	KSROHD	Composite Flat Double Acting Type	**H** — Insert Flat Seat Single Type for RO	FLOW
			B — Bolted Flat Seat Single Type for RO	FLOW
	KSROFD	Composite Flat Double Acting Type for Ferrule	**FERRULE** — Ferrule Connection Type	FLOW
ULTRA LOW PRESSURE TYPE	KSRRL	Reverse Dome Knife Type - LP	**LS** — Insert Flat Seat Single Type for RRL & RRLD	FLOW
			LVS — Insert Flat Seat Single Type for RRL & RRLD(Vacuum)	FLOW
	KSRRLD	Reverse Dome Knife Double Acting Type - LP	**LS** — Insert Flat Seat Single Type for RRL & RRLD	FLOW
			LVS — Insert Flat Seat Single Type for RRL & RRLD(Vacuum)	FLOW
	KSROL	Composite Flat Type for Flange - LP	**RF** — Raised Face Flange Type	FLOW
			FF — Flat Face Flange Type	FLOW

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			%
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 35 kg/㎠	Yes	Yes	Yes	No	No	50%
1/4" ~ 4" (8A ~ 100A)							
1/2" ~ 72" (15A ~ 1800A)	0.05 ~ 35 kg/㎠	Yes	Yes	Yes	No	No	50%
1S~4S FREEULE	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
1/2" ~ 48" (15A ~ 1200A)	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
1/4" ~ 4" (8A ~ 100A)							
1S~4S FREEULE	0.05 ~ 15 kg/㎠	Yes	Yes	Yes	No	No	50%
1/2" ~ 10" (15A ~ 250A)	0.01 ~ 1.0 kg/㎠ (100 ~ 10,000 mmAq)	Yes	Yes	No	No	No	50%
1/2" ~ 10" (15A ~ 250A)	0.01 ~ 1.0 kg/㎠ (100 ~ 10,000 mmAq)	Yes	Yes	No	No	No	50%
4" ~ 32" (100A ~ 800A)	0.01 ~ 0.15 kg/㎠ (100 ~ 1,500 mmAq)	Yes	Yes	No	No	No	50%

PRODUCTS LIST
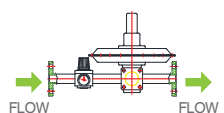
RUPTURE DISC

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			**VCR**	**PLUG**	**UNION**
KSRRKV / **KSRRKP** / **KSRRKU** (Image / Drawing)		Reverse Dome Shear Type	Standard VCR Connector	MFR Standard Screwed Connector	MFR Standard Union Connector
KSRSFV / **KSRSFP** / **KSRSFU** (Image / Drawing)		Forward Dome Scored Type	In/Outlet Standard Connetor	Inlet Screwed Male or Female	In/Outlet Screwed Male or Female or Weld neck
KSRSTV / **KSRSTP** / **KSRSTU** (Image / Drawing)		Forward Dome Tension Type		Outlet Screwed Male or Female	
KSRRCV / **KSRRCP** / **KSRRCU** (Image / Drawing)		Composite Dome Flat Seat 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%

PRODUCTS LIST

EXPLOSION PANEL

Model (Image)	Description	Connection Type	Drawing
KSRPR	■ Round Flat Type ■ Round Dome Type	RF — Raised Face Flange Type	FLOW
		FF — Flat Face Flange Type	FLOW
KSRPS	■ Rectangular Flat Type ■ Rectangular Dome Type	FF — Flat Face Flange Type	FLOW

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
Max. Φ3600	0.01 ~ 0.5 kg/cm² (100 ~ 5,000 mmAq)	Yes	Yes	No	No	No	50%
1400 X 2000 mm	0.01 ~ 0.5 kg/cm² (100 ~ 5,000 mmAq)	Yes	Yes	No	No	No	50%

EMERGENCY RELIEF HATCH

Model (Image)	Description	Connection Type	Drawing
KSRH	Rupture Rod & Seal Type	Standard Flange	FLOW

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
18" ~ 36" (450A ~ 900A)	150 ~ 5,000 mmAq	Yes	Yes	N/A	No	No	80%

N₂ BLALKETING SYSTEM

Model (Image)	Description	Connection Type	Drawing
KSBKL	Single Operating Type	Standard Flange or Screwed Piping	FLOW ... FLOW
KSBKT	Pilot Operating Type	Standard Flange or Screwed Piping	FLOW ... FLOW
KSBKS	Pilot Operating Type	Standard Flange or Screwed Piping	FLOW ... FLOW

Size	Set. Pressure	Vacuum Support Required	Available Service Phase		Spark	Fragment	Max Operating Ratio
			Gas or Vapor	Liquid			
1/2" ~ 2"	12.5 ~ 8,000 mmAq	N/A	Yes	No	N/A	N/A	N/A
1/2" ~ 2"	20 ~ 8,000 mmAq	N/A	Yes	No	N/A	N/A	N/A
1" ~ 2"	20 ~ 8,000 mmAq	N/A	Yes	No	N/A	N/A	N/A

REVERSE TYPE

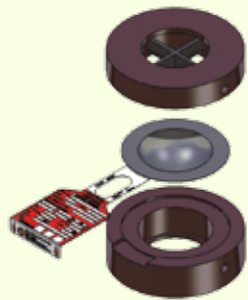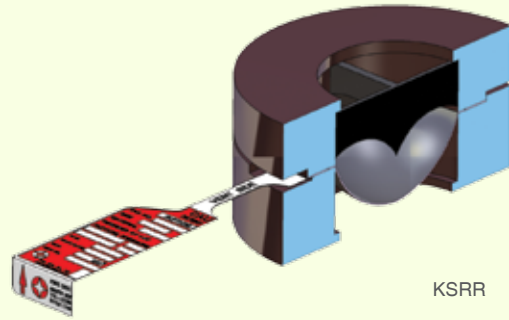## KSRR (Reverse Dome Knife Type)

- 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

KSRR

KSRR

## 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

KSRBKH

KSRBKH

KSRBK (Reverse Dome Buckling Knife Type for Flange)

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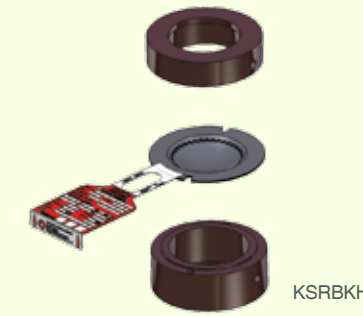
KSRBKH
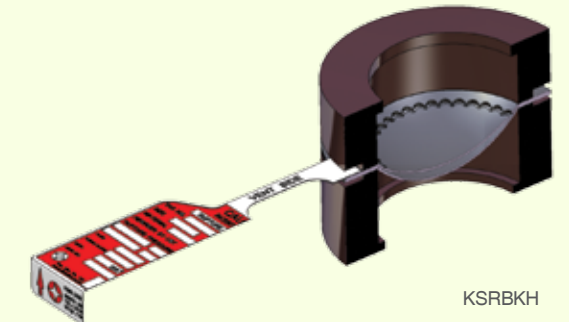
KSRBKH

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

KSRRK

KSRRK

KSRRKF (Reverse Dome Shear Type for Ferrule)

- KSRRK type disc designed for installation between ferrules
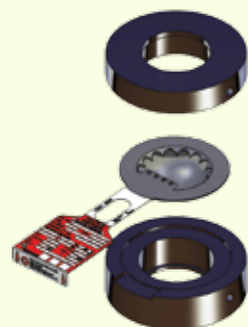
KSRRK
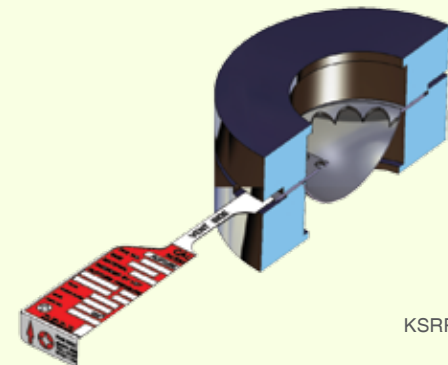
KSRRK

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
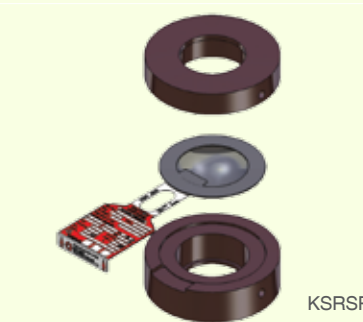
KSRSR
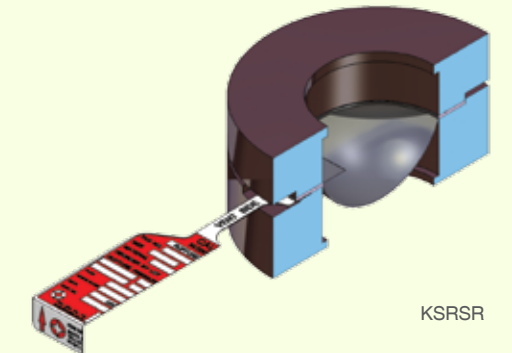
KSRSR

KSRSR

KSRSR

FORWARD TYPE

COMPOSITE DOME TYPE

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

KSRSF

KSRSF
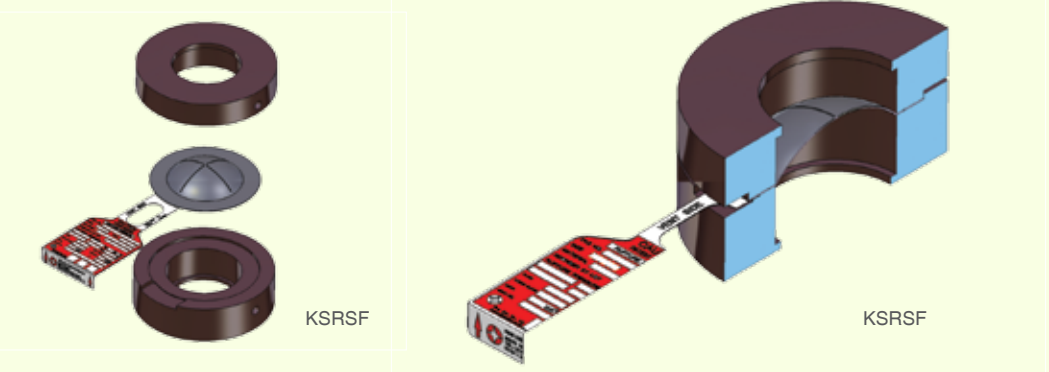
KSRC (Composite Dome Sloped Seat Type)

- 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
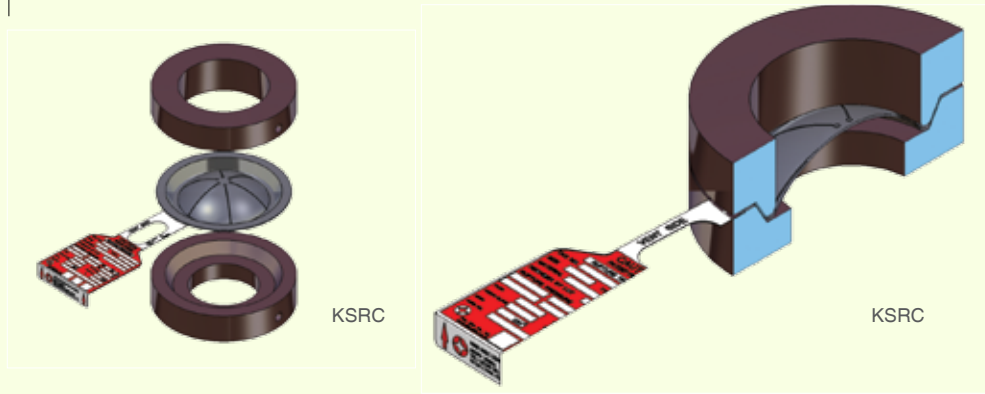
KSRC

KSRC

KSRC

KSRC

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

KSRCT

KSRCT

KSRST

KSRST

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

KSRRC (Composite Dome Flat Seat Type for Flange)

- Identical disc type with KSRRCH, but mounted directly between flanges without holder
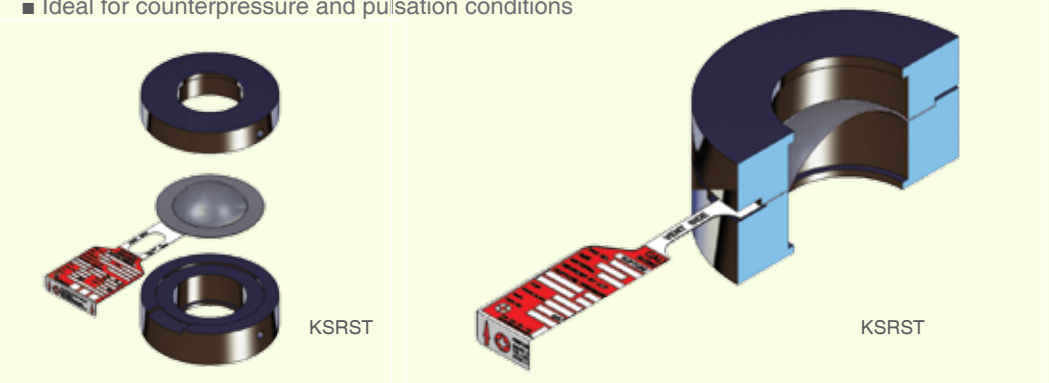
KSRRCF (Composite Dome Flat Seat Type for Ferrule)

- KSRRC type disc designed for installation between ferrules

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

KSRRCH

KSRRC

KSRRCF

KSRRCFD

KSRRCH

KSRRCH

KSRRC

COMPOSITE FLAT TYPE
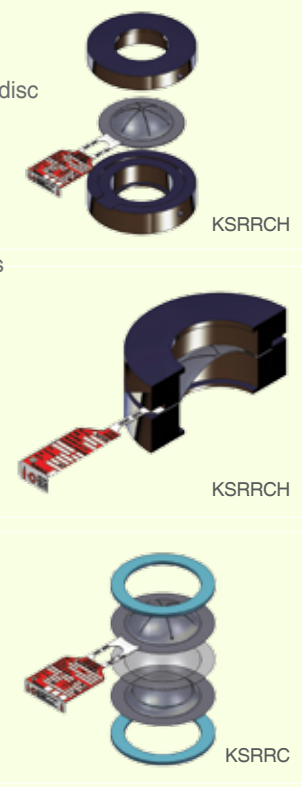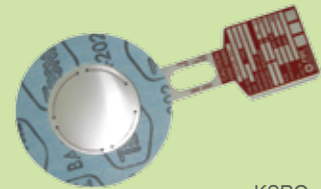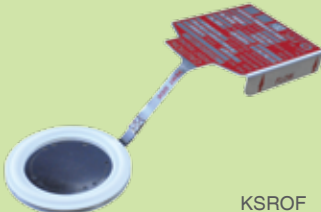
KSROH (Composite Flat Type)

- 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
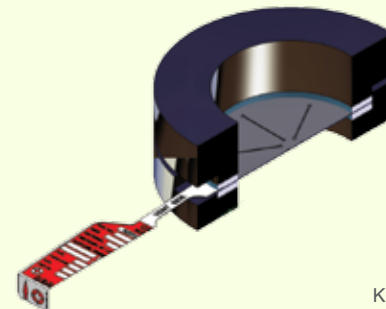
KSROHD (Composite Flat Double Acting Type)

- 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

KSRO

KSROF
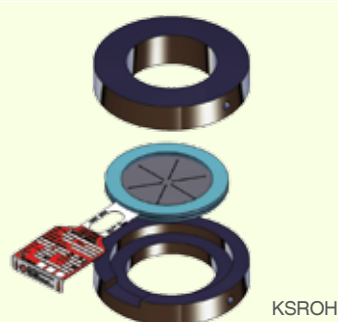
KSROHD

KSROFD

KSROH

KSROH
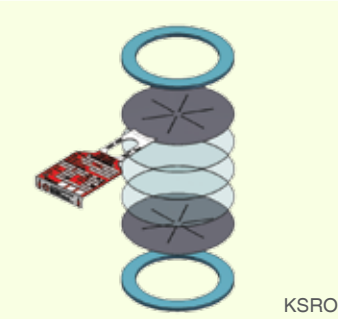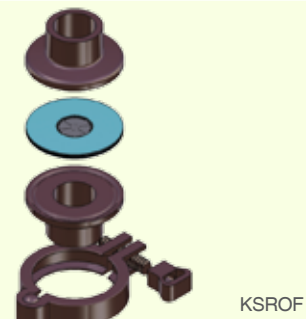
KSRO

KSROF

ULTRA LOW PRESSURE TYPE
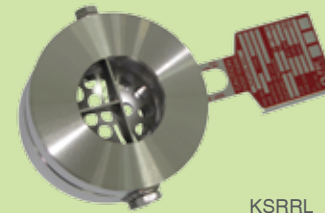
KSRRL (Reverse Dome Knife Type - LP)

- 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

KSRRL

KSROL

FITTING CONNECTION TYPE

- **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

VCR
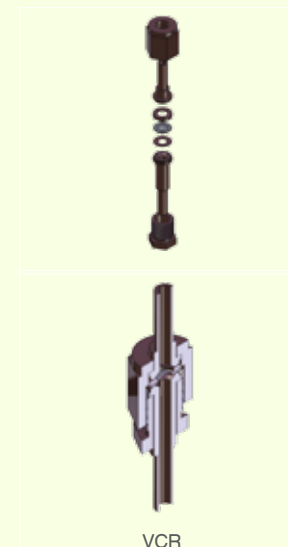
PLUG

UNION

VCR
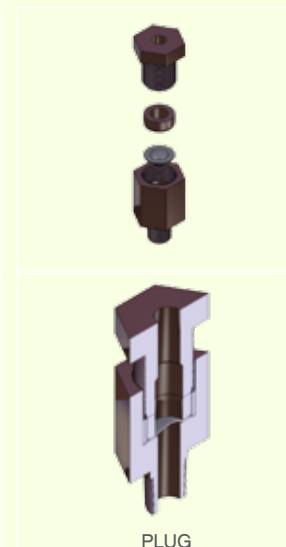
PLUG
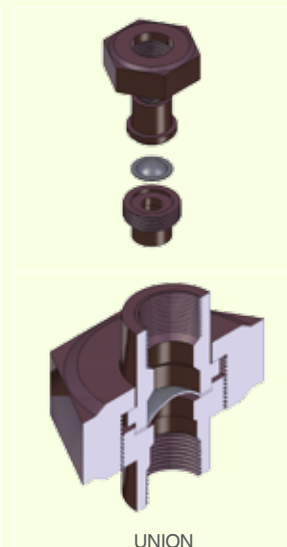
UNION

GRAPHITE DISC

BURST SENSOR

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

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.

KSRGM

KSRGI

KSRGD

KSRGM

- Ideal for 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

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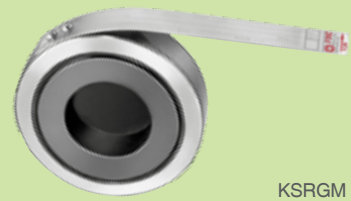- TFE liner is available to extend corrosion resistance

KSRGD

- 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/cm²	0.017 ~ above 70 kg/cm²	0.017 ~ 0.49 kg/cm²
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

KSBS-A

KSBS-A

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

- 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	1.66 μH

KSBS-B

KSBS-B

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

- 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	1.66 μH

KSBS-C

KSBS-C

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

- 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.
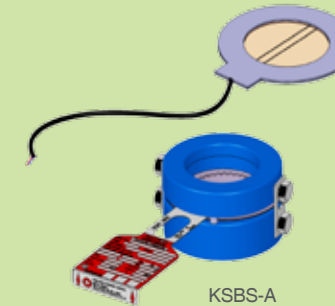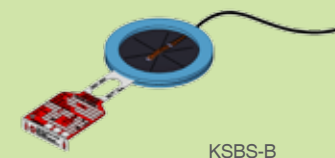- Electrical Specifications (Material with 1.5 meter extension cable)

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

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
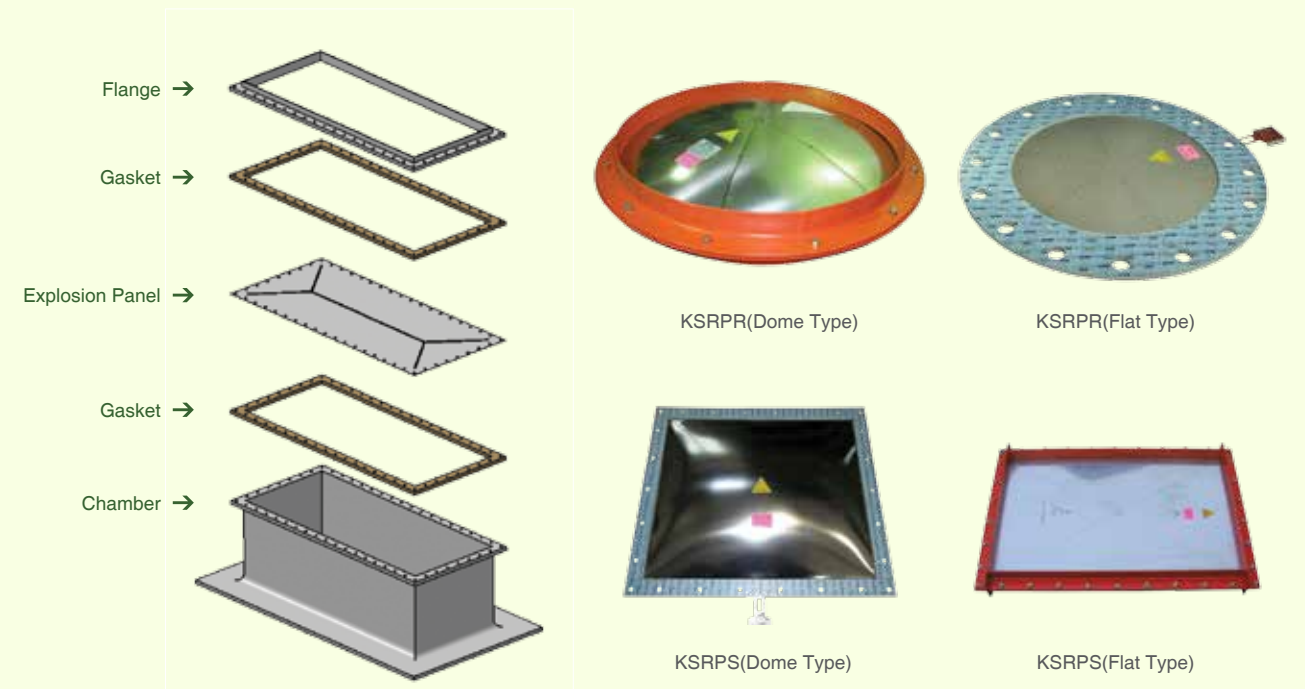
Burst Sensor

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

Flange →

Gasket →

Explosion Panel →

Gasket →

Chamber →

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
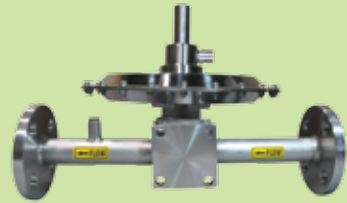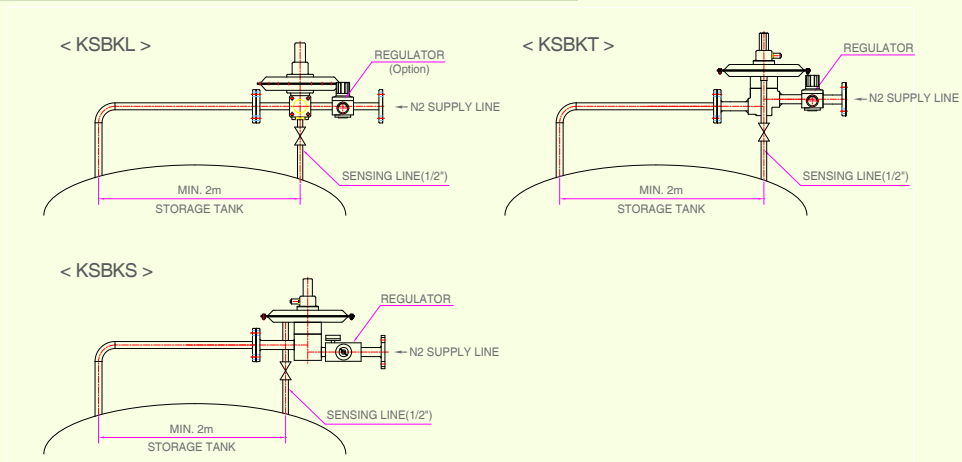- It prevents the modification of tank by controlling vacuum in the tank

Type

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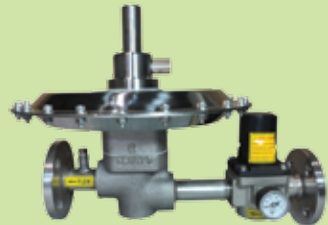- KSBKS (Ultra high capacity)

Flow Capacity (Rated Flow)

[Measure : N㎥/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	625.3	744.6	869.4	993.9
KSBKS	871.3	1316.9	1650.9	1891.8	2058	2168	2240.3

Installation- Layout

< KSBKL >
REGULATOR (Option)
N2 SUPPLY LINE
SENSING LINE(1/2")
MIN. 2m
STORAGE TANK

< KSBKT >
REGULATOR
N2 SUPPLY LINE
SENSING LINE(1/2")
MIN. 2m
STORAGE TANK

< KSBKS >
REGULATOR
N2 SUPPLY LINE
SENSING LINE(1/2")
MIN. 2m
STORAGE TANK
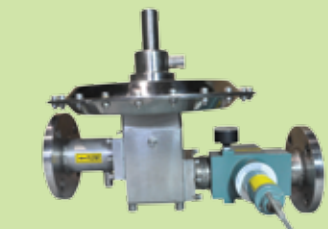
EMERGENCY RELIEF HATCH - KSRH

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

FDC NETWORK
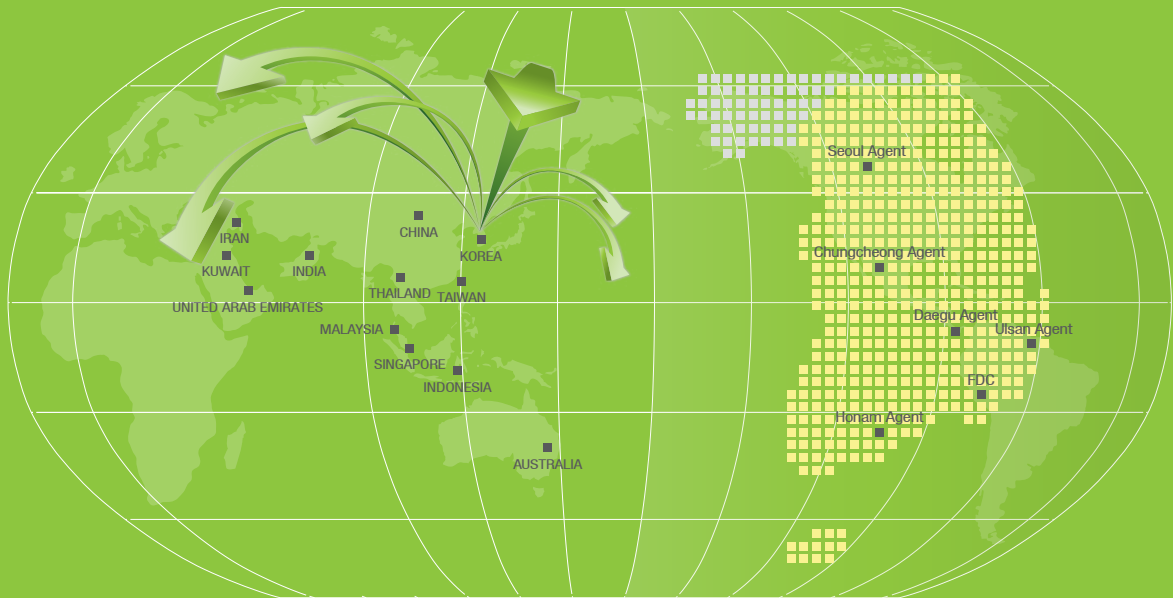
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