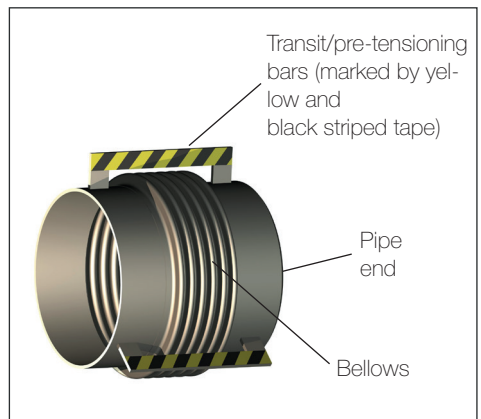
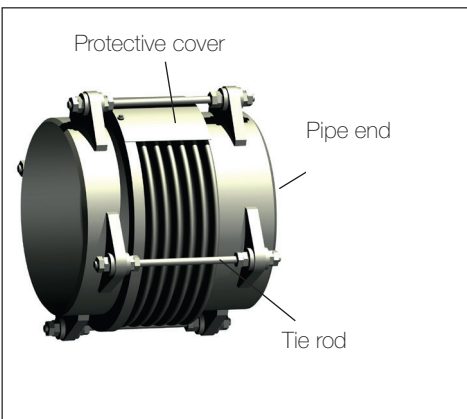
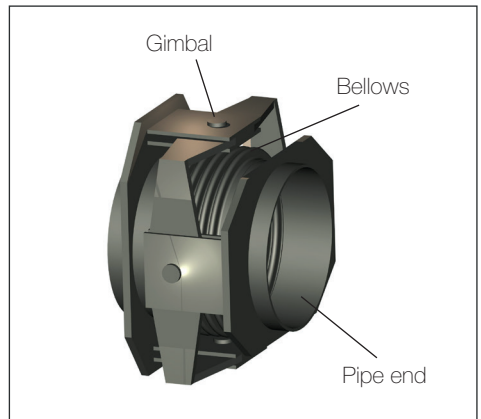
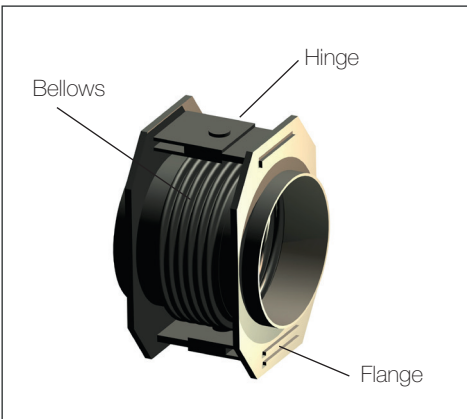
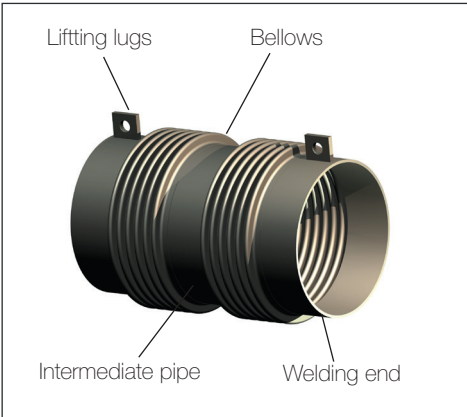


Montageanleitung

Installation Instruction





INSTALLATION AND MAINTENANCE

Compensators are designed to absorb movement according to predetermined design data. The calculated service life of a compensator is based on the precondition that the compensator will never be subjected to mechanical or thermal load exceeding the stated design data. In order to achieve the maximum service life, pressure resistance and reliability, caution should be taken during handling, storage and installation of the compensator. The necessary care should include taking the following advice. Failure to comply with the installation instructions could reduce the service life and pressure capacity of the compensator, which could lead to damage or at worst breakdown of the compensator or the pipe system.

STORAGE AND TRANSPORT

We recommend that a visual inspection is carried out immediately on receipt of delivery of the compensator to ensure that it has not been damaged during shipment.

- Transport fittings, tie rods, hinges or gimbals should not be used to sling and lift the compensator. The compensator should not be lifted by slings or chains around the bellows and must not be lifted in a manner which causes the bellows to be subjected to mechanical loads.
- The compensator must not be subjected to torsion during handling and installation.
- The compensator should be stored on an even, solid surface in a clean and dry environment under a roof or other rainproof cover.
- Compensators should not be stacked on top of each other or knocked against each other.
- If the weight of the end fittings tends to cause the bellows to bend the ends should be braced using wooden supports.
- Care should be taken to avoid mechanical damage as well as damage by water, moisture, sand, soil, building materials and chemicals.

Transport fittings/ pretensioning fittings

Transport and pre-tensioning bars will be identified by yellow and black striped tape. These fittings must NOT be removed until the compensator is fully installed. If these devices are removed prematurely the compensator may move to an incorrect condition and could possibly endanger people working in the vicinity. Furthermore, premature removal could cause the compensator not to function as intended, which could result in reduced service life or at worst breakdown of the compensator.

INSTALLATION

Installation should be carried out by suitably trained and competent staff working in compliance with relevant legislation and regulations for occupational safety.

Prior to installation

Unless clearly stated in the design data of the compensator, the compensator is not designed to compensate for installation inaccuracies in the piping and must not be used to connect them. Prior to installation the compensator should also be checked that it is undamaged and has no dents, damaged fittings and water marks on the steel (incipient rust) etc. It should also be checked that:

- The compensator is free from foreign objects such as insulation materials, dirt or debris.
- Sealing surfaces on flanges are even and clean.
- The gap in the pipeline where the compensator is to be installed matches the specified installation length of the compensator with design tolerances taken into account. The compensator must be fitted at the length stated in the specifications.
- The connecting ends of the pipeline are clean and correctly prepared for welding.
- The installation location of the compensator in the pipeline complies with that determined by the system designer.
- The expansion of the pipeline is in accordance with the design data of the compensator.
- The adjacent pipework is correctly installed

with anchors, guides and supports in place.

- Anchors must be adequate to accept reaction forces from the compensator and all other pipework loads.
- Only one compensator is fitted between two anchors.
- Tie rods on lateral compensators are correctly fitted and are secure.

Anchors/guides

Anchors and guides on the pipeline must be placed as per the guidelines in EJMA so that:

- The compensator is not subjected to dead-weight loads from the pipeline.
- The pipeline does not sag, “hog” or “snake” between anchors or guides.
- Drop rods or hanger rods should be avoided, guides should be slide or roller type.
- When using compensators the distance must not exceed 4 x the nominal diameter of the pipeline.
- When using compensators the distance must not exceed 14 x the nominal diameter of the pipeline.
- The distance between the remaining guides must not exceed 21 x the nominal diameter of the pipeline. This distance must be reduced if this is necessary in order to stabilize the pipeline.

During installation

- When welding or grinding near the compensator it should be protected against weld spatter and debris, we recommend use of a chloride-free welding blanket.
- Care must be taken to avoid accidental arcing on the thin-walled bellows in the compensator.
- The compensator should be protected from damage caused by adjacent construction work, splashes from mortar or plaster can damage the compensator and must be avoided.
- If the compensator is equipped with an inner sleeve, make sure the flow arrow on the compensator points in the direction of the system flow.
- When fitting angular compensators it is important that the hinge pins are in the

correct orientation.

- Do not apply torsion to the compensator to align the bolts on flanged units.
- Components such as tie rods, hinge links and gimbals must not be removed. They form part of the integrity and functionality of the compensator.
- Care should be taken with fitting tools, take care not to damage the bellows with spanners or wrenches when tightening bolts.
- On flanged units ensure that over-long studs or bolts do not contact and damage the bellows.
- When compensators are supplied without external covers and insulation is to be added a lagging cover should be fitted to prevent insulation material becoming trapped between the bellows convolutions where it can prevent the bellows from functioning correctly.

On completion of installation

Before the completed system is tested and commissioned it should be subjected to a visual inspection. Many years experience has shown that careful checking of the installation before pressure testing and final commissioning will help to ensure successful installation and performance. Before pressure testing and as part of the inspection regime ensure that all temporary shipping and pre-tensioning devices (marked by yellow and black striped tape) are removed from the compensator.

PRESSURE TEST

Pressure test must be carried out according to the stated test specifications on the drawing and/or the tag plates on the compensator.

Prior to pressure testing CHECK THE FOLLOWING

- Has the compensator been damaged during installation?
- Is the entire pipe system, especially anchors, guides and compensators, installed as shown in the drawings in the installation instructions?
- Is the compensator correctly fitted into the system and not used to correct fabrication

inaccuracies?

- Is the flow direction of the compensator correct?
- Are the bellows and other moving parts on the compensator free from foreign objects such as insulating material?
- Have all shipping bars, pre-tensioning devices, protective parts and packaging materials been removed?
- Have all guides, supports and compensators been released to allow the expected movements in the pipe system?
- If the system is designed for a light flow medium such as air or gas and is to be tested with a heavier medium such as water have the necessary steps been taken to ensure that the extra dead-weight loads to the compensator and pipe system can be safely accommodated?

During pressure testing CHECK THE FOLLOWING

- The pressure should be increased gradually until the specified test pressure is reached.
- Check the compensator for any sign of leakage at the connections and check the gauges for pressure drops.
- Examine the compensator for any signs of twisting, instability, squirming at the bellows or unexpected movement of any of its components.
- Any unexpected movement of the pipe system which could be pressure-related should be investigated and addressed.

After pressure testing CHECK THE FOLLOWING

The compensator and pipe system should remain as designed, in particular check that the anchors and their attachments to civil works or structure do not display any signs of distress.

It should be noted that after testing some residual testing fluid may remain in the bellows, if this is likely to affect the functioning of the system arrangements to remove the fluid may be necessary.

AVOID

- Dropping or knocking the bellows.
- Using cleaning agents containing chlorides.
- Using steel wool or steel brushes on the bellows.
- In case of any doubt the pressure test should not exceed more than 1½ x the design pressure without previous written confirmation from us.

MAINTENANCE

A correctly dimensioned and correctly installed compensator does not require any special maintenance other than the inspection that is carried out for the other parts of the pipe system in which the compensator is installed.

We recommend that you carry out ongoing inspection of the pipe system throughout its service life. The aim of these inspections is to check for the presence of rust, whether parts have come loose, etc. The frequency of these inspections is determined on an individual basis based on the function of the system, occurring loads and so on. The above does not guarantee that damage will not occur, but it does significantly reduce the risk.

It may be useful to know the common causes for faults in compensators. However, it is difficult to list all general maintenance directions as compensators have a wide field of application and many compensators are constructed for a specific application. We would like to draw your attention to the most common causes for failures below:

Shipping and handling damage

- Knock-damage, dents, scuffs and scratching of the bellows caused by incorrect handling or inflicted after installation.
- Unanticipated detrimental influences from the environment such as corrosion caused by salt, chemicals or the like in the atmosphere.

Installation damage and installation errors

- Incorrect location - installing compensators at a position in the pipework not intended by

the system designer.

- Using the compensator to correct fabrication errors without first confirming this is acceptable with the designer.
- Premature removal of shipping or pre-tensioning devices or failure to remove them after installation.
- Damage from weld spatter due to lack of protection during installation.
- Installation of units fitted with flow liners with the liner against the flow direction.

Operational damage

- Corrosion damage caused by the flow medium, in particular chloride presence.
- Fatigue failure owing to unforeseen vibration in the system.
- Fatigue failure caused by movements for which the compensator was not designed, especially

lateral movements.

- Damage caused by accumulation and packing of foreign material between the bellows convolutions, this can affect the bellows internally or externally.
- Torsion.
- Overpressure in the pipe system.

PLEASE NOTE!

Please be aware that noncompliance with the above and with our general terms of sales and delivery will void the warranty!

See also the EJMA instructions for installation of compensators.

If you have any questions etc. regarding installation, please do not hesitate to contact us!

INSTALLATION EXAMPLES FOR ...



MONTAGEEKSEMPLER FOR ...



MONTERINGSEXEMPEL FÖR ...



ASENNUSESIMERKKI...



MONTAGEBEISPIELE FÜR ...



EXEMPLES DE MONTAGE POUR ...



MONTAGEVOORBEELDEN VOOR ...



EJEMPLOS DE MONTAJE ...



PRZYKŁADY MONTAŻU ...



ПРИМЕРЫ МОНТАЖА ДЛЯ ...



... أمثلة على تركيب



स्थापना के उदाहरण

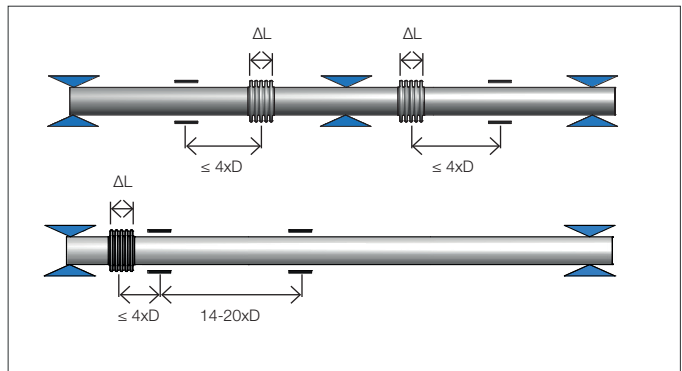


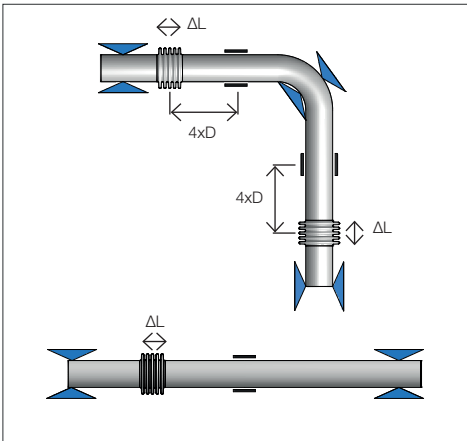
Axial expansion joints Aksiale kompensatorer Axialkompensatorer Axialkompensatorer
 Aksiaalinen paljetasain Axialkompensatoren Kompensateurs axiaux Kompensateurs axiaux
 Axiaalcompensatoren Compensadores Axiales Kompensatory osiowe Kompensatory osiowe
 Осево́й компенсатор دةوروملما دالتمآال تالوصو अक्षीय विस्तार जोयंटस

Distance between compensator and guides
 Afstand mellem kompensator og føringer
 Avstånd mellan kompensator och styrningar
 Paljetasaimen ja tuentojen välinen etäisyys
 Abstand zwischen Kompensator und Lager
 Distance entre le compensateur et les guidages
 Afstand tussen compensator en geleide punten
 Distancia entre compensador y guías
 Odległość między kompensatorem a prowadnicą
 Расстояние между компенсатором и направляющей
 المسافة بين المعادل والدليل

कौम्पेसेटर और गाईड में फासला ; फ़दद

1. Anchor as close as possible / Fikspunkt så tæt på som muligt / Fixpunkter så nära som möjligt / Kiintopiste mahdollisimman lähelle / Fixtpunkt so nah wie möglich / Point fixe le plus proche possible / Vast punt zo dicht mogelijk / Punto fijo lo más cerca posible / Punkty stałe położone jak najbliżej / неподвижная опора как можно ближе / المثبت على أقرب مسافة ممكنة / जितना नजदीक हो सके ऐकर करें
2. First guide max. 4 x diameter / Første glideleje max. 4 x diameter / Första styrningen max. 4 x diameter / Ensimmäinen tuenta enintään 4 x halkaisija / Ersten Gleitlager max. 4 x Durchmesser / Premier guidage max. 4 x diamètre / Eerste geleide punt max. 4 x diameter / Primera Guía, máximo 4 veces el diámetro / Pierwsza prowadnica maks. 4 x średnica / Первая скользящая опора макс. 4 x диаметр / التمدد الأول $4 \times$ القطر أقصى / पहला गाईड ज्यादा से ज्यादा व्यास के 4 गुना होना चाहिये
3. Following guides 14-20 x diameter / Efterfølgende glidelejer 14-20 x diameter / Seuraavat tuennat 14-20 x halkaisija / Efterföljande styrningar 14-20 x diameter / Nachfolgende Gelitlager 14-20 x Diameter / Guidages suivants 14-20 x diamètre / Volgende geleide punten 14-20 x diameter / Las guías siguientes, 14-20 veces el diámetro / Następne prowadnice 14-20 x średnica / Последующие скользящие опоры 14-20 x диаметр / دلائل اتباع 14-20 \times القطر / बाकी के गाइडस व्यास के 14 से 20 गुना पर होने चाहिये





Installation with cold spring (Cold spring is usually 50% of total movement)

Forspænding ved montage (Forspænding er normalvis 50% af total bevægelse)

Montering med förspänning (förspänning är normalt 50% av total rörelse)

Asennus esijännitetynä (esijännitys tavallisesti 50% kokonaisliikkeestä)

Vorspannung bei Montage (Vorspannung normalerweise 50 % der Gesamtbewegung)

Montage avec pré-tension (Pré-tension est normalement 50% du mouvement total)

Montage met voorspanning (Voorspanning bedraagt gewoonlijk 50% van de totale beweging)

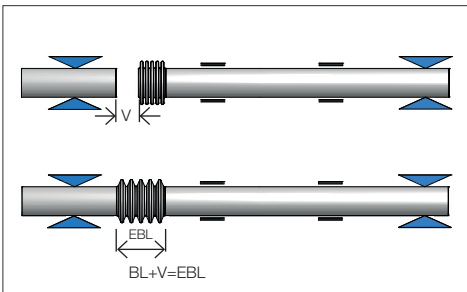
Montaje con pre-tensión (Pre-tensión normalmente el 50 % del movimiento total)

Montaż na naciągę wstępny "na zimno" (Naciąg wstępny "na zimno" stanowi zwykle 50% kompensacji całkowitej)

Установка во взведенном состоянии (сжатие, как правило, составляет 50% от общего хода)

التركيب باستخدام السحب البارد (عادة ما يكون السحب البارد بنسبة 50% من إجمالي الدليل)

कोल्ड पुल के साथ स्थापना (कोल्ड पुल कुल विस्तार का आधा) होना चाहिये





Definitions/Definition/Definitioner/Määritelmät/Definition/Définitions / Definities / Definiciones / Definicje / Определеие / تعريف / परिभाषा

BL = Free-length / Indbygningslængde / Tillverkningslängd / Vapaa pituus / Baulänge / Longueur de fabrication / Fabricatielengte / Longitud de fabricación / Długość swobodna / Длина / الطول الحر / निःशुल्क लम्बाई

EBL = Installation length / Installationslængde / Installationslängd / Asennuspituus / Einbaulänge / Longueur d'installation / Inbouwlengte / Longitud de montaje / Długość montażowa / Строительная длина / طول التركيب / स्थापना की लम्बाई

V = Cold spring / Forspænding / Förspänning / Esijännitys / Vorspannung / Précontrainte / Voorspanning / Pre-tensión / Naciąg wstępny "na zimno" / Взведенный / السحب البارد / कोल्ड पुल

 = Anchor / Fikspunkt / Fixpunkt / Kiintopiste / Festpunkt / Point fixe / Vast punt / Punto fijo / Punkt stały / неподвижная опора / مثبت / ऐकर

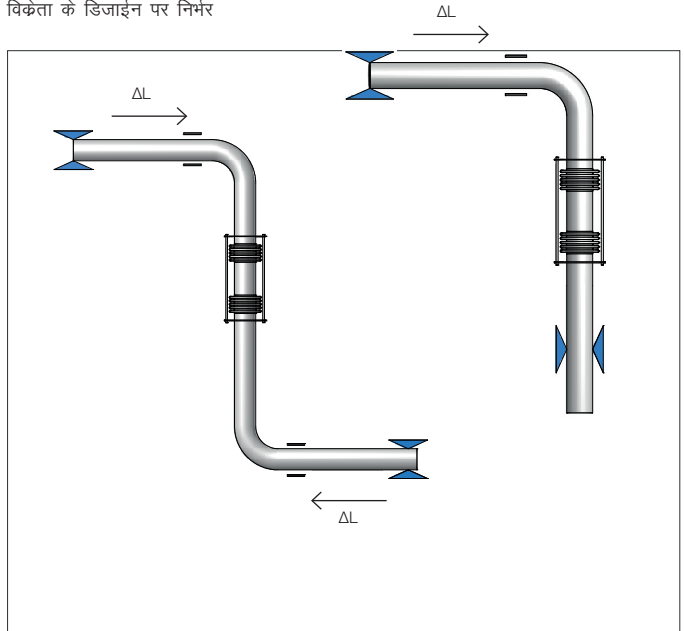
 = Guide / Glideleje / Styrningar / Liikutuki / Loslager / Guidage / Geleide punt / Guías / Prowadnice / Скользящая опора / دلائل / गाईडस

ΔL = Expansion / Bevægelse / Rörelse / Laajeneminen / Bewegung / Mouvement / Bewegung / Movimiento de dilatación / Kompensacja / Смещение / التمدد / विस्तार

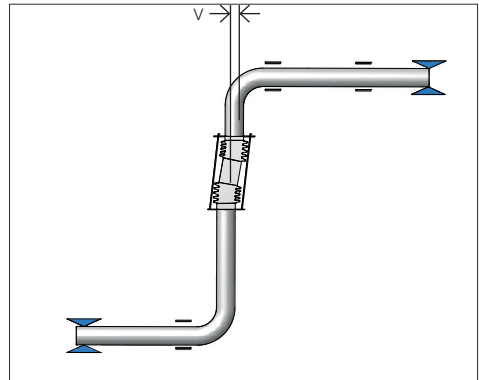
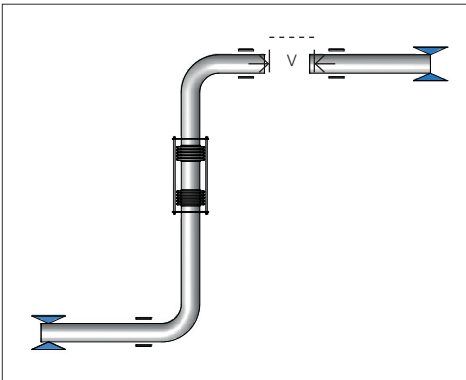
🇬🇧 Lateral expansion joints 🇩🇰 Laterale kompensatorer 🇸🇪 Lateralkompensatorer
 🇩🇪 Sivuttaispaljetasain 🇩🇪 Lateralkompensatoren 🇫🇷 Compensateurs latéraux
 🇮🇹 Lateraalcompensatoren 🇪🇸 Compensadores Laterales 🇷🇺 Kompensatory bocznе
 🇷🇺 Сдвиговой компенсатор अक्षीय विस्तार जॉयंट्स 🇮🇪 ی جانب لدا عم

Position of supports and compensator
 Placering af understøtninger og kompensator
 Läge för fästern och kompensator
 Tukien ja paljetasaimen sijoitus
 Position der Unterstützung und Kompensator
 Positionnement des supports et compensateur
 Positie van steunen en compensator
 Posición de los soportes y del compensador
 Pozycja podstaw i kompensatora
 Размещение опор и компенсатора
 وضع الدعائم والمعادل
 कोमपेंसेटर और उसकी समर्थन की स्थिति



Depending on the suppliers design
 Afhængig af leverandørens design
 Beroende på tillverkarens konstruktion
 Riippuvainen toimittajan suunnittelusta
 Abhängig vom Design der Lieferanten
 Dépendant de la construction du fournisseur
 Afhankelijk van het ontwerp van de leverancier
 Según el diseño del suministrador
 W zależności od wymogów projektowych producenta
 В зависимости от конструкции поставщика
 حسب تصميم المورد
 विक्रेता के डिजाईन पर निर्भर



Installation with cold spring (Cold spring is usually 50% of total movement)
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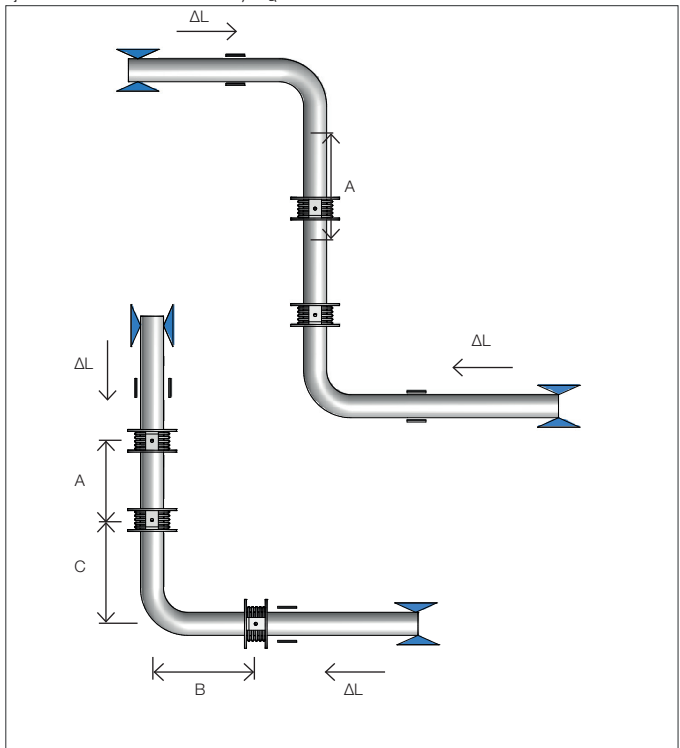
Definitions/ Definition/Definitioner/Määritelmät/Definition/Définitions Definities / Definiciones / Definicje / Определение / تعريف / परिभाषा

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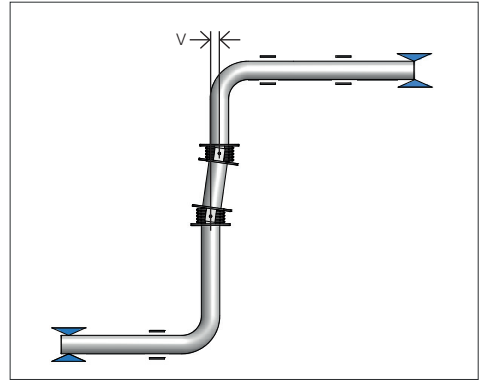
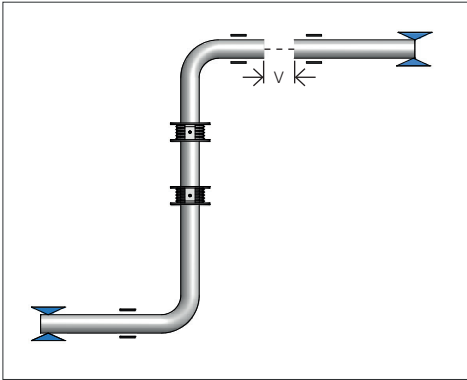
 Angular compensators  Angulare kompensatorer  Winkelkompensatoren
 Kulmapaljetasain  Angularkompensatoren  Compensateurs angulaires
 Angulaire compensatoren  Compensadores angulares  Kompensatory kątowe
 Угловой компенсатор  अक्षीय विस्तार जॉइंट्स  معادل زاوی

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 कोम्पेन्सटरस और उसकी समर्थन की स्थिति



Distance A, B and C: To be determined by supplier
 Afstand A, B og C: Fastlægges af leverandøren
 Avstånd A, B och C: Fastställs av tillverkaren
 Toimittaja määrittää etäisyydet A, B ja C
 Distanz A, B und C: Wird vom Lieferanten festgelegt
 Distance A, B et C: A déterminar par le fournisseur
 Afstand A, B en C: Te bepalen door de leverancier
 Distancias A, B y C: A determinar por el suministrador
 Odległości A, B i C: mają być określone przez dostawcę
 Расстояние A, B и C: определяется поставщиком
 المسافة A و B و C: يتم تحديدها عن طريق المورد
 ए ट और ६ के बीच का फासला ,फ़द्ध



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 Montaž na naciągu wstępny "na zimno" (Naciąg wstępny "na zimno" stanowi zwykłe 50% kompensacji całkowitej)
 Установка во взведенном состоянии (сжатие, как правило, составляет 50% от общего хода)
 التركيب باستخدام السحب البارد (عادة ما يكون السحب البارد بنسبة 50% من إجمالي التمدد)
 कोल्ड पुल के साथ स्थापना (कोल्ड पुल कुल विस्तार का आधा होना चाहिये)



Definitions/Definition/Definitioner/Määritelmät/Definition/Définitions / Definities / Definiciones / Definicje / Определение / تعریف / परिभाषा

- EBL = Installation length / Installationslængde / Installationslängd / Asennuspituus / Einbaulänge / Longueur d'installation / Inbouwlenkte / Longitud de montaje / Długość montażowa/ Строительная длина / طول التركيب / स्थापना की लम्बाई
- V = Cold spring / Forspænding / Förspänning / Esijännitys / Vorspannung / Précontrainte / Voorspanning / Pre-tensión / Naciąg wstępny "na zimno" / Взведенный / السحب البارد / कोल्ड पुल
-  = Anchor / Fikspunkt / Fixpunkt / Kiintopiste / Festpunkt / Point fixe / Vast punt / Punto fijo / Punkt stały / Неподвижная опора / مثبت / ऐकर
-  = Guide / Glideleje / Styrningar / Liikutuki / Loslager / Guidage / Geleide punt / Guías / Prowadnice / Скользящая опора / دلائل / गाईड्स
- ΔL = Expansion / Bevægelse / Rörelse / Laajeneminen / Bewegung / Mouvement / Beweging / Movimiento de dilatación / Kompensacja / Смещение / التمدد / विस्तार

Please contact us in case of doubt or questions.

Kontakt os endelig ved tvivl eller spørgsmål.

Kontakta oss i tveksamma fall eller om du har frågor.

Pyydämme ottamaan yhteyttä mikäli teillä on kysymyksiä

Fals Sie irgenswelche Fragen haben,
stehen wir Ihnen natürlich jederzeit zur Verfügung.

Veillez nous contacter en cas de doute ou questions.

Gelieve ons te contacteren in geval van twijfel of vragen.

Por favor, contacte con nosotros en caso de duda o aclaraciones.

Prosimy o kontakt w wypadku zaistnienia jakichkolwiek wątpliwości,
bądź potrzeby uzyskania wyjaśnień.

Обращайтесь к нам в случае любых сомнений.

يرجى الاتصال بنا إذا كانت لديك أي شكوك أو استفسارات

किसी भाका या सवाल के लिये हमसे सम्पर्क करें

The installation instruction is available in other European languages on request.

Montagevejledningen på andre sprog end de angivne fås på forespørgsel.

Om du önskar installationsinstruktionerna på ett annat europeiskt språk kan detta fås på begäran.

Asennusohjeet löytyvät muilla eurooppalaisilla kielillä pyydettäessä.

Die Montageanleitung ist auf anderen europäischen Sprachen, bei Anfrage erhältlich.

Ce notice d'installation est disponible en autre langues Européennes, sur demande.

De montagehandleiding is beschikbaar in andere Europese talen, op aanvraag.

Las instrucciones para el montaje se pueden obtener en distintos idiomas europeos, poniéndose en contacto con nosotros.

Instrukcja instalacji jest dostępna na życzenie w innych językach europejskich.

Инструкция по установке на иных языках, предоставляется по запросу.

تعليمات التركيب متوفرة بلغات أوروبية أخرى عند الطلب

स्थापना के निर्देश कई यूरोपियन भाााओं में उपलब्ध है और अनुरोध पर भेजे जा सकते हैं।



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