Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Rexroth IndraDyn A
Asynchronous Motors MAD / MAF

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Operating Instructions

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Asynchronous Motors MAD / MAF

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Purpose of Documentation
This documentation…

- briefs mounting, operating and maintenance personnel,
- contains basic instructions on the assembly, operation and maintenance of the motors.

Record of Revision

Edition	Release Date	Notes
DOK-MOTOR*-MAD/MAF****-IT01-EN-P	11/2011	1st Edition

Legal validity
The data in this document are intended solely for product description purposes and are not intended to be understood as assured characteristics in legal terms.
We reserve the right to modify the contents of the documentation and supplies of the products.

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Bgm.-Dr.-Nebel-Str. 2 ■ 97816 Lohr a. Main, Germany
Phone +49 (0)93 52 / 18-0 ■ Fax +49 (0)93 52 / 18-84 00
http://www.boschrexroth.com/
Dept. DC-IA/EDM3 (fs)

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

D Deutsch	USA English	F Français
⚠WARNUNG Lebensgefahr bei Nichtbeachtung der nachstehenden Sicherheitshinweise! Nehmen Sie die Produkte erst dann in Betrieb, nachdem Sie die mit dem Produkt gelieferten Unterlagen und Sicherheitshinweise vollständig durchgelesen, verstanden und beachtet haben. Sollten Ihnen keine Unterlagen in Ihrer Landessprache vorliegen, wenden Sie sich an Ihren zuständigen Rexroth-Vertriebspartner. Nur qualifiziertes Personal darf an Antriebskomponenten arbeiten. Nähere Erläuterungen zu den Sicherheitshinweisen entnehmen Sie Kapitel 1 dieser Dokumentation.	**⚠WARNING Danger to life in case of non-compliance with the below-mentioned safety instructions!** 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. If no documents in your language were supplied, please consult your Rexroth sales partner. Only qualified persons may work with drive components. For detailed explanations on the safety instructions, see chapter 1 of this documentation.	**⚠AVERTISSEMENT Danger de mort en cas de non-respect des consignes de sécurité figurant ci-après !** 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. Si vous ne disposez pas de la documentation dans votre langue, merci de consulter votre partenaire Rexroth. Seul un personnel qualifié est autorisé à travailler sur les composants d'entraînement. Vous trouverez des explications plus détaillées relatives aux consignes de sécurité au chapitre 1 de la présente documentation.
⚠WARNUNG Hohe elektrische Spannung! Lebensgefahr durch elektrischen Schlag! Betreiben Sie Antriebskomponenten nur mit fest installiertem Schutzleiter. Schalten Sie vor Zugriff auf Antriebskomponenten die Spannungsversorgung aus. Beachten Sie die Entladezeiten von Kondensatoren.	**⚠WARNING High electrical voltage! Danger to life by electric shock!** Only operate drive components with a permanently installed equipment grounding conductor. Disconnect the power supply before accessing drive components. Observe the discharge times of the capacitors.	**⚠AVERTISSEMENT Tensions électriques élevées ! Danger de mort par électrocution !** N'exploitez les composants d'entraînement que si un conducteur de protection est installé de manière permanente. Avant d'intervenir sur les composants d'entraînement, coupez toujours la tension d'alimentation. Tenez compte des délais de décharge de condensateurs.
⚠WARNUNG Gefahrbringende Bewegungen! Lebensgefahr! Halten Sie sich nicht im Bewegungsbereich von Maschinen und Maschinenteilen auf. Verhindern Sie den unbeabsichtigten Zutritt für Personen. Bringen Sie vor dem Zugriff oder Zutritt in den Gefahrenbereich die Antriebe sicher zum Stillstand.	**⚠WARNING Dangerous movements! Danger to life!** Keep free and clear of the ranges of motion of machines and moving machine parts. Prevent personnel from accidentally entering the range of motion of machines. Make sure that the drives are brought to safe standstill before accessing or entering the danger zone.	**⚠AVERTISSEMENT Mouvements entraînant une situation dangereuse ! Danger de mort !** Ne séjournez pas dans la zone de mouvement de machines et de composants de machines. Évitez tout accès accidentel de personnes. Avant toute intervention ou tout accès dans la zone de danger, assurez-vous de l'arrêt préalable de tous les entraînements.
⚠WARNUNG Elektromagnetische / magnetische Felder! Gesundheitsgefahr für Personen mit Herzschrittmachern, metallischen Implantaten oder Hörgeräten! Zutritt zu Bereichen, in denen Antriebskomponenten montiert und betrieben werden, ist für oben genannten Personen untersagt bzw. nur nach Rücksprache mit einem Arzt erlaubt.	**⚠WARNING Electromagnetic / magnetic fields! Health hazard for persons with heart pacemakers, metal implants or hearing aids!** 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.	**⚠AVERTISSEMENT Champs électromagnétiques / magnétiques ! Risque pour la santé des porteurs de stimulateurs cardiaques, d'implants métalliques et d'appareils auditifs !** 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.
⚠VORSICHT Heiße Oberflächen (> 60 °C)! Verbrennungsgefahr! Vermeiden Sie das Berühren von metallischen Oberflächen (z. B. Kühlkörpern). Abkühlzeit der Antriebskomponenten einhalten (mind. 15 Minuten).	**⚠CAUTION Hot surfaces (> 60 °C [140 °F])! Risk of burns!** 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).	**⚠ATTENTION Surfaces chaudes (> 60 °C)! Risque de brûlure !** Évitez de toucher des surfaces métalliques (p. ex. dissipateurs thermiques). Respectez le délai de refroidissement des composants d'entraînement (au moins 15 minutes).

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

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

E Español	P Português	I Italiano
⚠ADVERTENCIA ¡Campos electromagnéticos/magnéticos! ¡Peligro para la salud de las personas con marcapasos, implantes metálicos o audífonos! 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.	**⚠ATENÇÃO Campos eletromagnéticos / magnéticos! Perigo de saúde para pessoas com marcapassos, implantes metálicos ou aparelhos auditivos!** 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.	**⚠AVVERTENZA Campi elettromagnetici / magnetici! Pericolo per la salute delle persone portatrici di pacemaker, protesi metalliche o apparecchi acustici!** 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.
⚠ATENCIÓN ¡Superficies calientes (> 60 °C)! ¡Peligro de quemaduras! 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).	**⚠CUIDADO Superfícies quentes (> 60 °C)! Perigo de queimaduras!** Evite tocar superfícies metálicas (p. ex. radiadores). Respeite o tempo de arrefecimento dos componentes de acionamento (mín. 15 minutos).	**⚠ATTENZIONE Superfici bollenti (> 60 °C)! Pericolo di ustioni!** Evitare il contatto con superfici metalliche (ad es. dissipatori di calore). Rispettare i tempi di raffreddamento dei componenti di comando (almeno 15 minuti).
⚠ATENCIÓN ¡Manipulación inadecuada en el transporte y montaje! ¡Peligro de lesiones! Utilice dispositivos de montaje y de transporte adecuados. Utilice herramientas adecuadas y equipo de protección personal.	**⚠CUIDADO Manejo incorreto no transporte e montagem! Perigo de ferimentos!** Utilize dispositivos de montagem e de transporte adequados. Utilize ferramentas e equipamento de proteção individual adequados.	**⚠ATTENZIONE Manipolazione inappropriata durante il trasporto e il montaggio! Pericolo di lesioni!** Utilizzare dispositivi di montaggio e trasporto adatti. Utilizzare attrezzi adatti ed equipaggiamento di protezione personale.
⚠ATENCIÓN ¡Manejo inadecuado de las pilas! ¡Peligro de lesiones! No trate de reactivar o cargar pilas descargadas (peligro de explosión y cauterización). No desarme ni dañe las pilas. No tire las pilas al fuego.	**⚠CUIDADO Manejo incorreto de baterias! Perigo de ferimentos!** Não tente reativar nem carregar baterias vazias (perigo de explosão e de queimaduras com ácido). Não desmonte nem danifique as baterias. Não deite as baterias no fogo.	**⚠ATTENZIONE Utilizzo inappropriato delle batterie! Pericolo di lesioni!** Non tentare di riattivare o ricaricare batterie scariche (pericolo di esplosione e corrosione). Non scomporre o danneggiare le batterie. Non gettare le batterie nel fuoco.

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

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

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

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

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

SLO Slovensko	SK Slovenčina	RO Română
⚠ POZOR Vroče površine (> 60 °C)! Nevarnost opeklin! Izogibajte se stiku s kovinskimi površinami (npr. hladilnimi telesi). Upoštevajte čas hlajenja pogonskih komponent (najm. 15 minut).	**⚠ UPOZORNENIE Horúce povrchy (> 60 °C)! Nebezpečenstvo popálenia!** Zabráňte kontaktu s kovovými povrchmi (napr. chladiacimi telesami). Dodržiavajte čas vychladenia komponentov pohonu (min. 15 minút).	**⚠ ATENȚIE Suprafețe fierbinți (> 60 °C)! Pericol de arsuri!** Nu atingeți suprafețele metalice (de ex. radiatoare de răcire). Respectați timpii de răcire ai componentelor de acționare (min. 15 minute).
⚠ POZOR Nestrokovno ravnanje med transportom in namestitvijo! Nevarnost poškodb! Uporabljajte ustrezne pripomočke za nameščanje in transport. Uporabite ustrezno orodje in osebno zaščitno opremo.	**⚠ UPOZORNENIE Neodborná manipulácia pri transporte a montáži! Nebezpečenstvo poranenia!** Používajte vhodné montážne a transportné zariadenia. Používajte vhodné náradie a osobné ochranné prostriedky.	**⚠ ATENȚIE Manipulare necorespunzătoare la transport și montaj! Pericol de vătămare!** Utilizați dispozitive adecvate de montaj și transport. Folosiți instrumente corespunzătoare și echipament personal de protecție.
⚠ POZOR Nepravilno ravnanje z baterijami! Nevarnost poškodb! Ne poskušajte ponovno aktivirati ali napolniti praznih baterij (Nevarnost zaradi eksplozij ali jedkanja). Ne razstavljajte ali poškodujte nobenih baterij. Baterij ne mečite v ogenj.	**⚠ UPOZORNENIE Neodborná manipulácia s batériami! Nebezpečenstvo poranenia!** Nepokúšajte sa reaktivovať alebo nabíjať prázdne batérie (nebezpečenstvo výbuchu a poleptania). Batérie nerozoberajte ani nepoškodzujte. Nehádžte batérie do ohňa.	**⚠ ATENȚIE Manipulare necorespunzătoare a bateriilor! Pericol de vătămare!** Nu încercați să reactivați sau să încărcați bateriile goale (pericol de explozie și pericol de arsuri). Nu dezasamblați și nu deteriorați bateriile. Nu aruncați bateriile în foc.

H Magyar	BG Български	LV Latviski
⚠ FIGYELMEZTETÉS! Az alábbi biztonsági útmutatások figyelmen kívül hagyása életveszélyes helyzethez vezethet! Üzembe helyezés előtt olvassa el, értelmezze, és vegye figyelembe a csomagban található dokumentumban foglaltakat és a biztonsági útmutatásokat. Amennyiben a csomagban nem talál az Ön nyelvén írt dokumentumokat, vegye fel a kapcsolatot az illetékes Rexroth-képviselővel. A hajtás alkatrészein kizárólag képzett személy dolgozhat. A biztonsági útmutatókkal kapcsolatban további magyarázatot ennek a dokumentumnak az első fejezetében találhat.	**⚠ ПРЕДУПРЕЖДЕНИЕ Опасност за живота при неспазване на посочените подолу инструкции за безопасност!** 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. Ако текстът не е написан на Вашия език, моля обърнете се към Вашия компетентен търговски представител на Rexroth. Със задвижващите компоненти трябва да работи само квалифициран персонал. Подробни пояснения към инструкциите за безопасност можете да видите в Глава 1 на тази документация.	**⚠ BRĪDINĀJUMS Turpinājumā doto drošības norādījumu neievērošana var apdraudēt dzīvību!** Sāciet lietot izstrādājumu tikai pēc tam, kad esat pilnībā izlasījuši, sapratuši un ņēmuši vērā kopā ar izstrādājumu piegādātos dokumentus. Ja dokumenti nav pieejami Jūsu valsts valodā, vērsieties pie pilnvarotā Rexroth izplatītāja. Darbus pie piedziņas komponentiem drīkst veikt tikai kvalificēts personāls. Detalizētus paskaidrojumus attiecībā uz drošības norādījumiem skatiet šī dokumenta 1. nodaļā.
⚠ FIGYELMEZTETÉS! Magas elektromos feszültség! Életveszély áramütés miatt! A hajtás alkatrészeit csak véglegesen telepített védővezetővel üzemeltesse! Mielőtt hozzányúl a hajtás alkatrészeihez, kapcsolja ki az áramellátást. Ügyeljen a kondenzátorok kisülési idejére!	**⚠ ПРЕДУПРЕЖДЕНИЕ Високо електрическо напрежение! Опасност за живота от удар от електрически ток!** Работете със задвижващите компоненти само при здраво закрепен заземяващ проводник. Преди работа по задвижващите компоненти, изключете захранващото напрежение. Обърнете внимание на времето за разреждане на кондензаторите.	**⚠ BRĪDINĀJUMS Augsts elektriskais spriegums! Dzīvības apdraudējums elektriskā trieciena dēļ!** Piedziņas komponentus darbiniet tikai ar fiksēti uzstādītu zemējumvadu. Pirms darba pie piedziņas komponentiem atslēdziet elektroapgādi. Ņemiet vērā kondensatoru izlādes laikus.
⚠ FIGYELMEZTETÉS! Veszélyes mozgás! Életveszély! Ne tartózkodjon a gépek és a gépalkatrészek mozgási területén belül! Illetéktelen személyeket ne engedjen a gép közelébe! Mielőtt beavatkozik, vagy a veszélyes zónába belép a hajtásokat biztonságosan állítsa le.	**⚠ ПРЕДУПРЕЖДЕНИЕ Опасни движения! Опасност за живота!** Не стойте в обсега на движение на машините и частите на машините. Не допускайте непреднамерен достъп на хора. Преди работа или влизане в опасната зона, спрете надеждно приводния механизъм.	**⚠ BRĪDINĀJUMS Bīstamas kustības! Dzīvības apdraudējums!** Neuzturieties mašīnu un mašīnas detaļu kustību zonā. Novērsiet nepiederošu personu piekļūšanu. Pirms darba bīstamajās zonās pilnībā apstādiniet piedziņu.

H Magyar	BG Български	LV Latviski
⚠ FIGYELMEZTETÉS! Elektromágneses / mágneses mező! Káros hatással lehet a szívritmus-szabályozó készülékkel, fémbeültetéssel vagy hallókészülékkel rendelkezők egészségére! 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.	**⚠ ПРЕДУПРЕЖДЕНИЕ Електромагнитни / магнитни полета! Опасност за здравето на хора със сърдечни стимулатори, метални импланти или слухови апарати!** 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.	**⚠ BRĪDINĀJUMS Elektromagnētiskais / magnētiskais lauks! Veselības apdraudējums personām ar sirds stimulatoriem, metāliskiem implantiem vai dzirdes aparātiem!** Tuvošanās zonām, kurās tiek montēti un darbināti piedziņas komponenti, iepriekš minētajām personām ir aizliegta, respektīvi, atļauta tikai pēc konsultēšanās ar ārstu.
⚠ VIGYÁZAT! Forró felületek (> 60 °C)! Égésveszély! Ne érjen hozzá fémfelületekhez (pl. hűtőtestekhez)! Vegye figyelembe a hajtás alkatrészeinek kihűlési idejét (min. 15 perc)!	**⚠ ВНИМАНИЕ Горещи повърхности (> 60 °C)! Опасност от изгаряне!** Не докосвайте метални повърхности (например радиатори). Съблюдавайте времето на охлаждане на задвижващите компоненти (мин. 15 минути).	**⚠ UZMANĪBU Karstas virsmas (> 60 °C)! Apdedzināšanās risks!** Neskarieties pie metāliskām virsmām (piemēram, dzesētāja). Ļaujiet piedziņas komponentiem atdzist (min. 15 minūtes).
⚠ VIGYÁZAT! Szakszerűtlen kezelés szállításkor és szereléskor! Sérülésveszély! A megfelelő beszerelési és szállítási eljárásokat alkalmazza! Használjon megfelelő szerszámokat és személyes védőfelszerelést!	**⚠ ВНИМАНИЕ Неправилно боравене по време на транспорт и монтаж!Опасност от нараняване!** Използвайте подходящо монтажно и транспортно оборудване. Използвайте подходящи инструменти и лични предпазни средства.	**⚠ UZMANĪBU Nepareizi veikta transportēšana un montāža! Traumu gūšanas risks!** Izmantojiet piemērotas montāžas un transportēšanas ierīces. Izmantojiet piemērotus instrumentus un individuālos aizsardzības līdzekļus.
⚠ VIGYÁZAT! Akkumulátorok szakszerűtlen kezelése! Sérülésveszély! Üres akkumulátorokat ne aktiváljon újra, illetve ne töltsön fel (robbanás- és marásveszély)! Az akkumulátorokat ne szedje szét, és ne rongálja meg! Az akkumulátort ne dobja tűzbe!	**⚠ ВНИМАНИЕ Неправилно боравене с батерии! Опасност от нараняване!** Не се опитвайте да активирате отново или да зареждате разредени батерии (Опасност от експлозия и напръскване с агресивен агент). Не разглобявайте и не повреждайте батерии. Не хвърляйте батерии в огън.	**⚠ UZMANĪBU Nepareiza bateriju lietošana! Traumu gūšanas risks!** Nemēģiniet no jauna aktivizēt vai uzlādēt tukšas baterijas (eksploziju un ķīmisko apdegumu draudi). Neizjauciet un nesabojājiet baterijas. Nemetiet baterijas ugunī.

LT Lietuviškai	EST Eesti	GR Ελληνικά
⚠ ĮSPĖJIMAS Pavojus gyvybei nesilaikant toliau pateikiamų saugumo nurodymų! Naudokite gaminį tik kruopščiai perskaitę prie jo pridėtus aprašus, saugumo nurodymus. Susipažinkite su jais ir vadovaukitės naudodami gaminį. Jei Jūs negavote aprašo gimtąja kalba, kreipkitės į įgaliotus Rexroth atstovus. Prie pavaros komponentų leidžiama dirbti tik kvalifikuotam personalui. Išsamesnius saugumo nurodymų paaiškinimus rasite šios dokumentacijos 1 skyriuje.	**⚠ HOIATUS Alljärgnevate ohutusjuhiste eiramine on eluohtlik!** Võtke tooted käiku alles siis, kui olete toodetega kaasasolevad materjalid ning ohutusjuhised täielikult läbi lugenud, neist aru saanud ja neid järginud. Kui Teil puuduvad emakeelsed materjalid, siis pöörduge Rexrothi kohaliku müügiesinduse poole. Ajamikomponentidega tohib töötada üksnes kvalifitseeritud personal. Täpsemaid selgitusi ohutusjuhiste kohta leiate käesoleva dokumentatsiooni peatükist 1.	**⚠ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Κίνδυνος θανάτου σε περίπτωση μη συμμόρφωσης με τις παρακάτω οδηγίες ασφαλείας!** Θέστε το προϊόν σε λειτουργία αφού διαβάσετε, κατανοήσετε και λάβετε υπόψη το σύνολο των οδηγιών ασφαλείας που το συνοδεύουν. Εάν δεν υπάρχει τεκμηρίωση στη γλώσσα σας, απευθυνθείτε σε εξουσιοδοτημένο αντιπρόσωπο της Rexroth. Μόνο εξειδικευμένο προσωπικό επιτρέπεται να χειρίζεται στοιχεία μετάδοσης κίνησης. Περαιτέρω επεξηγήσεις των οδηγιών ασφαλείας διατίθενται στο κεφάλαιο 1 της παρούσας τεκμηρίωσης.
⚠ ĮSPĖJIMAS Aukšta elektros įtampa! Pavojus gyvybei dėl elektros smūgio! Pavaros komponentus eksploatuokite tik su fiksuotai instaliuotu apsauginiu laidu. Prieš prieidami prie pavaros komponentų išjunkite maitinimo įtampą. Atsižvelkite į kondensatorių išsikrovimo trukmę.	**⚠ HOIATUS Kõrge elektripinge! Eluohtlik elektrilöögi tõttu!** Käitage ajamikomponente üksnes püsivalt installeeritud maandusega. Lülitage enne ajamikomponentidega tööde alustamist toitepinge välja. Järgige kondensaatorite mahalaadumisaegu.	**⚠ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Υψηλή ηλεκτρική τάση! Κίνδυνος θανάτου από ηλεκτροπληξία!** Θέτετε σε λειτουργία τα στοιχεία μετάδοσης κίνησης μόνο εφόσον έχει τοποθετηθεί καλά προστατευτικός αγωγός γείωσης. Πριν από οποιαδήποτε παρέμβαση, αποσυνδέστε την τροφοδοσία των στοιχείων μετάδοσης κίνησης. Λάβετε υπόψη τους χρόνους αποφόρτισης των πυκνωτών.

LT Lietuviškai	EST Eesti	GR Ελληνικά
⚠ ĮSPĖJIMAS Pavojingi judesiai! Pavojus gyvybei! Nebūkite mašinų ar jų dalių judėjimo zonoje. Neleiskite netyčia patekti asmenims. Prieš patekdami į pavojaus zoną saugiai išjunkite pavaras.	**⚠ HOIATUS Ohtlikud liikumised! Eluohtlik!** Ärge viibige masina ja masinaosade liikumispiirkonnas. Tõkestage inimeste ettekavatsematu sisenemine masina ja masinaosade liikumispiirkonda. Tagage ajamite turvaline seiskamine enne ohupiirkonda juurdepääsu või sisenemist.	**⚠ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Επικίνδυνες τάσεις! Κίνδυνος θανάτου!** Μην στέκεστε στην περιοχή κίνησης μηχανημάτων και εξαρτημάτων. Αποτρέπετε την τυχαία είσοδο ατόμων. Πριν από την παρέμβαση ή πρόσβαση στην περιοχή κινδύνου, μεριμνήστε για την ασφαλή ακινητοποίηση των συστημάτων μετάδοσης κίνησης.
⚠ ĮSPĖJIMAS Elektromagnetiniai / magnetiniai laukai! Pavojus asmenų su širdies stimuliatoriais, metaliniais implantais arba klausos aparatais sveikatai! Prieiga prie zonų, kuriose montuojami ir eksploatuojami pavaros komponentai, aukščiau nurodytiems asmenims yra draudžiama arba leistina tik pasitarus su gydytoju.	**⚠ HOIATUS Elektromagnetilised / magnetilised väljad! Terviseohtlik südamestimulaatorite, metallimplantaatide ja kuulmisseadmetega inimestele!** Sisenemine piirkondadesse, kus toimub ajamikomponentide monteerimine ja käitamine, on ülalnimetatud isikutele keelatud või lubatud üksnes pärast arstiga konsulteerimist.	**⚠ ΠΡΟΕΙΔΟΠΟΙΗΣΗ Ηλεκτρομαγνητικά/ μαγνητικά πεδία! Κίνδυνος για την υγεία ατόμων με καρδιακούς βηματοδότες, μεταλλικά εμφυτεύματα ή συσκευές ακοής!** 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.
⚠ PERSPĖJIMAS Karšti paviršiai (> 60 °C)! Nudegimo pavojus! Venkite liesti metalinius paviršius (pvz., radiatorių). Išlaikykite pavaros komponentų atvėsimo trukmę (bent 15 minučių).	**⚠ ETTEVAATUST Kuumad välispinnad (> 60 °C)! Põletusoht!** Vältige metalsete välispindade (nt radiaatorid) puudutamist. Pidage kinni ajamikomponentide mahajahtumisajast (vähemalt 15 minutit).	**⚠ ΠΡΟΣΟΧΗ Καυτές επιφάνειες (> 60 °C)! Κίνδυνος εγκαύματος!** Αποφεύγετε την επαφή με μεταλλικές επιφάνειες (π.χ. μονάδες ψύξης). Λάβετε υπόψη το χρόνο ψύξης των στοιχείων μετάδοσης κίνησης (τουλάχιστον 15 λεπτά).
⚠ PERSPĖJIMAS Netinkamas darbas transportuojant ir montuojant! Susižalojimo pavojus! Naudokite tinkamus montavimo ir transportavimo įrenginius. Naudokite tinkamus įrankius ir asmens saugos priemones.	**⚠ ETTEVAATUST Asjatundmatu käsitsemine transportimisel ja montaažil! Vigastusoht!** Kasutage sobivaid montaaži- ja transpordiseadiseid. Kasutage sobivaid tööriistu ja isiklikku kaitsevarustust.	**⚠ ΠΡΟΣΟΧΗ Ακατάλληλος χειρισμός κατά τη μεταφορά και συναρμολόγηση! Κίνδυνος τραυματισμού!** Χρησιμοποιείτε κατάλληλους μηχανισμούς συναρμολόγησης και μεταφοράς. Χρησιμοποιείτε κατάλληλα εργαλεία και ατομικό εξοπλισμό προστασίας.
⚠ PERSPĖJIMAS Netinkamas darbas su baterijomis! Susižalojimo pavojus! Nebandykite tuščių baterijų reaktyvuoti arba įkrauti (sprogimo ir išėsdinimo pavojus). Neardykite ir nepažeiskite baterijų. Nemeskite baterijų į ugnį.	**⚠ ETTEVAATUST Patareide asjatundmatu käsitsemine! Vigastusoht!** Ärge üritage kunagi tühje patareisid reaktiveerida või täis laadida (plahvatus- ja söövitusoht). Ärge demonteerige ega kahjustage patareisid. Ärge visake patareisid tulle.	**⚠ ΠΡΟΣΟΧΗ Ακατάλληλος χειρισμός μπαταριών! Κίνδυνος τραυματισμού!** Μην επιδιώκετε να ενεργοποιήσετε ξανά ή να φορτίσετε κενές μπαταρίες (κίνδυνος έκρηξης και διάβρωσης). Μην διαλύετε ή καταστρέφετε τις μπαταρίες. Μην απορρίπτετε τις μπαταρίες στη φωτιά.

CN 中文
⚠ 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！ 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。 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。 只允许有资格人员对驱动器部件进行操作。 安全说明的详细解释在本文档的第一章。
⚠ 警告 高电压！电击导致生命危险！ 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。 在接触驱动器部件前先将驱动器部件断电。 确保电容放电时间。
⚠ 警告 危险运动！生命危险！ 保证设备的运动区域内和移动部件周围无障碍物。 防止人员意外进入设备运动区域内。 在接近或进入危险区域之前，确保传动设备安全停止。

CN 中文
⚠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！** 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。
⚠小心 **热表面（大于 60 度）！灼伤风险！** 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）。
⚠小心 **安装和运输不当导致受伤危险！当心受伤！** 使用适当的运输和安装设备。 使用适合的工具及用适当的防护设备。
⚠小心 **电池操作不当！受伤风险！** 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）。 请勿拆解或损坏电池。请勿将电池投入明火中。

Table of Contents

Table of Contents

1 About this Documentation

1.1 Validity of this Documentation

This documentation is valid for Rexroth housing motors of the MAD / MAF series and must be observed by assemblers, operators, service engineers and facility operators.

☞ Motors of the IndraDyn A series with encoder option S6 or M6 are suitable for operation in certain explosion-hazardous areas. These ATEX motors have their own instruction manual designated DOK-MOTOR*-IDYN*A*EXPD-IB□□-□□-P.

1.2 Additional Documentation

Operate this product only, if you have the following documentation available. You must understand and observe this documentation.

	Title	Document type	Document number
🕮	Rexroth IndraDyn A Asynchronous Motors MAD/MAF	Project Planning Manual	DOK-MOTOR*-MAD/MAF****-PR□□-□□-P
🕮	Rexroth Connection Cables IndraDrive and IndraDyn	Selection Data	DOK-CONNEC-CABLE*INDRV-AU□□-□□-P

Fig.1-1: Additional documentation

1.3 Presentation of Information

Safety instructions for electric drives and controls

The safety instructions in these operating instructions include signal words (danger, warning, caution, note) and, if applicable, a signal symbol (according 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.

NOTICE

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

About this Documentation

Symbols

Symbol	Meaning
	Reference to supplementary documentation
	This note gives important information, which must be observed.
▶	Single, independent action step
1. 2. 3.	Numbered action instructions: The numbers show that the action steps must be taken one after the other.
	Warning against dangerous electric voltage
	Warning against hot surfaces
	Warning against rotating machine parts
	Warning against overhead load
	Electrostatic sensitive devices
	Prohibition for persons bearing a cardiac pacemaker
	Do not carry along metal parts or clocks
	Hammer scales are forbidden
	The UL Recognized Compontent Mark shows recognized component parts which are components of a bigger product or system.
	The letters C and E stand for "Conformité Européenne“. The CE mark only shows that a product conforms with the respective EC guidelines. Conformity with the Low Voltage Directive 2006/95/EC, DIN EN 60034-1, DIN EN 60034-5 is confirmed for MAD / MAF motors.
	Component prepared for use in systems for "integrated safety technology".

Fig. 1-2: Meaning of symbols

2 Safety Instructions

2.1 About this Chapter

Please observe the general safety instructions in this chapter and the safety instructions and handling instructions in this manual. This will help you to avoid personal danger, material damage and errors.

☞ This manual must be stored by the user during the whole product lifetime and passed on when selling.

2.2 Appropriate Use

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

The motors have been designed for installation in industrial machinery. The motors comply with the following standards and directives.

Standards

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

Directives

2006/95/EC	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 correct installation (for example: physical separation of signal and power cables, using shielded cables ...). The converter manufacturer's EMC instructions must be observed.

The machine may not be commissioned before conformity with these directives has been determined.

2.3 Inappropriate Use

Any use of the MAD / MAF 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".

Use in hazardous areas (ATEX) is forbidden, unless the motors are explicitly provided for this purpose.

Direct operation on the three-phase network is forbidden.

2.4 Personnel Qualification

For the purpose of this manual, qualified personnel means persons who are familiar with transporting, installing, mounting, commissioning and operating the components of the electrical drive and control system and the associated hazards and have an appropriate qualification for their job.

All persons working on, with or in the vicinity of an electrical system must be informed of the relevant safety requirements, safety instructions and internal instructions (DIN EN 50110-1).

2.5 General Safety Instructions

Do not install or operate motors or components of the electric drive and control system before you have not carefully read all delivered documents.

Please observe the particular applicable national, local and system-specific regulations, the safety instructions in the documentation as well as the warning and informative labels on the motors.

Improper handling of the motors and non-compliance with the safety instructions contained in this manual may result in material damage, personal injury, electric shock and, in extreme cases, in death.

For damage due to non-compliance with the safety instructions, Bosch Rexroth does not assume any liability.

Applications for functional safety are only allowed if the motors have the SI mark on the rating plate.

2.6 Product and Technology-dependent Safety Instructions

2.6.1 Protection against Electrical Voltage

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 the work:

1. Isolate.
2. Protect the system or plant against restart.
3. Ensure de-energization.
4. Ground and short-circuit.
5. Cover or shield any adjacent live parts.

After completion of the work, unmake the measures in reverse order.

During operation, dangerous voltages occur! Danger to life! Risk of injury due to electric shock!

- Before switching on, establish the fixed connection of the protective conductor to all electric components according to the connection diagram.
- Operation, even for short-term measuring and testing purposes, is only permitted with the protective conductor securely connected to the component points provided.

2.6.2 Protection against Mechanical Hazards

Dangerous movements! Danger to life, risk of injury, severe personal injury or material damage!

- Do not stay within the area of motion of the machine. Prevent persons from accidently entering the danger zone.
- Make vertical axes safe against falling or declining after switching off the motor, e.g., by
  - locking the vertical axis mechanically,
  - providing an external braking / catching / clamping device, or
  - ensuring sufficient equilibration of the vertical axis.

Only using the serially delivered **motor holding brake** or an external holding brake activated by the drive controller **is not suitable for personal protection!**

Rotating parts! Danger to life, risk of injury, severe personal injury or material damage!

- Secure key and/or transmission elements against ejection.
- Install covers on dangerous rotating machine parts before start-up.

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 electric motors and can be a great danger for persons.

Strong magnetic and electromagnetic fields pose a health hazard for persons with heart pacemakers, metallic implants and hearing aids in the direct environment of motor components!

- Persons with heart pacemakers and metallic implants are not allowed to approach or handle these motor components.

Crushing hazard of fingers and hands due to strong attractive forces of the magnets!

- Handle only with protective gloves.

Risk of destruction of sensitive parts!

- Keep watches, credit cards, check cards and identity cards with magnetic strips as well as all ferromagnetic metallic parts such as iron, nickel and cobalt away from the permanant magnets.

2.6.4 Protection against Burns

Risk of burns by hot surfaces!

- Avoid contact with hot motor surfaces. **Temperatures may rise to over 70 °C**.
- Allow the motors 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.

3 Scope of Delivery

The scope of delivery of an IndraDyn housing motor contains:

- Motor in original package
- Additional type plate
- Operating instructions with safety instructions
- Optional connecting accessories for motors with terminal box
- Protective covers for output shaft, plug connections and coolant connections of water-cooled motors.

On delivery, immediately verify whether the delivered goods are those specified on the delivery note. The forwarder must be promptly informed of any damage on the packaging and goods, which is detected on delivery. It is forbidden to use damaged products.

4 About this Product

4.1 Product Description

4.1.1 Technical Features

The motors of the MAD / MAF series are asynchronous housing motors for operating converters or inverters of Bosch Rexroth.

Product	AC motor
Manufacturer	Bosch Rexroth Electric Drives and Controls GmbH Buergermeister-Dr.-Nebel-Strasse 2 97816 Lohr am Main / Germany
Type	**MAD**100, -130, -160, -180, -225 **MAF**100, -130, -160, -180, -225
Listing acc. to UL standard (UL)	UL 1004, Fifth Edition
Listing acc. to CSA standard (UL)	Canadian National Standard(s) C22.2 No. 100-04
UL Files (UL)	E 335445
Ambient temperature in operation	0 ... 40 °C
Motor design	B05 / B35 (DIN EN 60034-7)
Degree of protection	IP65 (DIN EN 60034-5)
Vibration severity grade	See motor type code
Concentricity, run-out and alignment	For encoders S2, S6, M2, M6 tolerance R (DIN IEC 60072-1)
Flange	acc. to DIN 42955
Shaft end	Cylindric (DIN 748 part 3), keyway optional, centering hole (DIN 332 part 2)
Installation altitude	0 ... 1,000 m
Sound pressure level	< 75 dB(A)
Insulation class	155 (DIN EN 60034-1)
Balancing	Full-key or half-key balancing
Electrical connection	Power connection: terminal box or connector socket Encoder connection: connector socket
Encoder system	S2 (optical, Singleturn EnDat 2.1, 2048 signal periods) S6 (optical, Singleturn EnDat 2.1, 2048 signal periods) [1)] M2 (optical, Multiturn EnDat 2.1, 2048 signal periods) M6 (optical, Multiturn EnDat 2.1, 2048 signal period) [1)] C0 (optical, incremental encoder, 2048 signal periods)
Motor holding brake (optional)	Depending on the holding brake (see type code): electrically applying or electrically releasing U_N 24V DC (±10%)
1) IndraDyn A motors for explosion-hazardous areas have their own instruction manual designated DOK-MOTOR*-IDYN*A*EXPD-IB□□-□□-P.	

About this Product

4.1.2 Type of Construction

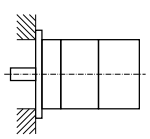
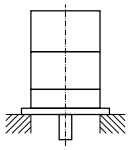
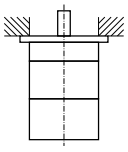
Motor design B05		
IM B5	**IM V1**	**IM V3**
		
Flange mounted on the drive side of the flange	Flange mounted on the drive side of the flange; drive side facing down	Flange mounted on the drive side of the flange; drive side facing up

Fig.4-1: Allowed B05 types of installation according to DIN EN 60034-7

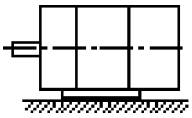
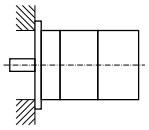
Motor design B35	
IM B3	**IM B5**
	
Foot installation, feet facing down	Flange mounted on the drive side of the flange

Fig.4-2: Allowed B35 types of installation according to DIN EN 60034-7

4.1.3 Degree of Protection

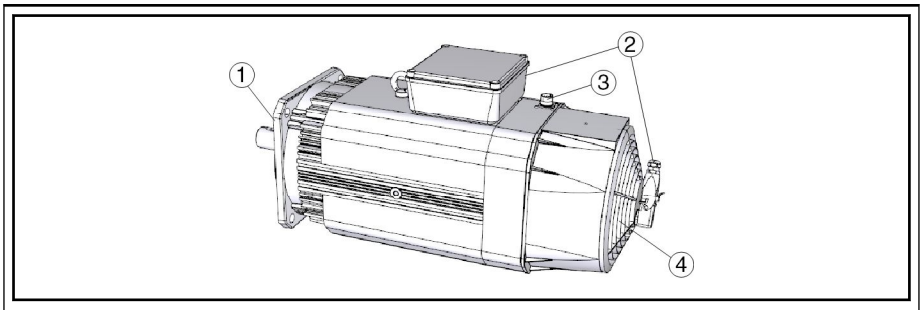


Fig.4-3:

Degree-of-protection area		Degree of protection	Remark
①	Output shaft without shaft seal	IP54	Observe the instructions in the motor project planning manual for vertical installation positions
	Output shaft with shaft sealing ring	IP65	Option
	Output shaft with labyrinth seal	IP65	Option
②	Power connection Fan connection	IP65	Terminal box or plug

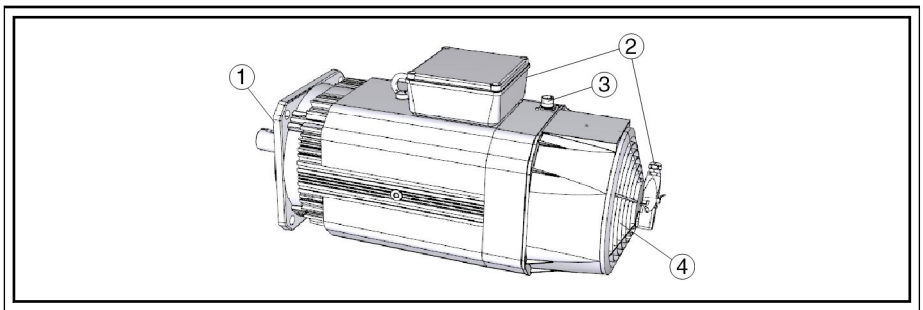


Fig.4-3:

Degree-of-protection area		Degree of protection	Remark
③	Connection of motor encoder	IP65	
④	Motor fan	IP65	Fan motor IP65 Fan grille IP24

Fig.4-4: Definition of degree-of-protection areas on the motor

4.1.4 Output Shaft

Centering hole

Centering hole according to DIN 332-2	MAD / MAF				
	100	130	160	180	225
DS M16	■	■			
DS M20			■	■	■

Fig.4-5: Centering hole

Key (optional)

Corresponding key according to DIN 6885-AS (included in the scope of delivery)	MAD / MAF				
	100	130	160	180	225
10×8×45	■				
12×8×80		■			
16×10×80			■		
18×11×110				■	
20x12x110					■

Fig.4-6: Keys

4.1.5 Bearings

MAD and MAF motors are equipped with permanently greased bearings. For detailed information on the available bearings variants and their service life in relation to the shaft and bearing load, please refer to the Project Planning Manual 🕮 Rexroth IndraDyn A.

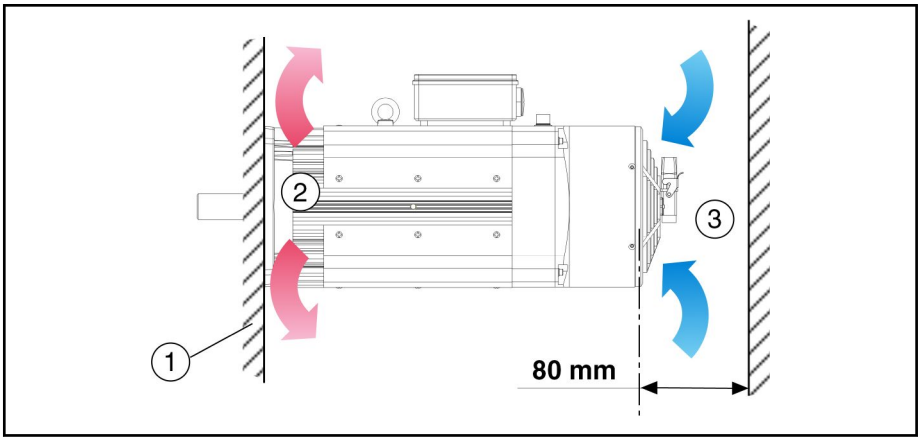
4.1.6 Cooling

Surface Ventilation

MAD motors may only operated with fans. They are cooled via air flows that are guided through air baffles over the surface of the motor.

In order to ensure that the axial fan can convert the amount of air required, a minimum distance between the fan grille and the machine must be taken into account for sucking in/flowing off the air. The distance is based on the motor construction.

About this Product



① Machine
② Air flow-off space
③ Air suck-in space

Fig.4-7: MAD ventilation

The fan is explicitly not suitable for use under the following conditions:

- Delivery of air containing abrasive (eroding) particles.
- Intake air, which is corrosive, e.g. salt mist.
- Delivery of air containing a high dust load, e.g., suction of saw dust.
- Delivery of flammable gases/particles
- Use of the ventilator as a safety-related component or for assumping safety-related functions

Liquid Cooling

Liquid-cooled motors may only be operated in a closed cooling water circuit with heat exchanger. The coolant flow direction can be selected as desired.

Add anti-corrosion agent to the coolant system. Observe the information provided in the Project Planning Manual 🕮 Rexroth IndraDyn A.

4.2 Product Identification

4.2.1 Type Code

Product

MA_ _ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

MA**D** = see project planning manual
MA**F** = see project planning manual

Size

MA_ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

= see project planning manual

Length

MA_ _ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

= see project planning manual

Winding

MA_ _ _ _ _ - _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

= see project planning manual

Cooling

MA_ _ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

SA = axial fan, blowing
SL = fan cowl with fan adapter
FQ = liquid cooling (connection thread)
FR = liquid cooling (fast coupling)

Encoder

MA_ _ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ _ _ _ - _ _ - _ _

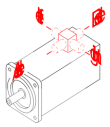
S2 = singleturn absolute encoder, EnDat2.1, 2,048 increments
S6 = singleturn absolute encoder, EnDat2.1, 2,048 increments for hazardous areas[1)]
M2 = multiturn absolute encoder, EnDat2.1, 2,048 increments
M6 = multiturn absolute encoder, EnDat2.1, 2,048 increments for hazardous areas[1)]
C0 = incremental encoder, 2,048 increments
N0 = without motor encoder

Electrical Connection

MA_ _ _ _ _ - _ _ _ _ _ - _ _ - _ _ - _ - _ _ - _ _

A = connector A-side
B = connector B-side
R = connector right
L = connector left
E = terminal box A-side
H = terminal box B-side
D = terminal box right
G = terminal box left

Position of power connector = top



1) IndraDyn A motors for explosion-hazardous areas have their own instruction manual designated DOK-MOTOR*-IDYN*A*EXPD-IB□□-□□-P.

Fig.4-8: Type code (1/2)

About this Product

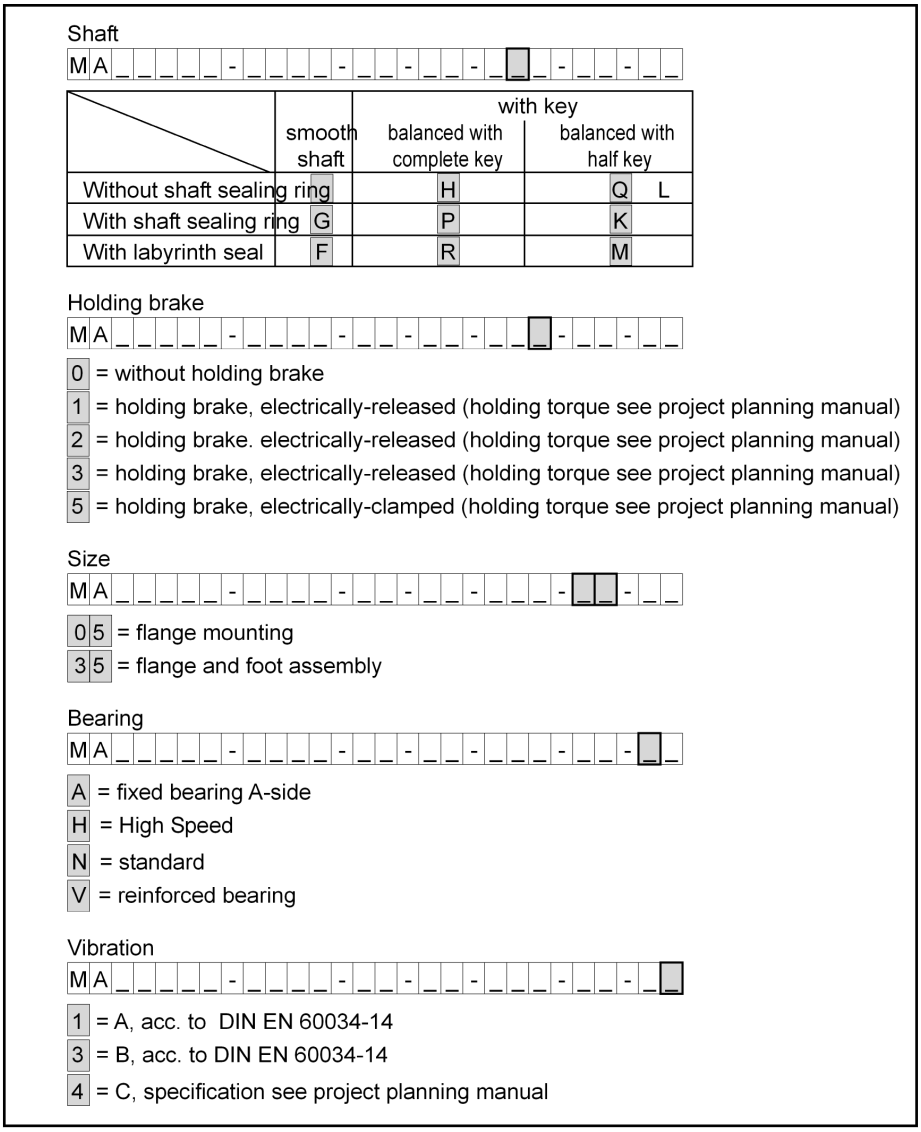
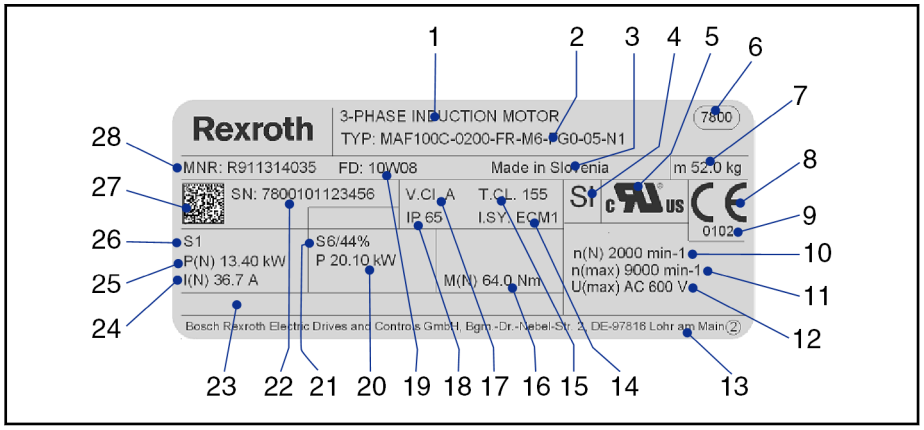


Fig.4-9: Type code (2/2)

4.2.2 Rating Plate (Example MAF100)



1	Type of machine
2	Type designation
3	Designation of origin
4	Safety technology acc. to EN 61508-1
5	UL mark
6	Manufacturing factory
7	Motor mass in kg
8	CE conformity mark
9	Code number of the test body
10	Rated speed
11	Maximum speed
12	Maximum input voltage
13	Company address
14	Insulation system
15	Thermal temperature class
16	Rated torque
17	Vibration severity step
18	Degree of protection of the housing
19	Production date
20	Motor power for operation mode S6
21	Operation mode S6/44%
22	Serial number
23	Field for holding brake (optional) with holding torque, rated voltage, rated current
24	Rated current in delta connection for operation mode S1
25	Rated power in delta connection for operation mode S1
26	Operation mode S1
27	Rexroth bar code
28	Material number

Fig.4-10: MAF rating plate example

IndraDynA motors are supplied with 2 rating plates each. Apply the second rating plate to the machine at a well-visible point so that the motor data can be read at any time.

5 Transport and Storage

5.1 Transport (Shipping) Instructions

The motors must be transported in their original package considering classes 2K2, 2B1, 2C2, 2S2, 2M1 acc. to DIN EN 60721-3-2.

Please observe the following limitations of this classification:

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

☞ Before transport, discharge the liquid coolant from liquid-cooled motors to avoid frost damage.

5.2 Notes 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 ESD safety measures.

⚠ WARNING

Risk of injury and material damage due to improper handling during transport!

▸ Only use hoisting gear suited for the weight of the motors. Use the eye-bolt provided on the motor to lift the motor. Securely tighten this eye-bolt before using it.

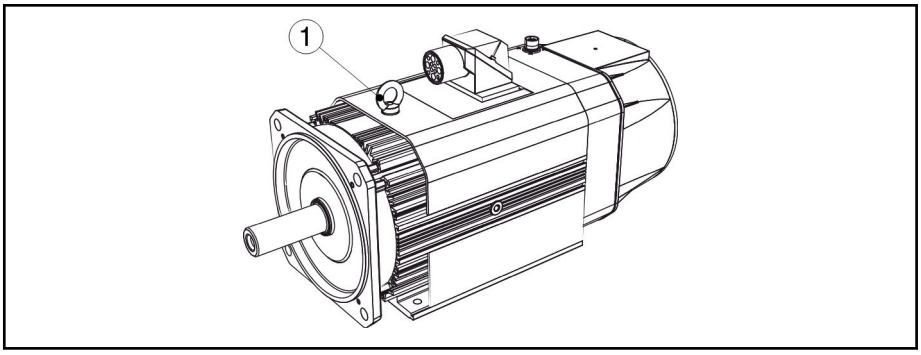
▸ Never walk under hanging loads.

▸ Do not lift the motor on the shaft or - where MAD motors are concerned - on the optional fan housing.

▸ Use suitable protective equipment and protective clothing during transport, and wear safety shoes.

☞ Please observe DIN 580 when transporting motors by means of eye-bolts. Non-observance of the information in this DIN standard may cause overload of the lifting eye-bolts and result in injury to persons and/or damage to products.

Transport and Storage



① Eye-bolt (ensure tight seating before use)
Fig.5-1: Lifting and transporting motors

▸ Before transporting the motor, determine the weight of the motor. For motor weight data, please refer to the rating plate or to the Project Planning Manual 🕮 Rexroth IndraDyn A.

▸ Adjust the carrying capacity of the lifting device to the motor weight.

▸ Avoid increased transport vibrations.

▸ Remove the existing transport locks prior to commissioning and keep them.

5.3 Product Storage

Store the motors in their original package at a dry, dust free, vibration free and light protected place without direct solar radiation. Please observe classes 1K2, 1B1, 1C1,1S1,1M2 specified for storage acc. to DIN EN 60721-3-2.

Please observe the following classification limitations:

- Storage temperature -20 ... +60 °C
- Relative air humidity 5 … 95 %
- Absolute air humidity 1 … 29 g/m³
- No condensation
- No ice formation/freezing
- No occurence of salt mist

NOTICE **Damage due to moisture and humidity!**

▸ Use coverings to protect the products from moisture.

▸ Store them only in rainproof and dry rooms.

▸ Before storage, discharge the liquid coolant from liquid-cooled motors to avoid frost damage.

5.4 Storage Times

Additional measures must be taken on commissioning to preserve proper functioning – irrespective of the storage time which may be longer than the warranty period of our products. However, this does not result in any additional warranty claims.

Motors

Storage time	Measures on commissioning
< 1 year	Resurface the holding brake (optional)
1 ... 5 years	1. Check the electric contacts to verify that they are free from corrosion 2. Allow the motor to run in without load at 800 ... 1,000 rpm for one hour 3. Resurface the holding brake (optional)
> 5 years	1. Change the bearings 2. Change the encoder 3. Resurface the holding brake (optional) 4. Check the electric contacts to verify that they are free from corrosion

Fig.5-2: Measures before commissioning motors stored for a prolonged period of time

Cables and connectors

Storage time	Measures prior to commissioning
< 1 year	None
1 ... 5 years	▶ Check the electric contacts to verify that they are free from corrosion
> 5 years	▶ 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, ...).

Fig.5-3: Measures before commissioning cables and connectors stored for a prolonged period of time

6 Assembly

6.1 Motor Assembly

6.1.1 Flange Assembly

NOTICE **Motor damage due to ingress of liquids!**

Liquid which exists over a longer period on the shaft sealing ring of the output shaft can ingress into the motor and cause damage.

- Ensure that liquid cannot be present at the output shaft.
- Do not mount any open gearboxes (gearboxes that are not hermetically sealed).

For details on the mounting holes, please refer to the Project Planning Manual 🕮 Rexroth IndraDyn A. Use all motor mounting holes to ensure that the motor is safely mounted to the machine.

- If coupling is direct, ensure that the support is plane and the orientation is precise.
- Avoid pinching or jamming the centering collar on the motor side.
- Avoid damage to the insertion fitting on the system side.
- Use the following screws and washers for flange assembly.

Mounting screws for flange assembly in case of IndraDyn A motors

Overall motor size	Hole ⌀ [mm]	Screw 8.8 DIN EN ISO 4762 DIN EN ISO 4014	Tightening torque M_A[Nm] with μ_K= 0.12	Washer DIN EN ISO ...
100	14	M12 × ...	84	28,738
130...225	18	M16 × ...	206	7,090

Fig.6-1: Tightening torque of mounting screws (flange assembly)

6.1.2 Foot Assembly

Before mounting IndraDyn A motors through foot assembly, please observe the distance from motor shaft center to lower foot edge specified in the respective motor dimension sheet. Compare this value with the connection dimension present on the machine side.

☞ The mounting holes and the distances comply with the general tolerance acc. to DIN ISO 2768-1 (tolerance class m).

Before mounting the motor to the machine, align the motor such that the center line of the motor shaft is in true alignment with the center line of the connection shaft.

When selecting motor foot assembly, we recommend to proceed as follows:

1. MAD130 ... 225: Dismount the lower air baffles on the side to get free access to the mounting holes.
2. Align the motor such that the center line of the motor shaft is in true alignment with the center line of the connection shaft of the machine. To align the motor, use lengths of steel plate as a base.
3. Connect the motor firmly to the machine.

Assembly

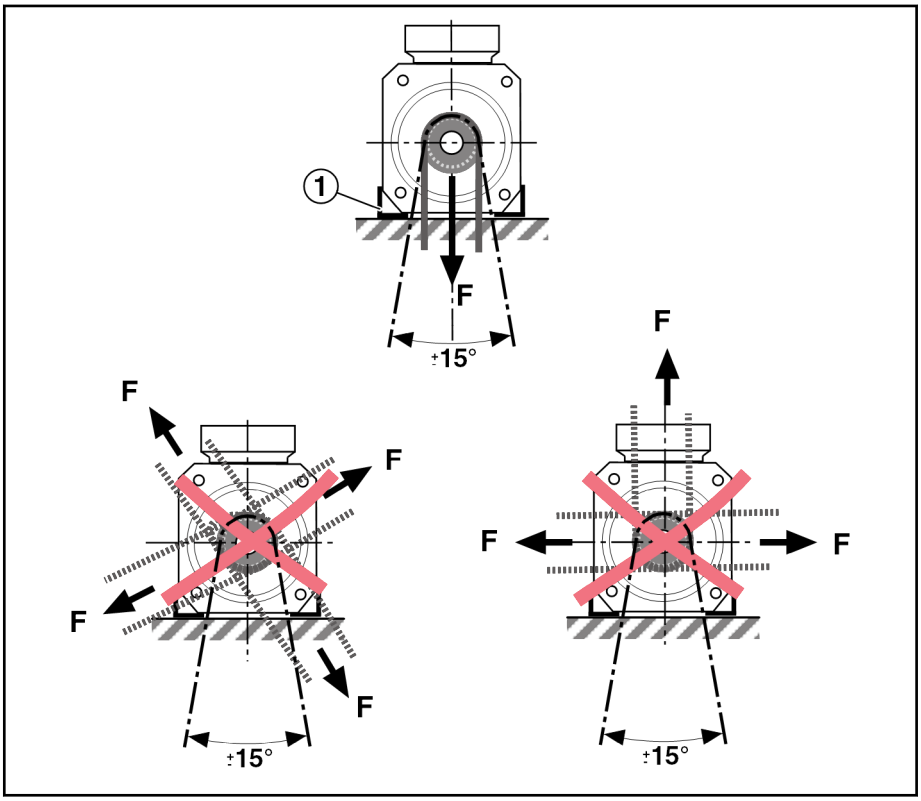
Mounting screws for foot assembly in case of IndraDyn A motors

Overall motor size	Hole ⌀ [mm]	Screw 8.8 DIN EN ISO 4762 DIN EN ISO 4014	Tightening torque M_A [Nm] with μ_K= 0,12	Washer DIN EN ISO ...
100	11	M10 x ...	48	28,738
130	12			
160	14	M12 x ...	84	
180	14.5			
225	22	M20 × ...	206	7,090

Fig.6-2: Tightening torque of mounting screws (foot assembly)

4. MAD130 ... 225: Re-install the air baffles dismounted at the beginning to the motor.

In contrast to flange assembly, radial forces may only act vertically to the mounting surface (± 15°) with foot assembly. The transfer of forces with other effective force directions is not permitted.



① Mounting feet

Fig.6-3: Example of MAF foot assembly

When using foot assembly, please pay attention to the following:

- Forces acting on the motor feet that are transferred from a gearbox are not permitted.

  Forces that are acting via the gearbox shaft must be supported on the gearbox.
- Improper installation results in forces that can quickly lead to motor damage.
- Check whether you can use "flange assembly" as an alternative.

6.1.3 Attaching Transmission Elements

Fit and pull off the transmission elements such as pulleys and couplings only with suitable equipment; heat them, if necessary.

▸ Avoid unallowed belt tensions. Take the allowed radial and axial forces specified in the project planning manuals into account.

▸ The balance of transmission elements must comply with the balancing type of the motor.

NOTICE

Motor damage due to strikes onto the motor shaft

▸ Do not strike the shaft end and do not exceed the allowed axial and radial forces of the motor.

Fitting

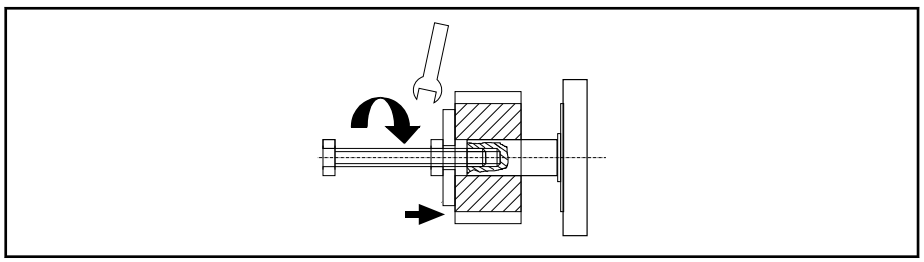


Fig.6-4: Fitting the transmission element

▸ Use the centering hole for fitting transmission elements. For details on the center holes, please refer to the Project Planning Manual 🕮 Rexroth IndraDyn A. If necessary, heat the transmission element.

Assembly

6.2 Connecting the Electric Supply

6.2.1 Safety

⚠ 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. Protect the system or plant against restart.
3. Ensure de-energization.
4. Ground and short-circuit.
5. Cover or shield any adjacent live parts.

⚠ WARNING **High electrical voltage! Danger to life, danger of injury due to electric shock.**

▸ Any work may only be carried out while the motor is at standstill.

▸ Never connect or disconnect flange sockets when they are live!

NOTICE **Never touch the connection points of electrostatic sensitive devices!**

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

▸ Observe ESD safety measures.

6.2.2 Line Connection with Connector Socket

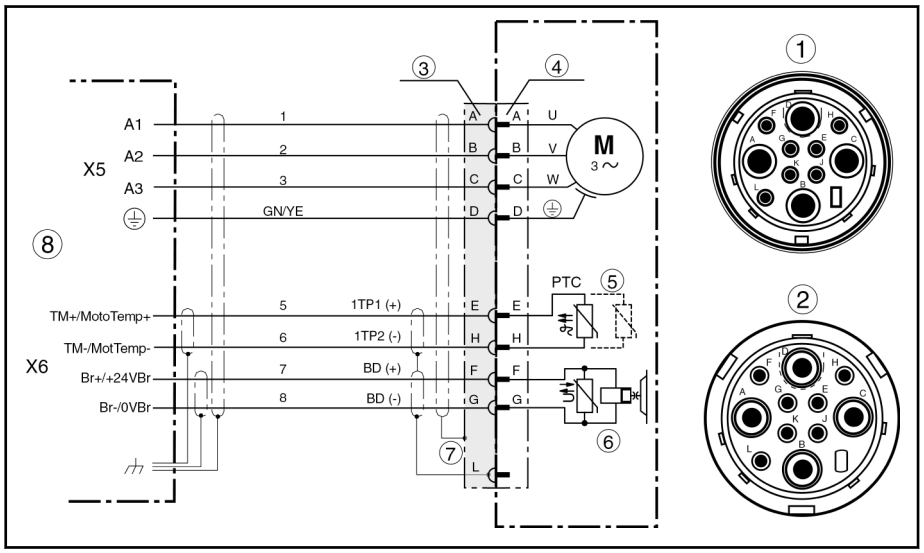
When connecting, ensure the following:

- Use ready-made Rexroth cables; see documentation 🕮 Rexroth Connection Cables IndraDrive and IndraDyn.
- Observe the circuit diagrams listed in the Project Planning Manual 🕮 Rexroth IndraDyn A.
- The connections must be established such that a permanent safe electrical connection is ensured.
- Establish a safe protective conductor connection.
- Only use flange sockets which are free from dirt, foreign bodies and humidity.
- Completely tighten the flange sockets in screw design. The vibration O-ring may no longer be visible.

- Connect or disconnect plug connections only in de-energized, dry and clean state.
- Protect the flange sockets from external force effect.

When motors in ATEX design are used:

Connect an additional protective conductor connection according to the Operating Instructions DOK-MOTOR*-IDYN*A*EXPD-IB□□-□□-P.



① Flange socket INS480 (view on the plug-in side)
② Flange socket INS380 (view on the plug-in side)
③ Coupling
④ Flange socket
⑤ Only one PTC sensor is applied (spare sensor lines are provided in the socket housing)
⑥ Holding brake (optional)
⑦ Overall shield connection by clamping the strain relief cable in the socket
⑧ Connection designations on the Rexroth drive controller

Fig.6-5: Line connection via flange socket; connection diagram

- Ensure the line cross-section required for connecting the particular motor specified in the Project Planning Manual 🕮 Rexroth IndraDyn A.
- Use ready-made Rexroth connection cables; see documentation 🕮 Rexroth Connection Cables IndraDrive and IndraDyn.

Assembly

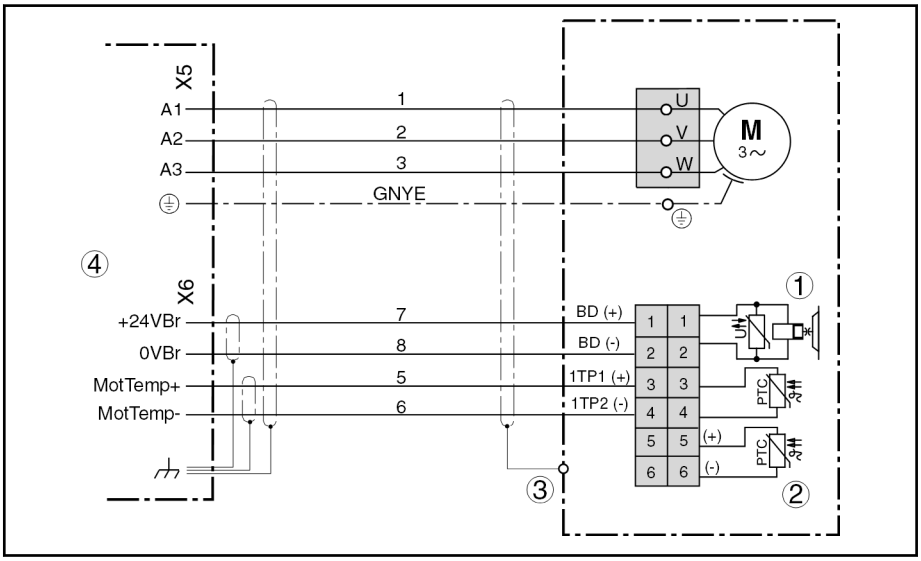
6.2.3 Power Connection via Terminal Box

Overall motor size MAD/MAF...	Terminal box				
	Designation	U-V-W	Terminal area [mm²]	Ø PE	Connecting thread Screwed cable gland
100	RLK1200	WEF[1)]	1.5 ... 16	RTE[2)] for thread M8	See specifications in the Project Planning Manual 🕮 Rexroth IndraDyn A
130	RLK1300	WEF	1.5 ... 35	RTE for thread M8	
160	RLK1300	WEF	1.5 ... 35	RTE for thread M8	
180	RLK1400	RTE for thread M12	1.5 ... 50	RTE for thread M12	
225	RLK1500	RTE for thread M12	1.5 ... 70	RTE for thread M12	
1) WEF = wire end ferrule 2) RTE = ring terminal end					

Fig.6-6: Overview of motors with terminal box

- Ensure the line cross-section required for connecting the particular motor specified in the Project Planning Manual 🕮 Rexroth IndraDyn A.
- Use ready-made Rexroth connection cables; see documentation 🕮 Rexroth Connection Cables IndraDrive and IndraDyn.
- The cable gland at the terminal box is screwed via adapter plates and, if applicable, thread reducing fittings. These parts are included in the motor scope of delivery. If necessary, they can also be re-ordered separately.

Terminal box connection diagram

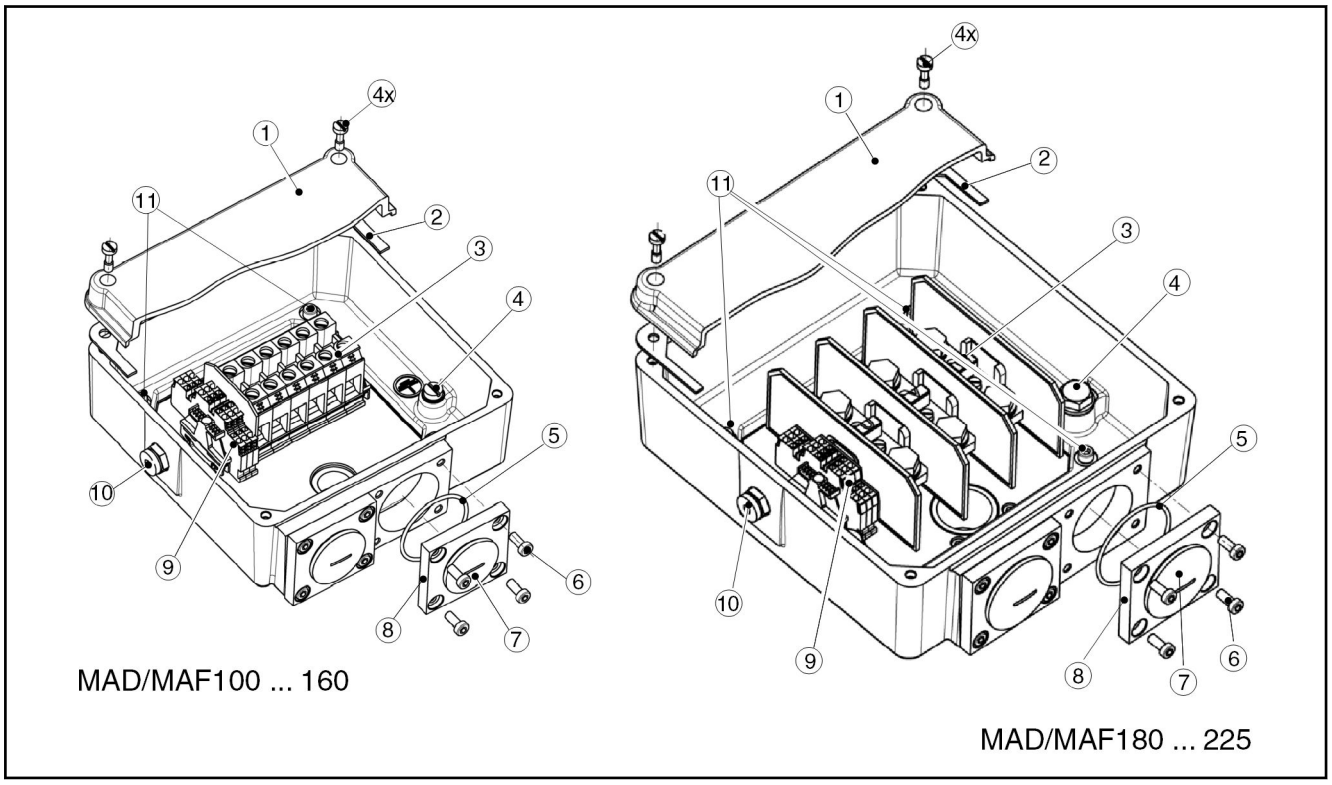


① Holding brake (optional)
② Spare temperature sensor (connect the spare sensor lines only if necessary)
③ Shield connection by clamping the strain relief cable in the screwed cable gland
④ Connection designations on the Rexroth drive controller

Fig.6-7: Terminal box connection diagram

- The brake connections 1-2 are assigned only if the motor was manufactured with the brake option.
- Only one of the PTC thermistor connector pairs (3-4 or 5-6) in the motor cable should be connected to the motor.
- Do not remove or damage the seal glued into the cover.
- Observe the size of the screwed cable gland and connection thread for the cable inlet into the terminal box.
- In particular, make sure that the connection cables are installed in the terminal box orderly and free of tension to avoid abrasion or pressure marks on the cables.
- The connections of the motor windings in the terminal box may not be removed.

Terminal box details



①	Cover
②	Seal
③	Terminal block U-V-W
④	PE connection
⑤	O-ring
⑥	Adapter plate fastening screws
⑦	Protection cover of cable gland connecting thread
⑧	Adapter plate for cable screwing
⑨	Terminal strip (brake, temperature sensor)
⑩	Purge gas connection (only for motors in ATEX design)
⑪	Terminal screws for setting the cable outlet direction (4x)

Fig.6-8: Terminal box details

Connecting the power cable to the terminal box

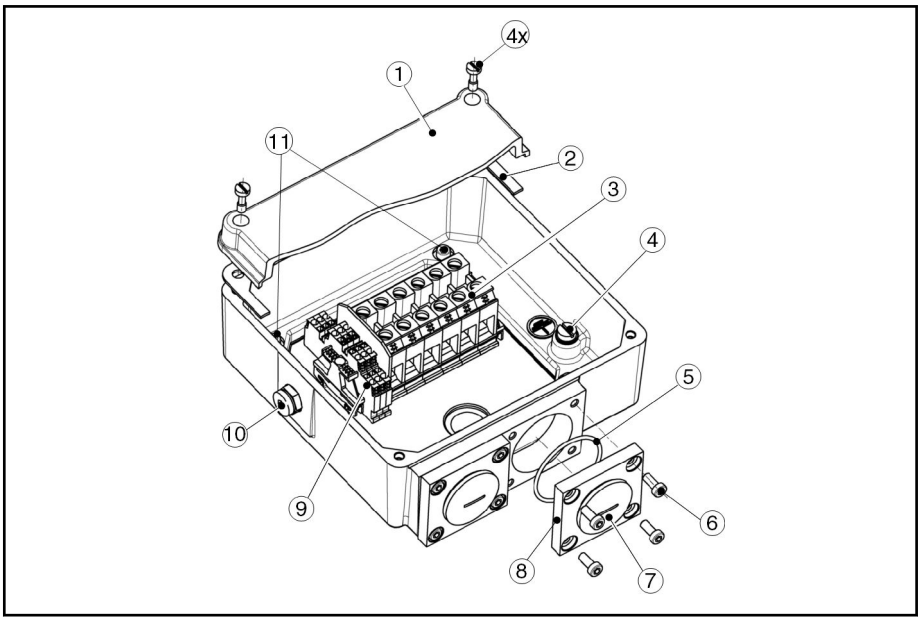
The required outlet direction of the power cable is selected in the type code of the motor. The terminal box is mounted to the motor at the factory accord-

ing to the outlet direction specified by the user. If necessary, the cable outlet direction can be re-adjusted at the terminal box.

Proceed as follows when connecting the power cable to the terminal box:

1. Open the cover of the terminal box ①.

   Unscrew and remove the mounting screws (4 screws).



① Cover
② Seal
③ Terminal block U-V-W
④ PE connection
⑤ O-ring
⑥ Adapter plate fastening screws
⑦ Protection cover of cable gland connecting thread
⑧ Adapter plate for cable screwing
⑨ Terminal strip (brake, temperature sensor)
⑩ Purge gas connection (only for motors in ATEX design)
⑪ Terminal screws for setting the cable outlet direction (4x)

Fig.6-9: Terminal box (options "D, E, G, H").

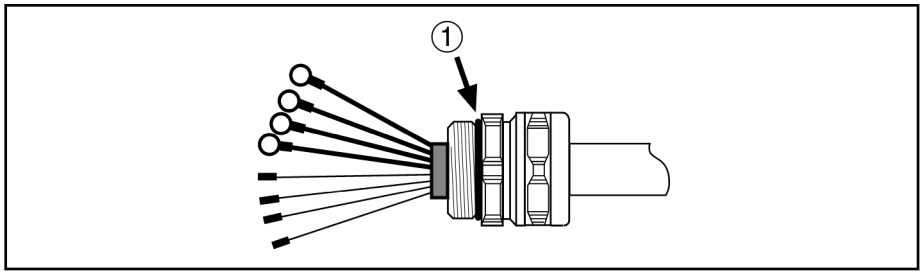
2. Check the cable outlet direction and rotate the terminal box if necessary.
   - Detach the terminal box.

     Unscrew the mounting screws ⑪ and rotate the terminal box by 90 to no more than 180 degrees to achieve the desired outlet direction.
   - Fasten the terminal box.

   Screw in and tighten the mounting screws ⑫.

   Screw tightening torque ⑪: 6.5 Nm (±10 %)

   ⇒ There is a seal between the terminal box and the motor housing. After rotating and before re-tightening the terminal box, check the seal to ensure its proper condition and correct positioning.
3. Unscrew the protection cover of the screwed cable gland ⑦.
4. Detach the adapter plate ⑧ from the terminal box.
5. Tightly screw the adapter plate to the metric cable gland at the power cable.



① O-ring position

Fig.6-10: O-ring at the screwed cable gland

⇒ Before attaching the adapter plate to the power cable, visually check the O-ring at the screwed power cable gland for proper condition and correct position. If the O-ring is missing, do not use the power cable. In this case, contact your Rexroth sales or service partner.

6. Place the power cable through the opening into the terminal box up to the adapter plate. Reattach the adapter plate to the terminal box.

   Screw tightening torque ⑥: 9 Nm (±10 %)

   ⇒ Before attaching the adapter plate ⑥ to the terminal box, check the O-ring ⑤ inserted in the adapter plate for proper condition and correct position.

7. Connect the wires in accordance to the connection diagram for standard or double cabling.

   Observe the following tightening torques:

   Tightening torque of the screws in Nm (±10 %) for power connection

Terminal box on	U-V-W		PE	
	M6	M12	M8	M12
MAD/MAF100 ... 160	2.5	- / -	3.5	- / -
MAD/MAF180 ... 225	- / -	14	- / -	20

Fig.6-11: Tightening torque for screws in Nm in the terminal box

8. Close and attach the cover of the terminal box.

   Moisten the thread of the mounting screws for the cover ① with liquid threadlocker. Then attach the cover using all of the mounting screws.

   Tightening torque of the screws: 6.5 Nm (±10 %)

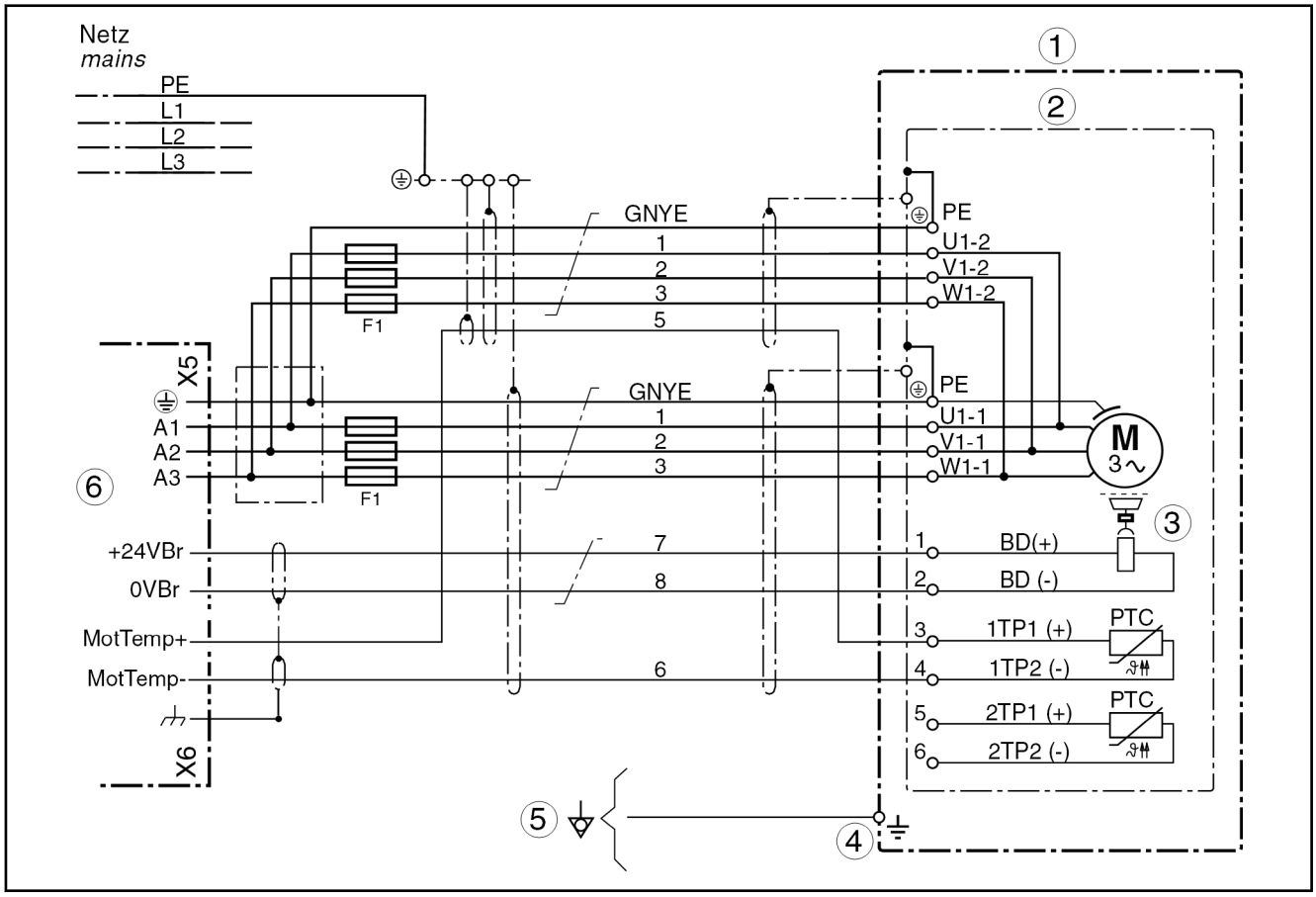
   ⇒ Before attaching the cover to the terminal box, check the glued-in seal ② on the terminal box cover for proper condition and correct position.

Double cabling

Motor connection with two power cables is required if a corresponding single cable cannot be used due to the large bending radius or due to its dimensions.

Assembly

☞ The following connection diagram shows a possible connection. When planning the double cabling, observe the installation regulations applicable at the installation site of the machine.



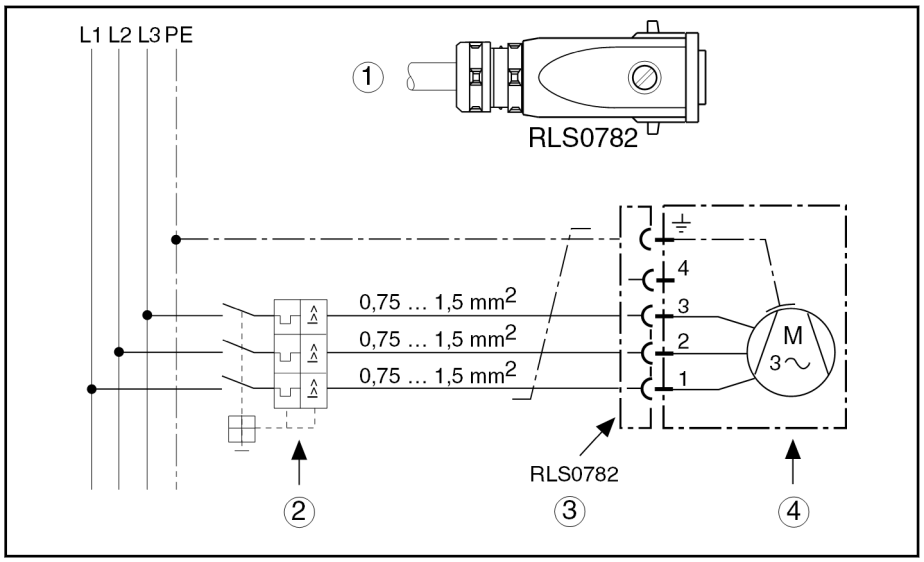
① Motor housing
② Terminal box
③ Holding brake (optional)
④ Equipotential bonding connection at the motor (only for MAF225C-0150 and ATEX motors, respectively)
⑤ Equipotential bonding connection at the machine (required with MAF225C-0150 and ATEX motors)
⑥ Rexroth drive controller

Fig.6-12: Double cabling connection diagram

- Double cabling is only possible for the power connection using the terminal box.
- Fuses F1 (NH…) which protect the wires from overload in case of cable break must be dimensioned in accordance with the current carrying capacity of the respective line cross-section.
- The fuses should be installed in the control cabinet such that they are as close as possible to the power output of the controller.
- On the motor side of the fuses, the shield of the motor power cable must be connected to the control cabinet such that it is conducting over a large area.
- Power cables are not available for placing the double cabling. Standard Rexroth power cables must be opened and customized as required.

6.2.4 Connecting the Motor Fan (only for MAD Motors)

The motor fan is connected to the supply system via a cable and motor protecting switch and functions independent of the controller.



① Power connection cable diameter Ø 7 ... 10 mm
② Circuit breaker
③ Connector
④ Fan

Fig.6-13: Fan connection

- To connect the motor fan, the fan plug must be opened and closed.
- The plug for connecting the motor fan is included in the scope of delivery and is located on the fan.
- The electric connection may be established by skilled personnel only. Please observe the safety instructions.
- The tightness of the plug housing may not be reduced.
- The machine manufacturer selects the motor protection switch and the electrical protection. Please observe the regulations in the country of installation.

Assembly

6.3 Connecting the Cooling Water (only for MAF Motors)

☞ Inflow (IN) and outflow (OUT) can be assigned at the user's discretion. The assignment does not affect the performance data of the motor.

Motor MAF ...	Connection via …		Remark
	Thread	Quick-action coupling [Ø d_i hose]	
100 ... 130	G1/4"	9 mm	Select the connection type acc. to the type code
160 ... 225	G1/2"	13 mm	

Fig.6-14: Overview of coolant connections

On delivery, the connection threads at the motor are covered with protective stoppers. These protective stoppers may only be removed shortly before the coolant lines are screwed in or the quick-action couplings are removed to avoid the intrusion of dirt into the cooling system.

Cooling line connection threads

Overall size MAF…	Connection thread	Max. permissible depth of engagement [mm]	Max. permissible tightening range [Nm]
100 ... 130	G1/4"	14	18 ... 20
160 ... 225	G1/2"	18	27 ... 30

Fig.6-15: Coolant connection thread, permissible tightening torques and thread depths

NOTICE **Wrong tightening torques may destroy the coolant connection threads on the motor!**

Make absolutely sure not to exceed the permissible tightening torque of the motor connections! Exceeding the tightening torque or depth of engagement can lead to irreversible motor damage.

The motor-sided coolant connections are designed for coolant connection threads with axial sealing.

Bosch Rexroth recommends to use connection threads which contain an O-ring for axial sealing of the screw connection.

Sealing with hemp bred, teflon tape or conical screw unions is not considered suitable as this kind of sealing can stress and/or even damage the connection thread on the motor to an unreasonably high degree.

☞ The machine manufacturer is responsible for the tightness of the coolant connection and for testing and accepting it after installation of the motor.

Furthermore, a regular test of correct condition of the coolant connection should be specified in the machine maintenance schedule.

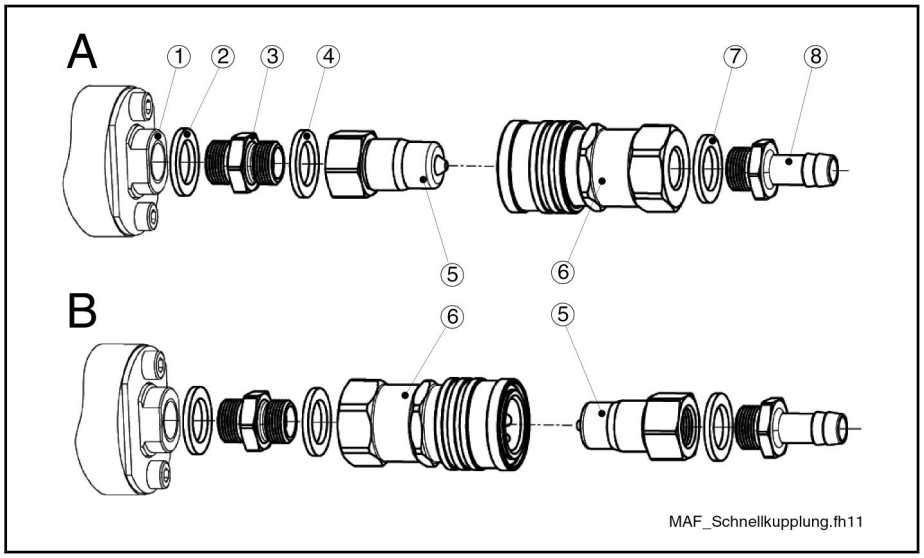
Quick-action coupling

Another coolant connection variant is the quick-action coupling. It has a leak protection at both sides and can be released even under full pressure of the coolant system.

If a motor having this coolant connection is ordered, all parts of the quick-action coupling are included in the motor delivery. The user can choose from

two mounting options for the quick-action coupling based on the ambient conditions of the motor.

1. **Variant A**: Sealing nipple mounted at motor side
2. **Variant B**: Coupling mounted at motor side



①	Connection threads at the motor
②④⑦	Seal
③	Double nipple
⑤	Sealing nipple
⑥	Coupling
⑧	Threaded nozzle for hose

Fig.6-16: Quick-action coupling mounting variants

☞ First connect the double nipple to the coupling or the sealing nipple. Thereafter, screw the double nipple into the connection thread at the motor. This procedure prevents any multiple stress on the connection thread in the motor.

When mounting the quick-action coupling, ensure

- that the seals are properly positioned, and
- that you keep the tightening torques between the individual coupling components specified below.

Thread sizes of the quick-action coupling	Permissible tightening range [Nm] between the components of the quick-action coupling
1/8" ... 1/4"	23 ... 25
1/2"	28 ... 30

Fig.6-17: Permissible tightening torque of the quick-action coupling

- that you observe the permitted screw-in depths and tightening torques on the motor

Overall size MAF…	Connection thread	Max. permissible depth of engagement [mm]	Permissible tightening range [Nm]
100	G1/8"	14	14 ... 15
130	G1/4"	14	18 ... 20
160 ... 225	G1/2"	18	27 ... 30

Fig.6-18: Coolant connection thread, permissible tightening torques and thread depths

Assembly

When selecting the coolant hose , observe the required inner diameter of the hose d_i pursuant to fig. 6-14 " Overview of coolant connections" on page 44.

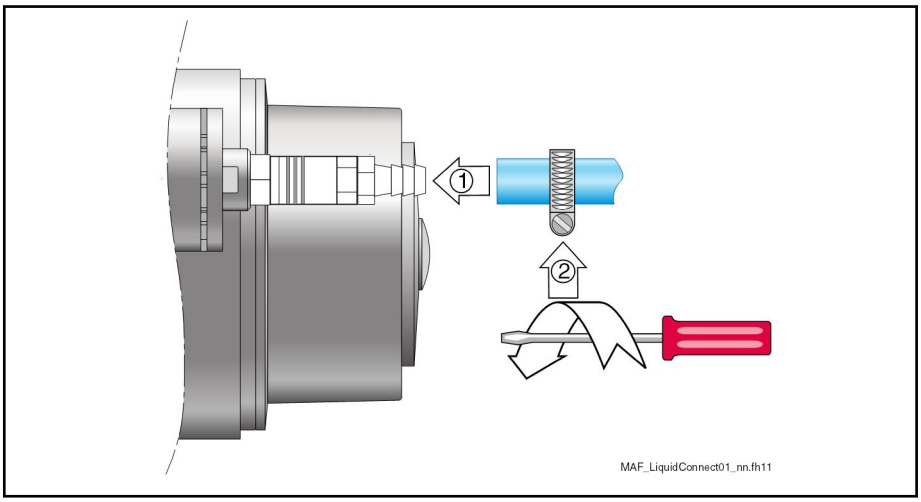


Fig.6-19: Connecting the coolant hose (example)

Basic procedure for assembly:

1. Remove the protective covers of the coolant connection threads at the motor and screw in the pre-mounted quick-action coupling.
2. Slip the hose onto the connection element (threaded nozzle). Avoid any bending or damaging of the screwed connection at the motor side.
3. Screw down the hose end with the fixing clamp over the connection element.
   - For service purposes, the quick-action coupling may be removed from the sealing nipple using the coupler. It is not necessary to open the hose connection.

If you use another connection technology at the hose side, other assembly steps may be required. Refer to the manufacturer for information on assembly.

☞
- To supply the MAF motors with cooling liquid, additional installation material such as hoses and fixing clamps (not included in the delivery) are required.
- Ensure that the cooling water meets the requirements specified in the Project Planning Manual 🕮 Rexroth IndraDyn A.

⚠ WARNING **Danger of injury due to improper handling of conductors which are under pressure!**

▸ Observe the manufacturers' operating instructions and specifications referring to the cooling system.

▸ Wear suitable protective equipment (e.g. safety goggles, protective gloves, safety shoes).

▸ Remove spilled liquid from the floor immediately to prevent the risk of falling!

▸ Release pressure and discharge medium before dismounting the lines.

▸ Do not try to strip, open or cut lines that are under load.

Coolant input pressure at the motor

The maximum input pressure of the motors is 6 bar (3 bar in case of motors produced prior to 2008-06-30).

6.4 Encoder Connection

The connector on the motor side and the coupler on the cable side are connected to each other and screwed on by hand. Please take note of the mechanical coding.

Motor	Overall size	Connector socket (X3) for encoder connection	
		M2 / S2 M6 / S6	C0
MAD	100	RGS1003	INS0629
	130 ... 225	RGS1004 *)	INS0719
MAF	100 ... 225	RGS1003	INS0629

Fig.6-20: Encoder connection socket designations

Pin assignment

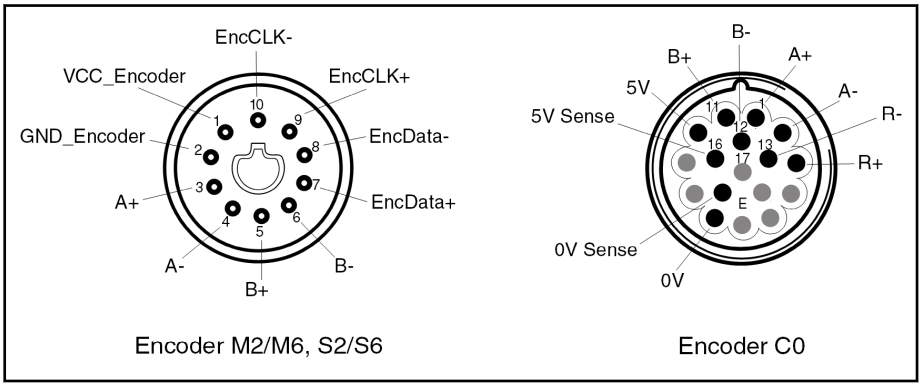


Fig.6-21: Encoder type M2/S2 and M6/S6 connection

7 Commissioning and Operation

7.1 Safety

⚠ WARNING **High electrical voltage! Danger to life, risk of injury due to electric shock.**

Live parts are dangerous.

▸ Do not open any covers or connector sockets during operation.

▸ Never connect or disconnect plug connectors and connection terminals when they are live!

⚠ WARNING **Risk of injury due to rotating motor shaft!**

▸ Do not remove any covers, machine parts or protection devices during operation.

▸ Do not enter the range of movement of the machine. Prevent persons from entering this area, e.g., by means of

- safety fence, safety guards, protective covers
- optical sensors

⚠ CAUTION **Thermal danger due to hot surfaces with temperatures over 70 °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

MAD / MAF motors can only be commissioned with other components (drive controller, control unit).

Prior to commissioning

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

- Storage time of the motor. Depending on the storage time, take measures to ensure safe operation. Run in bearings, resurface the holding brake, ... See table chapter 5.4 "Storage Times" on page 30.
- Ensure that the motor and the motor cooling unit are properly connected.
- Ensure that a holding brake voltage of 24 V ±10 % exists at the motor. If necessary, adjust the voltage.
- Check the proper function of the holding brake.
- Ensure that the motor and all components belonging to the drive are undamaged.
- Ensure that keys are protected against ejection.

Commissioning

For details on the commissioning order, please refer to the respective documentation of the drive controller or firmware description.

Please observe the general safety instructions on the protection against hazardous movements chapter 2.6.2 "Protection against Mechanical Hazards" on page 16

7.3 Operation

The ambient and operating conditions as well as technical data specified in the Project Planning Manual 🕮 Rexroth IndraDyn A must be kept during operation.

Checks during operation:

- Pay attention to exceptional noise.
- Pay attention to increased vibrations.
- Check the motor and fan units for cleanliness.
- Check the cooling water connections for tightness.
- Check the monitoring devices and diagnostic / error messages of the controllers.

Decommission the drive in case of deviations from normal operation. For the further procedure, please refer to chapter 12 "Troubleshooting" on page 59.

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. Protect the system or plant against restart.
3. Ensure de-energization.
4. Ground and short-circuit.
5. Cover or shield any adjacent live parts.

⚠ WARNING **Damage to persons and property at maintenance during operation!**

- ▸ Do not carry out any maintenance measures, while the machine is running.
- ▸ During maintenance work, protect the system against restarting and unauthorized use.

⚠ CAUTION **Hot surfaces with temperatures over 70 °C may cause burns!**

- ▸ Allow the motors to cool down prior to commencing work.
- ▸ Wear safety gloves.
- ▸ Do not work on hot surfaces.

Motors

Excessive dirt, dust or chips may adversely affect the functionality of the motors and, in extreme cases, even cause a failure of the motors. Clean the cooling fins of the motors at regular intervals (after one year at the latest) to reach a sufficiently high heat emission surface. If the cooling ribs are partially covered with dirt, sufficient heat dissipation via the ambient air is no longer ensured.

Connection cables

⚠ WARNING **Contact with live parts may cause death by electrocution!**

- ▸ Change damaged connection cables and decommission the plant immediately.
- ▸ Do not repair any connection cables provisionally.

- Check connection cables for damage at regular intervals and replace them, if necessary.
- Check any optional energy management chains (drag chains) for defects.

- Check the protective conductor connection for proper condition and firm seating at regular intervals and replace it, if necessary.

8.2 Repair, Maintenance and Spare Parts

The service lives of motor components, such as seals and bearings, may vary depending on the operating conditions, such as operation mode, speed, vibration and shock load, and frequent reverse mode.

We recommend to change the bearings not later than after 30,000 operating hours. Shorter replacement intervals may be necessary; cf. checks during operation (chapter 7.3 "Operation" on page 50).

We recommend regular visual inspections on shaft sealing rings. Depending on operating conditions, signs of wear may appear after 5,000 operating hours. If necessary, replace the shaft sealing rings.

☞ Wearing parts are reliably and professionally repaired and replaced by the Bosch Rexroth Service in shopfloor-oriented quality.

The Bosch Rexroth service helpdesk at our headquarters in Lohr, Germany and our worldwide service provide **24/7 support and assistance**.

	Helpdesk	Service hotline Worldwide
Phone	+49 (0) 9352 40 50 60	Outside of Germany please contact your local sales/service office first. For hotline numbers, please refer to the sales office addresses on the Internet.
Fax	+49 (0) 9352 18 49 41	
E-mail	service.svc@boschrexroth.de	
Internet	http://www.boschrexroth.com You will also find additional information on service, maintenance (e.g. delivery addresses) and training.	

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 affected products, especially type codes and serial numbers
- Your phone, fax numbers and e-mail address so we can contact you in case of questions.

9 Disassembly and Exchange

9.1 Tools Required

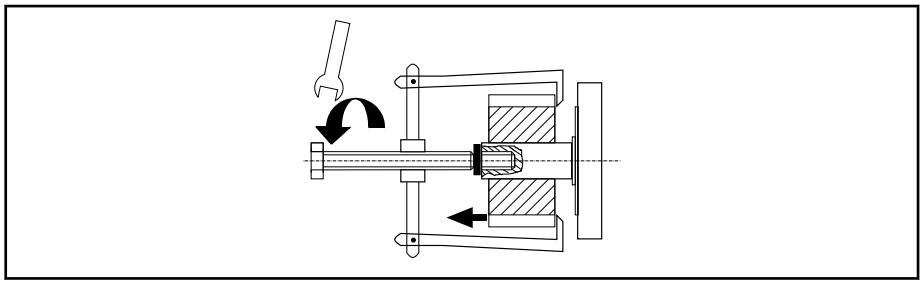
NOTICE

Motor damage due to strikes onto the motor shaft

- Do not strike the shaft end and do not exceed the allowed axial and radial forces of the motor.
- Use fitting and pull-off tools.

Use suitable tools when disassembling transmission elements.

Pulling off



① Shim

Fig.9-1: Pulling off the transmission element

Use tools suitable for pulling off. Use a shim to protect the shaft end when using pulling-off tools. Heat the output element, if necessary.

9.2 Preparing Storage

Before motors are stored, the protection covers on connector sockets, shaft and input openings for cooling water in case of liquid-cooled motors which were attached on delivery must be re-attached.

When motors are liquid-cooled, completely discharge the coolant from the cooling tubes (e.g., via purging the coolant holes with pressure air). This will prevent frost damage at storage temperatures ≤ 0° C.

10 Environmental Protection and Disposal

Production processes

The products are made in energy- and resource-optimized production processes which allow re-using and recycling the resulting waste. We regularly try to replace pollutant-loaded raw materials and supplies by more environment-friendly alternatives.

No release of hazardous substances

Our products do not contain any hazardous substances which may be released in case of appropriate use. Normally, our products will not have any negative influences on the environment.

Significant components

Basically, our motors consist of the following components: steel, aluminum, copper, brass, permanent magnets (rare earth metal), electronic components.

Return

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

Furthermore, the products returned for disposal may not contain any undue foreign material or foreign components.

Send 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

Packaging

Packaging materials consist of cardboard, wood and polystyrene and can be recycled anywhere without any problem.

For ecological reasons, please refrain from returning the empty packages to us.

Batteries and accumulators

Batteries and accumulators can be labeled with this symbol.

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.

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.

Products made of plastics can 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 valid legal requirements.

11 Extension and Modification

11.1 Optional Accessories

11.1.1 Ready-made Connection Cables

Title		Document type	Document number
🕮	Rexroth Connection Cables IndraDrive and IndraDyn	Selection data	DOK-CONNEC-CABLE*INDRV-AU□□-□□--P

Fig.11-1: Additional documentation

11.1.2 Sealing Air Connection

When the motor is to be operated under adverse conditions, a higher degree of protection than the standard one with radial shaft sealing ring (IP65) may be required. High demands may be set on the tightness of motor seals when the motors are operated in areas where oily coolants are used. We recommend using sealing air in addition to the radial shaft sealing ring for these fields of application.

For IndraDyn A motors of overall sizes 100 to 160 with connector sockets for power connection, air pressure connector kits are available as accessories.

Order designation for accessory sets

Overall motor size MAD/MAF...	Motor flange socket (type)	Designation
100	INS0480	SUP-M01-MHD (MNR R911283006)
130 ... 160	INS0380	SUP-M02-MHD (MNR R911283007)

Fig.11-2: Sealing air connection accessories

☞
- Proper functioning of the sealing air application requires a proper sealing function of the radial shaft sealing ring. Please observe the information about maintenance intervals (Fig.: 8.2).
- An installation manual is included with the selected accessory kit.

11.1.3 Gearbox

Shift and planetary gearboxes can be attached to IndraDyn A motors.

In this context, Bosch Rexroth recommends using gearboxes of the Rexroth GTM series that are attachment-compatible to the IndraDyn A motors. When selecting a gearbox, please observe the information in the type code of the GTM gearboxes.

Type	Gearbox type	Preconditions at the motor	Document number Project Planning Manual
GTM	Planetary gearbox	Plain motor drive shaft	DOK-GEAR**-GTM********-PR□□-□□--P

Fig.11-3: Gearboxes for IndraDyn A motors

Extension and Modification

The compatibility and availability of gearboxes of other manufacturers or other types of gearboxes must be clarified with the particular gearbox manufacturer.

For the allowed shaft load and attachment of drive elements, please refer to the information provided in the Project Planning Manual 🕮 Rexroth IndraDyn A.

12 Troubleshooting

12.1 Procedure

As a matter of principle, the instructions in the project planning and commissioning manuals must be followed in case of failures and errors. If necessary, the manufacturer must be contacted.

Malfunction	Error cause	Measures
The motor does not run	Drive enable is missing	Activate the drive enable
	Controller fault	Troubleshooting according to the documentation of the controller
	Supply voltage is missing	Check the supply voltage
	Brake is not released	Check the brake activation
Vibrations	Coupling elements or attachments are poorly balanced	Re-balance
	Adjustment of shaft end attachments (coupling, gearbox, ...) is insufficient	Re-align the attachments
	Mounting screws are loose	Tighten and secure screwed connections as specified
Running noise	Foreign bodies within the motor	Stop operation of the motor -> repair by manufacturer
	Bearing is damaged	Stop operation of the motor -> repair by manufacturer
High motor temperature Motor temperature monitoring unit responds	Operation outside of characteristic data	Reduce the load, check the sizing if necessary
	Heat dissipation is impaired	Clean the motor Clean the grille of the fan unit and check the function of the fan Check the coolant circuit of liquid cooling systems
Wrong or incorrect temperature displayed	Temperature sensor not connected	Connect the temperature sensor
	Temperature sensor is defective	Connect a backup temperature sensor Stop operation of the motor -> repair by manufacturer

Fig. 12-1: Troubleshooting

13 Technical Data

Technical data and operating characteristics are described for all motor types in the Project Planning Manual 🕮 Rexroth IndraDyn A.

14 Appendix

14.1 Declarations of Conformity

Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth Bosch Group

Konformitätserklärung

Dok.-Nr.: **TC30319-1**
Datum: **2011-06-07**

- ☐ nach Maschinenrichtlinie 2006/42/EG
- ☒ nach Niederspannungsrichtlinie 2006/95/EG
- ☐ nach EMV-Richtlinie 2004/108/EG
- ☐ nach Druckgeräte-Richtlinie 97/23/EG
- ☐ nach ATEX-Richtlinie 94/9/EG

Hiermit erklärt der Hersteller,

Bosch Rexroth Electric Drives and Controls GmbH
Bürgermeister-Dr.-Nebel-Straße 2
97816 Lohr a. Main / Germany

dass das nachstehende Produkt

Bezeichnung: AC-Motor

Typ: MAD100, MAD130, MAD160, MAD180, MAD225
MAF100, MAF130, MAF160, MAF180, MAF225

Ab Herstelldatum: 2003-01-01

in Übereinstimmung mit der oben genannten EU-Richtlinie entwickelt, konstruiert und gefertigt wurde.

Angewandte harmonisierte Normen:

Norm	Titel	Ausgabe
EN 60034-1	Drehende elektrische Maschinen – Teil 1: Bemessung und Betriebsverhalten	2010+ Cor.:2010
EN 60034-5	Drehende elektrische Maschinen – Teil 5: Schutzarten aufgrund der Gesamtkonstruktion von drehenden elektrischen Maschinen (IP-Code) – Einteilung	2001 + A1:2007

Weitere Erläuterungen:

Dieses Produkt ist eine Einbaukomponente, die auf Grund ihrer Einbaueigenschaften nicht vorneherein 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 (Endgerät, Maschine, Anlagen) eine Überprüfung der EMV-Eigenschaften durch den Endproduktthersteller zweckmäßig.

Lohr a. Main (Ort), den 2011-06-07 (Datum) i.V.
Eberhard Schemm
Entwicklungsbereichsleiter Antriebe

Škofja Loka (Ort), den 2011-06-07 (Datum) i.V.
Hans Bangert
Werkleitung SkIP/PM

Änderungen im Inhalt der Konformitätserklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.

Seite 1 / 1

Appendix

Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth Bosch Group

Declaration of conformity

(Translation of the original Declaration of Conformity)

Doc. No.: **TC30319-1**

Date: **2011-06-07**

- ☐ in accordance with Machinery Directive 2006/42/EC
- ☒ in accordance with Low Voltage Directive 2006/95/EC
- ☐ in accordance with EMC Directive 2004/108/EC
- ☐ in accordance with Pressure Equipment Directive 97/23/EC
- ☐ in accordance with ATEX Directive 94/9/EC

The manufacturer

Bosch Rexroth Electric Drives and Controls GmbH
Bürgermeister-Dr.-Nebel-Straße 2
97816 Lohr a. Main / Germany

hereby declares that the product below

Name: AC motor

Type: MAD100, MAD130, MAD160, MAD180, MAD225
MAF100, MAF130, MAF160, MAF180, MAF225

From date of manufacture: 2003-01-01

was developed, designed and manufactured in compliance with the above-mentioned EU directive.

Harmonized Standards applied:

Standard	Title	Edition
EN 60034-1	Rotating electrical machines – Part 1: Rating and performance	2010+ Cor.:2010
EN 60034-5	Rotating electrical machines – Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP-code) - Classification	2001 + A1:2007

Further explanations:

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 purposese. 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.

Place/date/signature as indicated in the original declaration.

Fig.14-2: MAD/MAF CE conformity

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Notes

Rexroth
Bosch Group

Bosch Rexroth AG
Electric Drives and Controls
P.O. Box 13 57
97803 Lohr, Germany
Bgm.-Dr.-Nebel-Str. 2
97816 Lohr, Germany
Tel. +49 9352 18 0
Fax +49 9352 18 8400
www.boschrexroth.com/electrics

R911336186

DOK-MOTOR*-MAD/MAF****-IT01-EN-P