SBCouplings
Safety Break-away Couplings

Product Information

Kill the Spill

Version 7.2013 E
About MannTek

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.

MannTek is certified to ISO 9001. 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.

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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

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

**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.
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 pars 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, CO₂, 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

<table>
<thead>
<tr>
<th>DN</th>
<th>Breaking Force 1)</th>
<th>Connection 2)</th>
<th>Weight (kg) Stainless Steel</th>
<th>Weight (kg) Aluminium</th>
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<tbody>
<tr>
<td></td>
<td>SS</td>
<td>AI</td>
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<td></td>
<td>4.8 kN</td>
<td>3.2 kN</td>
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</tr>
<tr>
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<td>9 kN</td>
<td>2&quot; Thread</td>
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</tr>
<tr>
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<td>10 kN</td>
<td>2½&quot; Thread</td>
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<tr>
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<td>33 kN</td>
<td>15 kN</td>
<td>3&quot; Thread</td>
<td>8.5</td>
</tr>
<tr>
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<td>52 kN</td>
<td>24 kN</td>
<td>4&quot; Thread</td>
<td>15.5</td>
</tr>
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<td>5&quot; Thread</td>
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<td>5&quot;</td>
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<td>217 kN</td>
<td>217 kN</td>
<td>12&quot; Flange</td>
<td>185</td>
</tr>
</tbody>
</table>

1) 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”.

2) 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

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
<th>Temperature Range 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS (Stainless Steel)</td>
<td>EN 10272 - 1.4404+AT</td>
<td>-40°C up to 250°C</td>
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<td>EN 10213-4 - 1.4409+AT</td>
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<tr>
<td>Br/Rg (Brass/Bronze)</td>
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<td>EN 1982 - CB491K-GS</td>
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<td>EN 1706 - AC-42100-T6</td>
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<table>
<thead>
<tr>
<th>Material</th>
<th>Brand Name 4)</th>
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<tr>
<td>FKM</td>
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<td>EPDM</td>
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<tr>
<td>FFKM</td>
<td>Kalrez® / Chemraz®</td>
<td>-15°C up to 230°C</td>
</tr>
<tr>
<td>NBR</td>
<td>-</td>
<td>-38°C up to 80°C</td>
</tr>
</tbody>
</table>

3) 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.

4) 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 maximum 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 separation.

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

<table>
<thead>
<tr>
<th>DN</th>
<th>SS</th>
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<th>Connection</th>
<th>Weight (kg) Stainless Steel</th>
<th>Weight (kg) Aluminium</th>
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<td>3,2 kN</td>
<td>1&quot; Thread</td>
<td>1,6</td>
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<td>1&quot; Flange</td>
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<td>-</td>
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<tr>
<td>2&quot;</td>
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<td>9 kN</td>
<td>2&quot; Thread</td>
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<tr>
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<td>Body and Valves</td>
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<th>Brand Name 4)</th>
<th>Temperature Range 3)</th>
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<tbody>
<tr>
<td>O-Ring</td>
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<td>FKM</td>
<td>Viton®</td>
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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'

**Test Fluid:** n-Paraffin  **Temperature:** 20°C  **Density:** 0.75 kg/dm³  **Viscosity:** 1.75 mm²/s

![Flow Diagram Image]
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 personnel.

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 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.

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.
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°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°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
Checklist for the Choice of Safety Break-Away Couplings:

1. Which is the weakest component in your loading line
   a. hose assembly
   b. pipe support
   c. loading arm
   This results in the determination of the suitable type and the necessary pull force.

2. Expected angle of separation
   a. straight (up to max. 5 degrees)
   b. at an angle (up to 90 degrees)

3. Installation location
   a. fixed on one side (e.g. tank, pipe)
   b. between two hose assemblies

4. Size and connection of the coupling (flange or thread standard)
   a. nominal size DN
   b. connection 1
   c. connection 2

5. Material selection (body and seals of coupling)
   a. transferred media (name/CAS number, temperature, working pressure)
   b. where applicable, cleaning media (name/CAS number, temperature, working pressure)

6. Mandatory Guidelines
   a. guidelines, directives and standards which must be met (international, national, regional)
   b. 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/gummetal, stainless steel and PEEK. Other materials on request.
According to NATO standard STANAG 3756.

**DACouplings®**
Dry Aviation Couplings
2½", PN 10, aluminium
According to ISO 45, MS 24484, NATO STANAG 3105, British Aerospace Spec. 2C14

**FFBall Valves**
Full Flow Ball Valves
2" to 4", PN 10, aluminium
1- and 2-way Ball Valves for petroleum tank trucks.

**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

**DGCouplings®**
Dry Gas Couplings
1" to 4", PN 25.
Stainless steel. Other materials on request.

**Sampling, Vent or Drain Unit**
Stainless steel

**Swivel Joints**
¾" to 10", PN 10–PN 25.
Aluminium, brass/gummetal, stainless steel. Other materials on request.
Connection: BSP, NPT, Flanged connection (DIN, ANSI/ASA, etc.)

Company Information

Offshore & Marine
Gas (LPG)
Rail Tankers
Chemical Industry
Tank Trucks
Military
Container
Cryogenic Couplings

General information about Mann Tek, products and business segments.

Approval Information

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

Service

Service instructions and operation manuals.

Contact

**ELAFLEX**

ELAFLEX HIBY GmbH & Co. KG
Schnackenburgallee 121
22525 Hamburg/Germany
Tel. +49 (040) 540 00 50
Fax +49 (040) 540 00 567
E-Mail info@elaflex.de
Internet www.elaflex.de

**Mann Tek**

Mann Teknik AB
Strandvägen 16
SE-542 31 Mariestad/Sweden
Tel. +46 501 39 32 00
Fax +46 501 39 32 09
E-Mail sales@mann-tek.se
Internet www.mann-tek.com

Mann Tek is a member of the ELAFLEX group.