

# ***SBCouplings***

***Safety Break-away Couplings***



## **Product Information**

# KilltheSpill

## About Mann Tek

**Mann Teknik AB is a Swedish company located in Mariestad, Sweden.**

As part of the ELAFLEX group, Mann Tek produces and markets products for a safe and environmentally friendly handling of chemicals, petroleum based products, gases and other hazardous or sensitive media.

Main products are Dry Disconnect Couplings (DDCouplings®), for spill free liquid handling.

Since its foundation in 1995, Mann Tek has continuously grown and built up extensive competence in the construction, production and distribution of DDCouplings®.

Due to their robust construction and reliable quality, these couplings have gained a solid market reputation.

Mann Tek is certified to ISO 9001 : 2008. The products are CE-labeled, and a major part of the product range is certified to European Pressure Equipment Directive PED and ATEX.

Products are produced in accordance with several recognized standards, e. g. to NATO STANAG 3756.

# KilltheSpill

## Table of Content

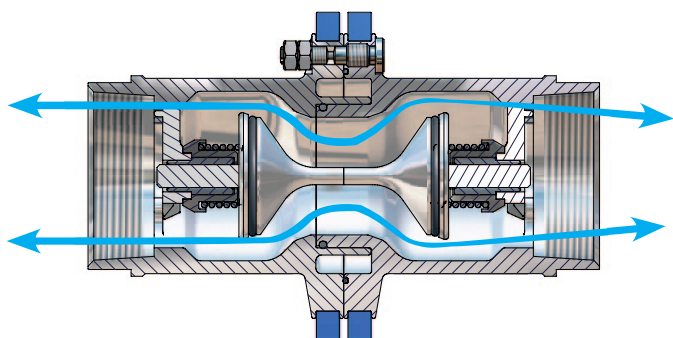
<b>Introduction</b>	<b>3</b>
SBC Breaking Bolt Series: How it Works	3
Features and Applications	4
 <b>SBC 'Industrial Version'</b>	 <b>5-7</b>
Explanation / Advantages	5
Connection Types	6
Technical Data	7
 <b>SBC 'Marine Version'</b>	 <b>8-10</b>
Explanation / Advantages	8
Connection Types	9
Technical Data	10
 Flow Diagram (Pressure Drop Curve)	 11
Options / Special Types	12
 <b>Cable Release Series</b>	 <b>13</b>
 <b>CBC 'Cryogenic'</b>	 <b>14</b>
 Checklist Safety Break-Away Couplings	 15
Company and Product Information	16

### Safety Break-Away Couplings serve for the protection of hose assemblies, loading arms and pipework against excessive external loads.

The couplings are designed to be the weakest link of the hose line or loading arm. If the equipment is subjected to inadvertent and strong tensile loads, e.g. due to a premature movement of road and rail tankers or the drifting of ships, the coupling will separate and instantly seal the two open ends automatically.

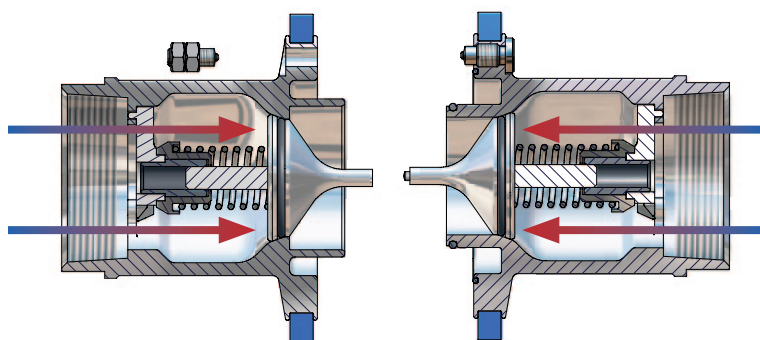
- Environmental impact and destroyed loading equipment are avoided.
- Increased passive safety, reduction of down time and cost savings for the loading and unloading of liquid media.

### SBC Breaking Bolt Series - How it Works



#### SBCoupling before emergency disconnect

The coupling consists of two halves, each with a valve and an O-Ring seal. Full flow.



#### SBCoupling after emergency disconnect

When separating, the spring loaded valves instantly close, the flow is stopped.

The breaking bolt series of SBC Safety Break-Away Couplings has three external breaking bolts.



## Features

- Passive safety for situations in which a hose or loading arm is subjected to inadvertent excessive loads
- Easy to reset on site after separation
- New generation with high flowrate / low pressure drop
- When separating, valves of both coupling parts close quickly – only minimal product loss
- Lightweight and robust design – high protection against impacts
- Available with DIN/ASA flanged connection or BSP/NPT threaded connection
- Operates without additional external energy supply

## Media

**Petroleum based products** like gasoline, diesel, JET A1, heating oil, heavy oil, hydraulic oil

**Liquefied gases** like LPG, butane, propane, CO<sub>2</sub>, LNG, DME, ethylene, propylene

**Chemicals** like acids, alkalis, solvents, aromatics, alcohols, refrigerants, paints and varnishes

## Applications

Loading and unloading of road tankers, rail tankers and ships

Offshore: ship to rig and ship to ship transfer

Loading and unloading of mobile containers

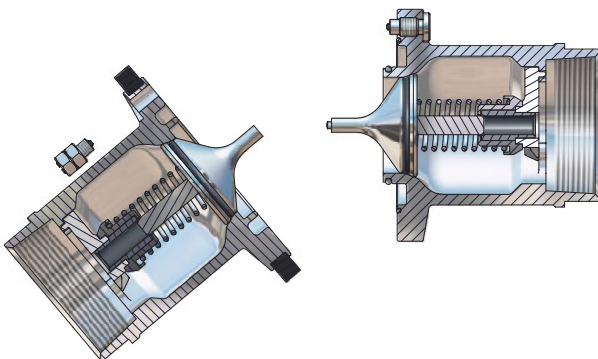
Refuelling of locomotives and ships

Refilling of wind turbines with gear oil

## SBCouplings (Breaking Bolt Series) are available as Industrial and Marine Version:

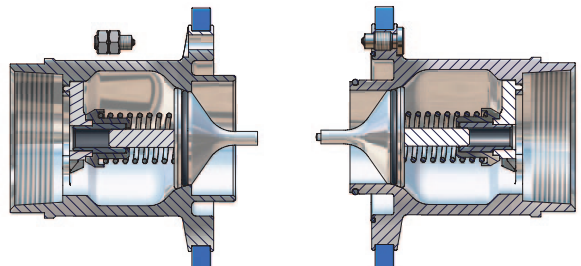
### 'Industrial Version'

Installation between a hose assembly or loading arm and a fixed point (e.g. pipe connection). Separation at an angle to the plane of the coupling, up to 90 degrees.



### 'Marine Version'

Installation between two hose assemblies. Separation after axial (inline) pull only.



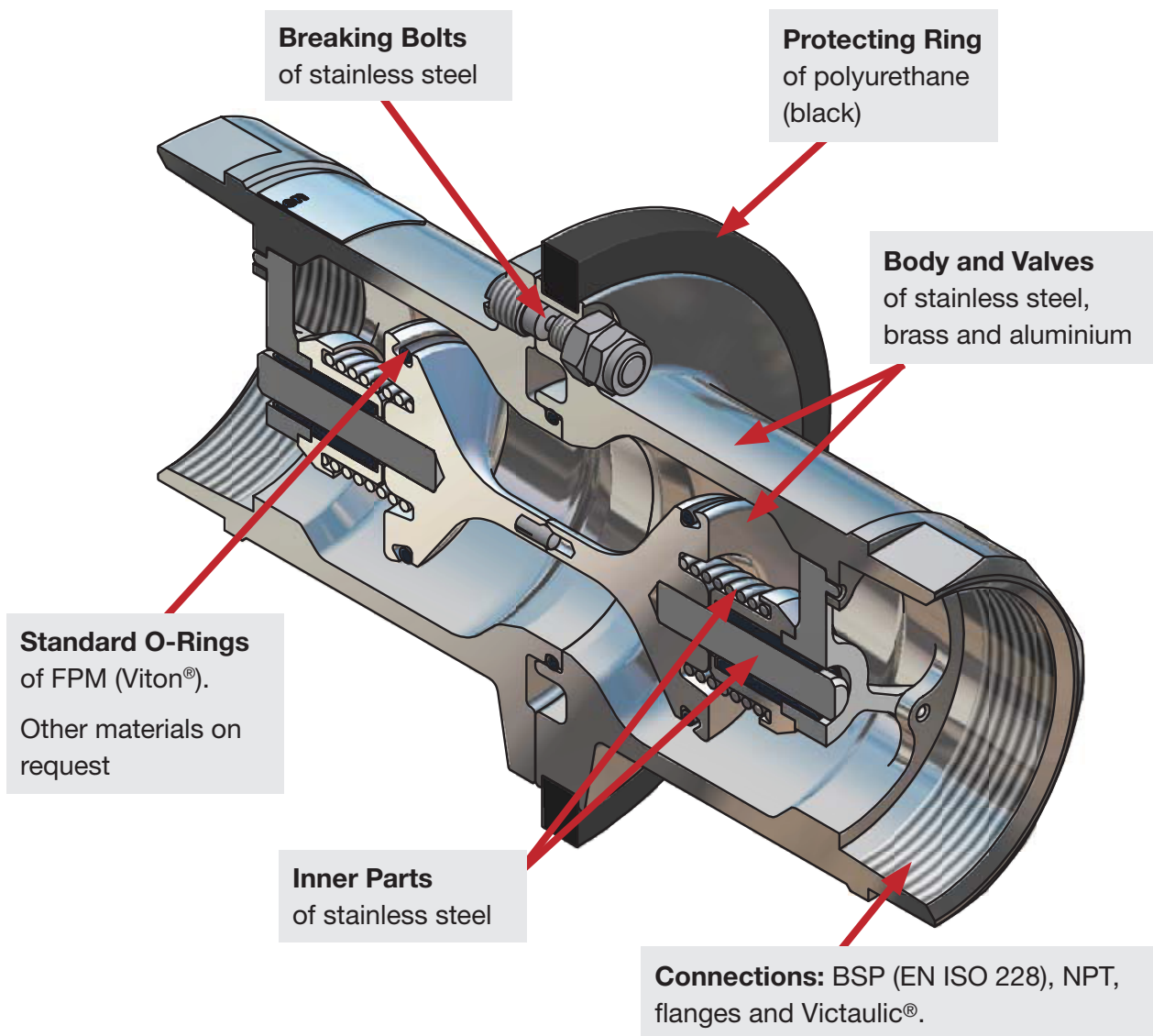


## 'Industrial Version'

This is the most used Safety Break-Away Coupling type, employed in the industrial environment for all types of media transfer.

It is installed between a hose assembly or loading arm and a fixed point, e.g. pipe connection, railcar or road tanker connection.

The coupling will separate at a defined maximal tensile force applied at an angle to the plane of the coupling housing, up to 90 degrees.

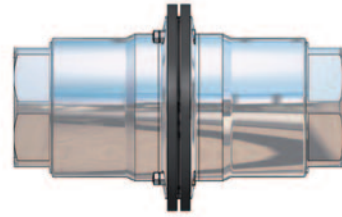


## Examples for Connection Types

**BSP Female Thread / BSP Female Thread**



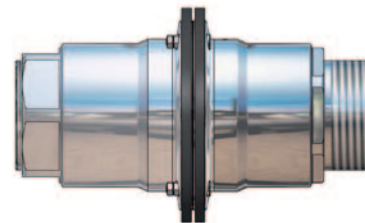
**NPT Female Thread / NPT Female Thread**



**Male Thread / Male Thread**  
(BSP or NPT)



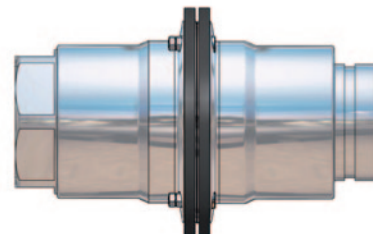
**Female Thread / Male Thread**  
(BSP or NPT)



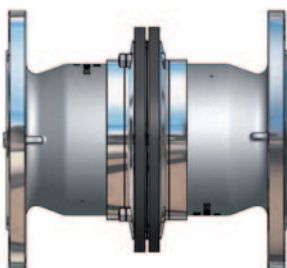
**Victaulic® / Victaulic®**  
(grooved pipe ends)



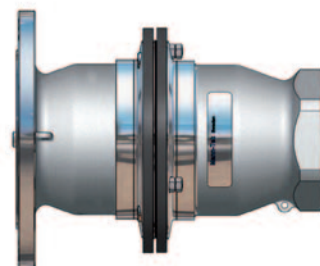
**Female Thread / Victaulic®**



**Flange / Flange**



**Flange / Thread**  
(BSP / NPT, female / male, Victaulic®)



## Technical Data

### Coupling Size, Breaking Force, Connection, Weight

DN	Breaking Force <sup>1)</sup>		Connection <sup>2)</sup>	Weight (kg) Stainless Steel	Weight (kg) Aluminium
	SS	Al			
1"	4,8 kN	3,2 kN	1" Thread	1,6	-
			1" Flange	2,7	-
2"	13 kN	9 kN	2" Thread	2,6	0,9
			2" Flange	7,3	2,5
2½"	22 kN	10 kN	2½" Thread	7,4	2,5
			2½" Flange	13,2	4,5
3"	33 kN	15 kN	3" Thread	8,5	2,9
			3" Flange	15,1	5,1
4"	52 kN	24 kN	4" Thread	15,5	5,3
			4" Flange	20,7	7,0
5"	81 kN	37 kN	5" Thread	32,0	12,0
			5" Victaulic®	31,0	11,7
6"	92 kN	54 kN	6" Thread	46,8	15,9
			6" Flange	57,6	19,6
8"	165 kN	96 kN	8" Thread	-	-
			8" Flange	71,0	25,9
10"	151 kN	151 kN	10" Flange	120	-
12"	217 kN	217 kN	12" Flange	185	-

<sup>1)</sup> **Mann Tek standard**, other on request. **Note:** stated breaking forces refer to an axial separation of the hose assembly or loading arm. For non-axial loads, the necessary separation force is lower. On request, Mann Tek can give additional information if you provide data regarding angle and force application point. To calculate the necessary breaking force, please request the Mann Tek "Design Guideline".

<sup>2)</sup> **Thread:** BSP female or male, NPT female or male

**Flanges:** ASA (ANSI) 150 or 300 psi, DN 25-150 PN 10/16 and PN 25/40, TW1/80, TW3/100, TW7/150, T.T.M.A.

### Materials, Temperature Range

	Material	Standard	Temperature Range <sup>3)</sup>
Body and Valves	SS (Stainless Steel)	EN 10272 - 1.4404+AT	-40°C up to 250°C
		EN 10213-4 - 1.4409+AT	
	Br/Rg (Brass/Bronze)	EN 12164 - CW614N	-40°C up to 200°C
		EN 1982 - CB491K-GS	
	Al (Aluminium)	EN 755 - AW-6262-T6	-40°C up to 150°C
		EN 1706 - AC-42100-T6	

	Material	Brand Name <sup>4)</sup>	Temperature Range <sup>3)</sup>
O-Ring	FKM	Viton®	-30°C up to 200°C
	EPDM	-	-40°C up to 120°C
	FFKM	Kalrez® / Chemraz®	-15°C up to 230°C
	NBR	-	-38°C up to 80°C

<sup>3)</sup> **Note:** standard temperature range for SBCouplings -20° up to +80° C. For all applications beyond these limits, the suitability of the coupling should be determined separately. Please ask Mann Tek.

<sup>4)</sup> Kalrez®, Viton® = registered trademarks of Pont; Chemraz® = registered trademark of Greene Tweed

**Working pressure:** Aluminium up to 2": PN 16 bar, Aluminium > 2½": PN 10 bar, Brass/Bronze 16 bar, Stainless Steel 25 bar (PN 40 bar on request). Mann Tek guarantees a safety factor of 1:5 as burst pressure.

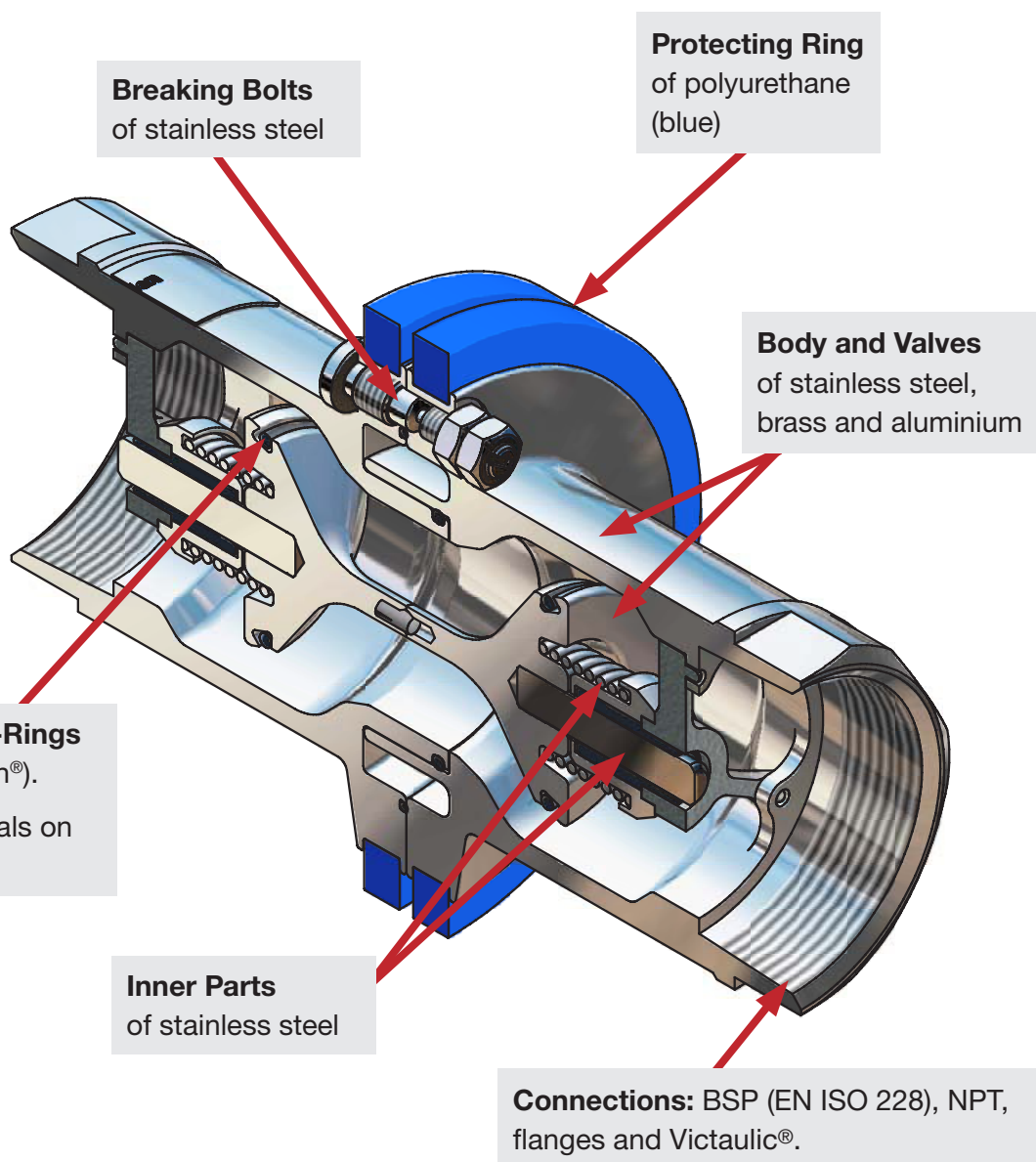
## 'Marine-Version'

This type is suitable for the installation between two hose assemblies.

The coupling will separate at a defined maximale tensile force, at axial (inline) pull only.

The inner construction is identical to the 'Industrial Version', but in comparison the coupling offers an increased resistance against torsion and bending loads to avoid an unwanted separataion.

**Typical applications are ship to rig and ship to ship media transfers.**



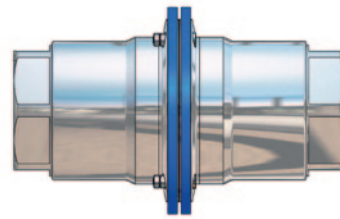


## Examples for Connection Types

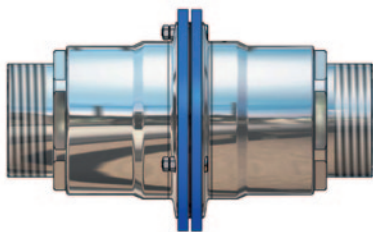
**BSP Female Thread / BSP Female Thread**



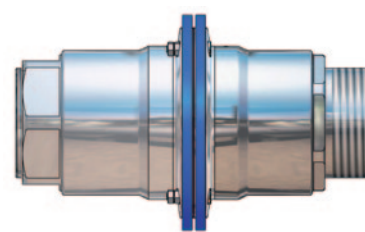
**NPT Female Thread / NPT Female Thread**



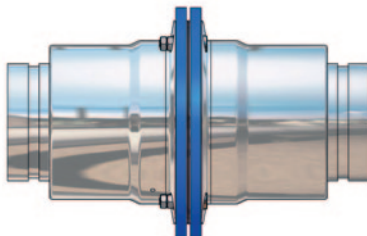
**Male Thread / Male Thread**  
(BSP or NPT)



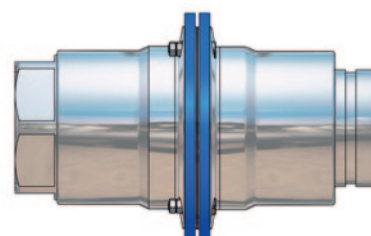
**Female Thread / Male Thread**  
(BSP or NPT)



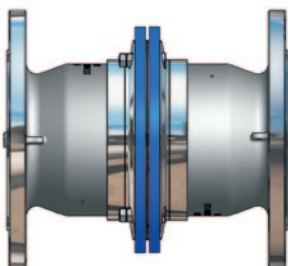
**Victaulic® / Victaulic®**  
(grooved pipe ends)



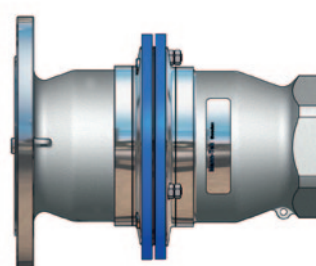
**Female Thread / Victaulic®**



**Flange / Flange**



**Flange / Thread**  
(BSP / NPT, female / male, Victaulic®)



## Technical Data

### Coupling Size, Breaking Force, Connection, Weight

DN	Breaking Force <sup>1)</sup>		Connection <sup>2)</sup>	Weight (kg) Stainless Steel	Weight (kg) Aluminium
	SS	Al			
1"	4,8 kN	3,2 kN	1" Thread	1,6	-
			1" Flange	2,7	-
2"	13 kN	9 kN	2" Thread	2,6	0,9
			2" Flange	7,3	2,5
2½"	22 kN	10 kN	2½" Thread	7,4	2,5
			2½" Flange	13,2	4,5
3"	33 kN	15 kN	3" Thread	8,5	2,9
			3" Flange	15,1	5,1
4"	52 kN	24 kN	4" Thread	15,5	5,3
			4" Flange	20,7	7,0
5"	81 kN	37 kN	5" Thread	32,0	12,0
			5" Victaulic®	31,0	11,7
6"	92 kN	54 kN	6" Thread	46,8	15,9
			6" Flange	57,6	19,6
8"	165 kN	96 kN	8" Thread	-	-
			8" Flange	71,0	25,9
10"	151 kN	151 kN	10" Flange	120	-
12"	217 kN	217 kN	12" Flange	185	-

<sup>1)</sup> **Mann Tek standard**, other on request. **Note:** stated breaking forces refer to an axial separation of the hose assembly or loading arm. For non-axial loads, the necessary separation force is lower. On request, Mann Tek can give additional information if you provide data regarding angle and force application point. To calculate the necessary breaking force, please request the Mann Tek "Design Guideline".

<sup>2)</sup> **Thread:** BSP female or male, NPT female or male

**Flanges:** ASA (ANSI) 150 or 300 psi, DN 25-150 PN 10/16 and PN 25/40, TW1/80, TW3/100, TW7/150, T.T.M.A.

### Materials, Temperature Range

	Material	Standard	Temperature Range <sup>3)</sup>
Body and Valves	SS (Stainless Steel)	EN 10272 - 1.4404+AT	-40°C up to 250°C
		EN 10213-4 - 1.4409+AT	
	Br/Rg (Brass/Bronze)	EN 12164 - CW614N	-40°C up to 200°C
		EN 1982 - CB491K-GS	
	Al (Aluminium)	EN 755 - AW-6262-T6	-40°C up to 150°C
		EN 1706 - AC-42100-T6	

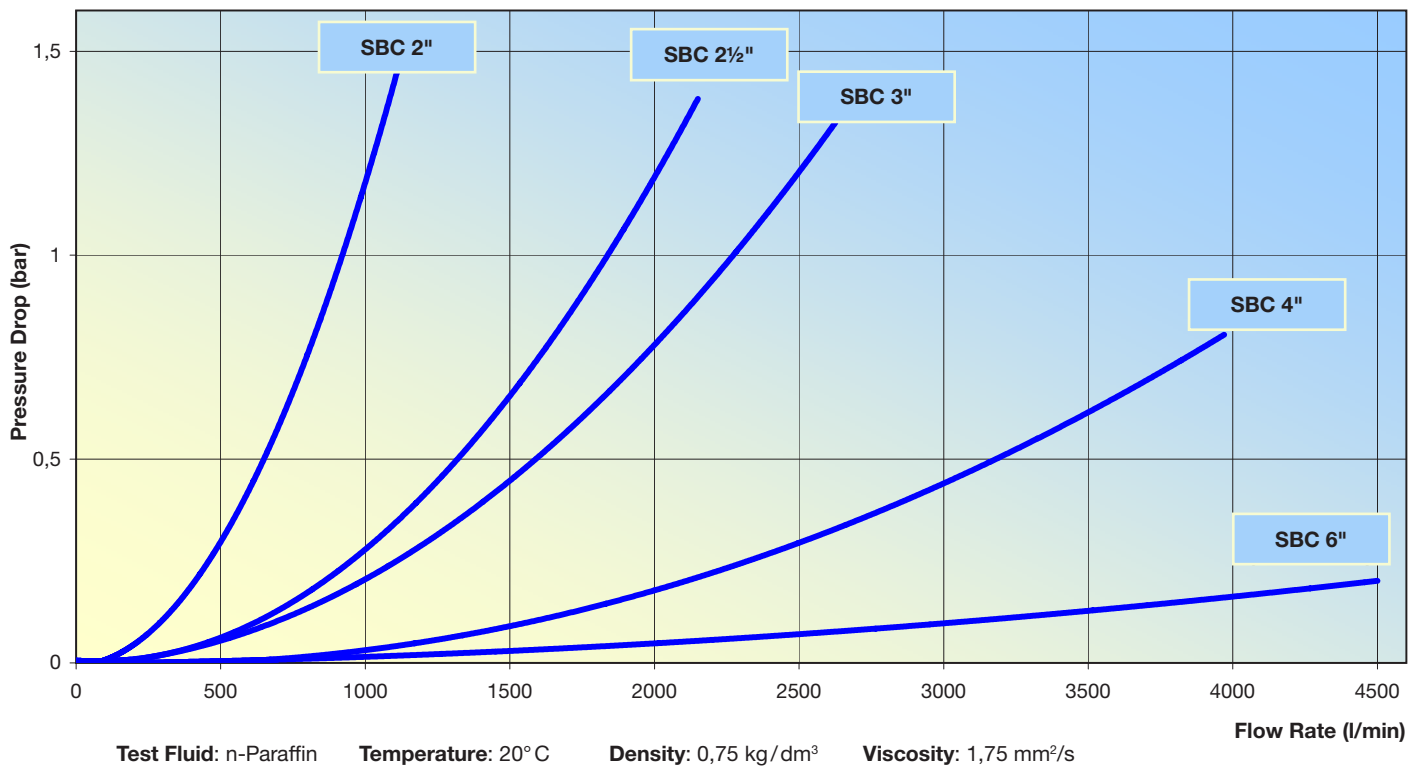
	Material	Brand Name <sup>4)</sup>	Temperature Range <sup>3)</sup>
O-Ring	FKM	Viton®	-30°C up to 200°C
	EPDM	-	-40°C up to 120°C
	FFKM	Kalrez® / Chemraz®	-15°C up to 230°C
	NBR	-	-38°C up to 80°C

<sup>3)</sup> **Note:** standard temperature range for SBCouplings -20° up to +80° C. For all applications beyond these limits, the suitability of the coupling should be determined separately. Please ask Mann Tek.

<sup>4)</sup> Kalrez®, Viton® = registered trademarks of Pont; Chemraz® = registered trademark of Greene Tweed

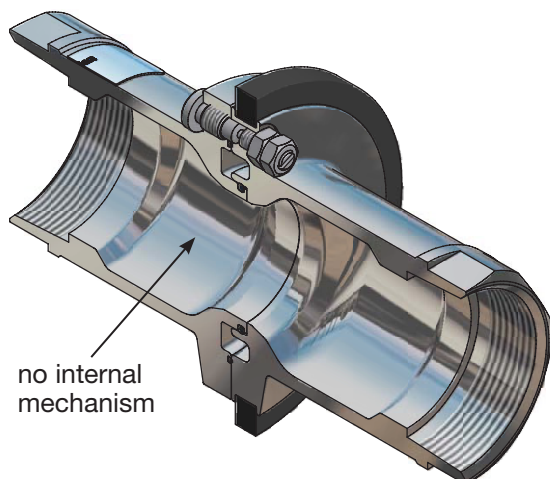
**Working pressure:** Aluminium up to 2": PN 16 bar, Aluminium > 2½": PN 10 bar, Brass/Bronze 16 bar, Stainless Steel 25 bar (PN 40 bar on request). Mann Tek guarantees a safety factor of 1:5 as burst pressure.

## Flow Diagram (Pressure Drop Curve) for SBC Breaking Bolt Series 'Industrial Version' and 'Marine Version'





## Non-Closure Break-Away Couplings



**Industrial and Marine Break-Away couplings are available in a special type without valves.**

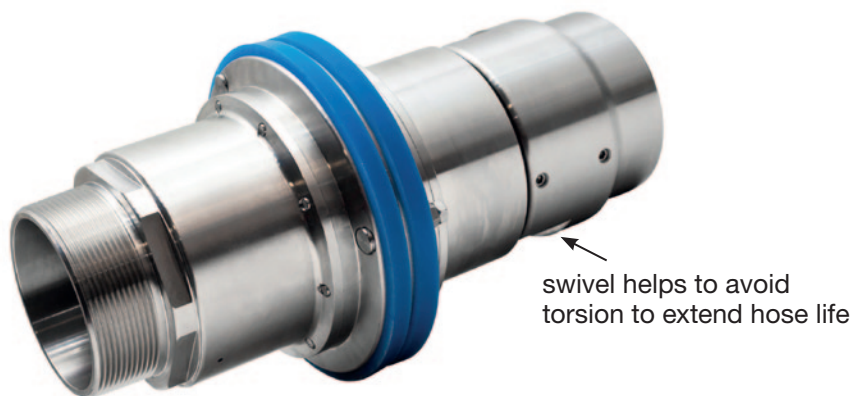
These couplings serve for a defined, safe separation within transfer systems – to protect equipment and personnell.

They shall only be used if the conveyed media is classified as non-hazardous and a release of the medium would be acceptable (application examples: rail water supply and drainage, rig fresh water supply and drainage).

## Safety Break-Away Couplings with Swivel / with Dry Coupling

SBC are available with an integrated swivel and with integrated DGC or DDC coupling.

Advantages compared to the combination of two separate parts: lightweight and compact, cost savings



**SBC with integrated Swivel**



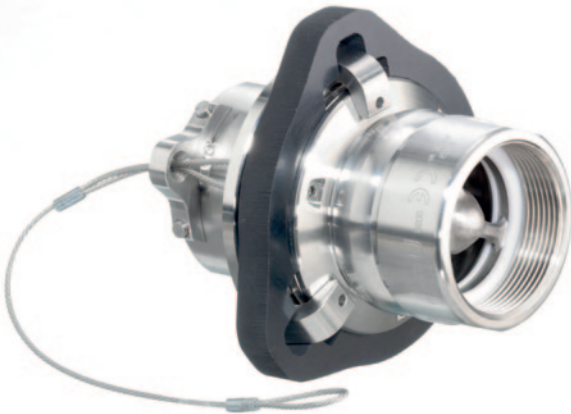
**SBC with integrated DGC  
(Dry Gas Coupling, for L.P. Gas)**



**SBC with integrated DDC  
(Dry Disconnect Coupling)**



## Safety Break-Away Coupling - Cable Release Series

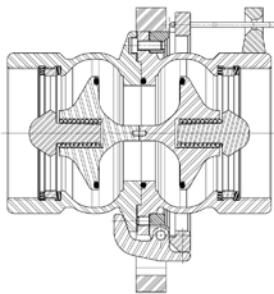


These couplings are used when very low separation forces are required.

Contrary to Safety Break-Away Couplings with breaking bolts, the tensile force is not transmitted via the hose or the loading arm, but by an integrated cable which is attached to a fixed point.

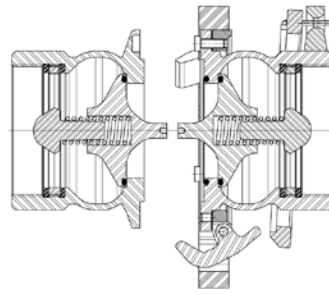
After the admitted travel limit of the cable has been reached, only a small pull is sufficient to actuate the separation. The necessary force is independent from the internal pressure.

### Before emergency disconnect



The coupling consists of two halves, each with a valve and an O-Ring seal. Full flow.

### After emergency disconnect



When separating, the spring loaded valves instantly close, the flow is stopped.

The cable release series of Safety Break-Away Couplings has three external clamps which actuate the separation once the tensile force via the integrated cable reaches a defined force. The spring loaded valves instantly close, product loss is avoided.

There are no loose components which can get lost. After separation, the coupling halves can be reconnected – no spare parts are needed.

### Features / Application

- Passive safety for situations in which a hose or loading arm is subjected to inadvertent excessive loads. Particularly suitable to protect transfer systems with low tensile strength.
- Use for all types of liquid media, at terminals for loading and unloading rail and road tankers
- Release of the coupling by travel limit of the cable, at angles up to 90 degrees. Even a small force on the cable is sufficient to actuate it.
- The coupling is not affected by lateral forces.
- Lightweight, compact and robust construction.
- Approvals according WHG § 19 (German environmental protection), ATEX zone 1, materials tests BAM (German Federal Institute for Materials Research and Testing)

### Technical Data / Versions

Body of stainless steel 1.4571 or Hastelloy 2.4610; coating e.g. with E-CTFE possible.

Seals EPDM, FEP, FPM/FKM, Kalrez® 6375 or 6230.

Standard versions DN 25-100 with thread connection EN ISO 228 or NPT, DN 150-250 with flange to DIN PN 10/16 or ANSI 150/300 psi.

Working pressure PN 25 bar.

Weights and dimensions on request.

# CBCouplings

## Cryogenic Break-away Couplings

CBC are Safety Break-Away Couplings based on a new design concept. They have been developed as a cost-saving alternative to 'Emergency Release' couplings, for applications up to 6".

Typical use includes the loading of cryogenic liquefied gas down to  $-200^{\circ}\text{C}$ , e.g. for liquefied natural gas (LNG) / liquefied biogas (LBG), liquid nitrogen (LN2), liquid oxygen or liquefied argon.

CBC are available as Breaking Bolt Series, in 'Industrial Version' (use between fixed point and hose/loading arm) and 'Marine Version' (use between two hose assemblies).



## Technical Data

### Sizes

1" (DN 25) up to 6" (DN 150)

### Working Pressure

PN 25 bar - 1" (DN 25) up to 4" (DN 100),  
PN 16 bar - 6" (DN 150),  
with a safety factor of 1:4

### Temperature Range

lowest working temperature  $-200^{\circ}\text{C}$

### Material Body

stainless steel

### Connections

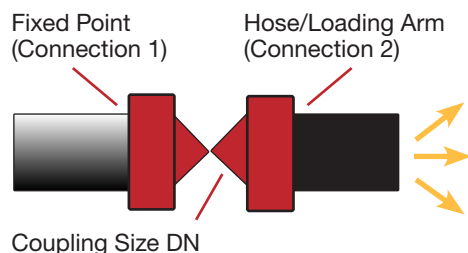
NPT thread, flanges to EN and ASME,  
welding and soldering ends

## Applications

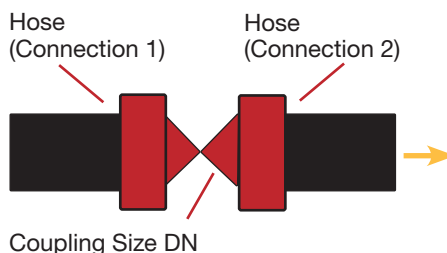
- bunkering of ships with LNG as fuel
- loading / unloading tankers with LNG
- loading / unloading rail and road tankers with LNG, LN2 etc.
- vapour recovery lines



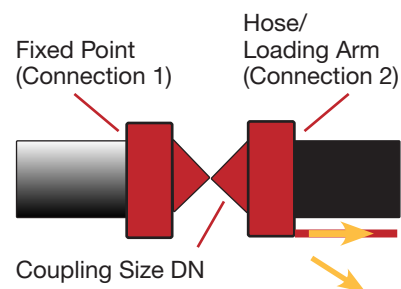
## SBC, CBC 'Industrial Version'



## SBC, CBC 'Marine Version'



## Cable Release Series



### Checklist for the Choice of Safety Break-Away Couplings:

#### 1. Which is the weakest component in your loading line

- hose assembly
- pipe support
- loading arm

This results in the determination of the suitable type and the necessary pull force.

#### 2. Expected angle of separation

- straight (up to max. 5 degrees)
- at an angle (up to 90 degrees)

#### 3. Installation location

- fixed on one side (e. g. tank, pipe)
- between two hose assemblies

#### 4. Size and connection of the coupling (flange or thread standard)

- nominal size DN
- connection 1
- connection 2

#### 5. Material selection (body and seals of coupling)

- transferred media (name/CAS number, temperature, working pressure)
- where applicable, cleaning media (name/CAS number, temperature, working pressure)

#### 6. Mandatory Guidelines

- guidelines, directives and standards which must be met (international, national, regional)
- required certificates for the approval  
(material certificate, manufacturer declaration, component approval)

## Product Information



### DDCouplings®

Dry Disconnect Couplings

1" to 8", PN 16 – PN 25.

Aluminium, brass/gunmetal, stainless steel and PEEK. Other materials on request.

According to NATO standard STANAG 3756.



### DGCouplings®

Dry Gas Couplings

1" to 4", PN 25.

Stainless steel. Other materials on request.



### DACouplings®

Dry Aviation Couplings

2½", PN 10, aluminium

According to ISO 45, MS 24484, NATO STANAG 3105, British Aerospace Spec. 2C14



### Sampling, Vent or Drain Unit

Stainless steel



### FFBall Valves

Full Flow Ball Valves

2" to 4", PN 10, aluminium

1- and 2-way Ball Valves for petroleum tank trucks.



### Swivel Joints

¾" to 10", PN 10-PN 25.

Aluminium, brass/gunmetal, stainless steel. Other materials on request.

Connection: BSP, NPT. Flanged connection (DIN, ANSI / ASA, etc.)



### SBCouplings

Safety Breakaway Couplings

**Industrial and Marine Version with Breaking Bolts**

1" to 12", PN10/25, aluminium, brass, stainless steel

**Cable Release Version**

2" to 12", PN10/25, stainless steel

## Business Segment Information



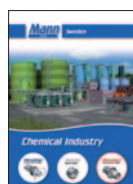
Offshore  
& Marine



Gas (LPG)



Rail Tankers



Chemical  
Industry



Tank Trucks



Military

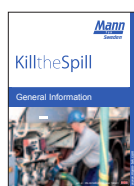


Container



Cryogenic  
Couplings

## Company Information



General information about Mann Tek, products and business segments.



Quality, health, safety and environment policy. Quality approvals, product approvals and declaration of conformity.



Service instructions and operation manuals.

## Contact



### PMO Consulting Sàrl

Rampe de la Gare 1

CH-1290 Versoix - Genève

Tél +41 (0) 22 779 09 83

pmo-consulting@bluewin.ch