

Rexroth LSF

Synchronous Linear Motors

Operating instruction
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 Synchronous Linear Motors

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Purpose of Documentation This documentation ...

- instructs assembly, operating and maintenance personnel
- contains basic notes about assembly, operation and maintenance of the motors

Record of Revision

Edition	Release Date	Notes
DOK-MOTOR*-LSF*****-IT01-EN-P	08/2013	1. Edition
DOK-MOTOR*-LSF*****-IT02-EN-P	06/2016	2. Edition; revising and supplementing

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Note This document has been printed on chlorine-free bleached paper.

<p>D Deutsch</p>	<p>USA English</p>	<p>F Français</p>
<p>▲WARNING Lebensgefahr bei Nichtbeachtung der nachstehenden Sicherheitshinweise!</p> <p>Nehmen Sie die Produkte erst dann in Betrieb, nachdem Sie die mit dem Produkt gelieferten Unterlagen und Sicherheitshinweise vollständig durchgelesen, verstanden und beachtet haben.</p> <p>Sollten Ihnen keine Unterlagen in Ihrer Landessprache vorliegen, wenden Sie sich an Ihren zuständigen Rexroth-Vertriebspartner.</p> <p>Nur qualifiziertes Personal darf an Antriebskomponenten arbeiten.</p> <p>Nähere Erläuterungen zu den Sicherheitshinweisen entnehmen Sie Kapitel 1 dieser Dokumentation.</p>	<p>▲WARNING Danger to life in case of non-compliance with the below-mentioned safety instructions!</p> <p>Do not attempt to install or put these products into operation until you have completely read, understood and observed the documents supplied with the product.</p> <p>If no documents in your language were supplied, please consult your Rexroth sales partner.</p> <p>Only qualified persons may work with drive components.</p> <p>For detailed explanations on the safety instructions, see chapter 1 of this documentation.</p>	<p>▲AVERTISSEMENT Danger de mort en cas de non-respect des consignes de sécurité figurant ci-après !</p> <p>Ne mettez les produits en service qu'après avoir lu complètement et après avoir compris et respecté les documents et les consignes de sécurité fournis avec le produit.</p> <p>Si vous ne disposez pas de la documentation dans votre langue, merci de consulter votre partenaire Rexroth.</p> <p>Seul un personnel qualifié est autorisé à travailler sur les composants d'entraînement.</p> <p>Vous trouverez des explications plus détaillées relatives aux consignes de sécurité au chapitre 1 de la présente documentation.</p>
<p>▲WARNING Hohe elektrische Spannung! Lebensgefahr durch elektrischen Schlag!</p> <p>Betreiben Sie Antriebskomponenten nur mit fest installiertem Schutzleiter.</p> <p>Schalten Sie vor Zugriff auf Antriebskomponenten die Spannungsversorgung aus.</p> <p>Beachten Sie die Entladezeiten von Kondensatoren.</p>	<p>▲WARNING High electrical voltage! Danger to life by electric shock!</p> <p>Only operate drive components with a permanently installed equipment grounding conductor.</p> <p>Disconnect the power supply before accessing drive components.</p> <p>Observe the discharge times of the capacitors.</p>	<p>▲AVERTISSEMENT Tensions électriques élevées ! Danger de mort par électrocution !</p> <p>N'exploitez les composants d'entraînement que si un conducteur de protection est installé de manière permanente.</p> <p>Avant d'intervenir sur les composants d'entraînement, coupez toujours la tension d'alimentation.</p> <p>Tenez compte des délais de décharge de condensateurs.</p>
<p>▲WARNING Gefahrbringende Bewegungen! Lebensgefahr!</p> <p>Halten Sie sich nicht im Bewegungsbereich von Maschinen und Maschinenteilen auf.</p> <p>Verhindern Sie den unbeabsichtigten Zutritt für Personen.</p> <p>Bringen Sie vor dem Zugriff oder Zutritt in den Gefahrenbereich die Antriebe sicher zum Stillstand.</p>	<p>▲WARNING Dangerous movements! Danger to life!</p> <p>Keep free and clear of the ranges of motion of machines and moving machine parts.</p> <p>Prevent personnel from accidentally entering the range of motion of machines.</p> <p>Make sure that the drives are brought to safe standstill before accessing or entering the danger zone.</p>	<p>▲AVERTISSEMENT Mouvements entraînant une situation dangereuse ! Danger de mort !</p> <p>Ne séjournez pas dans la zone de mouvement de machines et de composants de machines.</p> <p>Évitez tout accès accidentel de personnes.</p> <p>Avant toute intervention ou tout accès dans la zone de danger, assurez-vous de l'arrêt préalable de tous les entraînements.</p>
<p>▲WARNING Elektromagnetische / magnetische Felder! Gesundheitsgefahr für Personen mit Herzschrittmachern, metallischen Implantaten oder Hörgeräten!</p> <p>Zutritt zu Bereichen, in denen Antriebskomponenten montiert und betrieben werden, ist für oben genannten Personen untersagt bzw. nur nach Rücksprache mit einem Arzt erlaubt.</p>	<p>▲WARNING Electromagnetic / magnetic fields! Health hazard for persons with heart pacemakers, metal implants or hearing aids!</p> <p>The above-mentioned persons are not allowed to enter areas in which drive components are mounted and operated, or rather are only allowed to do this after they consulted a doctor.</p>	<p>▲AVERTISSEMENT Champs électromagnétiques / magnétiques ! Risque pour la santé des porteurs de stimulateurs cardiaques, d'implants métalliques et d'appareils auditifs !</p> <p>L'accès aux zones où sont montés et exploités les composants d'entraînement est interdit aux personnes susmentionnées ou bien ne leur est autorisé qu'après consultation d'un médecin.</p>
<p>▲VORSICHT Heiße Oberflächen (> 60 °C)! Verbrennungsgefahr!</p> <p>Vermeiden Sie das Berühren von metallischen Oberflächen (z. B. Kühlkörpern). Abkühlzeit der Antriebskomponenten einhalten (mind. 15 Minuten).</p>	<p>▲CAUTION Hot surfaces (> 60 °C [140 °F])! Risk of burns!</p> <p>Do not touch metallic surfaces (e.g. heat sinks). Comply with the time required for the drive components to cool down (at least 15 minutes).</p>	<p>▲ATTENTION Surfaces chaudes (> 60 °C)! Risque de brûlure !</p> <p>Évitez de toucher des surfaces métalliques (p. ex. dissipateurs thermiques). Respectez le délai de refroidissement des composants d'entraînement (au moins 15 minutes).</p>

D Deutsch	USA English	F Français
<p>▲VORSICHT Unsachgemäße Handhabung bei Transport und Montage! Verletzungsgefahr!</p> <p>Verwenden Sie geeignete Montage- und Transporteinrichtungen.</p> <p>Benutzen Sie geeignetes Werkzeug und persönliche Schutzausrüstung.</p>	<p>▲CAUTION Improper handling during transport and mounting! Risk of injury!</p> <p>Use suitable equipment for mounting and transport.</p> <p>Use suitable tools and personal protective equipment.</p>	<p>▲ATTENTION Manipulation incorrecte lors du transport et du montage ! Risque de blessure !</p> <p>Utilisez des dispositifs de montage et de transport adéquats.</p> <p>Utilisez des outils appropriés et votre équipement de protection personnel.</p>
<p>▲VORSICHT Unsachgemäße Handhabung von Batterien! Verletzungsgefahr!</p> <p>Versuchen Sie nicht, leere Batterien zu reaktivieren oder aufzuladen (Explosions- und Verätzungsgefahr).</p> <p>Zerlegen oder beschädigen Sie keine Batterien. Werfen Sie Batterien nicht ins Feuer.</p>	<p>▲CAUTION Improper handling of batteries! Risk of injury!</p> <p>Do not attempt to reactivate or recharge low batteries (risk of explosion and chemical burns).</p> <p>Do not dismantle or damage batteries. Do not throw batteries into open flames.</p>	<p>▲ATTENTION Manipulation incorrecte de piles! Risque de blessure!</p> <p>N'essayez pas de réactiver des piles vides ou de les charger (risque d'explosion et de brûlure par acide).</p> <p>Ne désassemblez et n'endommagez pas les piles. Ne jetez pas des piles dans le feu.</p>




E Español	P Português	I Italiano
<p>▲ADVERTENCIA ¡Peligro de muerte en caso de no observar las siguientes indicaciones de seguridad!</p> <p>Los productos no se pueden poner en servicio hasta después de haber leído por completo, comprendido y tenido en cuenta la documentación y las advertencias de seguridad que se incluyen en la entrega.</p> <p>Si no dispusiera de documentación en el idioma de su país, diríjase a su distribuidor competente de Rexroth.</p> <p>Solo el personal debidamente cualificado puede trabajar en componentes de accionamiento.</p> <p>Encontrará más detalles sobre las indicaciones de seguridad en el capítulo 1 de esta documentación.</p>	<p>▲ATENÇÃO Perigo de vida em caso de inobservância das seguintes instruções de segurança!</p> <p>Utilize apenas os produtos depois de ter lido, compreendido e tomado em consideração a documentação e as instruções de segurança fornecidas juntamente com o produto.</p> <p>Se não tiver disponível a documentação na sua língua, dirija-se ao seu parceiro de venda responsável da Rexroth.</p> <p>Apenas pessoal qualificado pode trabalhar nos componentes de acionamento.</p> <p>Explicações mais detalhadas relativamente às instruções de segurança constam no capítulo 1 desta documentação.</p>	<p>▲AVVERTENZA Pericolo di morte in caso di inosservanza delle seguenti indicazioni di sicurezza!</p> <p>Mettere in funzione i prodotti solo dopo aver letto, compreso e osservato per intero la documentazione e le indicazioni di sicurezza fornite con il prodotto.</p> <p>Se non dovesse essere presente la documentazione nella vostra lingua, siete pregati di rivolgervi al rivenditore Rexroth competente.</p> <p>Solo personale qualificato può eseguire lavori sui componenti di comando.</p> <p>Per ulteriori spiegazioni riguardanti le indicazioni di sicurezza consultare il capitolo 1 di questa documentazione.</p>
<p>▲ADVERTENCIA ¡Alta tensión eléctrica! ¡Peligro de muerte por descarga eléctrica!</p> <p>Active sólo los componentes de accionamiento con el conductor protector firmemente instalado.</p> <p>Desconecte la alimentación eléctrica antes de manipular los componentes de accionamiento.</p> <p>Tenga en cuenta los tiempos de descarga de los condensadores.</p>	<p>▲ATENÇÃO Alta tensão elétrica! Perigo de vida devido a choque elétrico!</p> <p>Opere componentes de accionamento apenas com condutores de proteção instalados.</p> <p>Desligue a alimentação de tensão antes de aceder aos componentes de accionamento.</p> <p>Respeite os períodos de descarga dos condensadores.</p>	<p>▲AVVERTENZA Alta tensione elettrica! Pericolo di morte in seguito a scosse elettriche!</p> <p>Mettere in esercizio i componenti di comando solo con conduttore di messa a terra ben installato.</p> <p>Staccare l'alimentazione prima di intervenire sui componenti di comando.</p> <p>Osservare i tempi di scarica del condensatore.</p>
<p>▲ADVERTENCIA ¡Movimientos peligrosos! ¡Peligro de muerte!</p> <p>No permanezca en la zona de movimiento de las máquinas ni de sus piezas.</p> <p>Impida el acceso accidental de personas.</p> <p>Antes de acceder o introducir las manos en la zona de peligro, los accionamientos se tienen que haber parado con seguridad.</p>	<p>▲ATENÇÃO Movimentos perigosos! Perigo de vida!</p> <p>Não permaneça na área de movimentação das máquinas e das peças das máquinas.</p> <p>Evite o acesso involuntário para pessoas.</p> <p>Antes de entrar ou aceder à área perigosa, imobilize os acionamentos de forma segura.</p>	<p>▲AVVERTENZA Movimenti pericolosi! Pericolo di morte!</p> <p>Non sostare nelle zone di manovra delle macchine e delle loro parti.</p> <p>Impedire un accesso non autorizzato per le persone.</p> <p>Prima di accedere alla zona di pericolo, arrestare e bloccare gli azionamenti.</p>




<p>E Español</p>	<p>P Português</p>	<p>I Italiano</p>
<p>⚠ ADVERTENCIA ¡Campos electromagnéticos/magnéticos! ¡Peligro para la salud de las personas con marcapasos, implantes metálicos o audífonos!</p> <p>El acceso de las personas arriba mencionadas a las zonas de montaje o funcionamiento de los componentes de accionamiento está prohibido, salvo que lo autorice previamente un médico.</p>	<p>⚠ ATENÇÃO Campos eletromagnéticos / magnéticos! Perigo de saúde para pessoas com marcapassos, implantes metálicos ou aparelhos auditivos!</p> <p>Acesso às áreas, nas quais os componentes de acionamento são montados e operados, é proibido para as pessoas em cima mencionadas ou apenas após permissão de um médico.</p>	<p>⚠ AVVERTENZA Campi elettromagnetici / magnetici! Pericolo per la salute delle persone portatrici di pacemaker, protesi metalliche o apparecchi acustici!</p> <p>L'accesso alle zone in cui sono installati o in funzione componenti di comando è vietato per le persone sopra citate o consentito solo dopo un colloquio con il medico.</p>
<p>⚠ ATENCIÓN ¡Superficies calientes (> 60 °C)! ¡Peligro de quemaduras!</p> <p>Evite el contacto con las superficies calientes (p. ej., disipadores de calor). Observe el tiempo de enfriamiento de los componentes de accionamiento (mín. 15 minutos).</p>	<p>⚠ CUIDADO Superfícies quentes (> 60 °C)! Perigo de queimaduras!</p> <p>Evite tocar superfícies metálicas (p. ex. radiadores). Respeite o tempo de arrefecimento dos componentes de acionamento (mín. 15 minutos).</p>	<p>⚠ ATTENZIONE Superfici bollenti (> 60 °C)! Pericolo di ustioni!</p> <p>Evitare il contatto con superfici metalliche (ad es. dissipatori di calore). Rispettare i tempi di raffreddamento dei componenti di comando (almeno 15 minuti).</p>
<p>⚠ ATENCIÓN ¡Manipulación inadecuada en el transporte y montaje! ¡Peligro de lesiones!</p> <p>Utilice dispositivos de montaje y de transporte adecuados.</p> <p>Utilice herramientas adecuadas y equipo de protección personal.</p>	<p>⚠ CUIDADO Manejo incorreto no transporte e montagem! Perigo de ferimentos!</p> <p>Utilize dispositivos de montagem e de transporte adequados.</p> <p>Utilize ferramentas e equipamento de proteção individual adequados.</p>	<p>⚠ ATTENZIONE Manipolazione inappropriata durante il trasporto e il montaggio! Pericolo di lesioni!</p> <p>Utilizzare dispositivi di montaggio e trasporto adatti.</p> <p>Utilizzare attrezzi adatti ed equipaggiamento di protezione personale.</p>
<p>⚠ ATENCIÓN ¡Manejo inadecuado de las pilas! ¡Peligro de lesiones!</p> <p>No trate de reactivar o cargar pilas descargadas (peligro de explosión y cauterización).</p> <p>No desarme ni dañe las pilas. No tire las pilas al fuego.</p>	<p>⚠ CUIDADO Manejo incorreto de baterias! Perigo de ferimentos!</p> <p>Não tente reativar nem carregar baterias vazias (perigo de explosão e de queimaduras com ácido).</p> <p>Não desmonte nem danifique as baterias. Não deite as baterias no fogo.</p>	<p>⚠ ATTENZIONE Utilizzo inappropriato delle batterie! Pericolo di lesioni!</p> <p>Non tentare di riattivare o ricaricare batterie scariche (pericolo di esplosione e corrosione).</p> <p>Non scomporre o danneggiare le batterie. Non gettare le batterie nel fuoco.</p>

<p>S Svenska</p>	<p>DK Dansk</p>	<p>NL Nederlands</p>
<p>⚠ VARNING Livsfara om följande säkerhetsanvisningar inte följs!</p> <p>Använd inte produkterna innan du har läst och förstått den dokumentation och de säkerhetsanvisningar som medföljer produkten, och följ alla anvisningar.</p> <p>Kontakta din Rexroth-återförsäljare om dokumentationen inte medföljer på ditt språk.</p> <p>Endast kvalificerad personal får arbeta med drivkomponenterna.</p> <p>Se kapitel 1 i denna dokumentation för närmare beskrivningar av säkerhetsanvisningarna.</p>	<p>⚠ ADVARSEL Livsfare ved manglende overholdelse af nedenstående sikkerhedsanvisninger!</p> <p>Tag ikke produktet i brug, før du har læst og forstået den dokumentation og de sikkerhedsanvisninger, som følger med produktet, og overhold de givne anvisninger.</p> <p>Kontakt din Rexroth-forhandler, hvis dokumentationen ikke medfølger på dit sprog.</p> <p>Det er kun kvalificeret personale, der må arbejde på drive components.</p> <p>Nærmere forklaringer til sikkerhedsanvisningerne fremgår af kapitel 1 i denne dokumentation.</p>	<p>⚠ WAARSCHUWING Levensgevaar bij niet-naleving van onderstaande veiligheidsinstructies!</p> <p>Stel de producten pas in bedrijf nadat u de met het product geleverde documenten en de veiligheidsinformatie volledig gelezen, begrepen en in acht genomen heeft.</p> <p>Mocht u niet beschikken over documenten in uw landstaal, kunt u contact opnemen met uw plaatselijke Rexroth distributiepartner.</p> <p>Uitsluitend gekwalificeerd personeel mag aan de aandrijvingscomponenten werken.</p> <p>Meer informatie over de veiligheidsinstructies vindt u in hoofdstuk 1 van deze documentatie.</p>
<p>⚠ VARNING Hög elektrisk spänning! Livsfara genom elchock!</p> <p>Använd endast drivkomponenterna med fastmonterad skyddsledare.</p> <p>Koppla bort spänningsförsörjningen före arbete på drivkomponenter.</p> <p>Var medveten om kondensatorernas urladdningstid.</p>	<p>⚠ ADVARSEL Elektrisk højspænding! Livsfare på grund af elektrisk stød!</p> <p>Drive components må kun benyttes med et fast installeret jordstik.</p> <p>Sørg for at koble spændingsforsyningen fra, inden du rører ved drive components.</p> <p>Overhold kondensatorernes afladningstider.</p>	<p>⚠ WAARSCHUWING Hoge elektrische spanning! Levensgevaar door elektrische schok!</p> <p>Bedien de aandrijvingscomponenten uitsluitend met vast geïnstalleerde aardleiding.</p> <p>Schakel voor toegang tot aandrijvingscomponenten de spanningsvoorziening uit.</p> <p>Neem de ontlaadtijden van condensatoren in acht.</p>

S Svenska	DK Dansk	NL Nederlands
<p>⚠ VARNING Farliga rörelser! Livsfaral</p> <p>Uppehåll dig inte inom maskiners och maskindelarars rörelseområde.</p> <p>Förhindra att obehöriga personer får tillträde.</p> <p>Innan du börjar arbeta eller vistas inom drivsystemets riskområde måste maskinen vara stillastående.</p>	<p>⚠ ADVARSEL Farlige bevægelser! Livsfare!</p> <p>Du må ikke opholde dig inden for maskiners og maskindeles bevægelsesradius.</p> <p>Sørg for, at ingen personer kan få utilsigtet adgang.</p> <p>Stands drevene helt, inden du rører ved drevene eller træder ind i deres fareområde.</p>	<p>⚠ WAARSCHUWING Risicovolle bewegingen! Levensgevaar!</p> <p>Houdt u niet op in het bewegingsbereik van machines en machineonderdelen.</p> <p>Voorkom dat personen onbedoeld toegang verkrijgen.</p> <p>Voor toegang tot de gevaarlijke zone moeten de aandrijvingen veilig tot stilstand gebracht zijn.</p>
<p>⚠ VARNING Elektromagnetiska/magnetiska fält! Hälsofara för personer med pacemaker, implantat av metall eller hörapparat!</p> <p>Det är förbjudet för ovan nämnda personer (eller kräver överläggning med läkare) att beträda områden där drivkomponenter är monterade och i drift.</p>	<p>⚠ ADVARSEL Elektromagnetiske/magnetiske felter! Sundhedsfare for personer med pacemakere, metalliske implantater eller høreapparater!</p> <p>For disse personer er der adgang forbudt eller kun adgang med tilladelse fra læge til de områder, hvor drive components monteres og drives.</p>	<p>⚠ WAARSCHUWING Elektromagnetische / magnetische velden! Gevaar voor de gezondheid van personen met pacemakers, metalen implantaten of hoorapparaten!</p> <p>Toegang tot gebieden, waarin aandrijvingscomponenten worden gemonteerd en bediend, is verboden voor voornoemde personen of uitsluitend toegestaan na overleg met een arts.</p>
<p>⚠ OBSERVERA Varma ytor (> 60 °C)! Risk för brännskador!</p> <p>Undvik att vidröra metallytor (t.ex. kylelement). Var medveten om att det tar tid för drivkomponenterna att svalna (minst 15 minuter).</p>	<p>⚠ FORSIGTIG Varme overflader (> 60 °C)! Risiko for forbrændinger!</p> <p>Undgå at berøre metaloverflader (f.eks. køleelementer). Overhold drive components nedkølingstid (min. 15 min.).</p>	<p>⚠ VOORZICHTIG Hete oppervlakken (> 60 °C)! Verbrandingsgevaar!</p> <p>Voorkom contact met metalen oppervlakken (bijv. Koellichamen). Afkoeltijd van de aandrijvingscomponenten in acht nemen (min. 15 minuten).</p>
<p>⚠ OBSERVERA Felaktig hantering vid transport och montering! Skaderisk!</p> <p>Använd passande monterings- och transportanordningar.</p> <p>Använd lämpliga verktyg och personlig skyddsutrustning.</p>	<p>⚠ FORSIGTIG Fejlhåndtering ved transport og montering! Risiko for kvæstelser!</p> <p>Benyt egnede monterings- og transportanordninger.</p> <p>Benyt egnet værktøj og personligt sikkerhedsudstyr.</p>	<p>⚠ VOORZICHTIG Onjuist gebruik bij transport en montage! Letselgevaar!</p> <p>Gebruik geschikte montage- en transportinrichtingen.</p> <p>Gebruik geschikt gereedschap en een persoonlijke veiligheidsuitrusting.</p>
<p>⚠ OBSERVERA Felaktig hantering av batterier! Skaderisk!</p> <p>Försök inte återaktivera eller ladda upp batterier (risk för explosioner och frätskador).</p> <p>Batterierna får inte tas isär eller skadas. Släng inte batterierna i elden.</p>	<p>⚠ FORSIGTIG Fejlhåndtering af batterier! Risiko for kvæstelser!</p> <p>Forsøg ikke at genaktivere eller oplade tomme batterier (eksplosions- og ætsningsfare).</p> <p>Undlad at skille batterier ad eller at beskadige dem. Smid ikke batterier ind i åben ild.</p>	<p>⚠ VOORZICHTIG Onjuist gebruik van batterijen! Letselgevaar!</p> <p>Probeer nooit lege batterijen te reactiveren of op te laden (explosiegevaar en gevaar voor beschadiging van weefsel door cauterisatie).</p> <p>Batterijen niet demonteren of beschadigen. Nooit batterijen in het vuur werpen.</p>

<p>FIN Suomi</p>	<p>PL Polski</p>	<p>CZ Český</p>
<p>VAROITUS Näiden turvaohjeiden noudattamatta jättämisestä on seurauksena hengenvaara!</p> <p>Ota tuote käyttöön vasta sen jälkeen, kun olet lukenut läpi tuotteen mukana toimitetut asiakirjat ja turvallisuusohjeet, ymmärtänyt ne ja ottanut ne huomioon.</p> <p>Jos asiakirjoja ei ole saatavana omalla äidinkielelläsi, ota yhteys asianomaiseen Rexrothin myyntiedustajaan.</p> <p>Käyttölaitteiden komponenttien parissa saa työskennellä ainoastaan valtuutettu henkilöstö.</p> <p>Lisätietoa turvaohjeista löydät tämän dokumentaation luvusta 1.</p>	<p>OSTRZEŻENIE Zagrożenie życia w razie nieprzestrzegania poniższych wskazówek bezpieczeństwa!</p> <p>Nie uruchamiać produktów przed uprzednim przeczytaniem i pełnym zrozumieniem wszystkich dokumentów dostarczonych wraz z produktem oraz wskazówek bezpieczeństwa. Należy przestrzegać wszystkich zawartych tam zaleceń.</p> <p>W przypadku braku dokumentów w Państwa języku, prosimy o skontaktowanie się z lokalnym partnerem handlowym Rexroth.</p> <p>Przy zespołach napędowych może pracować wyłącznie wykwalifikowany personel.</p> <p>Blizsze objaśnienia wskazówek bezpieczeństwa znajdują się w Rozdziale 1 niniejszej dokumentacji.</p>	<p>VAROVÁNÍ Nebezpečí života v případě nedodržení níže uvedených bezpečnostních pokynů!</p> <p>Před uvedením výrobků do provozu si přečtěte kompletní dokumentaci a bezpečnostní pokyny dodávané s výrobkem, pochopte je a dodržujte.</p> <p>Nemáte-li k dispozici podklady ve svém jazyce, obraťte se na příslušného obchodního partnera Rexroth.</p> <p>Na komponentách pohonu smí pracovat pouze kvalifikovaný personál.</p> <p>Podrobnější vysvětlení k bezpečnostním pokynům naleznete v kapitole 1 této dokumentace.</p>
<p>VAROITUS Voimakas sähköjännite! Sähköiskun aiheuttama hengenvaara!</p> <p>Käytä käyttölaitteen komponentteja ainoastaan maadoitusjohtimen ollessa kiinteästi asennettuna.</p> <p>Katkaise jännitteensyöttö ennen käyttölaitteen komponenteille suoritettavien töiden aloittamista.</p> <p>Huomioi kondensaattoreiden purkausajat.</p>	<p>OSTRZEŻENIE Wysokie napięcie elektryczne! Zagrożenie życia w wyniku porażenia prądem!</p> <p>Zespoły napędu mogą być eksploatowane wyłącznie z zainstalowanym na stałe przewodem ochronnym.</p> <p>Przed uzyskaniem dostępu do podzespołów napędu należy odłączyć zasilanie elektryczne.</p> <p>Zwracać uwagę na czas rozładowania kondensatorów.</p>	<p>VAROVÁNÍ Vysoké elektrické napětí! Nebezpečí života při zasažení elektrickým proudem!</p> <p>Komponenty pohonu smí být v provozu pouze s pevně nainstalovaným ochranným vodičem.</p> <p>Než začnete zasahovat do komponent pohonu, odpojte je od elektrického napájení.</p> <p>Dodržujte vybíjecí časy kondenzátorů.</p>
<p>VAROITUS Vaarallisia liikkeitä! Hengenvaara!</p> <p>Älä oleskele koneiden tai koneenosien liikealueella.</p> <p>Pidä huolta siitä, ettei muita henkilöitä pääse alueelle vahingossa.</p> <p>Pysäytä käyttölaitteet varmasti ennen vaara-alueelle koskemista tai menemistä.</p>	<p>OSTRZEŻENIE Niebezpieczne ruchy! Zagrożenie życia!</p> <p>Nie wolno przebywać w obszarze pracy maszyny i jej elementów.</p> <p>Nie dopuszczać osób niepowołanych do obszaru pracy maszyny.</p> <p>Przed dotknięciem urządzenia/maszyny lub zbliżeniem się do obszaru zagrożenia należy zgodnie z zasadami bezpieczeństwa wyłączyć napędy.</p>	<p>VAROVÁNÍ Nebezpečné pohyby! Nebezpečí života!</p> <p>Nezdržujte se v dosahu pohybu strojů a jejich součástí.</p> <p>Zabraňte náhodnému přístupu osob.</p> <p>Před zásahem nebo vstupem do nebezpečného prostoru bezpečně zastavte pohonu.</p>
<p>VAROITUS Sähkömagneettisia/ magneettisia kenttiä! Terveystieteellisten haittojen vaara henkilöille, joilla on sydämentahdistin, metallinen implantti tai kuulolaite!</p> <p>Yllä mainituilta henkilöiltä on pääsy kielletty alueelle, joilla asennetaan tai käytetään käyttölaitteen komponentteja, tai heidän on ensin saatava tähän suostumus lääkäriltään.</p>	<p>OSTRZEŻENIE Pola elektromagnetyczne / magnetyczne! Zagrożenie zdrowia dla osób z rozrusznikiem serca, metalowymi implantami lub aparatami słuchowymi!</p> <p>Wstęp na teren, gdzie odbywa się montaż i eksploatacja napędów jest dla ww. osób zabroniony względnie dozwolony po konsultacji z lekarzem.</p>	<p>VAROVÁNÍ Elektromagnetická/ magnetická pole! Nebezpečí pro zdraví osob s kardiostimulátory, kovovými implantáty nebo naslouchadly!</p> <p>Výše uvedené osoby mají zakázán přístup do prostorů, kde jsou montovány a používány komponenty pohonu, resp. ho mají povolen pouze po poradě s lékařem.</p>
<p>HUOMIO Kuumia pintoja (> 60 °C)! Palovammojen vaara!</p> <p>Vältä metallipintojen koskettamista (esim. jäähdytyslevyt). Noudata käyttölaitteen komponenttien jäähtymisaikoja (väh. 15 minuuttia).</p>	<p>PRZESTROGA Gorące powierzchnie (> 60 °C)! Niebezpieczeństwo poparzenia!</p> <p>Unikać kontaktu z powierzchniami metalowymi (np. radiatorami). Przestrzegać czasów schładzania podzespołów napędów (min. 15 minut).</p>	<p>UPOZORNĚNÍ Horké povrchy (> 60 °C)! Nebezpečí popálení!</p> <p>Nedotýkejte se kovových povrchů (např. chladičích těles). Dodržujte dobu ochlazení komponent pohonu (min. 15 minut).</p>

 Suomi	 Polski	 Český
<p>▲ HUOMIO Epäasianmukainen käsittely kuljetuksen ja asennuksen yhteydessä! Loukkaantumisaara!</p> <p>Käytä soveltuvia asennus- ja kuljetuslaitteita.</p> <p>Käytä omia työkaluja ja henkilökohtaisia suojavarusteita.</p>	<p>▲ PRZESTROGA Niewłaściwe obchodzenie się podczas transportu i montażu! Ryzyko urazu!</p> <p>Stosować odpowiednie urządzenia montażowe i transportowe.</p> <p>Stosować odpowiednie narzędzia i środki ochrony osobistej.</p>	<p>▲ UPOZORNĚNÍ Nesprávné zacházení při přepravě a montáži! Nebezpečí zranění!</p> <p>Používejte vhodná montážní a dopravní zařízení.</p> <p>Používejte vhodné nářadí a osobní ochranné vybavení.</p>
<p>▲ HUOMIO Paristonjen epäasianmukainen käsittely! Loukkaantumisaara!</p> <p>Älä yritä saada tyhjiä paristoja toimimaan tai ladata niitä uudelleen (räjähdys- ja syöpymisaara).</p> <p>Älä hajota paristoja osiin tai vaurioita niitä. Älä heitä paristoja tullen.</p>	<p>▲ PRZESTROGA Niewłaściwe obchodzenie się z bateriami! Ryzyko urazu!</p> <p>Nie próbować reaktywować i nie ładować zużytych baterii (niebezpieczeństwo wybuchu oraz poparzenia żrącą substancją).</p> <p>Nie demontować i nie niszczyć baterii. Nie wrzucać baterii do ognia.</p>	<p>▲ UPOZORNĚNÍ Nesprávné zacházení s bateriemi! Nebezpečí zranění!</p> <p>Nepokoušejte se znovu aktivovat nebo dobíjet prázdné baterie (nebezpečí výbuchu a poleptání).</p> <p>Nerozebírejte ani nepoškozujte baterie. Neházejte baterie do ohně.</p>

 Slovensko	 Slovenčina	 Română
<p>▲ OPOZORILO Življenjska nevarnost pri neupoštevanju naslednjih napotkov za varnost!</p> <p>Izdelke začnite uporabljati šele, ko v celoti preberete, razumete in upoštevate izdelkom priloženo dokumentacijo in varnostne napotke.</p> <p>Če priložena dokumentacija ni na voljo v vašem maternem jeziku, se obrnite na pristojnega distributerja Rexroth.</p> <p>Samo kvalificirano osebje sme delati na pogonskih komponentah.</p> <p>Podrobnejša pojasnila o varnostnih navodilih najdete v poglavju 1 v tej dokumentaciji.</p>	<p>▲ VAROVANIE Nebezpečnostv ohrozenia života pri nedodržiavaní nasledujúcich bezpečnostných pokynov!</p> <p>Výrobky uvádzajte do prevádzky až potom, čo ste úplne prečítali, pochopili a zobrali do úvahy podklady a bezpečnostné pokyny dodané s výrobkom.</p> <p>Ak by ste nemali k dispozícii žiadne podklady v jazyku svojej krajiny, obráťte sa prosím na svojho príslušného predajcu Rexroth.</p> <p>Na komponentoch pohonu smie pracovať iba kvalifikovaný personál.</p> <p>Bližšie vysvetlenia k bezpečnostným pokynom zistíte z kapitoly 1 tejto dokumentácie.</p>	<p>▲ AVERTIZARE Pericol de moarte în cazul nerespectării următoarelor instrucțiuni de siguranță!</p> <p>Punerea în funcțiune a produselor trebuie efectuată după citirea, înțelegerea și respectarea documentelor și instrucțiunilor de siguranță, care sunt livrate împreună cu produsele.</p> <p>În cazul în care documentele nu sunt în limba dumneavoastră maternă, vă rugăm să contactați partenerul de vânzări Rexroth.</p> <p>Numai un personal calificat poate lucra cu componentele de acționare.</p> <p>Explicații detaliate privind instrucțiunile de siguranță găsiți în capitolul 1 al acestei documentații.</p>
<p>▲ OPOZORILO Visoka električna napetost! Življenjska nevarnost zaradi električnega udara!</p> <p>Pogonske komponente uporabljajte samo s fiksno nameščenim zaščitnim vodnikom.</p> <p>Pred dostopom do pogonske komponente odklopite napajanje.</p> <p>Upoštevajte čase praznjenja kondenzatorjev.</p>	<p>▲ VAROVANIE Vysoké elektrické napätie! Nebezpečnostv ohrozenia života v dôsledku zásahu elektrickým prúdom!</p> <p>Komponenty pohonu prevádzkujte iba s pevne nainštalovaným ochranným vodičom.</p> <p>Pred prístupom na komponenty pohonu odpojte zdroj napätia.</p> <p>Rešpektujte časy vybitia kondenzátorov.</p>	<p>▲ AVERTIZARE Tensiune electrică înaltă! Pericol de moarte prin electrocutare!</p> <p>Exploatați componentele de acționare numai cu împământarea instalată permanent.</p> <p>Înainte de intervenția asupra componentelor de acționare, deconectați alimentarea cu tensiune electrică.</p> <p>Țineți cont de timpii de descărcare ai condensatorilor.</p>
<p>▲ OPOZORILO Nevarni premiki! Življenjska nevarnost!</p> <p>Ne zadržujte se v območju delovanja strojev.</p> <p>Preprečite nenadzorovan dostop oseb.</p> <p>Pred prijemom ali dostopom v nevarno območje varno zaustavite vse gnane dele.</p>	<p>▲ VAROVANIE Pohyby prinášajúce nebezpečnostv! Nebezpečnostv ohrozenia života!</p> <p>Nezdržiavajte sa v oblasti pohybu strojov a častí strojov.</p> <p>Zabráňte nepovolanému prístupu osôb.</p> <p>Pred zásahom alebo prístupom do nebezpečnej oblasti uveďte pohony bezpečne do zastavenia.</p>	<p>▲ AVERTIZARE Mișcări periculoase! Pericol de moarte!</p> <p>Nu staționați în zona de mișcare a mașinilor și a componentelor în mișcare a mașinilor.</p> <p>Împiedicați accesul neintenționat al persoanelor în zona de lucru a mașinilor.</p> <p>Înainte de intervenția sau accesul în zona periculoasă, opriți în siguranță componentele de acționare.</p>

<p>SLO Slovensko</p>	<p>SK Slovenčina</p>	<p>RO Română</p>
<p>⚠ OPOZORILO Elektromagnetna / magnetna polja! Nevarnost za zdravje za osebe s spodbujevalniki srca, kovinskimi vsadki ali slušnimi aparati!</p> <p>Dostop do območij, v katerih so nameščene delujoče pogonske komponente, je za zgoraj navedene osebe prepovedan oz. dovoljen samo po posvetu z zdravnikom.</p>	<p>⚠ VAROVANIE Elektromagnetické/ magnetické polia! Nebezpečenstvo pre zdravie osôb s kardioštimulátormi, kovovými implantátmi alebo načúvacími prístrojmi!</p> <p>Prístup k oblastiam, v ktorých sú namontované a prevádzkujú sa komponenty pohonu, je pre hore uvedené osoby zakázaný resp. je dovolený iba po konzultácii s lekárom.</p>	<p>⚠ AVERTIZARE Câmpuri electromagnetice / magnetice! Pericol pentru sănătatea persoanelor cu stimuloare cardiace, implanturi metalice sau aparate auditive!</p> <p>Intrarea în zone, în care se montează sau se exploatează componente de acționare, este interzisă pentru persoanele sus numite respectiv este permisă numai cu acordul medicului.</p>
<p>⚠ POZOR Vroče površine (> 60 °C)! Nevarnost opeklin!</p> <p>Izogibajte se stiku s kovinskimi površinami (npr. hladilnimi telesii). Upoštevajte čas hlajenja pogonskih komponent (najm. 15 minut).</p>	<p>⚠ UPOZORNENIE Horúce povrchy (> 60 °C)! Nebezpečenstvo popálenia!</p> <p>Zabráňte kontaktu s kovovými povrchmi (napr. chladiacimi telesami). Dodržiavajte čas vychladenia komponentov pohonu (min. 15 minút).</p>	<p>⚠ ATENȚIE Suprafețe fierbinți (> 60 °C)! Pericol de arsuri!</p> <p>Nu atingeți suprafețele metalice (de ex. radiatoare de răcire). Respectați timpii de răcire ai componentelor de acționare (min. 15 minute).</p>
<p>⚠ POZOR Nestrokovno ravnanje med transportom in nameštívijo! Nevarnost poškodb!</p> <p>Uporablajte ustrezne pripomočke za nameščanje in transport.</p> <p>Uporabite ustrezno orodje in osebno zaščitno opremo.</p>	<p>⚠ UPOZORNENIE Neodborná manipulácia pri transporte a montáži! Nebezpečenstvo poranenia!</p> <p>Používajte vhodné montážne a transportné zariadenia.</p> <p>Používajte vhodné náradie a osobné ochranné prostriedky.</p>	<p>⚠ ATENȚIE Manipulare necorespunzătoare la transport și montaj! Pericol de vătămare!</p> <p>Utilizați dispozitive adecvate de montaj și transport.</p> <p>Folosiți instrumente corespunzătoare și echipament personal de protecție.</p>
<p>⚠ POZOR Nepravilno ravnanje z baterijami! Nevarnost poškodb!</p> <p>Ne poskušajte ponovno aktivirati ali napolniti praznih baterij (Nevarnost zaradi eksplozije ali jedkanja).</p> <p>Ne razstavljajte ali poškodujte nobenih baterij. Baterij ne mečite v ogenj.</p>	<p>⚠ UPOZORNENIE Neodborná manipulácia s batériami! Nebezpečenstvo poranenia!</p> <p>Nepokúšajte sa reaktivovať alebo nabíjať prázdne batérie (nebezpečenstvo výbuchu a poleptania).</p> <p>Batérie nerozoberajte ani nepoškodzuje. Nehádzte batérie do ohňa.</p>	<p>⚠ ATENȚIE Manipulare necorespunzătoare a bateriilor! Pericol de vătămare!</p> <p>Nu încercați să reactivați sau să încărcăți bateriile goale (pericol de explozie și pericol de arsuri).</p> <p>Nu dezasamblați și nu deteriorați bateriile. Nu aruncați bateriile în foc.</p>

<p>H Magyar</p>	<p>BG Български</p>	<p>LV Latviski</p>
<p>⚠ FIGYELMEZTETÉS! Az alábbi biztonsági útmutatások figyelmen kívül hagyása életveszélyes helyzethez vezethet!</p> <p>Üzembe helyezés előtt olvassa el, értelmezze, és vegye figyelembe a csomagban található dokumentumban foglaltakat és a biztonsági útmutatásokat.</p> <p>Amennyiben a csomagban nem talál az Ön nyelvén írt dokumentumokat, vegye fel a kapcsolatot az illetékes Rexroth-képviselővel.</p> <p>A hajtás alkatrészein kizárólag képzett személy dolgozhat.</p> <p>A biztonsági útmutatókkal kapcsolatban további magyarázatot ennek a dokumentumnak az első fejezetében találhat.</p>	<p>⚠ ПРЕДУПРЕЖДЕНИЕ Опасност за живота при неспазване на посочените подолу инструкции за безопасност!</p> <p>Използвайте продуктите след като сте се запознали подробно с приложената към продукта документация и указания за безопасност, разбрали сте ги и сте се съобразили с тях.</p> <p>Ако текстът не е написан на Вашия език, моля обърнете се към Вашия компетентен търговски представител на Rexroth.</p> <p>Със задвижващите компоненти трябва да работи само квалифициран персонал.</p> <p>Подробни пояснения към инструкциите за безопасност можете да видите в Глава 1 на тази документация.</p>	<p>⚠ BRĪDINĀJUMS Turpinājuma doto drošības norādījumu neievērošana var apdraudēt dzīvību!</p> <p>Sāciet lietot izstrādājumu tikai pēc tam, kad esat pilnībā izlasījuši, sapratuši un nēmuši vērā kopā ar izstrādājumu piegādātos dokumentus.</p> <p>Ja dokumenti nav pieejami Jūsu valsts valodā, vērsieties pie pilnvarotā Rexroth izplatītāja.</p> <p>Darbus pie piedziņas komponentiem drīkst veikt tikai kvalificēts personāls.</p> <p>Detalizētus paskaidrojumus attiecībā uz drošības norādījumiem skatiet šī dokumenta 1. nodaļā.</p>
<p>⚠ FIGYELMEZTETÉS! Magas elektromos feszültség! Életveszély áramütés miatt!</p> <p>A hajtás alkatrészeit csak véglegesen telepített védővezetővel üzemeltesse!</p> <p>Mielőtt hozzányúl a hajtás alkatrészeihez, kapcsolja ki az áramellátást.</p> <p>Ügyeljen a kondenzátorok kisülési idejére!</p>	<p>⚠ ПРЕДУПРЕЖДЕНИЕ Високо електрическо напрежение! Опасност за живота от удар от електрически ток!</p> <p>Работете със задвижващите компоненти само при здраво закрепен заземяващ проводник.</p> <p>Преди работа по задвижващите компоненти, изключете захранващото напрежение.</p> <p>Обърнете внимание на времето за разреждане на кондензаторите.</p>	<p>⚠ BRĪDINĀJUMS Augsts elektriskais spriegums! Dzīvības apdraudējums elektriskā trieciena dēļ!</p> <p>Piedziņas komponentus darbiniet tikai ar fiksēti uzstādītu zemējumvadu.</p> <p>Pirms darba pie piedziņas komponentiem atslēdziet elektroapgādi.</p> <p>Ņemiet vērā kondensatoru izlādes laikus.</p>

H Magyar	BG Български	LV Latviski
<p>▲ FIGYELMEZTETÉS! Veszélyes mozgás! Életveszély!</p> <p>Ne tartózkodjon a gépek és a gépkatrészek mozgási területén belül!</p> <p>Illetéktelen személyeket ne engedjen a gép közelébe!</p> <p>Mielőtt beavatkozik, vagy a veszélyes zónába lép a hajtásokat biztonságosan állítsa le.</p>	<p>▲ ПРЕДУПРЕЖДЕНИЕ Опасни движения! Опасност за живота!</p> <p>Не стойте в обсега на движение на машините и частите на машините.</p> <p>Не допускайте непреднамерен достъп на хора.</p> <p>Преди работа или влизане в опасната зона, спрете надеждно приводния механизъм.</p>	<p>▲ BRĪDINĀJUMS Bīstamas kustības! Dzīvības apdraudējums!</p> <p>Neuzturieties mašīnu un mašīnas detaļu kustību zonā.</p> <p>Novērsiet nepiederošu personu piekļūšanu.</p> <p>Pirms darba bīstamajās zonās pilnībā apstādiniet piedziņu.</p>
<p>▲ FIGYELMEZTETÉS! Elektromágneses / mágneses mező! Káros hatással lehet a szívritmus-szabályozó készülékkel, fémbelüktetéssel vagy hallókészülékkel rendelkezők egészségére!</p> <p>Azokra a területekre, ahol hajtások alkatrészeit szerelik és üzemeltetik, a fent említett személyeknek tilos a belépés, illetve csak orvosi konzultációt követően szabad az adott területekre lépniük.</p>	<p>▲ ПРЕДУПРЕЖДЕНИЕ Електромагнитни / магнитни полета! Опасност за здравето на хора със сърдечни стимулатори, метални импланти или слухови апарати!</p> <p>Достъпът за гореспоменатите лица до зони, в които ще се монтират и ще работят задвижващи компоненти се забранява, или разрешава само след консултация с лекар.</p>	<p>▲ BRĪDINĀJUMS Elektromagnētiskais / magnētiskais lauks! Veselības apdraudējums personām ar sirds stimulatoriem, metāliskiem implantiem vai dzirdes aparātiem!</p> <p>Tuvošanās zonām, kurās tiek montēti un darbināti piedziņas komponenti, iepriekš minētajām personām ir aizliegta, respektīvi, atļauta tikai pēc konsultēšanās ar ārstu.</p>
<p>▲ VIGYÁZAT! Forró felületek (> 60 °C)! Égésveszély!</p> <p>Ne érjen hozzá fémfelületekhez (pl. hűtőtetekhez)! Vegye figyelembe a hajtás alkatrészeinek kihűlési idejét (min. 15 perc)!</p>	<p>▲ ВНИМАНИЕ Горещи повърхности (> 60 °C)! Опасност от изгаряне!</p> <p>Не докосвайте метални повърхности (например радиатори). Съблюдавайте времето на охлаждане на задвижващите компоненти (мин. 15 минути).</p>	<p>▲ UZMANĪBU Karstas virsmas (> 60 °C)! Apdedzināšanās risks!</p> <p>Neskarīties pie metāliskām virsmām (piemēram, dzesētāja). Ļaujiet piedziņas komponentiem atdzist (min. 15 minūtes).</p>
<p>▲ VIGYÁZAT! Szakszerűtlen kezelés szállításkor és szereléskor! Sérülésveszély!</p> <p>A megfelelő beszerelési és szállítási eljárásokat alkalmazza!</p> <p>Használjon megfelelő szerszámokat és személyes védőfelszerelést!</p>	<p>▲ ВНИМАНИЕ Неправилно боравене по време на транспорт и монтаж! Опасност от нараняване!</p> <p>Използвайте подходящо монтажно и транспортно оборудване.</p> <p>Използвайте подходящи инструменти и лични предпазни средства.</p>	<p>▲ UZMANĪBU Nepareizi veikta transportēšana un montāža! Traumu gūšanas risks!</p> <p>Izmantojiet piemērotas montāžas un transportēšanas ierīces.</p> <p>Izmantojiet piemērotus instrumentus un individuālos aizsardzības līdzekļus.</p>
<p>▲ VIGYÁZAT! Akkumulátorok szakszerűtlen kezelése! Sérülésveszély!</p> <p>Üres akkumulátorokat ne aktiváljon újra, illetve ne töltsön fel (robbanás- és marásveszély)!</p> <p>Az akkumulátorokat ne szedje szét, és ne rongálja meg! Az akkumulátort ne dobja tűzbe!</p>	<p>▲ ВНИМАНИЕ Неправилно боравене с батерии! Опасност от нараняване!</p> <p>Не се опитвайте да активирате отново или да зареждате разредени батерии (Опасност от експлозия и напръскване с агресивен агент).</p> <p>Не разглобявайте и не повреждайте батерии. Не хвърляйте батерии в огън.</p>	<p>▲ UZMANĪBU Nepareiza bateriju lietošana! Traumu gūšanas risks!</p> <p>Nemēģiniet no jauna aktivizēt vai uzlādēt tukšas baterijas (eksploziju un ķīmisko apdegumu draudi).</p> <p>Neizjauciet un nesabojājiet baterijas. Nemetiet baterijas ugunī.</p>

<p>LT Lietuviškai</p>	<p>EST Eesti</p>	<p>GR Ελληνικά</p>
<p>⚠️ ISPĖJIMAS Pavojus gyvybei nesilaikant toliau pateikiamų saugumo nurodymų!</p> <p>Naudokite gaminį tik kruopščiai perskaitę prie jo pridėtus aprašus, saugumo nurodymus. Susipažinkite su jais ir vadovaukitės naudodami gaminį.</p> <p>Jei Jūs negavote aprašo gimtąja kalba, kreipkitės į igaliotus Rexroth atstovus.</p> <p>Prie pavaros komponentų leidžiama dirbti tik kvalifikuotam personalui.</p> <p>Išsamesnius saugumo nurodymų paaiškinimus rasite šios dokumentacijos 1 skyriuje.</p>	<p>⚠️ HOIATUS Alljärgnevatate ohutusjuhiste eiramine on eluohtlik!</p> <p>Võtke tooted käiku alles siis, kui olete toodetega kaasasolevad materjalid ning ohutusjuhised täielikult läbi lugenud, neist aru saanud ja neid järginud.</p> <p>Kui Teil puuduvad emakeelsed materjalid, siis pöörduge Rexrothi kohaliku müügiesinduse poole.</p> <p>Ajamikomponentidega tohib töötada üksnes kvalifitseeritud personal.</p> <p>Täpsemaid selgitusi ohutusjuhiste kohta leiate käesoleva dokumentatsiooni peatükist 1.</p>	<p>⚠️ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Κίνδυνος θανάτου σε περίπτωση μη συμμόρφωσης με τις παρακάτω οδηγίες ασφαλείας!</p> <p>Θέστε το προϊόν σε λειτουργία αφού διαβάσετε, κατανοήσετε και λάβετε υπόψη το σύνολο των οδηγιών ασφαλείας που το συνοδεύουν.</p> <p>Εάν δεν υπάρχει τεκμηρίωση στη γλώσσα σας, απευθυνθείτε σε εξουσιοδοτημένο αντιπρόσωπο της Rexroth.</p> <p>Μόνο εξειδικευμένο προσωπικό επιτρέπεται να χειρίζεται στοιχεία μετάδοσης κίνησης.</p> <p>Περαιτέρω επεξηγήσεις των οδηγιών ασφαλείας διατίθενται στο κεφάλαιο 1 της παρούσας τεκμηρίωσης.</p>
<p>⚠️ ISPĖJIMAS Aukšta elektros įtampa! Pavojus gyvybei dėl elektros smūgio!</p> <p>Pavaros komponentus eksploatuokite tik su fiksuotai instaliuotu apsauginiu laidu.</p> <p>Prieš prieidami prie pavaros komponentų išjunkite maitinimo įtampą.</p> <p>Atsižvelkite į kondensatorių išsikrovimo trukmę.</p>	<p>⚠️ HOIATUS Kõrge elektripinge! Eluohtlik elektrilöögi tõttu!</p> <p>Käitage ajamikomponente üksnes püsival installaeritud maandusega.</p> <p>Lülitage enne ajamikomponentidega tööde alustamist toitepinge välja.</p> <p>Järgige kondensaatorite mahalaadumisaegu.</p>	<p>⚠️ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Υψηλή ηλεκτρική τάση! Κίνδυνος θανάτου από ηλεκτροπληξία!</p> <p>Θέτετε σε λειτουργία τα στοιχεία μετάδοσης κίνησης μόνο εφόσον έχει τοποθετηθεί καλά προστατευτικός αγωγός γείωσης.</p> <p>Πριν από οποιαδήποτε παρέμβαση, αποσυνδέστε την τροφοδοσία των στοιχείων μετάδοσης κίνησης.</p> <p>Λάβετε υπόψη τους χρόνους αποφόρτισης των πυκνωτών.</p>
<p>⚠️ ISPĖJIMAS Pavojingi judesiai! Pavojus gyvybei!</p> <p>Nebūkite mašinų ar jų dalių judėjimo zonoje. Neleiskite netyčia patekti asmenims.</p> <p>Prieš patekdami į pavojaus zoną saugiai išjunkite pavaras.</p>	<p>⚠️ HOIATUS Ohtlikud liikumised! Eluohtlik!</p> <p>Ärge viibige masina ja masinaosade liikumispiirkonnas.</p> <p>Tõkestage inimeste ettekavatsematu sisenemine masina ja masinaosade liikumispiirkonda.</p> <p>Tagage ajamite turvaline seiskamine enne ohupiirkonda juurdepääsu või sisenemist.</p>	<p>⚠️ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Επικίνδυνες τάσεις! Κίνδυνος θανάτου!</p> <p>Μην στέκεστε στην περιοχή κίνησης μηχανημάτων και εξαρτημάτων.</p> <p>Αποτρέψτε την τυχαία είσοδο ατόμων.</p> <p>Πριν από την παρέμβαση ή πρόσβαση στην περιοχή κινδύνου, μεριμνήστε για την ασφαλή ακινητοποίηση των συστημάτων μετάδοσης κίνησης.</p>
<p>⚠️ ISPĖJIMAS Elektromagnetiniai / magnetiniai laukai! Pavojus asmenų su širdies stimulatoriais, metaliniais implantais arba klausos aparatais sveikatai!</p> <p>Prieiga prie zonų, kuriose montuojami ir eksploatuojami pavaros komponentai, aukščiau nurodytiems asmenims yra draudžiama arba leistina tik pasitarus su gydytoju.</p>	<p>⚠️ HOIATUS Elektromagnetilised / magnetilised väljad! Terviseohtlik südamestimulaatorite, metallimplantaatide ja kuulmisseadmetega inimestele!</p> <p>Sisenemine piirkondadesse, kus toimub ajamikomponentide monteerimine ja käitamine, on ülalnimetatud isikutele keelatud või lubatud üksnes pärast arstiga konsulteerimist.</p>	<p>⚠️ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Ηλεκτρομαγνητικά/ μαγνητικά πεδία! Κίνδυνος για την υγεία ατόμων με καρδιακούς βηματοδότες, μεταλλικά εμφυτεύματα ή συσκευές ακοής!</p> <p>Η είσοδος σε περιοχές όπου πραγματοποιείται συναρμολόγηση και λειτουργία στοιχείων μετάδοσης κίνησης απαγορεύεται στα προαναφερθέντα άτομα, εκτός αν τους έχει δοθεί σχετική άδεια κατόπιν συνεννόησης με γιατρό.</p>
<p>⚠️ PERSPĖJIMAS Karšti paviršiai (> 60 °C)! Nudėgimo pavojus!</p> <p>Venkite liesti metalinius paviršius (pvz., radiatorių). Išlaikykite pavaros komponentų atvėsimą trukmę (bent 15 minučių).</p>	<p>⚠️ ETTEVAATUST Kuumad välispinnad (> 60 °C)! Põletusoh!</p> <p>Vältige metalsete välispindade (nt radiaatorid) puudutamist. Pidage kinni ajamikomponentide mahajahtumisaegast (vähemalt 15 minutit).</p>	<p>⚠️ ΠΡΟΣΟΧΗ Καυτές επιφάνειες (> 60 °C)! Κίνδυνος εγκαύματος!</p> <p>Αποφεύγετε την επαφή με μεταλλικές επιφάνειες (π.χ. μονάδες ψύξης). Λάβετε υπόψη το χρόνο ψύξης των στοιχείων μετάδοσης κίνησης (τουλάχιστον 15 λεπτά).</p>

LT Lietuviškai	EST Eesti	GR Ελληνικά
<p>▲ PERSPĖJIMAS Netinkamas darbas transportuojant ir montuojant! Susižalojimo pavojus!</p> <p>Naudokite tinkamus montavimo ir transportavimo įrenginius.</p> <p>Naudokite tinkamus įrankius ir asmens saugos priemones.</p>	<p>▲ ETTEVAATUSTI Asjatundmatu käsitsemine transportimisel ja montaažil! Vigastusoht!</p> <p>Kasutage sobivaid montaaži- ja transportiseadiseid.</p> <p>Kasutage sobivaid tööriistu ja isiklikku kaitsevarustust.</p>	<p>▲ ΠΡΟΣΟΧΗ Ακατάλληλος χειρισμός κατά τη μεταφορά και συναρμολόγηση! Κίνδυνος τραυματισμού!</p> <p>Χρησιμοποιείτε κατάλληλους μηχανισμούς συναρμολόγησης και μεταφοράς.</p> <p>Χρησιμοποιείτε κατάλληλα εργαλεία και ατομικό εξοπλισμό προστασίας.</p>
<p>▲ PERSPĖJIMAS Netinkamas darbas su baterijomis! Susižalojimo pavojus!</p> <p>Nebandykite tuščių baterijų reaktivuoti arba įkrauti (sprogimo ir išėsdinimo pavojus).</p> <p>Neardykite ir nepažeiskite baterijų.</p> <p>Nemeskite baterijų į ugnį.</p>	<p>▲ ETTEVAATUSTI Patareide asjatundmatu käsitsemine! Vigastusoht!</p> <p>Ärge üritage kunagi tühje patareisid reaktiveerida või täis laadida (plahvatus- ja söövitusoht).</p> <p>Ärge demonteerige ega kahjustage patareisid. Ärge visake patareisid tulle.</p>	<p>▲ ΠΡΟΣΟΧΗ Ακατάλληλος χειρισμός μπαταριών! Κίνδυνος τραυματισμού!</p> <p>Μην επιδιώκετε να ενεργοποιήσετε ξανά ή να φορτίσετε κενές μπαταρίες (κίνδυνος έκρηξης και διάβρωσης).</p> <p>Μην διαλύετε ή καταστρέφετε τις μπαταρίες. Μην απορρίπτετε τις μπαταρίες στη φωτιά.</p>

CN 中文
<p>▲ 警告 如果不按照下述指定的安全说明使用，将会导致人身伤害！</p> <p>在没有阅读，理解随本产品附带的文件并熟知正当使用前，不要安装或使用本产品。</p> <p>如果没有您所在国家官方语言文件说明，请与 Rexroth 销售伙伴联系。</p> <p>只允许有资格人员对驱动器部件进行操作。</p> <p>安全说明的详细解释在本文档的第一章。</p>
<p>▲ 警告 高压！电击导致生命危险！</p> <p>只有在安装了永久良好的设备接地导线后才可以对驱动器的部件进行操作。</p> <p>在接触驱动器部件前先将驱动器部件断电。</p> <p>确保电容放电时间。</p>
<p>▲ 警告 危险运动！生命危险！</p> <p>保证设备的运动区域内和移动部件周围无障碍物。</p> <p>防止人员意外进入设备运动区域内。</p> <p>在接近或进入危险区域之前，确保传动设备安全停止。</p>
<p>▲ 警告 电磁场/磁场！对佩戴心脏起搏器、金属植入物和助听器的人员会造成严重的人身伤害！</p> <p>上述人员禁止进入安装及运行的驱动器区域，或者必须事先咨询医生。</p>
<p>▲ 小心 热表面（大于 60 度）！灼伤风险！</p> <p>不要触摸金属表面（例如散热器）。驱动器部件断电后需要时间进行冷却（至少 15 分钟）。</p>
<p>▲ 小心 安装和运输不当导致受伤危险！当心受伤！</p> <p>使用适当的运输和安装设备。</p> <p>使用适合的工具及用适当的防护设备。</p>
<p>▲ 小心 电池操作不当！受伤风险！</p> <p>请勿对低电量电池重新激活或重新充电（爆炸和腐蚀的危险）。</p> <p>请勿拆解或损坏电池。请勿将电池投入明火中。</p>

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1 About this documentation





1.1 Validity of the documentation

This instruction must be observed by assemblers, operator, service engineers and facility operators. It contains notes about handling the motor components primary and secondary part of a LSF kit motor.

Before you operate motors, read this operating instruction to ensure a safe and frictionless functionality and a long motor lifetime.

1.2 Additional documentation

This operating instruction is only valid with the following Rexroth documentation:

	Title	Document type	Document number
	Synchronous Linear Motors LSF	Project planning manual	DOK-MOTOR*-LSF*****-GN□□-□□-P
	Rexroth Connection Cable IndraDrive and IndraDyn	Selection data	DOK-CONNec-CABLE*INDRV-AU□□-□□-P
	Electromagnetic Compatibility in Drive and Control Systems (DOK-GENERL-EMV*****-PR□□-□□-P).	Project planning	DOK-GENERL-EMV*****-PR□□-□□-P
	Documentation about special products are available on demand.		

Tab. 1-1: Additional documentation

1.3 Presentation of information

Safety instructions The safety notes in this documentation describe signal words (danger, warning, caution, note) and a signal symbol (acc. to ANSI Z535.6-2006).

The signal word is intended to draw your attention to the safety instructions and describes the seriousness of the danger. The warning triangle with exclamation mark indicates the danger for persons.

DANGER

Non-compliance with this safety instructions **will** result in death or severe personal injury.

WARNING

Non-compliance with this safety instructions **can** result in death or severe personal injury.

CAUTION


Non-compliance with this safety instructions can result in moderate or minor personal injury.

About this documentation

NOTICE

Non-compliance with this safety instructions can result in material damage.

Symbols

Symbol	Significance
	Reference to supplementary documentation
	This note gives important information, which must be observed.
	Single, independent handling step
1. 2. 3.	Numbered instruction The numbers specify the handling steps
	Warning against dangerous electric voltage.
	Warning against hot surfaces.
	Warning against rotating machine parts.
	Warning against overhead load.
	Warning against crushing hazard.
	Electrostatic sensitive devices.
	Prohibition for persons with cardiac pacemaker.
	Do not carry along metal parts or clocks.
	Hammer scales are forbidden.
	The UL Recognized Component Mark identifies recognized component parts which are components of a bigger product or system.
	The letters "C" and "E" stand for „Communautés Européennes“. The CE-marking expresses the conformity of a product with relevant EC-regulations. Conformity with the Low Voltage Directive 2006/95EC, DIN EN 60034-1, DIN EN 60034-5 is confirmed for LSF motors.
	Components for the use in systems for "integrated safety technique" prepared.

Tab. 1-2: *Meaning of symbols*

2 Safety instructions

2.1 About this product

Observe the general safety notes in this chapter and the safety instructions in this documentation. Therewith, you avoid personal danger, damage and errors



This operating instruction must be stored and transferred in case of sale during the complete product lifetime.

2.2 Intended use



Handle all motor components carefully, in all kinds of situations. Pay close attention to the safety notes and notes regarding the magnetic pull of the permanent magnets on the secondary part.

Prerequisites for proper and safe use of the motors are proper transport, appropriate storage, proper assembly and connection, careful maintenance, operation and overhaul.

The motors have been designed for installation in industrial machinery. The motors are according to the following standards and directives.

Standards

DIN EN 60034-1	Rating and performance behavior
DIN EN 60034-5	Degree of protection

Directives

2006/95/EG	Low voltage directive
------------	-----------------------

The machine manufacturer must evaluate the electric and mechanic safety as well as environmental influences in the assembled state of the machine according to the Machine Directive 2006/42/EC and DIN EN 60204-1 (safety of machines).

The electric installation must comply with the protection requirements of the EMC Directive 2004/108/EC. The plant manufacturer is responsible for appropriate installation (for example: physical separation of signal and power cables, using shielded cables, ...). The EMC instructions of the converter manufacturer must be observed.

Start-up is prohibited as long as the conformity with these directives is declared.

Safety instructions

2.3 Unintended use

Any use of the motors outside of the specified fields of application or under operating conditions and technical data other than those specified in this documentation is considered to be "inappropriate use".

Unless explicitly provided for this purpose, the motors may not be used in explosion-hazardous areas (ATEX).

Trademark right third parties

Observe the trademark rights of third parties during assembly and use of single components delivered from Bosch Rexroth. For any infringement of the right, the customer is liable for the accruing damage.

2.4 Qualification of personnel

This operating instruction is intended for persons, who are familiar with transportation, installation, assembly, start-up and operation of components of electric drive and control systems and therewith associated danger and they must have appropriate qualifications.

All persons, working on, with or near an electric facility, must know the safety requirements, safety instructions and operating instructions (DIN EN 50110-1).

2.5 General safety instructions

Do not install or operate motors or components of an electric drive and control system, as long as you have not read and understood all relevant documents.

Please observe the respectively valid national, local and plant-specific regulations, the safety notes in the documentation and the warning signs on the components.

Improper use of the components and non-observance of the described safety notes can lead to damage, bodily injury, electric shock or in extreme case lead to death.

In the case of damage due to non-observance of the safety notes, Bosch Rexroth assumes no liability.

2.6 Product- and technology-dependent safety instructions

2.6.1 Protection from electric voltage

Work required on the electric system may only be carried out by skilled electricians. Tools for electricians (VDE tools) are absolutely necessary.

Before working:

1. Enable.
2. Secure against reactivation.
3. Ensure de-energization.
4. Ground and short-circuit.
5. Cover or shield any adjacent live parts.

After completing the job, cancel the measures in reverse order.

Dangerous voltage occurs during operation! Danger to life, risk of injury by electric shock!

- Before start-up, connect the protective conductors on all electric components according to the connection plan.

- Operation, even for short measuring purposes is only allowed with fixed connected protective conductor on the specified points of the components.

2.6.2 Protection from mechanical danger

Dangerous movements! Danger to life, risk of injury, heavy injury or material damage.

- Do not stay within the motion zone of the machine. Avoid unauthorized access into the danger zone.
- Additionally secure vertical axes to prevent them from sinking or descending after having shutdown the motor, for instance as follows:
 - Mechanically lock the vertical axis,
 - providing an external braking / catching / clamping device, or
 - ensuring sufficient equilibration of the vertical axis.

2.6.3 Protection against magnetic and electromagnetic fields

Magnetic and electromagnetic fields are created in the direct environment of live conductors or permanent magnets of electro motors and are a serious danger for persons. The machine operator must sufficiently protect personnel working in these areas from possibly occurring damage by suitable measures (e.g. warning notes, protective clothes, designation of the danger zone). Observe the safety instructions [chapter 2.6.4 "Protection during handling and assembly" on page 18](#).

Observe the country-specific regulations. For Germany, please observe the specifications of the occupational insurance association BGV B11 and BGR B11 regarding "electromagnetic fields".

Electro magnetic and magnetic fields!

Danger for persons with active body aids or passive metallic implants and for pregnant women.

- For persons with active body aids (like heart pacemakers), passive metallic implants (like hip prosthesis) and pregnant women possible hazards exist due to electro magnetic or magnetic fields in direct environment of electric drive and control components and the corresponding live conductors.

Access into these areas can be dangerous for these persons:

- Areas, in which components of electrical drive and control systems and corresponding live conductors are mounted, activated or operated.
- Areas in which motor parts with permanent magnets are stored, repaired or assembled.
- Above mentioned persons must contact their attending physician before entering these areas.
- Please observe the valid industrial safety regulations for plants which are fitted with components of electrical drive and control systems and corresponding live conductors.

Risk of destruction of sensitive parts! Data loss!

- Keep watches, credit cards, check cards and identity cards and all ferromagnetic metal parts, such as iron, nickel and cobalt away from permanent magnets.

Safety instructions

Crushing hazard of fingers and hand due to heavy attractive forces of the magnets!

The attractive force of the permanent magnets have an effect on all magnetic materials. These attractive forces surge especially within a neighborhood < 100 mm. Loose or not fastened components made of magnetizable materials can abruptly and inadvertently attracted with the permanent magnets. Apart from crushing hazard, even the danger of chipping recalcitrant material, causing eye injury, exists.

- Extreme caution during handling of motor components with permanent magnets. Do never underestimate strong attractive forces.
- Never work alone.
- Use personal safety equipment (e.g. protective gloves, protective glasses).
- Unpack single motor components with permanent magnets immediately prior mounting.
- Do not unpack several motor components with permanent magnets or directly place them side by side at your working space.
- Do not bring magnetized or magnetizable materials in the area of permanent magnets. If using magnetizable tools cannot be avoided, hold on the tool very tight, move carefully and observe the attractive force effect of the permanent magnets.

Behavior in the case of accidents with permanent magnets

During work with permanent magnets, the following emergency tools must be ready to use in the case of an accident to release impacted body parts (like fingers, hands, arms a.s.o.):

- Hammer (3-5kg) made of non-magnetized material like brass
- Minimum 2 wedges with approx. 10 - 15 ° lip angles made of non-magnetized material like brass, wood or similar to impact driving into the cutting slit.
- A crowbar made of brass.

In the case of an accident:

- Keep calm!
- If the machine is live, immediately de-energize (emergency button).
- Give first aid or request appropriate help (e.g. emergency doctor).
- Disconnect magnetic adherent parts with the emergency tools. Therefore, beat the wedges with a hammer into the cutting slit to free the caught body parts.

2.6.4 Protection during handling and assembly

Motor components with permanent magnets (e.g. secondary parts of a synchronous linear motor or rotor of a synchronous kit motor) create very strong attractive forces from ferromagnetic parts like further motor components with permanent magnets or parts of iron, nickel or cobalt.

Please observe the safety notes about strong attractive forces of permanent magnets under [chapter 2.6.3 "Protection against magnetic and electromagnetic fields"](#) on page 17.

The attractive forces of the permanent magnets influence all magnetizable materials. Especially in an area < 100 mm, the attractive forces rise. Sur-

Safety instructions

rounding components can abruptly and inadvertently be attracted by the permanent magnets. Apart from crushing hazard, even the danger of chipping recalcitrant material, causing eye injury, exists.

Use the origin package of the motor components for transport and storage only. The origin package of Rexroth is constructed in such a way that the motor components with the permanent magnets are positioned within the package with suitable distance, providing that the package is correctly used.

Observe the following instructions during unpacking and handling.

- Instruct the personal with regard to the danger.
- Use personal safety equipment (e.g. protective gloves, protective glasses).
- Store all components in its origin package until assembly and for transport.
- Do only work on clean working spaces in which no ferromagnetic parts exist.
- If possible, use non-magnetic tools, e.g. made from aluminum or brass.
- Remove only one motor component from the package and secure it on your working space against slipping, rolling away.

Instruct all participating persons about the dangers and if necessary, expand the preliminary instructions.

Store the original package of the motor components with permanent magnets

Store the original package for later use.

In the case of reuse, ensure a good readability of the safety notes on the package. They must not be paste over!

Risk of injuries due to improper handling! Bodily injury due to crushing, scissors, cutting, punching!

- Observe the instructions on the package.
- Store the motor components with permanent magnets in the original package, only.
- Do not internally store or transport the motor components unpacked.
- Observe the accident prevention regulations.
- Use suitable assembly and transport equipment.
- Prevent clamping and squeezing by means of suitable measures.
- Use suitable tools, if necessary use special tools.
- Properly use lifting devices and tools.
- Use suitable safety equipment (like protective helmets, protective glasses, safety shoes, protective gloves).
- Never walk under hanging loads.
- Immediately remove spill on the ground, otherwise risk of falling!

2.6.5 Protection against burns

Risk of burns due to hot motor surfaces!

- Avoid contact with hot motor surfaces. **Temperatures may rise over 60 °C.**

Safety instructions

- Allow the motor components to cool down long enough before touching them.
- Temperature-sensitive components may not come into contact with the motor surface. Ensure appropriate mounting distance of connection cables and other components.

2.6.6 Electrostatic sensitive devices (EGB)

Rexroth motors contain parts which underlie an electrostatic danger. These components, especially temperature sensors of the motor winding can be destroyed by improper use.

Avoid, e.g. direct contact of open wires of the connection cable of temperature sensors without being electrostatically discharged or grounded.



Do suitable ESD protective measures before you handle imperiled components (e.g. ESD protective clothes, wristlets, conductive floor, grounded cabinets and working surfaces).

3 Scope of delivery

The total scope of delivery is listed on the delivery note or waybill. However, its content can be partitioned in several packages. Each package can be identified by a forwarding label.

**Scope of delivery of primary part
LSP**

The scope of delivery of a primary part contains:

- Primary part in origin package
- Type plate
- Safety instructions

**Scope of delivery secondary part
LSS**

The scope of delivery of a secondary part contains:

- Secondary part in origin package
- Type plate
- Safety instructions

At delivery, immediately check if the supplied components match with the delivery note. The carrier must be informed immediately, in the case of any damaged package and goods. Start-up of damaged goods is prohibited.

4 About this product

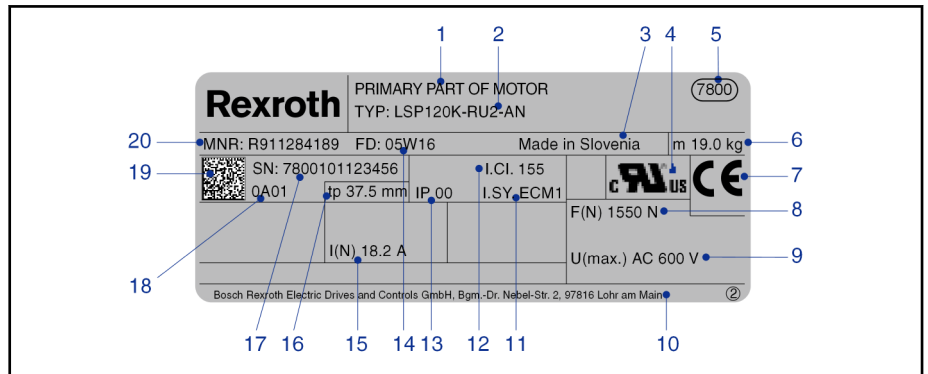
4.1 Product description

4.1.1 Technical features

Product	Three phase synchronous motor
Manufacturer	Bosch Rexroth Electric Drives and Controls GmbH Buergermeister-Dr.-Nebel-Straße 2 97816 Lohr am Main, Germany
Type	LSP 040, -080, -120, -140, -160, -200, -240 LSS 040, -080, -120, -140, -160, -200, -240
Listed acc. to UL standard (UL)	UL 1004, Fifth Edition
Listed acc. to CSA standard (UL)	Canadian National Standard(s) C22.2 No. 100-95
UL-Files (UL)	E341734
Ambient temperature during operation	0 ... 40 °C
Motor design	Open (kit motor)
Degree of protection	IP65 (DIN EN 60034-5)
Installation altitude	0 ... 1000 m
Sound pressure level	< 75 dB(A)
Insulation class	155 (DIN EN 60034-1)
Electrical connection	Connection cable

4.2.2 Designation of LSP

A type plate is mounted in front of the primary part, on which the power and coolant connection are fastened. The type plate makes a definite identification of the primary part possible. A second type plate is enclosed. This can be adjusted on the machine or used ulterior by the user. The type plate of the primary part contains the following data



- 1 Motor type
- 2 Type designation
- 3 Designation of origin
- 4 UL-label
- 5 Factory number
- 6 Mass of primary part
- 7 EC declaration of conformity
- 8 Rated power
- 9 Maximum input voltage
- 10 Company address
- 11 Insulation system
- 12 Thermal temperature class
- 13 Protection by housing
- 14 Manufacturing date
- 15 Rated current
- 16 Pole pitch
- 17 Serial number
- 18 Revision state
- 19 Rexroth barcode
- 20 Material number

Fig. 4-2: Type plate example primary part

About this product

4.2.3 Type Code LSS

Product	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	L S S = Secondary part of a synchronous kit motor
Frame size	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	_ = see LSF project planning manual
Magnet carrier design	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	_ = see LSF project planning manual
Mechanical design	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	3 = Fastening by screws
Segment length	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	_ = see LSF project planning manual
Cover plate	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ _ _ _
	A = with cover plate
Special design	L S S _ _ _ - _ _ - _ _ _ _ _ _ _ / _ _ _ _ _
	S 0 0 1 = without cover plate
	S 0 0 2 = with alternative cover plate fastening

Fig. 4-3: Type plate LSS



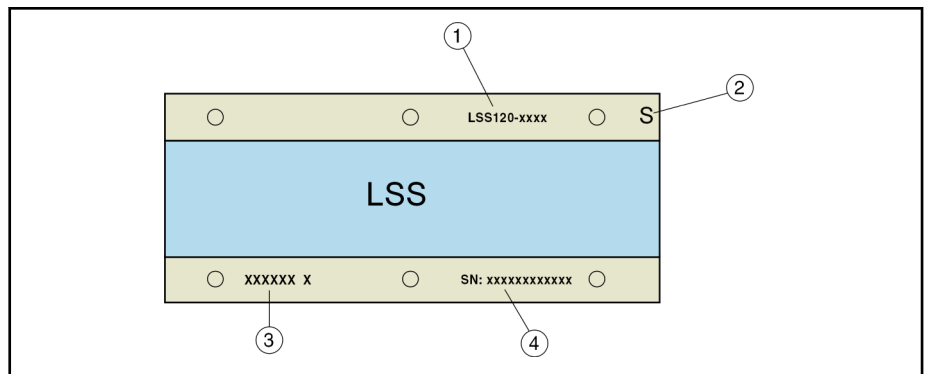
In the case of special design, details named in the operating instructions can deviate. In this case, order the supplementary documentation.

4.2.4 Designation of LSS

Due to lack of space, a type plate cannot be fixed on the secondary part. Two identical type plates are enclosed to the secondary part. To ensure a safe and continuous identification of the type, the type designation and the serial number are additionally on the secondary part.

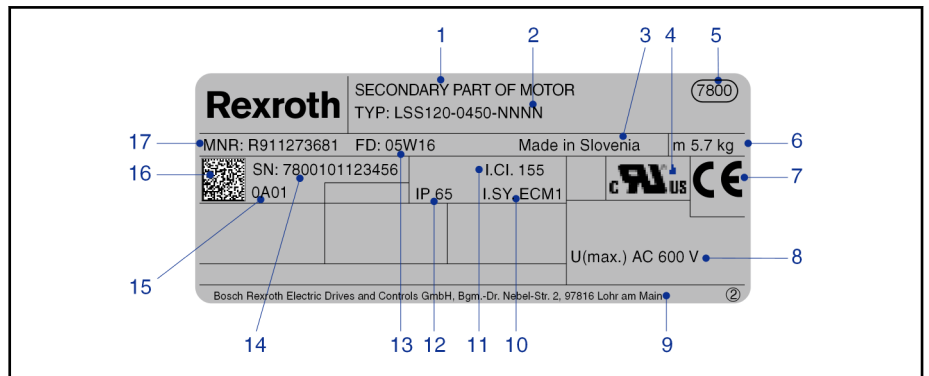
The type designation and the serial number are between the first two fastening holes of the front side, which is marked with a South Pole sign.

About this product



- ① Type
- ② Pole designation "S" (for South Pole)
- ① Internal labeling
- ① Serial number

Fig. 4-4: Position of type designation and serial number of secondary part



- 1 Motor type
- 2 Type designation
- 3 Designation of origin
- 4 UL sign
- 5 Factory number
- 6 Secondary part mass
- 7 EC declaration of conformity
- 8 Maximum input voltage
- 9 Company address
- 10 Insulation system
- 11 Thermal temperature class
- 12 Degree of protection by housing
- 13 Manufacturing date
- 14 Serial number
- 15 Revision state
- 16 Rexroth barcode
- 17 Material number

Fig. 4-5: Type plate example secondary part

5 Transport and storage

5.1 Notes about transport (shipping) instructions

⚠ WARNING

Strong attractive forces due to permanent magnets on the secondary part! Risk of injury and danger of crushing body parts by magnetic forces!

Observe the safety instructions [Chap.2.6.3](#) and [Chap. 2.6.4](#) .

The motor components (primary and secondary part) must be transported in their original package taking classes 2K2, 2B1, 2C2, 2S2, 2M1 specified acc. to DIN EN 60721-3-2 into account.

Please observe the following classification limitations:

- Transport temperature range -20 ... +80 °C
- Relative air humidity max. 75% (at +30 °C)
- No occurrence of salt mist

Warning notes on the package of the secondary parts

A self-adhesive label with the following warning notes is on the package of the secondary part:


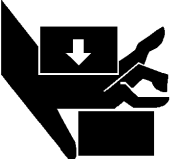

	<p>⚠ WARNING</p> <p>Health hazard to people with heart pacemakers, metal implants and hearing aids when in proximity to these parts!</p> <p>Strong magnetic fields due to permanent motor magnets!</p> <p>⇒ Anyone with pacemakers, metal implants or hearing aids are not permitted to approach or to handle these motor parts.</p> <p>⇒ If you have such conditions, consult with a physician prior to handling these parts.</p>	<p>⚠ WARNING</p> <p>Gesundheitsgefahr für Personen mit Herzschrittmachern, metallischen Implantaten oder Splintern und Hörgeräten in unmittelbarer Umgebung dieser Teile!</p> <p>Starkes Magnetfeld durch Permanentmagnete der Motorteile!</p> <p>⇒ Personen mit Herzschrittmachern, metallischen Implantaten oder Hörgeräten dürfen sich nicht diesen Motorteilen nähern oder damit umgehen.</p> <p>⇒ Besteht die Notwendigkeit für solche Personen, sich diesen Teilen zu nähern, so ist das zuvor von einem Arzt zu entscheiden.</p>
	<p>⚠ CAUTION</p> <p>Hazardous to fingers and hands due to high attractive forces of permanent motor magnets!</p> <p>Strong magnetic fields due to permanent motor magnets!</p> <p>⇒ Handle only with protective gloves! Handle with extreme care.</p>	<p>⚠ VORSICHT</p> <p>Quetschgefahr von Finger und Hand durch starke Anziehungskräfte der Magnete!</p> <p>Starkes Magnetfeld durch Permanentmagnete der Motorteile!</p> <p>⇒ Nur mit Schutzhandschuhen anfassen. Vorsichtig handhaben.</p>
	<p>⚠ CAUTION</p> <p>Hazardous to sensitive parts!</p> <p>⇒ Keep watches, credit cards, identification cards with magnetic strips, magnetic tape and ferromagnetic material (such as iron, nickel, and cobalt) away from magnetic parts.</p>	<p>⚠ VORSICHT</p> <p>Zerstörungsgefahr empfindlicher Teile!</p> <p>⇒ Uhren, Kreditkarten, Scheckkarten und Ausweise mit Magnetstreifen sowie alle ferromagnetische Metallteile wie Eisen, Nickel und Cobalt von den Permanentmagneten der Motorteile fernhalten.</p>

Fig. 5-1: Warning label on the packaging of LSS secondary parts

5.2 Instructions on machine transport

NOTICE

Never touch the connection points of electrostatic sensitive devices!



Installed components (e.g., KTY84, encoder) may contain electrostatic sensitive devices (ESD).

- ▶ Observe the ESD safety measures.

Transport and storage

⚠ WARNING**Material damage due to improper handling during transport!**

- ▶ Do not lift or move the primary part on the cable strand.

Depending from size and weight of the particular motor components, they cannot be transported by hand. In this case, use suitable lifting tools.

Transport primary part

To move the primary part in horizontal position, transport it by ring screws, for example. Therefore, please observe the thread dimensions in the dimension sheet of the primary part.

⚠ CAUTION**Risk of injuries and / or damage when using primary parts!**

- ⇒ To screw in the ring screws, use both threaded holes on every front side of the primary part.
- ⇒ Manually screw the ring screws into the fastening thread as far as possible or the base of head of the ring screw lies on the primary part.
- ⇒ Use 4 lifting belts of equal lengths to reach a uniform load of the threaded holes and to prevent tilting of the primary parts during transport.

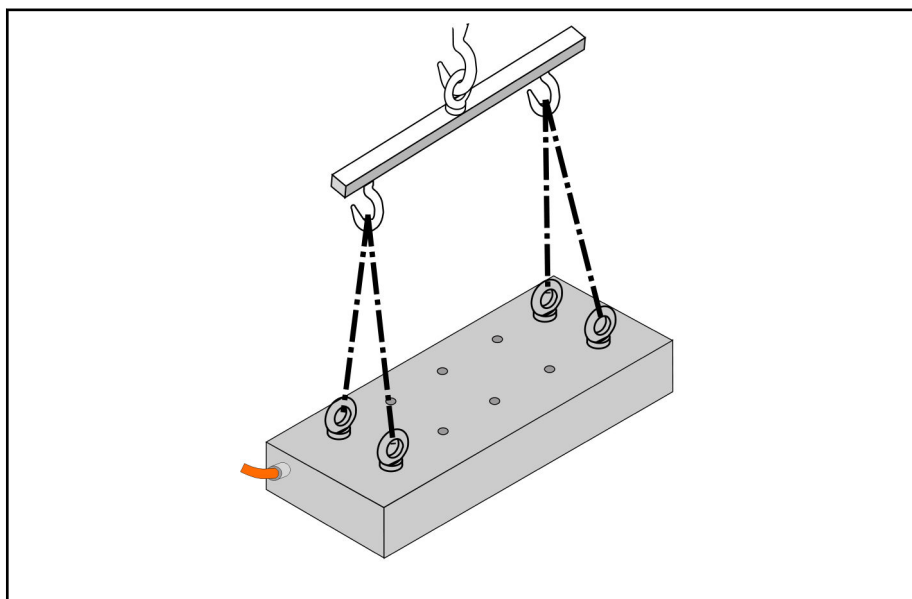


Fig. 5-2: Transport primary part (example)

Transport secondary part**⚠ CAUTION****Risk of injuries and / or damage when handling secondary parts of synchronous linear motors!**

- ⇒ Heed the safety notes and warnings (refer to [fig. 5-1 "Warning label on the packaging of LSS secondary parts" on page 29](#)) when using secondary parts and make sure that they are kept.
- ⇒ Remove the transport or assembly protection which is stuck on the cover plate only when or after mounting into the machine.

Transport and storage



Transport the secondary part in its original packing to the place of assembly and let it be packed until it must be mounted. Store the original packing after assembly of the secondary part for further use (e.g. re-storage or return). Observe a proper state and good visibility of the affixed warning notes.

Depending from size and weight of the secondary part it is no longer possible to transport it by hand. Due to heavy magnetic fields around the secondary part, use antimagnetic lifting devices.

We recommend to transport the secondary part with lifting belts.

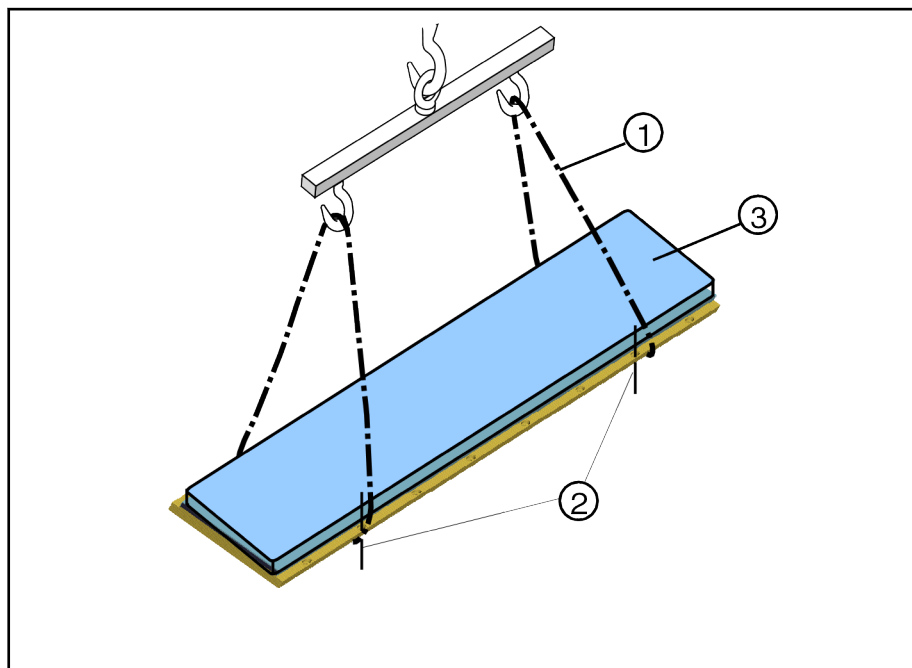
Safety during transport on lifting belt.

To prevent slipping lifting belts during transport, secure it. Therefore, two fastening screws for the secondary part can be connected into the appropriate hole on the secondary part (see [fig. 5-3 "Transport secondary part \(example\)" on page 31](#)). Ensure sufficient protrusion of the securing underneath the secondary part.

⚠ CAUTION

Risk of injuries and / or damage when handling secondary parts!

⇒ The permanent magnets of the secondary parts of synchronous linear motors are magnetically not shielded. Use an antimagnetic lock during transport of the secondary parts with lifting belts. The securing prevents from sliding of lifting belts during transport.



- ① Lifting devices
- ② Lock against slipping together of the lifting belts
- ③ Affixed transport and assembly protection

Fig. 5-3: Transport secondary part (example)

Transport by air freight

⚠ CAUTION

Possible influence of plane electronic on board through magnet fields!

⇒ Heed the packaging and transport instructions (IATA 953)

Transport and storage

5.3 Product storage

Store the motor components in their original package at a dry, dust free, vibration free and light protected place without direct solar radiation. Observe the specified classes 1K3, 1B1, 1C1,1S1,1M2 of DIN EN 60721-3-2 1K3, 1B1, 1C1,1S1,1M2 for storage.

- Storage temperature range -25 ... +55 °C
- Relative air humidity 5 ... 75 % ¹⁾
- Absolute air humidity 1 ... 29 g/m³
- No condensation
- No ice formation/freezing
- None direct solar radiation ¹⁾
- No occurrence of salt mist ¹⁾

1) Deviating to DIN EN 60721-3-1

NOTICE

Damage due to moisture and humidity!

- ▶ Protect the products from dampness and corrosion.
- ▶ Store them only in rainproof and dry rooms.

On delivery, protective sleeves and covers may be attached to our motors. They must remain on the motor for transport and storage. Do not remove these parts until shortly before assembly.

5.4 Storage times

Additional measures have to taken upon commissioning to ensure smooth functioning – irrespective of the storage time which may be longer than the warranty period of our products. However, this does not entail any additional warranty claims.

Motors

Storage time/months			Measures for commissioning
> 1	> 12	> 60	
■	■	■	Visual inspection of all parts to be damage-free
	■	■	Check the electric contacts to verify that they are free from corrosion
	■	■	Measure insulation resistance. Dry the winding at a value of < 1kOhm per volt rated voltage.

Tab. 5-1: Measures before commissioning motors that have been stored over a prolonged period of time

Cable und plug connector

Storage time/months			Measures for commissioning
> 1	> 12	> 60	
■	■	■	Visual inspection of all parts to be damage-free
	■	■	Check the electric contacts to verify that they are free from corrosion
		■	Visually inspect the cable jacket. Do not use the cable if you detect any abnormalities (squeezed or kinked spots, color deviations, ...).

Tab. 5-2: Measures before commissioning cables and connectors that have been stored over a prolonged period of time

6 Assembly

6.1 General notes



The machine manufacturer has to consider the special character of his construction and must work out special mounting instructions for the motor components primary and secondary part. The machine manufacturer's mounting instructions are the only binding guidelines.

The range and order of installation of motor components is depending from the machine construction or the available space in the machine. Thereby, the arrangement of the motor components play a significant role.

The project planning manual "Synchronous Linear Motors LSF" contains a suggestion to assemble motor components. This suggestion can be understood a guideline to estimate the necessary assembly effort and to prepare the necessary implements for assembly.

Before you begin with the assembly, you must observe or check the following points:

- Observation of the necessary installation sizes (see project planning manual Synchronous Linear Motors LSF)
- Machine construction fulfills the requests for mounting (stiffness, attractive force, feed force and acceleration force, etc.) and is prepared for installation of the motor components.
- Clean screw-on surfaces between machine and motor components
- Installation of motor components by skilled personnel only
- Compliance of danger and safety notes is guaranteed.

Screw lock

All screwed connections must be secured against potential impacts and vibrations during operation of the machine. A suitable and field-tested screw lock for all metal thread connections is, e.g., Loctite 243.

Loctite 243 is a liquid screw lock (medium-hard) and is applied to the parts to be mounted immediately prior to assembly. For detailed information on the proper handling and processing, please refer to the manufacturer's data sheets under <http://www.loctite.de>. The manufacturer's homepage also provides information on hardening accelerators or other screw locks.

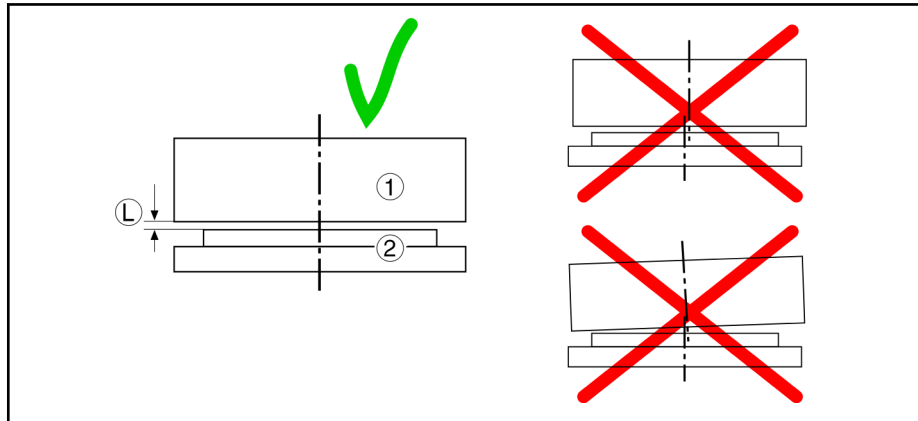
Assembly

6.2 Mechanical assembly

6.2.1 Air-gap, parallelism and symmetry among the motor components

Parallelism and symmetry When mounting primary and secondary parts, their position is specified by the holes or threads within the machine slide and within the machine bed.

Due to the clearance, which exists within the holes of the screw connections, the motor components must be adjusted correctly acc. to before the screws are tightened according to the following figure.



- ① Primary part
- ② Secondary part
- (L) Air gap

Fig. 6-1: *Aligning the motor components*

Air gap After assembly of the motor components, we recommend to check the minimum air gap between primary and secondary part.

Therefore, insert a test strip made of antimagnetic material (aluminum, plastics) with a thickness of

- 1.35 ... 1.40 mm

into the air gap between primary and secondary part. The test strip must be versatile in the air gap on every position of the total path via the complete surface of the primary part.

With this measure, you ensure the minimum necessary air gap between the motor components.




Furthermore, with this test you will detect a faulty assembly (e.g. due to dirt under the mounting surface, faulty installation dimension, insufficient machine rigidity etc.) in time.

⚠ CAUTION


Motor damage due to insufficient air gap between primary and secondary part!

With aforementioned measures check the necessary minimum air gap between primary and secondary part immediately after assembly of both motor components.

6.2.2 Assembly of secondary part segments

⚠ WARNING	Danger due to permanent magnets!
	<ul style="list-style-type: none"> ▶ Health hazard for persons with heart pacemakers, metallic implants and hearing aids in direct environment of permanent magnets.
	<ul style="list-style-type: none"> ▶ Crushing hazard of fingers and hand due to heavy attractive forces of the magnets.
	<ul style="list-style-type: none"> ▶ Risk of destruction of sensitive parts such as watches, credit cards, ...

Observe the safety instructions [Chap.2.6.3](#) and [Chap. 2.6.4](#) .

	<p>To fasten the secondary parts, it is only allowed to use new, unused screws.</p> <p>All screws have to be tightened with the specified tightening torque. Additionally secure each screw connection with Loctite 243, for example. Observe the instructions of the adhesive manufacturer about correct screw lock.</p>
---	---

The screw-on surfaces and stop faces must be cleaned and be free of grease before the secondary parts can be screwed on the machine construction. It must be expected that certain influences continuously occur during motor operation, contact of secondary part with coolant lubricants, grinding emulsion, and others, for example. This can reduce the kinetic friction among the screwed parts during the machine lifetime. In this case, we recommend to use screws with a higher fastening class, 10.9 for example, to realize a higher tightening torque.

The tightening torques of the fastening screws is specified in the following table:

Frame size secondary part	Screw size	Fastening class	Tightening torque (+/-10%)
040 ... 240	M6 (DIN 7984, flat head)	8.8	10 Nm
		10.9	15 Nm

Tab. 6-1: Fastening screws with tightening torque for the secondary parts LSS

The calculation of screw connection for fastening the secondary part are based on assumption that the screwing surface of the secondary part and the screwing surface of the machine is clean and the secondary part is screwed directly with the machine.

Assembly



- In certain cases it is not possible to screw the secondary part with the machine directly, as additional materials like distance plates, thermal grease and so on, are among secondary part and machine. Then a sufficient fastening of the screw connection must be ensured by the machine manufacturer.
- The effect of liquid screw lock is damaged due to loosening or re-screwing the screws (e.g. by torque tests) and must therefore be renewed. For a correct screw lock, observe the notes of the adhesive manufacturer.

Segmented secondary part

WARNING

Malfunction and / or uncontrolled movement of the motor and therewith danger of material damage or risk of injuries!



⇒ Correct concatenation of secondary part segments

If several secondary part segments are used over the whole traverse path, keep the poles and the flush direction at concatenation according to the following figure.

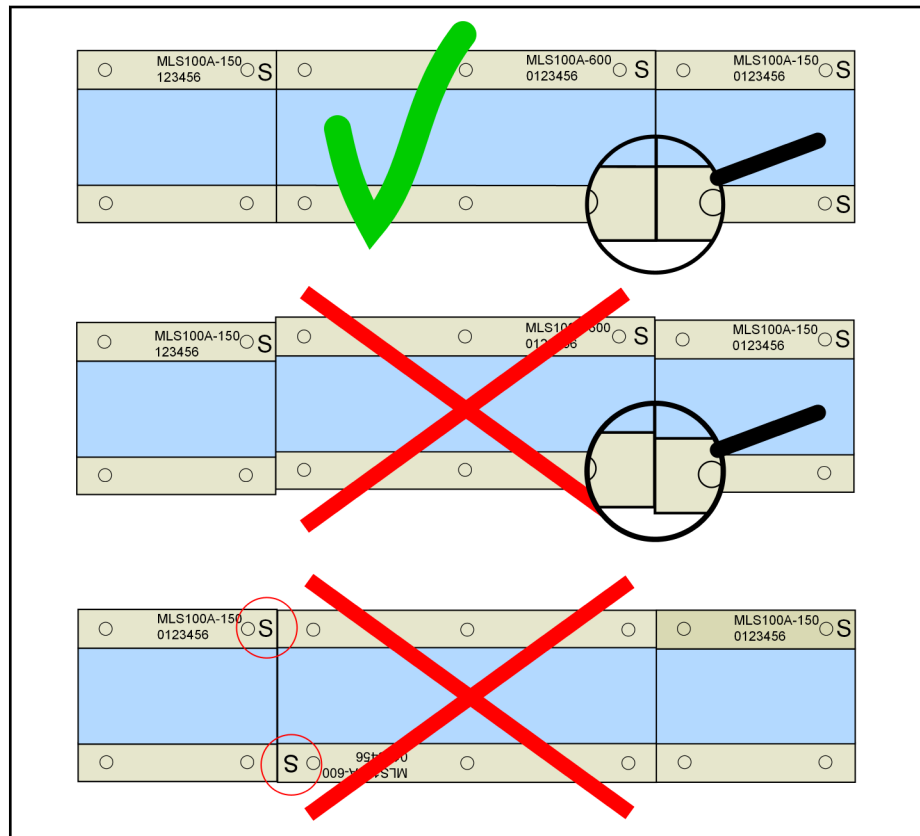


Fig. 6-2: Concatenation of several secondary part segments

⚠ WARNING Risk of injuries or material damage due to attractive or repulsive force at concatenation of secondary part segments!



- ⇒ Secure against uncontrolled movement
- ⇒ Remove the transport or assembly protection only when or after mounting into the machine

The attractive or repulsive force when arranging the secondary part segments can be up to 300 N depending from their frame size.

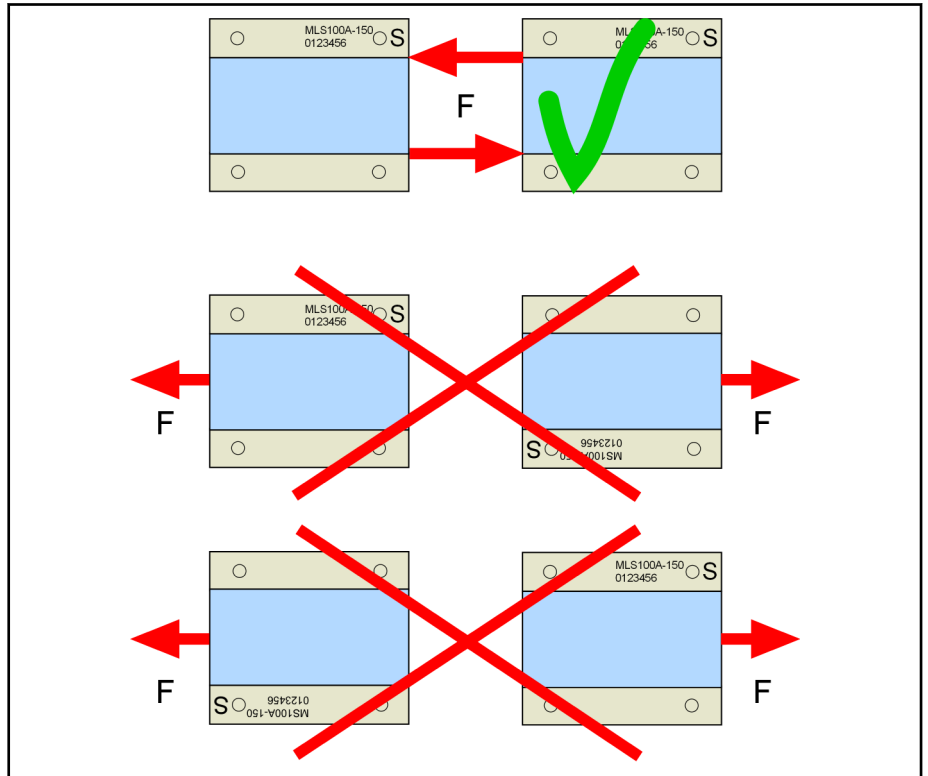


Fig. 6-3: Attractive or repulsive force when arranging the secondary part segments

6.2.3 Assembly of primary parts



To fasten the primary part, only new, unused screws must be used.

Tighten all screws with the specified tightening torque. Additionally secure each screw connection with Loctite 243, for example. For correct screw lock, please observe the notes of the adhesive manufacturer.

Assembly

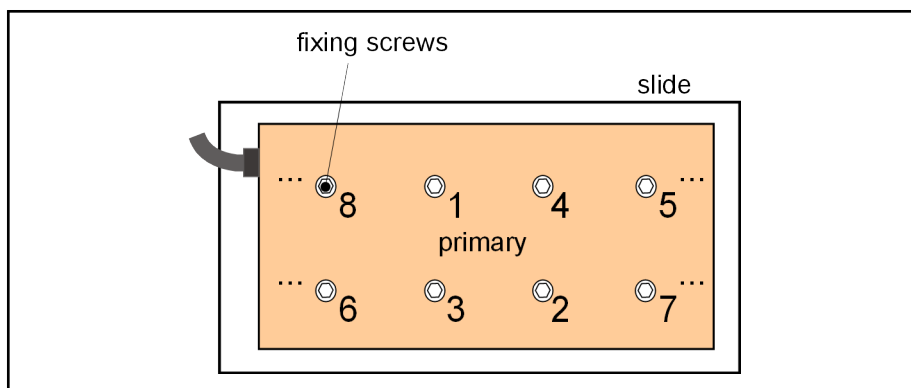


Fig. 6-4: Tightening order of fastening screws of primary part

The screw-on surfaces must be cleaned and be free of grease before the primary parts can be screwed on the machine construction. If it can be expected, that certain influences are continuously occurring during motor operation, like contact of the primary part with coolant lubricant, grinding emulsion a.s.o., the kinetic friction among the screwed parts can be reduced during the machine lifetime. In this case, we recommend to use screws with a higher fastening class, like 10.9, to realize a higher tightening torque.

Mounting instructions:

1. Fasten the primary part with screws 1, 2, 3...n until the primary part lies on the slide.
2. Fasten screws - from inside to outside - 1, 2, 3 ... x with nominal tightening torque:

Primary part Design	Screw size	Fastening class	Tightening torque (+/- 10%)
Standard encapsulation	M6 (DIN EN ISO 4762)	8.8	10 Nm
		10.9	15 Nm
Thermo encapsulation	M8 (DIN EN ISO 4762)	8.8	25 Nm

Tab. 6-2: Tightening torque for the fastening screws of the primary parts



The effect of liquid screw lock is damaged by loosening or re-tightening of screws (e.g. due to torque tests) and must be renewed. For correct screw lock, observe the notes of the adhesive manufacturer.

6.2.4 Connection liquid cooling

The coolant connection on the motor side are provided for coolant connection threads with axial sealing. Bosch Rexroth therefore recommends to use screw connections which already contain an O-ring for sealing the screw connection in axial direction.

Not suited are sealings made of hemp, teflon-tape or with conical thread, as this mode of sealings can permanently damage the connection thread on the motor and therefore excessively strain.



When connecting the coolant ducts, observe the feed and outlet direction of coolant specified in the dimension sheet.

The sealing of the coolant connection is in the liability of the machine manufacturer and must be checked and approved after each motor installation. Additionally, record regular monitoring of the proper state of the cooling connection in the maintenance plan of the machine.

Tightening torque

The tightening torque of the screws of the motor may not be exceeded. Please note, depending from the selected connection thread, the specified value cannot be exhausted, but must be reduced to do not damage the connection thread.



Therefore observe the information of the manufacturer of the selected connection thread, especially the details about permissible tightening torque.

Primary part with ...	Screwed connection on the motor	
	Thread	Screw-in depths
Standard encapsulation	G1/4	max. 10 mm
Thermo encapsulation	G1/8"	

Tab. 6-3: Connection liquid cooling

Assembly

6.3 Electrical connection

6.3.1 Power connection

Power cables on primary part

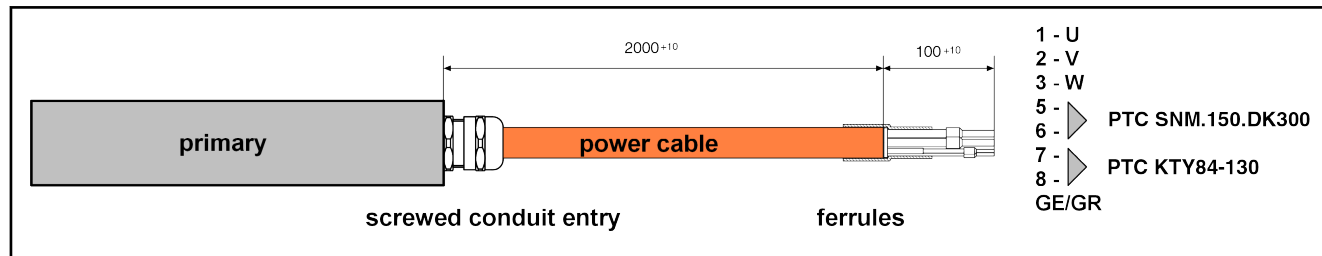


Fig. 6-5: Design of power cable on the primary part LSP

This connection cable is connected with the primary part. The technical data of the connection cable for every single frame size in standard design (= Other designs NNNN) are given in the following overview. The condition of the connection cable on primary parts in special design can deviate from the following details. Please also observe the information provided in the supplementary documentation (data sheet) for the special design.

Motor frame size	Connection cable on primary part	Cross section power wires [mm ²]	Cross-section control wires [mm ²]	Diameter D [mm]	Bending radius R static [mm]
LSP040	INK653	1.0	0.75	12	72
LSP080	INK603	4.0	1.0 or 1.5	16.3	100
LSP120	INK604	6.0		18.5	110
LSP140					
LSP160					
LSP200					
LSP240					

Tab. 6-4: Power cable on the primary part LSP

Routing of power cables

The power cables must not be exposed to dynamic bending load. Do not install the primary part cable in a moving energy chain.

We recommend to lead this cable in a fixed installation to

- a flange socket,
- a coupling or
- a terminal box (not in the scope of delivery of Bosch Rexroth)

. From this junction, the power cable can be laid through the energy chains or the machine construction. Ready-made connection cables are available from Rexroth.

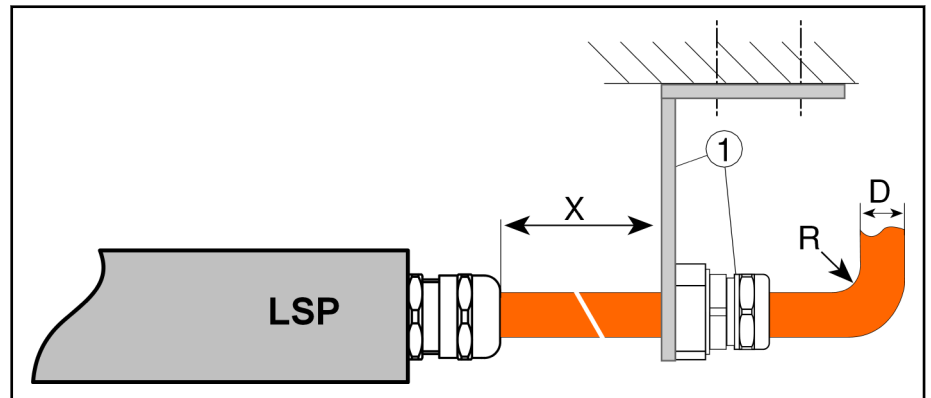
NOTICE

Avoid bending, pulling and pushing loads as well as continuous movements of the connection cable at the point where the cable exits from the primary part. Any load of this kind, can lead to irreparable damage (e.g. cable break) on the primary part!

If a fixed installation is not possible, provide the connection cable with a strain relief (see fig. 6-6 "Example for strain relief of connection cable" on page 43) to protect the cable and the primary part from any damage (e.g. cable break).



If the grounding of the secondary parts cannot be ensured with mounting into the customer's machine construction, connect it according to DIN VDE 0100-410 with the potential of the protective conductor .



- Dimension "x" Minimum distance 10 mm
- ① Strain relief of the connection cable on primary part
- D Diameter of connection cable
- R Allowed bending radius

Fig. 6-6: Example for strain relief of connection cable

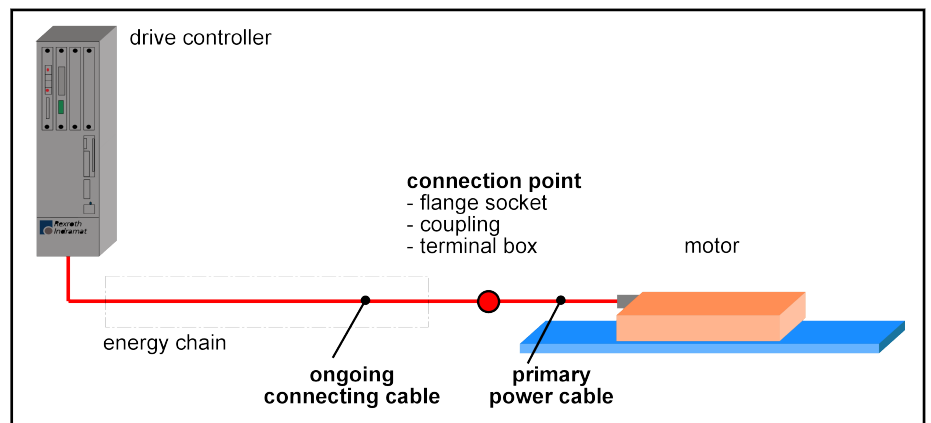


Fig. 6-7: Routing connection cable of primary part

Assembly

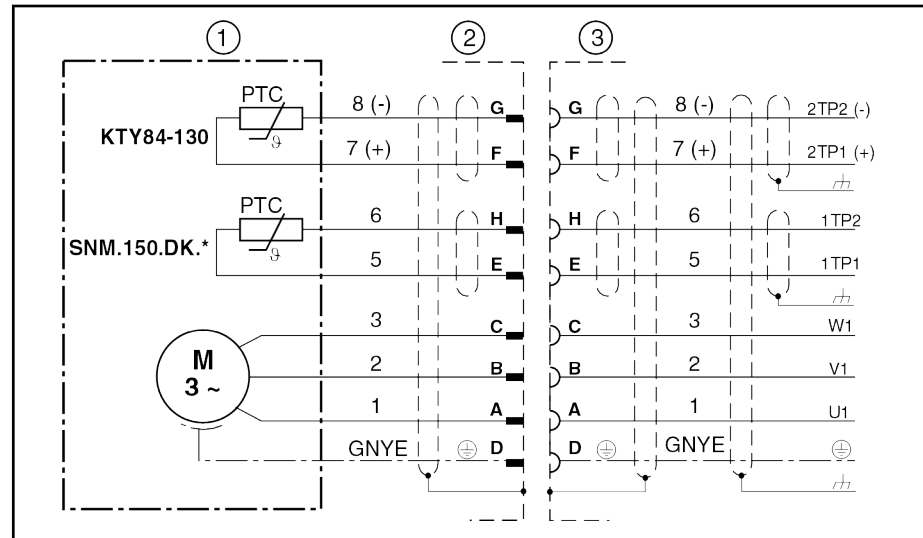
⚠ WARNING Due to dynamic bending loads, the connection cable and the motor are damaged!

- ⇒ Do not install the primary part cable in a moving energy chain
- ⇒ Installation of a continuative power cable lead after a junction into an energy chain.

👉 The power cable of the primary part is designed for the highest type current of a frame size. The cross section of a continuative power or connection cable can be designed smaller, if necessary.

Connection power

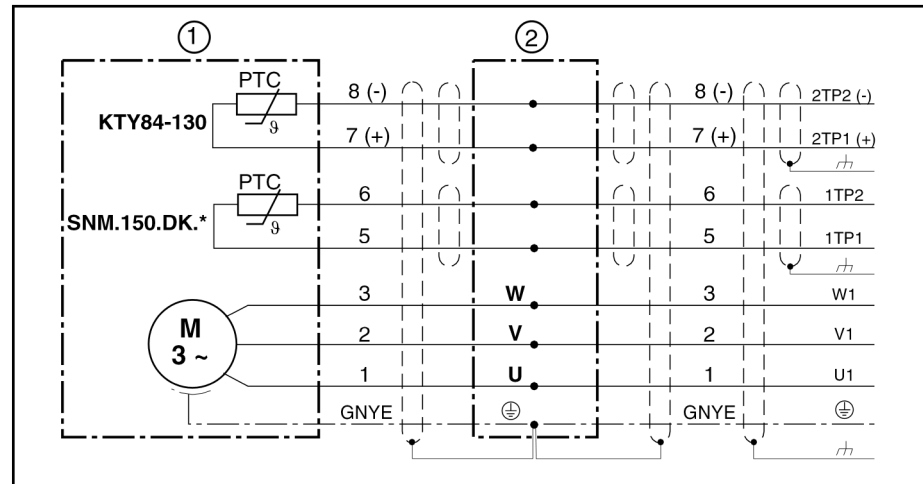
Connection via flange socket and coupling



- ① Primary part LSP
- ② Flange socket INS0486
- ① Coupling INS0481

Fig. 6-8: Connection example with flange socket and coupling

Connection via terminal boxes



- ① Primary part LSP
- ② Terminal boxes

Fig. 6-9: Connection example with terminal boxes

Installation mode and cable diameter

Parallel motor connection

When connecting a motor parallel on a drive controller, the following possibilities exist to assembly the motor cable.

- Passing a collective cable with a higher cross section (fig. 6-12 "Parallel arrangement, collective connection cable" on page 46)
- Passing of two separate parallel cables (fig. 6-11 "Parallel arrangement, separate connection cable" on page 45)

The last possibility offers the benefit of smaller bending radii. The whole cross section of parallel installed cables must be according to the increased cross section for parallel motor connections.

Power connection for single arrangement

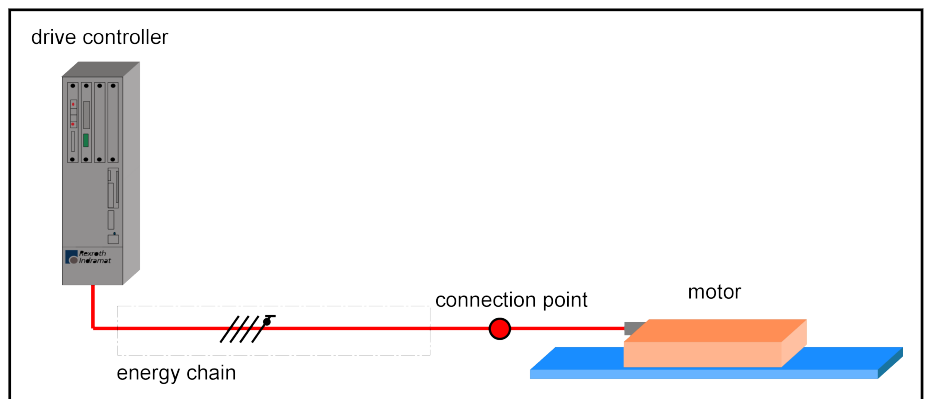


Fig. 6-10: Power connection for single arrangement

Power connection for parallel arrangement, separate connection cable

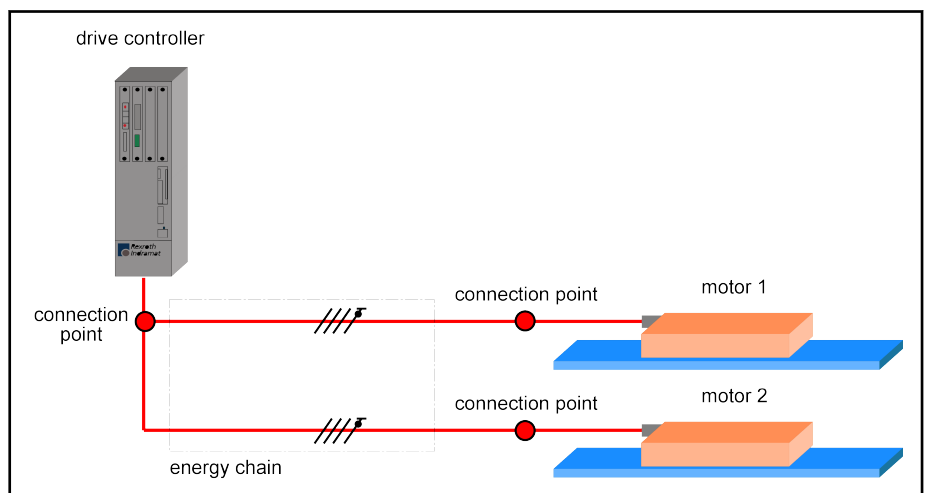


Fig. 6-11: Parallel arrangement, separate connection cable

Assembly

Power connection at parallel arrangement, collective connection cable with higher cross section

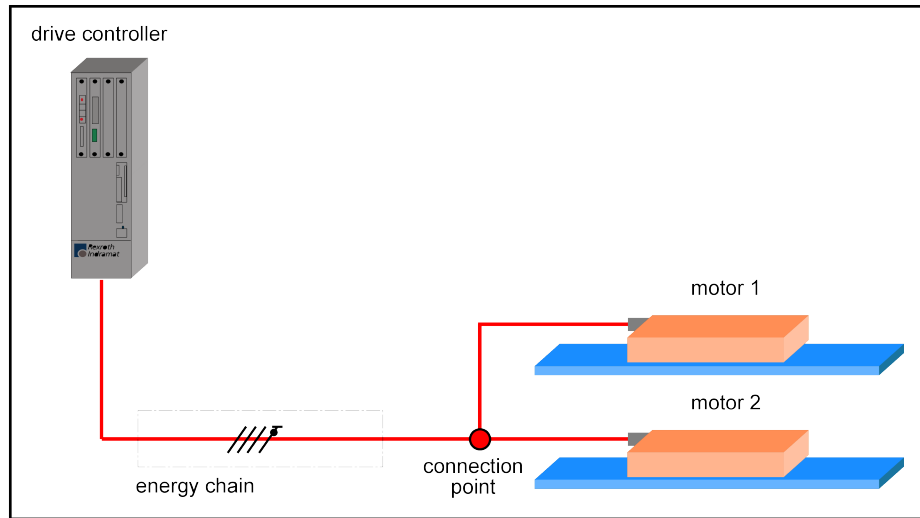


Fig. 6-12: Parallel arrangement, collective connection cable

Connection on a Rexroth drive controller

Single arrangement

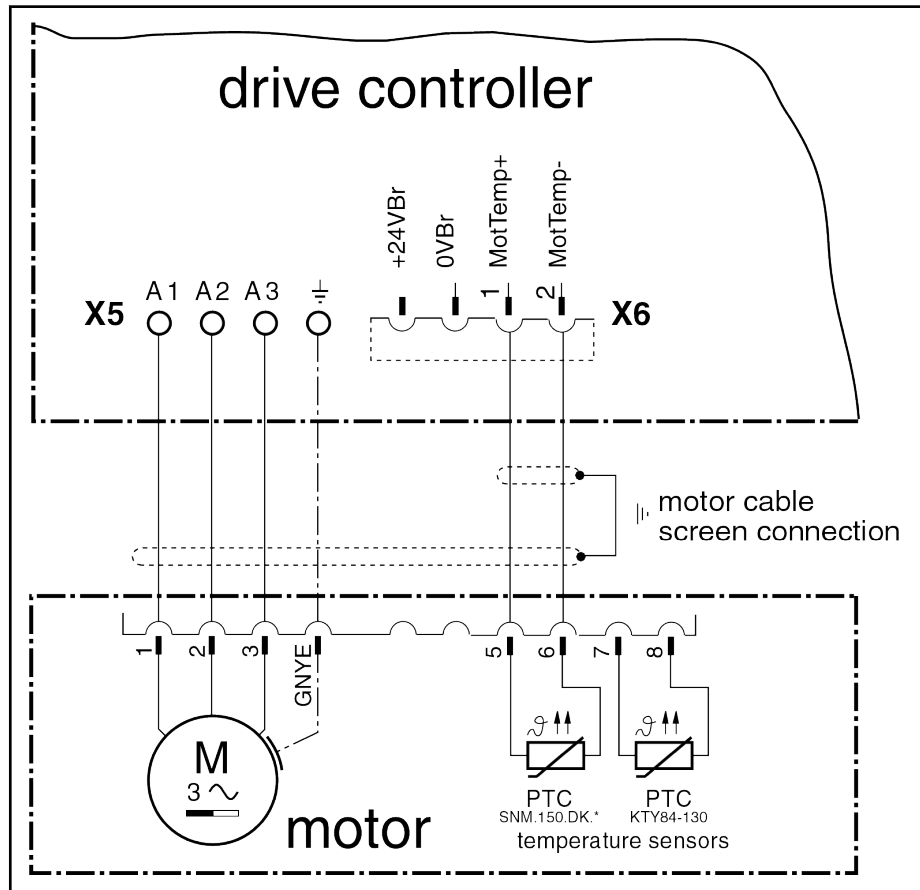


Fig. 6-13: Connection on drive controller - single arrangement primary part

Parallel arrangement

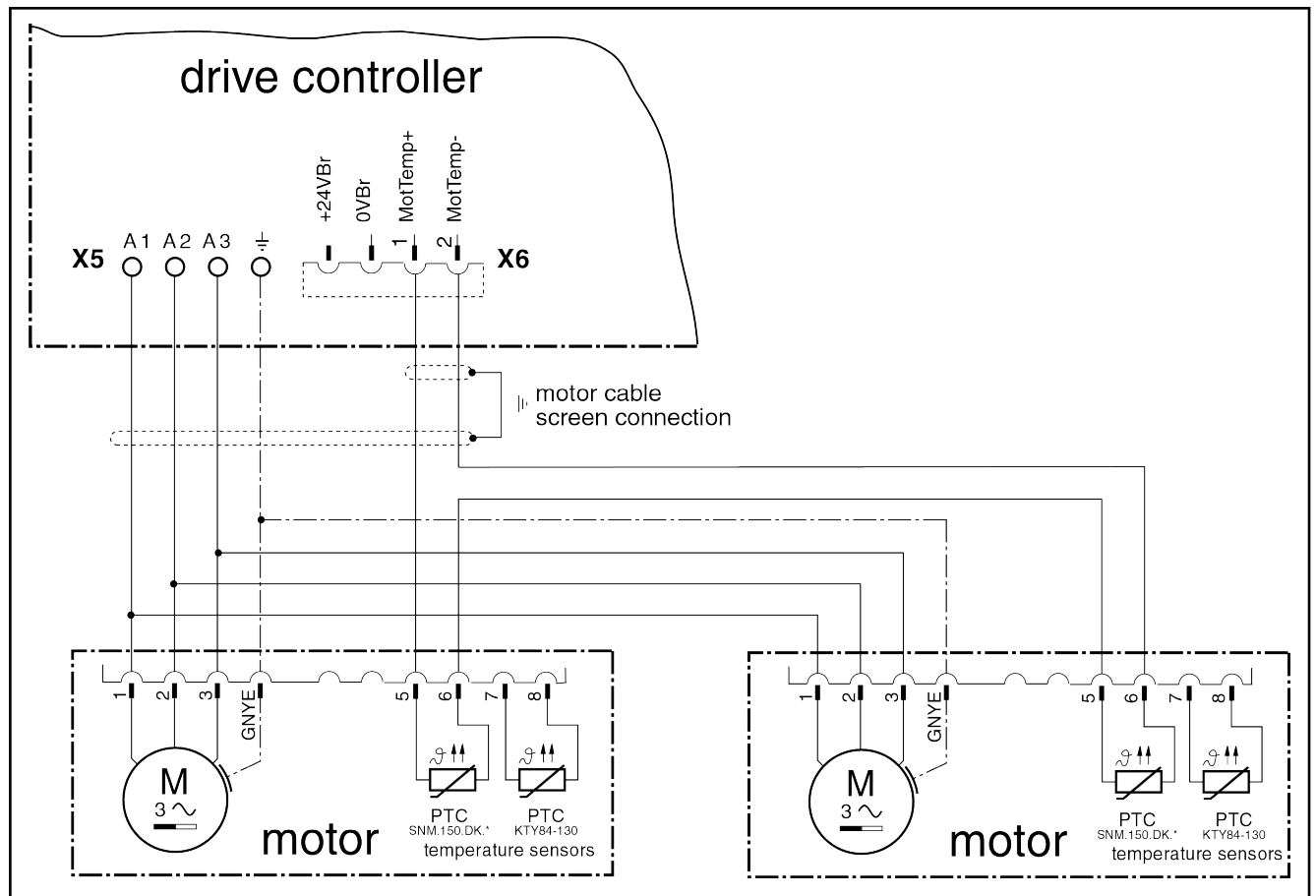


Fig. 6-14: Connection on drive controller - parallel arrangement primary part

Connection of power cables depending from the primary part arrangement at parallel arrangement

The connection of the power wires of the connection cable on the drive controller at parallel arrangement of primary parts with cable output in the opposite direction is dependent from the direction of the outgoing cable.

Connection for primary part cable output into the same direction			
Drive controller X5	A1	A2	A3
Primary part 1	A1	A2	A3
Primary part 2	A1	A2	A3
Connection for primary part cable outlet in opposite direction			
Drive controller X5	A1	A2	A3
Primary part 1	A1	A2	A3
Primary part 2	A1	A3	A2

Tab. 6-5: Connection of the power wires in case of parallel arrangement of primary parts on a drive controller

Assembly

6.3.2 Connection linear scale

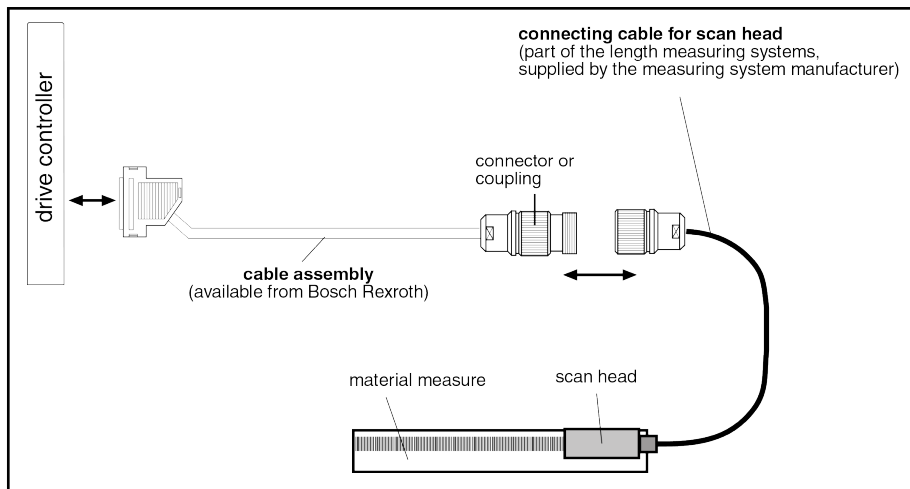


Fig. 6-15: Connection example linear scale

Depending from the connection mode (connector or coupling), Rexroth offers different ready-made connection cables for connecting controller and measuring systems:

Connection cable	Type of measurement system	
	Absolute, ENDAT	Incremental
DIAX04 <--> Connector	IKS 4142	IKS 4384
DKCxx.3 <--> Connector	IKS 4001	IKS 4002
IndraDrive <--> Connector	IKS 4038	IKS 4041
DIAX04 <--> Coupling	---	IKS 4383
DKCxx.3 <--> Coupling	---	IKS 4389
IndraDrive <--> Coupling	---	IKS 4040

Tab. 6-6: Connection cable linear scale

7 Commissioning and operation

7.1 Safety

WARNING

High electric voltage! Danger to life, risk of injury by electric shock.



Life parts are dangerous.

- ▶ Do not open any covers or flange sockets during operation.
- ▶ Do not connect or disconnect plug-connectors and connection clamps.

WARNING

Risk of injuries due to moving machine parts!



- ▶ Do not remove covers, machine parts or protective devices during operation.
- ▶ Do not enter the motion area of the machine. Avoid unintended access for persons, due to
 - Safety fences, safety screens or protective covers.
 - Optical sensors

CAUTION


Thermal danger due to hot surfaces with temperatures over 60 °C during operation



- ▶ Do not touch hot motor surfaces.
- ▶ Install protection against contact, if necessary.
- ▶ Make sure that no temperature-sensitive components (cables, electronic components, ...) touch hot surfaces.

7.2 Commissioning




The motor can be operated only after installation into a machine. For start up, please observe the documentation of all system components. For detailed start up procedure of the motors refer to the project planning manual  Synchronous Linear Motors LSF and the respective documentation about drive controller or firmware description.

Prior to commissioning, ensure that the following requirements are met.

- Make sure that the motor is mechanically and electrically connected correctly.
- Ensure that the motor and all participating components of the drive are undamaged (e.g. length measuring system).
- Make sure that the axis can freely move over the whole traverse path.
- Please observe the general safety instructions on the protection against hazardous movements [chapter 2.6.2 "Protection from mechanical danger" on page 17](#).

Commissioning and operation

7.3 Operation

During operation, keep the ambient and operation conditions and technical data specified in the project planning manual  Synchronous Linear Motors LSF.

Checks during operation:

- ▶ Pay attention to exceptional noise.
- ▶ Pay attention to increased vibrations.
- ▶ Check the motor for cleanliness.
- ▶ Check the monitoring devices and diagnostic / error messages of the controllers.

Decommission the drive when deviations from normal operation exist. For further procedure refer to [chapter 11 "Troubleshooting" on page 57](#).

8 Maintenance and repair

8.1 Cleaning and servicing

WARNING

Danger! Electric voltage! Operations in the vicinity of live parts are extremely dangerous.



Work required on the electric system may only be carried out by skilled electricians. Tools for electricians (VDE tools) are absolutely necessary.

Prior to commencing work:

1. Isolate (even auxiliary circuits).
2. Secure against reactivation.
3. Ensure de-energization.
4. Ground and short-circuit.
5. Cover or shield any adjacent live parts.

WARNING

Personal and material damage during maintenance work in operation!



- ▶ Never do any maintenance work on life machines.
- ▶ While carrying out maintenance work, secure the machine such that it cannot restart or be used by unauthorized persons.

CAUTION

Hot surfaces with temperatures over 60 °C may cause burns!



- ▶ Before you work in the machine, let the motor cool down.
- ▶ Wear safety gloves.
- ▶ Do not work on hot surfaces.

Motors

Excessive dirt, chips or dust can negatively influence the motor functions. In extreme cases lead to motor loss. Clean the motor in regular distances - after one year at the latest.

Connection cable

WARNING

Death by electrocution possible due to live parts!



- ▶ Immediately put the machine out of operation and replace defective connection cables.
- ▶ Never do any provisional repairs on the connection cables.

- Check in regular distances the connection cables on damage and replace them if necessary.
- Check optionally existing drag chains (Drag chains) on defects.
- Check the protective conductor in regular distances on proper state and firm seating. If necessary replace it.

Maintenance and repair

8.2 Service repair, maintenance and spare parts

Increase availability with regular preventive maintenance measures. Observe the machine manufacturer's instructions in the machine maintenance plan and the maintenance measures described below.

The following points should be observed and if necessary restored during the preventive check of motor and auxiliary components:

- Noticeable sound during operation
- Scratches on primary and secondary part
- State of power and encoder cables in a drag chain.
- State of linear scale (e.g. soiled)
- State of guides (e.g. deterioration of linear guides)

Measure	Interval
Check the mechanical and electrical connections.	According to the specifications in the machine maintenance plan, but at least every 1000 operating hours.
Check the machine for smooth running, vibrations and bearing noise.	According to the specifications in the machine maintenance plan, but at least every 1000 operating hours.

Tab. 8-1: Maintenance measures



Generally, keep the motor installation room clean to prevent that dirt (e.g. shavings, swarfs, grease by guides, etc.) reaches the air gap between primary and secondary part

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

Service Germany

Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drives and controls.

Contact the **Service Helpdesk & Hotline** under:

Phone: **+49 9352 40 5060**
 Fax: **+49 9352 18 4941**
 Email: service.svc@boschrexroth.de
 Internet: <http://www.boschrexroth.com>

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers refer to the sales office addresses on the Internet.

Preparing information

For quick and efficient help, please have the following information ready:

- Detailed description of the fault and the circumstances
- Information on the rating plate of the products in question, particularly type codes and serial numbers
- Your contact data (phone number, fax number, e-mail address)

9 Disassembly

DANGER

Fatal injury due to errors during the activation of motors or work on moving elements!

- ⇒ Work on machines is only allowed if they are secured and while they are not running.
- ⇒ Before starting disassembly, secure the machine against unforeseeable movements and against unauthorized operation.
- ⇒ Before dismantling the motor and the supply lines, secure them against dropping or moving and disconnect the mechanical connections only thereafter.

WARNING

High electric voltage! Danger to life, risk of injury by electric shock.



Life parts are dangerous.

- ▶ Do not open any covers or flange sockets during operation.
- ▶ Do not connect or disconnect plug-connectors and connection clamps.

WARNING

Danger due to permanent magnets!



▶ Health hazard for persons with heart pacemakers, metallic implants and hearing aids in direct environment of permanent magnets.



▶ Crushing hazard of fingers and hand due to heavy attractive forces of the magnets.



▶ Risk of destruction of sensitive parts such as watches, credit cards, ...

Observe the safety instructions [Chap. 2.6.3](#) and [Chap. 2.6.4](#) .



The machine manufacturer must observe the special features of the construction and create a special disassembly instruction for the motor components. Only this disassembly instruction of the machine manufacturer is binding.

1. Observe the disassembly instruction of the machine manufacturer.
2. Use the machine-side control command to decelerate the drive to a controlled standstill.
3. Switch off the power and control voltage of the controller.
4. Switch off the main switch of the machine and deactivate external systems according to the instructions of the manufacturer.
5. Secure the machine against accidental movements and against unauthorized operation.

Disassembly

6. Wait until the discharge time of the electrical systems has elapsed and then disconnect all electrical connections. Lock electric cables and contacts against contact with other electrical parts.
7. Remove dirt, chips and other any kind of residues from the motor.
8. Before dismounting the motor and the supply lines, secure them against dropping or moving and disconnect the mechanical connections only thereafter.
9. If necessary, record all measures in the commissioning log or machine maintenance plan.

10 Environmental protection and disposal

Disposal of the motor components can be done according to the applicable legal process in normal recycling process.

Recycling Most of the products can be recycled due to their high content of metal. In order to recycle the metal in the best possible way, the products must be disassembled into individual assemblies. Metals contained in electric and electronic assemblies can also be recycled by means of special separation processes.

Significant motor components

Basically, our motors consist of the following components:

- Steel, aluminum, copper, brass
- Plastic parts, insulation and composite material
- Electronic components
- Permanent magnets

Plastic parts of the products may contain flame retardants. These plastic parts are labeled according to EN ISO 1043. They have to be recycled separately or disposed of according to the applicable legal provisions.

⚠ WARNING Danger due to permanent magnets!



▶ Health hazard for persons with heart pacemakers, metallic implants and hearing aids in direct environment of permanent magnets.



▶ Crushing hazard of fingers and hand due to heavy attractive forces of the magnets.



▶ Risk of destruction of sensitive parts such as watches, credit cards, ...

Observe the safety instructions [Chap.2.6.3](#) and [Chap. 2.6.4](#) .



The permanent magnets of the secondary part must be demagnetized before disposal to avoid injuries or damage.

Demagnetize magnets

The demagnetization of the permanent magnets of the secondary part is reached via special thermal treatment. The handling duration is influenced by the frame of the motor component. The secondary part has to remain in the oven for a minimum of 30 minutes, starting at the time, the magnetic surface has reached 300 °C.



After cooling down of the secondary part and successful demagnetization, the magnets can be effortlessly disconnected from the mounting plate.

Packaging

Our packaging materials do not contain any problematic materials and can therefore be easily disposed. Packaging materials are: Wood, carton and styrofoam

Batteries and accumulators

Batteries and accumulators can be labeled with this symbol.

Environmental protection and disposal



The symbol indicating "separate collection" for all batteries and accumulators is the crossed-out wheeled bin.

End users in the EU are legally bound to return used batteries. Outside the validity of the EU Directive 2006/66/EC, the particularly applicable regulations must be followed.

Used batteries can contain hazardous substances which can harm the environment or people's health when improperly stored or disposed of.

After use, the batteries or accumulators contained in Rexroth products must be properly disposed of according to the country-specific collection systems.

Disposal by the manufacturer

Our products can be returned to us for disposal. However, this requires that the products be free from oil, grease or other dirt.

The motor components must be returned in a suitable packaging (origin package if possible). In the case of a transport by air freight, please observe the dangerous goods regulations (IATA) for the secondary part.

Deliver the products "free domicile" to the following address:

Bosch Rexroth AG
Electric Drives and Controls
Buergermeister-Dr.-Nebel-Straße 2
97816 Lohr am Main, Germany

11 Troubleshooting

11.1 Procedure:

Possible causes for failures of motors can be restricted to the following areas:

- Motor cooling and temperature behavior
- Internal temperature sensor
- Mechanical damage of the motor
- Mechanical connection to machine

The lengths measuring system and the temperature sensor are monitored by the controller or the control unit; corresponding diagnostic messages are displayed. Observe the instructions in the corresponding documentation.

The sections below describe examples of some fault states along with possible causes. This list is not exhaustive.


Malfunctions	Error cause	Measures
Motor does not run	Controller enable signal missing	Activate controller enable signal
	Controller fault	Troubleshoot acc. to documentation of controller
	Voltage supply missing	Control voltage supply
Vibrations	Mounting screws loose	Lock screw connections acc. to specifications
Running noise	Foreign bodies within the motor	Stop the motor --> repair by manufacturer
	Guides defective	Stop the motor --> repair by manufacturer
High motor temperatures Motor temperature monitoring is activated	Operation outside of rated data	Reduce load and check the dimensioning
Wrong or defective temperature display	Temperature sensor not connected	Connect temperature sensor
	Temperature sensor defective	If available: Connect substitute temperature sensor Stop the motor --> repair by manufacturer

Tab. 11-1: Malfunctions on MCL motors



In the case of malfunctions, please additionally observe the notes described in the project planning manual. Contact the manufacturer, if necessary.


12 Technical data

Technical data and operating characteristic curves are explained in detail for all motor types in the project planning manual  LSF Synchronous Linear Motors.

13 Appendix

13.1 Declaration of conformity primary part

Factory standard



Konformitätserklärung

im Sinne der EG-Niederspannungsrichtlinie 73/23/EWG, Anhang III B

Produkt/Product/produit: LSP

INN 84.41-42-01
2000-12-01

Declaration of Conformity as per EC Low-Voltage directive 73/23/EEC, Attachment III B
Déclaration du fabricant conformément à la directive "CE" relative à la basse tension 73/23/CEE, Annexe III B

Hiermit erklären wir in alleiniger Verantwortung, dass das Produkt

Assuming sole responsibility, we herewith declare that the product

Par la présente, nous déclarons sous notre propre et unique responsabilité que le produit

1. Produkt:	Primärteil für Linearmotor LSF	
Product:	Primary part for linear motor LSF	
Produit:	Partie primaire pour moteur linéaire LSF	
2. Hersteller:	Rexroth Indramat GmbH	
Manufacturer:	Bürgermeister-Dr.-Nebel-Straße 2	
Constructeur:	97816 Lohr a. Main / Germany	
3. Typ / Type:	LSP040, LSP080, LSP120, LSP140, LSP160, LSP200, LSP240	
4. ab Herstellungsdatum:	1996-07-01	
from date of manufacture:		
à partir de la date de fabrication:		
5. Angewendete Normen / Applicable standard / Normes utilisées		
<u>Norm / Standard / Norme</u>	<u>Titel / Title / Titre</u>	<u>Ausgabe / Edition</u>
EN 60034-1	Rotating electrical machines - Part 1: Rating and performance	1998
EN 60034-5	Rotating electrical machines - Part 5: Classification of degrees of protection provided by enclosures for rotating machinery	1986

einschließlich des erforderlichen Zubehörs den Bestimmungen der EG-Richtlinie 73/23/EWG in der Folge 93/68/EWG entspricht.

Erläuterungen:
Dieses Produkt ist eine Einbaueinheit, die auf Grund ihrer Einbaueigenschaften nicht vornehmlich den Vorschriften für Endgeräte, Maschinen oder Anlagen entsprechen kann. Es darf daher nur zu Einbauzwecken verwendet werden.

Die Bewertung der elektrischen und mechanischen Sicherheit, der Umwelteinflüsse (Fremdkörper, Feuchtigkeit) muss im eingebauten Zustand am Endprodukt erfolgen.

Im eingebauten Zustand können sich die EMV-Eigenschaften dieses Produktes ändern. Deshalb ist für das Endprodukt (Endgeräte, Maschine, Anlagen) eine Überprüfung der EMV-Eigenschaften durch den EndproduktHersteller zweckmäßig.

including the accessories required, complies with the requirements specified by EC directive 73/23/EEC, with the amendment 93/68/EEC.

Explanatory notes:
This product is a built-in unit which, owing to its installation characteristics, is not able to comply with the regulations for complete apparatus, machines or installations from the outset. For this reason, it may only be used for built-in purposes.

The product may only be assessed with regard to its electrical and mechanical safety as well as to environmental effects (foreign bodies, moisture) after it has been installed in the product intended for the final user.

After the product has been installed, its EMC properties may change. Hence the product intended for the final user (complete apparatus, machines or installations) should be inspected with regard to its EMC properties by the manufacturer of the product intended for the final user.


accessoires nécessaires compris, satisfait aux dispositions de la directive CE 73/23/CEE, modifiée par la directive 93/68/CEE.


Explications:
Ce produit est un composant devant être encastré et qui, en tant que tel, peut ne pas correspondre aux prescriptions imposées pour appareils finaux, machines ou installations. En conséquence, ce produit ne doit être utilisé qu'à l'état encastré.

L'évaluation de la sécurité électrique et mécanique ainsi que celle de l'influence exercée par des conditions ambiantes extérieures (corps étrangers, humidité) doivent être effectuées sur l'appareil final, après encastrement du produit.

En état monté, les propriétés CEM du présent produit peuvent subir des modifications. C'est pourquoi, il est recommandé au constructeur du produit final (appareils, machines, installations où est intégré le présent produit) d'effectuer un nouveau contrôle des propriétés CEM du produit final.


Lohr, den 2000-12-01
 Ort/location/localité Datum/date

i.V. 
 Jürgen Guldner
 Leiter/Qualitäts-Management/
 Quality Management Head/Responsable Qualité

i.V. 
 Norbert Nellen
 Produktsicherheitsbeauftragter/product assurance supervisor
 Responsable sécurité de produit

Änderungen im Inhalt der Konformitätserklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.
 We reserve the right to make changes in the conformity declaration. Presently applicable edition can be obtained upon request.
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Fig. 13-1: CE declaration of conformity primary part

Appendix

13.2 Declaration of conformity secondary part

Factory standard																																	
Konformitätserklärung		Rexroth																															
im Sinne der EG-Niederspannungsrichtlinie 73/23/EWG, Anhang III B																																	
Produkt/Product/produit: LSS		INN 84.41-42-02 2000-12-01																															
Declaration of Conformity as per EC Low-Voltage directive 73/23/EEC, Attachment III B																																	
Déclaration du fabricant conformément à la directive "CE" relative à la basse tension 73/23/CEE, Annexe III B																																	
Hiermit erklären wir in alleiniger Verantwortung, dass das Produkt	Assuming sole responsibility, we herewith declare that the product	Par la présente, nous déclarons sous notre propre et unique responsabilité que le produit																															
<table border="1"> <tr> <td>1. Produkt:</td> <td>Sekundärteil für Linearmotor LSF</td> </tr> <tr> <td>Product:</td> <td>Secondary part for linear motor LSF</td> </tr> <tr> <td>Produit:</td> <td>Partie secondaire pour moteur linéaire LSF</td> </tr> <tr> <td>2. Hersteller:</td> <td>Rexroth Indramat GmbH</td> </tr> <tr> <td>Manufacturer:</td> <td>Bürgermeister-Dr.-Nebel-Straße 2</td> </tr> <tr> <td>Constructeur:</td> <td>97816 Lohr a. Main / Germany</td> </tr> <tr> <td>3. Typ / Type:</td> <td>LSS040, LSS080, LSS120, LSS160, LSS200, LSS240</td> </tr> <tr> <td>4. ab Herstellungsdatum:</td> <td>1996-07-01</td> </tr> <tr> <td>from date of manufacture:</td> <td></td> </tr> <tr> <td>à partir de la date de fabrication:</td> <td></td> </tr> <tr> <td>5. Angewendete Normen / Applicable standard / Normes utilisées</td> <td></td> </tr> <tr> <td><u>Norm / Standard / Norme</u></td> <td><u>Titel / Title / Titre</u></td> <td><u>Ausgabe / Edition</u></td> </tr> <tr> <td>EN 60034-1</td> <td>Rotating electrical machines - Part 1: Rating and performance</td> <td>1998</td> </tr> <tr> <td>EN 60034-5</td> <td>Rotating electrical machines - Part 5: Classification of degrees of protection provided by enclosures for rotating machinery</td> <td>1986</td> </tr> </table>			1. Produkt:	Sekundärteil für Linearmotor LSF	Product:	Secondary part for linear motor LSF	Produit:	Partie secondaire pour moteur linéaire LSF	2. Hersteller:	Rexroth Indramat GmbH	Manufacturer:	Bürgermeister-Dr.-Nebel-Straße 2	Constructeur:	97816 Lohr a. Main / Germany	3. Typ / Type:	LSS040, LSS080, LSS120, LSS160, LSS200, LSS240	4. ab Herstellungsdatum:	1996-07-01	from date of manufacture:		à partir de la date de fabrication:		5. Angewendete Normen / Applicable standard / Normes utilisées		<u>Norm / Standard / Norme</u>	<u>Titel / Title / Titre</u>	<u>Ausgabe / Edition</u>	EN 60034-1	Rotating electrical machines - Part 1: Rating and performance	1998	EN 60034-5	Rotating electrical machines - Part 5: Classification of degrees of protection provided by enclosures for rotating machinery	1986
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einschließlich des erforderlichen Zubehörs den Bestimmungen der EG-Richtlinie 73/23/EWG in der Folge 93/68/EWG entspricht.	including the accessories required, complies with the requirements specified by EC directive 73/23/EEC, with the amendment 93/68/EEC.	accessoires nécessaires compris, satisfait aux dispositions de la directive CE 73/23/CEE, modifiée par la directive 93/68/CEE.																															
Erläuterungen: Dieses Produkt ist eine Einbaueinheit, die auf Grund ihrer Einbaueigenschaften nicht vornehmlich den Vorschriften für Endgeräte, Maschinen oder Anlagen entsprechen kann. Es darf daher nur zu Einbauzwecken verwendet werden.	Explanatory notes: This product is a built-in unit which, owing to its installation characteristics, is not able to comply with the regulations for complete apparatus, machines or installations from the outset. For this reason, it may only be used for built-in purposes.	Explications: Ce produit est un composant devant être encastré et qui, en tant que tel, peut ne pas correspondre aux prescriptions imposées pour appareils finaux, machines ou installations. En conséquence, ce produit ne doit être utilisé qu'à l'état encastré.																															
Die Bewertung der elektrischen und mechanischen Sicherheit, der Umwelteinflüsse (Fremdkörper, Feuchtigkeit) muss im eingebauten Zustand am Endprodukt erfolgen.	The product may only be assessed with regard to its electrical and mechanical safety as well as to environmental effects (foreign bodies, moisture) after it has been installed in the product intended for the final user.	L'évaluation de la sécurité électrique et mécanique ainsi que celle de l'influence exercée par des conditions ambiantes extérieures (corps étrangers, humidité) doivent être effectuées sur l'appareil final, après encastrement du produit.																															
Im eingebauten Zustand können sich die EMV-Eigenschaften dieses Produktes ändern. Deshalb ist für das Endprodukt (Endgeräte, Maschine, Anlagen) eine Überprüfung der EMV-Eigenschaften durch den Endprodukt hersteller zweckmäßig.	After the product has been installed, its EMC properties may change. Hence the product intended for the final user (complete apparatus, machines or installations) should be inspected with regard to its EMC properties by the manufacturer of the product intended for the final user.	En état monté, les propriétés CEM du présent produit peuvent subir des modifications. C'est pourquoi, il est recommandé au constructeur du produit final (appareils, machines, installations où est intégré le présent produit) d'effectuer un nouveau contrôle des propriétés CEM du produit final.																															
Lohr, den 2000-12-01 Ort/location/localité Datum/date	i.V.  Quality management responsible/Responsable Qualité	i.V.  Norbert Nellen Produktsicherheitsbeauftragter/product assurance supervisor Responsable sécurité de produit																															
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Fig. 13-2: CE declaration of conformity secondary part

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Notes

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