

NOVAFLEX[®]



Safety
Breakaway
Couplings



*Advanced Fluid Handling Systems
by Novaflex*



Safety Breakaway Couplings by Novaflex[®]

*Providing the highest standard of safety technology
to protect personnel, critical assets and the environment.*

NovaFlex[®] Safety Breakaway Systems

Approvals - Safety Breakaway Couplings 1-2

ABV - Series 3

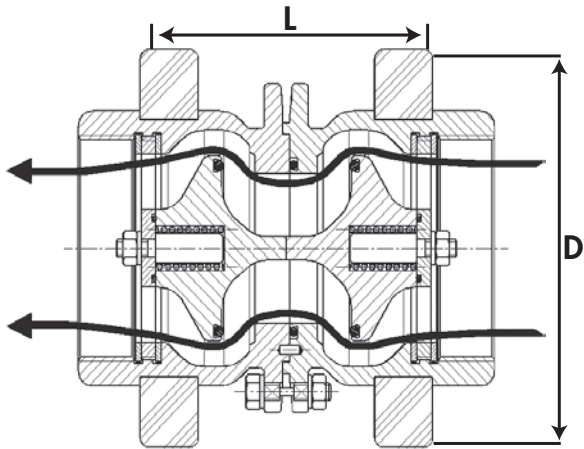
ABVS - Series 4

ABVL - Series 5

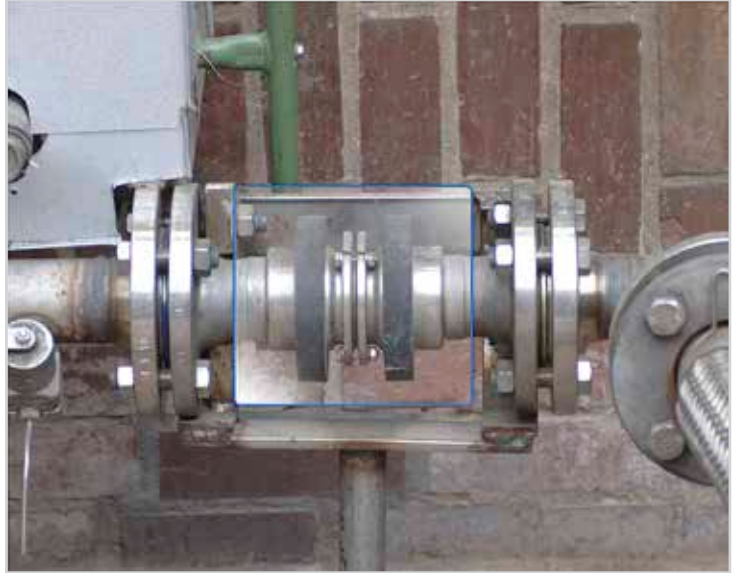
ABVM - Series 6

ABVC - Series 7





ABV series before emergency separation



Approvals/Certificates

CRN - Canada

Approved acc. to WHG §19, by DIBT
(German Institute for Building Technology)

ATEX Zone 1 approved

TA Luft (German Clean Air Act) approved

After testing by BAM (Federal Institute for
Materials Research and Testing)

EC type examination

Safety Breakaway Couplings

RS Breakaway Couplings, with 100 years of engineering experience are safety components used to prevent one of the most serious safety hazards in the loading process of fluid media: the unwanted and disproportionate tensile load on the fluid transfer hose line; caused, for example, when tankers and trains drive off too soon or by ships drifting.

Such tensile loads can mechanically damage or even destroy both the connection points and the fluid transfer hose line itself, which could even lead to uncontrolled leaks of the media being loaded, resulting in a potential corresponding risk to both people and the environment.

Safety Breakaway Couplings are typically designed with two functions to avoid these risks:

- A defined separating mechanism that triggers sufficiently earlier than the load limit
- A spontaneous automatic shutter for the sectioning points to prevent the media from leaking.

Why use a Safety Breakaway Coupling?

“Passive Safety Shutoff” valve is designed to prevent release of product in the event of pull aways:



- Prevents the uncontrolled release of product without human intervention.
- Shuts off flow in both directions instantly!
- Protects the hose line, plant piping and structures from high pull loads!
- Protects the environment and personnel against emissions of hazardous media!



Advantages at a Glance

Protection against industrial accidents

Staff protection

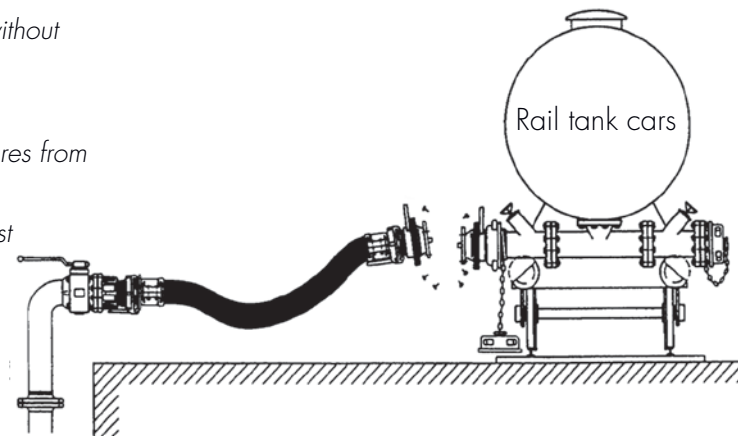
Hose protection

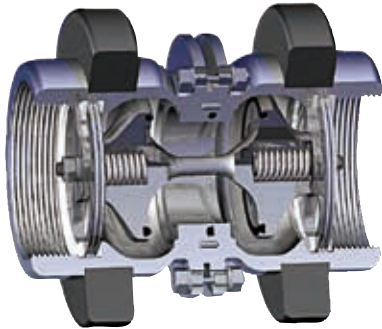
Protection against damage to the complete transfer system, pipe work, pumps, valves, hose etc.

Media loss prevention

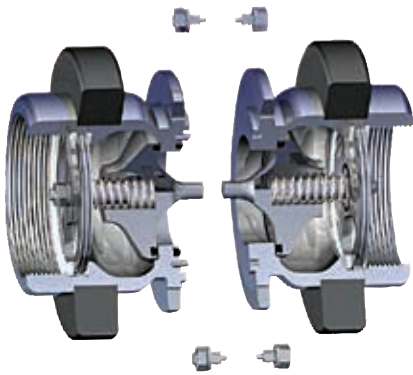
Environmental impact protection

Cost savings





Before emergency separation



After emergency separation

Separation by Force Limitation ABV Series Safety Breakaway Couplings

by NovaFlex® separate the fluid transfer line at a defined tensile load.

This should be selected with a sufficient safety margin below the load limit of the fluid transfer line, such as the maximum tensile load of a hose line. Three calibrated breaking pins, which connect to the coupling halves via a pair of flanges are used as the triggering elements.

The centre flanged connection has no overlap, so tensile forces acting on the fluid transfer line are directly transmitted to the breaking pins independent of the load angle. If the minimum tensile strength is exceeded, the pins break. This simultaneously loosens the flanged connection, releasing both coupling halves so that the fluid load line is separated and the valve halves close to shut off the product flow.

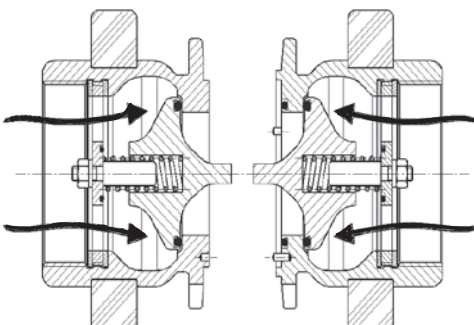
The greater the angle to the coupling axis, the greater the load is on one or maximum two pins, so that the planned separation takes place at a lower threshold value.

This function is available without limitation of the load angle, however a pure axial tensile force is to be assumed as a design case on principle. In this case the tensile force is distributed evenly to all three pins so that the threshold for triggering is the highest here. In contrast, with lateral tensile forces, the load is unevenly distributed to the breaking pins.

Closure by Valve Technology

The coupling halves are each equipped with a non-return valve to safely close the sectioning points of the fluid transfer line. The two spring-loaded non-return valves brace each other with opposing force in the operating state and keep the valve cross-section open for fluid flow.

This streamlined design ensures maximum flow and low pressure drop. In the case of separation the valve halves close immediately shutting off media flow.



ABV series after emergency separation

ABV Series Technical Data

Safe triggering at angles up to 180°

FNPT, Flanged 1" to 4"

Pressure range 232psi, aluminum 150psi

ABV-Series Technical Data

| ABV / Approvals | |
|---------------------------------------|--|
| Pressure Equipment Directive 97/23/EG | Pressure equipment with safety function |
| | Category IV, Type approved |
| | Type approval: TÜ.AGG.214 |
| Chemical Resistance | |
| Material | Stainless Steel 316Ti / 316 L (1.4571, 1.4408) |
| | Aluminium (EN AW 6082-T4, EN AW 5049-H112, EN AW 5083-O/H111) |
| | Hastelloy (2.4610, 2.4602, 2.4819) |
| Seal Material | FKM, EPDM, NBR, FFKM |
| Temperature range | Stainless Steel, Hastelloy: -40/+150°C Aluminium: -40/+60°C |
| Pressure Rating | Stainless Steel, Hastelloy: PN 16 Aluminium PN 10 |

ABVS Series Emergency Cable Release Breakaway Couplings

The Safety Cable - Traditional emergency release couplings with shear bolts are not ideal for every application because the strain is transmitted through the hose. With large diameters or high working pressures this can create problems with design or working tolerances. The cable release system can be set to a lower release limit, is more adjustable, and its operation does not depend on an excessive load but rather on a **limit of travel**.

The Principle of Cable Release

In the example of a loading bay with a hose loading arm, one end of the safety cable is fixed to a suitable point near the end of the hose and the other end to the coupling. Normally the cable, like the hose, is slack, but if unexpected or excessive movement occurs such as in an accidental drive away the cable, which is shorter than the hose it is protecting, becomes taut and actuates the coupling. As soon as the coupling has separated, safety valves in each half close automatically, sealing the open ends so that no product can escape.

Separation Without Use of Shear Pins

Even a small force on the safety cable of the ABV-S coupling is sufficient to actuate it, and for larger diameter hoses the ABVF-S couplings do the same job. If the coupling separates no parts have to be replaced: the ABV-S is simply reassembled on the spot and is ready for action again. Safety Breakaway couplings with Emergency Release Cables increase safety at work.

The ABV-S is designed for threaded connectors from 2" to 4" and the ABVF-S for flange connectors from 6" to 10". (The F stands for flange connectors to DIN 2633 PN 16/ANSI 150).

Advantages at a Glance

Safe release at angles up to 90°

No force applied to the hose

Not affected by lateral forces

Self-lubricating moving parts

Compact size

High quality with TÜV approved materials

Complies to WHG § 19

Complies to ATEX-Zone 1

Complies to BAM, CRN registration



ABVS series before separation



ABVS series after separation

ABV-S ABVF-S - Series Technical Data

| ABV-S / ABVF-S / Approvals | |
|---------------------------------------|--|
| Pressure Equipment Directive 97/23/EG | Pressure equipment with safety function |
| | Category IV, Type approved |
| | Type approval: TÜ.AGG.214 |
| Chemical Resistance | |
| Material | Stainless Steel 316Ti / 316 L (1.4571, 1.4408) |
| | Hastelloy (2.4610, 2.4602, 2.4819) |
| Seal Material | FKM, EPDM, NBR, FFKM |
| Temperature range | -40/+150°C |

ABVL Series - High Flow

ABVL Series is designed to prevent industrial accidents. For applications that require **MAXIMUM FLOW**, the ABVL style is the desired choice with up to *“four times the flow of the ABV Series”*.

ABVL protects the hose or flanged systems such as pipes from high burdens, even in cases of non-axial burdens that reduce the breakaway force of a hose. After the separation, the valves close and prevent the medium from escaping from the hose and tube side, and in this way protect both people and the environment. The separation occurs in a controlled fashion via the specially designed breaking pins integrated into the breakaway coupling.

| Flow - GPM | ABV | ABVL |
|------------|---------|----------|
| 2" | 112 GPM | 450 GPM |
| 3" | 282 GPM | 1000 GPM |
| 4" | 383 GPM | 1400 GPM |



Advantages at a Glance

Suitable for all loading processes between stationary and mobile unit

Applicable for all fluids (liquids and gases), also for those with high viscosity

Especially in loading processes in which the safety of a breakaway coupling must not have any influence on the pressure loss or the flow-through capacity

High savings potential in power consumption and time in comparison to standard breakaway couplings

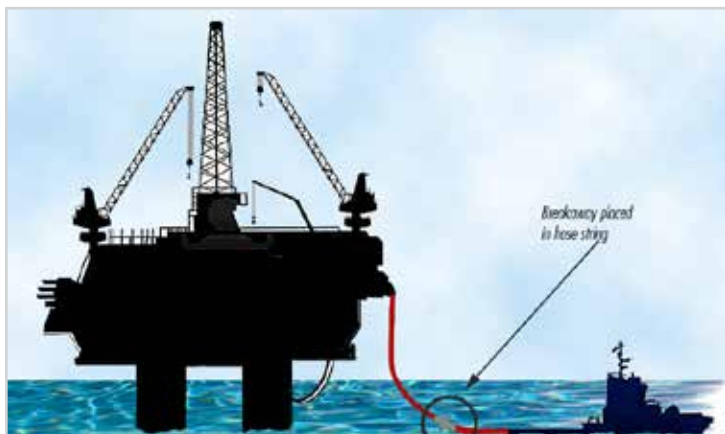
ABVL - Series Technical Data

| ABVL / Approvals | |
|---------------------------------------|---|
| Pressure Equipment Directive 97/23/EG | Pressure equipment with safety function |
| | Category IV, Type approved |
| | Type approval: TÜ.AGG.214 II 2G c IX |
| Chemical Resistance | |
| Material | Stainless Steel 316Ti / 316 L (1.4571, 1.4408). |
| | Hastelloy (2.4610, 2.4602, 2.4819) |
| | Aluminium EN AW 5083 H112 |
| Seal Material | FKM, EPDM, NBR, FFKM |
| Temperature range | -40/+150°C |



ABVM Series Marine Safety Breakaway Couplings

In Hose Applications - Spills over water are the most costly to remediate. Marine hose string Safety Breakaway Couplings act as a passive shutoff designed to specifically protect a hose string. Should a hose string be subjected to excess force for any reason, the breakaway separates stopping flow in both directions.



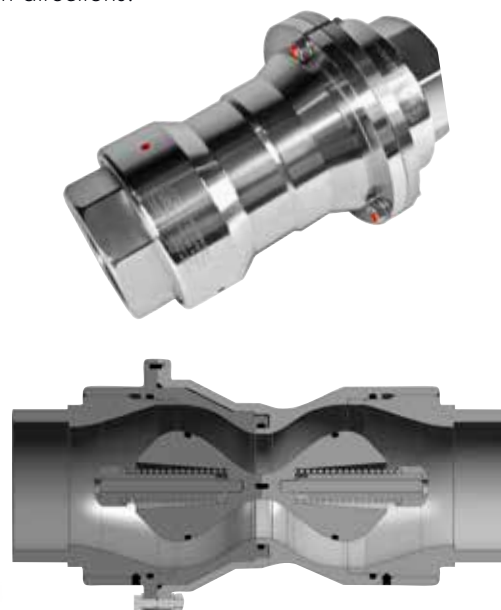
Marine Hose String Breakaway

These new breakaway couplings are designed for marine/offshore applications, where the breakaway coupling is mounted between two hose lines. The couplings are proven to be stable against shear forces due to the cylindrical overlap between two bodies.

ABVM - Series Technical Data

| ABML / Approvals | |
|---------------------------------------|--|
| Pressure Equipment Directive 97/23/EG | Pressure equipment with safety function |
| | Category IV, Type approved |
| | Type approval: TÜ.AGG.214 |
| Chemical Resistance | |
| Material | Stainless Steel 316Ti / 316 L (1.4571, 1.4408) |
| | Hastelloy (2.4610, 2.4602, 2.4819) |
| Seal Material | FKM, EPDM, NBR, FFKM |
| Temperature range | -40/+150°C |

| | |
|--------------------------|---|
| Nominal Pressure: | 230 psi PN 16 (others on request) |
| Nominal Width: | 2" to 4" (others upon request) |
| Connection ends: | Threads: BSP or NPT, Flanges: EN1092, ASA 16.5 150psi or 300psi |
| Material: | 1.4571 AISI 316Ti, seals upon request |



Advantages at a Glance

- Very stable against shear forces
- ABML: Low pressure drop due to specially designed valves
- Fewer parts for safe handling and easy maintenance
- Minimum leakage quantities due to quick-closing valves
- Multi-directional flow
- No welding in the design, so no weak points
- Safe activation through straight pull
- Worlds highest flow rates available

ABVML Series - High Flow Option

The ABML series breakaway couplings delivers higher flow rates compared to the standard marine breakaway coupling. This cuts loading times by up to 75%, this delivering real financial returns, due to the low pressure losses in this flow-optimized variant. The ABML series breakaway coupling is also particularly suitable for retrofitting to existing loading facilities - without any significant increase in loading times.

ABVC Series The Breakaway Coupling for Cryogenic Media

Even under normal circumstances, the process of loading fluid media requires a high standard of safety technology in the area of fittings. When the temperature factor is added to the mix, for example for cryogenic media, the requirements enter a new dimension. For low-temperature applications, RS ABVC breakaway coupling by Novaflex®, also supports RS safety standards for the unique challenges posed by cryogenics.

Separation by Force Limitation

As well as ensuring compliance with the corresponding leak rates, using our breakaway coupling offers guaranteed production for the hose line used and the plant components across the entire temperature range from -196 °C to 60 °C.

ABVC Series Technical Data

| ABVC / Approvals | |
|--|--------------------------------|
| Pressure Equipment Directive 97/23/EG | |
| Chemical Resistance | |
| Material | Stainless Steel 316 L (1.4404) |
| Seal Material | PTFE |
| Temperature range | -196°C - +60°C |



ABVC series before emergency separation



ABVC series after emergency separation



The ABVC Breakaway Coupling protects the hose line from unwanted breakaway, thus protecting personnel and the environment from uncontrolled product leakages. It's not just the low temperature, but also the particular hazard potential associated with cryogenic media such as LNG or liquid oxygen that calls for safe handling of the load line.

Advantages at a Glance

Safe function in the temperature range from -196° C to 60° C

Small residual amount thanks to swift valve closure

Safe triggering at breakaway angles of up to 90°

Controlled separation through breaking pins
Protects the hose and flanged-mounted systems from damage



Safety Breakaway Couplings by Novaflex®

Providing the highest standard of safety technology to protect personnel, critical assets and the environment.

All products by Novaflex® are warranted to be free from all defects in material and workmanship. It is impossible to test Novaflex® products under all conditions to which they might be subjected in the field. It is therefore the buyer and/or end user's responsibility to test all Novaflex® products under conditions that duplicate the service conditions prior to installation.

Prior to any application of the information within, please read carefully the following information:

This catalogue is a guide for use in selecting the product for the correct application. It contains warnings, reference directions and directions for safe use. All guidelines should be clearly understood before specifying or using any Novaflex® product. Failure to follow recommended application information and recommended procedures may result in premature failure, resulting in bodily injury or property damage. Contact Novaflex® or your local Novaflex® distributor for assistance.

For all Novaflex® products, always consult the most recent Proper Care and Maintenance Guides and Chemical Resistance Charts, available on our web site at www.novaflex.com

Due to continuous improvements, technical data is subject to change without notice.



The NovaFlex Group is a market leader through excellence in product innovation and design. The NovaFlex Group is a privately held company committed to continuous advancement in hose and connector solutions.

NovaFlex® has one of the broadest product ranges available in the hose and ducting marketplace, as well as the HVAC, Industrial Venting, Hose Industries and Commercial Exhaust Venting Systems.

Products are sold in industries across North America and around the world.



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