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

Rexroth
Bosch Group

Rexroth IndraDrive
Drive Controllers
Power Sections HCS04

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Instruction Manual

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Purpose of Documentation
This documentation provides information on the installation and operation of the described products, by persons trained and qualified to work with electrical installations.

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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 niet-naleving 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 instrucţiuni de siguranţă!** 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 Mişcări 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.

SLO Slovensko	SK Slovenčina	RO Română
⚠ 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.
⚠ 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 şi 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 по-долу 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.

H Magyar	BG Български	LV Latviski
⚠ 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.
⚠ 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.
⚠ 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).

LT Lietuviškai	EST Eesti	GR Ελληνικά
⚠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。
⚠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。

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1 Important Notes

1.1 Safety Instructions

1.1.1 General Information

- Do not attempt to install and operate the components of the electric drive and control system without first reading all documentation provided with the product. Read and understand these safety instructions and all user documentation prior to working with these components. If you do not have the user documentation for the components, contact your responsible Rexroth sales partner. Ask for these documents to be sent immediately to the person or persons responsible for the safe operation of the components.
- If the supplied documents contain some information you do not understand, it is absolutely necessary that you ask Rexroth for explanation before you start working at or with the components.
- If the component is resold, rented and/or passed on to others in any other form, these safety instructions must be delivered with the component in the official language of the user's country.
- Only qualified persons may work with components of the electric drive and control system or within its proximity.

  In terms of this Instruction Manual, qualified persons are those persons who are familiar with the installation, mounting, commissioning and operation of the components of the electric drive and control system, as well as with the hazards this implies, and who possess the qualifications their work requires. To comply with these qualifications, it is necessary, among other things,

  – to be trained, instructed or authorized to switch electric circuits and components safely on and off, to ground them and to mark them,
  – to be trained or instructed to maintain and use adequate safety equipment,
  – to attend a course of instruction in first aid.
- The technical data, connection and installation conditions of the components are specified in the respective application documentations and must be followed at all times.
- If the components take the form of hardware, then they must remain in their original state, in other words, no structural changes are permitted. It is not permitted to decompile software components or alter source codes.
- Do not mount damaged or faulty components or use them in operation.
- Only use accessories and spare parts approved by Rexroth.
- Follow the safety regulations and requirements of the country in which the electric components of the electric drive and control system are operated.
- Proper and correct transport, storage, mounting and installation, as well as care in operation and maintenance, are prerequisites for optimal and safe operation of the component.

Improper use of these components, failure to follow the safety instructions in this document or tampering with the product, including disabling of safety devices, could result in property damage, injury, electric shock or even death.

1.1.2 Protection Against Contact With Electrical Parts and Housings

☞ This section concerns components of the electric drive and control system with voltages of **more than 50 volts**.

Contact with parts conducting voltages above 50 volts can cause personal danger and electric shock. When operating components of the electric drive and control system, it is unavoidable that some parts of these components conduct dangerous voltage.

High electrical voltage! Danger to life, risk of injury by electric shock or serious injury!

- Only qualified persons are allowed to operate, maintain and/or repair the components of the electric drive and control system.
- Follow the general installation and safety regulations when working on power installations.
- Before switching on, the equipment grounding conductor must have been permanently connected to all electric components in accordance with the connection diagram.
- Even for brief measurements or tests, operation is only allowed if the equipment grounding conductor has been permanently connected to the points of the components provided for this purpose.
- Before accessing electrical parts with voltage potentials higher than 50 V, you must disconnect electric components from the mains or from the power supply unit. Secure the electric component from reconnection.
- With electric components, observe the following aspects:

  Always wait **30 minutes** after switching off power to allow live capacitors to discharge before accessing an electric component. Measure the electrical voltage of live parts before beginning to work to make sure that the equipment is safe to touch.
- Install the covers and guards provided for this purpose before switching on.
- Never touch electrical connection points of the components while power is turned on.
- Do not remove or plug in connectors when the component has been powered.
- Under specific conditions, electric drive systems can be operated at mains protected by residual-current-operated circuit-breakers sensitive to universal current (RCDs/RCMs).
- Secure built-in devices from penetrating foreign objects and water, as well as from direct contact, by providing an external housing, for example a control cabinet.

High housing voltage and high leakage current! Danger to life, risk of injury by electric shock!

- Before switching on and before commissioning, ground or connect the components of the electric drive and control system to the equipment grounding conductor at the grounding points.

- Connect the equipment grounding conductor of the components of the electric drive and control system permanently to the main power supply at all times. The leakage current is greater than 3.5 mA.
- Establish an equipment grounding connection with a minimum cross section according to the table below. With an outer conductor cross section smaller than 10 mm^2 (8 AWG), the alternative connection of two equipment grounding conductors is allowed, each having the same cross section as the outer conductors.

Cross section outer conductor	Minimum cross section equipment grounding conductor Leakage current ≥ 3.5 mA	
	1 equipment grounding conductor	2 equipment grounding conductors
1,5 mm^2 (AWG 16)	10 mm^2 (AWG 8)	2 × 1,5 mm^2 (AWG 16)
2,5 mm^2 (AWG 14)		2 × 2,5 mm^2 (AWG 14)
4 mm^2 (AWG 12)		2 × 4 mm^2 (AWG 12)
6 mm^2 (AWG 10)		2 × 6 mm^2 (AWG 10)
10 mm^2 (AWG 8)		-
16 mm^2 (AWG 6)	16 mm^2 (AWG 6)	-
25 mm^2 (AWG 4)		-
35 mm^2 (AWG 2)		-
50 mm^2 (AWG 1/0)	25 mm^2 (AWG 4)	-
70 mm^2 (AWG 2/0)	35 mm^2 (AWG 2)	-
...	...	...

Fig.1-1: Minimum Cross Section of the Equipment Grounding Connection

1.1.3 Protection Against Dangerous Movements

Dangerous movements can be caused by faulty control of connected motors. Some common examples are:

- Improper or wrong wiring or cable connection
- Operator errors
- Wrong input of parameters before commissioning
- Malfunction of sensors and encoders
- Defective components
- Software or firmware errors

These errors can occur immediately after equipment is switched on or even after an unspecified time of trouble-free operation.

The monitoring functions in the components of the electric drive and control system will normally be sufficient to avoid malfunction in the connected drives. Regarding personal safety, especially the danger of injury and/or property damage, this alone cannot be relied upon to ensure complete safety. Until the integrated monitoring functions become effective, it must be assumed in any case that faulty drive movements will occur. The extent of faulty drive movements depends upon the type of control and the state of operation.

Dangerous movements! Danger to life, risk of injury, serious injury or property damage!

A **risk assessment** must be prepared for the installation or machine, with its specific conditions, in which the components of the electric drive and control system are installed.

As a result of the risk assessment, the user must provide for monitoring functions and higher-level measures on the installation side for personal safety. The safety regulations applicable to the installation or machine must be taken into consideration. Unintended machine movements or other malfunctions are possible if safety devices are disabled, bypassed or not activated.

To avoid accidents, injury and/or property damage:

- Keep free and clear of the machine's range of motion and moving machine parts. Prevent personnel from accidentally entering the machine's range of motion by using, for example:
  - Safety fences
  - Safety guards
  - Protective coverings
  - Light barriers
- Make sure the safety fences and protective coverings are strong enough to resist maximum possible kinetic energy.
- Mount emergency stopping switches in the immediate reach of the operator. Before commissioning, verify that the emergency stopping equipment works. Do not operate the machine if the emergency stopping switch is not working.
- Prevent unintended start-up. Isolate the drive power connection by means of OFF switches/OFF buttons or use a safe starting lockout.
- Make sure that the drives are brought to safe standstill before accessing or entering the danger zone.
- Additionally secure vertical axes against falling or dropping after switching off the motor power by, for example,
  - mechanically securing the vertical axes,
  - adding an external braking/arrester/clamping mechanism or
  - ensuring sufficient counterbalancing of the vertical axes.
- The standard equipment **motor holding brake** or an external holding brake controlled by the drive controller is **not sufficient to guarantee personal safety**!
- Disconnect electrical power to the components of the electric drive and control system using the master switch and secure them from reconnection ("lock out") for:
  - Maintenance and repair work
  - Cleaning of equipment
  - Long periods of discontinued equipment use
- Prevent the operation of high-frequency, remote control and radio equipment near components of the electric drive and control system and their supply leads. If the use of these devices cannot be avoided, check the machine or installation, at initial commissioning of the electric drive and control system, for possible malfunctions when operating such high-frequency, remote control and radio equipment in its possible positions of

normal use. It might possibly be necessary to perform a special electromagnetic compatibility (EMC) test.

1.1.4 Protection Against Magnetic and Electromagnetic Fields During Operation and Mounting

Magnetic and electromagnetic fields generated by current-carrying conductors or permanent magnets of electric motors represent a serious danger to persons with heart pacemakers, metal implants and hearing aids.

Health hazard for persons with heart pacemakers, metal implants and hearing aids in proximity to electric components!

- Persons with heart pacemakers and metal implants are not allowed to enter the following areas:
  - Areas in which components of the electric drive and control systems are mounted, commissioned and operated.
  - Areas in which parts of motors with permanent magnets are stored, repaired or mounted.
- If it is necessary for somebody with a heart pacemaker to enter such an area, a doctor must be consulted prior to doing so. The noise immunity of implanted heart pacemakers differs so greatly that no general rules can be given.
- Those with metal implants or metal pieces, as well as with hearing aids, must consult a doctor before they enter the areas described above.

1.1.5 Protection Against Contact With Hot Parts

Hot surfaces of components of the electric drive and control system. Risk of burns!

- Do not touch hot surfaces of, for example, braking resistors, heat sinks, supply units and drive controllers, motors, windings and laminated cores!
- According to the operating conditions, temperatures of the surfaces can be **higher than 60 °C** (140 °F) during or after operation.
- Before touching motors after having switched them off, let them cool down for a sufficient period of time. Cooling down can require **up to 140 minutes**! The time required for cooling down is approximately five times the thermal time constant specified in the technical data.
- After switching chokes, supply units and drive controllers off, wait **15 minutes** to allow them to cool down before touching them.
- Wear safety gloves or do not work at hot surfaces.
- For certain applications, and in accordance with the respective safety regulations, the manufacturer of the machine or installation must take measures to avoid injuries caused by burns in the final application. These measures can be, for example: Warnings at the machine or installation, guards (shieldings or barriers) or safety instructions in the application documentation.

1.1.6 Protection During Handling and Mounting

Risk of injury by improper handling! Injury by crushing, shearing, cutting, hitting!

- Observe the relevant statutory regulations of accident prevention.
- Use suitable equipment for mounting and transport.
- Avoid jamming and crushing by appropriate measures.
- Always use suitable tools. Use special tools if specified.
- Use lifting equipment and tools in the correct manner.
- Use suitable protective equipment (hard hat, safety goggles, safety shoes, safety gloves, for example).
- Do not stand under hanging loads.
- Immediately clean up any spilled liquids from the floor due to the risk of falling!

1.1.7 Battery Safety

Batteries consist of active chemicals in a solid housing. Therefore, improper handling can cause injury or property damage.

Risk of injury by improper handling!

- Do not attempt to reactivate low batteries by heating or other methods (risk of explosion and cauterization).
- Do not attempt to recharge the batteries as this may cause leakage or explosion.
- Do not throw batteries into open flames.
- Do not dismantle batteries.
- When replacing the battery/batteries, do not damage the electrical parts installed in the devices.
- Only use the battery types specified for the product.

☞ Environmental protection and disposal! The batteries contained in the product are considered dangerous goods during land, air, and sea transport (risk of explosion) in the sense of the legal regulations. Dispose of used batteries separately from other waste. Observe the national regulations of your country.

1.2 Appropriate Use

This product may only be used for the applications mentioned in the additional documentations (see index entry "Additional documentations") and under the described application, ambient and operating conditions.

This product is exclusively intended for use in machines and systems in an industrial environment. This is to be understood as applications according to IEC 60204-1 "Safety of machinery, Electric equipment of machines" and NFPA 79 "Electrical Standard for Industrial Machinery".

☞ Components of the Rexroth IndraDrive system are **products of category C3** (with limited availability) according to IEC 61800-3. To ensure that this category (limit values) is maintained, suitable line filters must be used in the drive system.

These components are not provided for use in a public low-voltage network supplying residential areas with power. If these components are used in such a public network, high-frequency interference is to be expected. This can require additional measures of radio interference suppression.

2 Identification

2.1 Type Code

☞ The figure illustrates the basic structure of the type code. Our sales representative will help you with the current status of available versions.

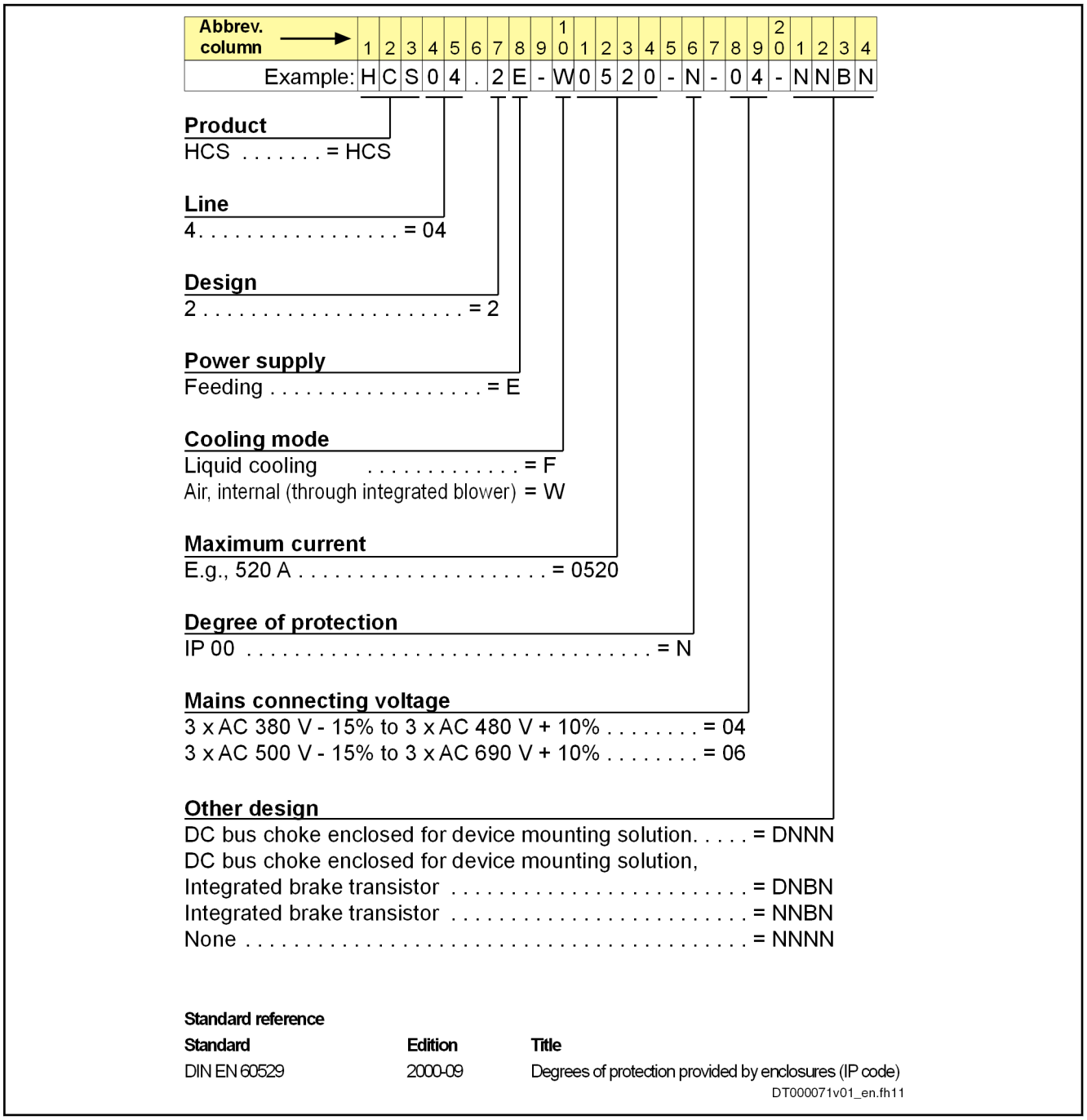
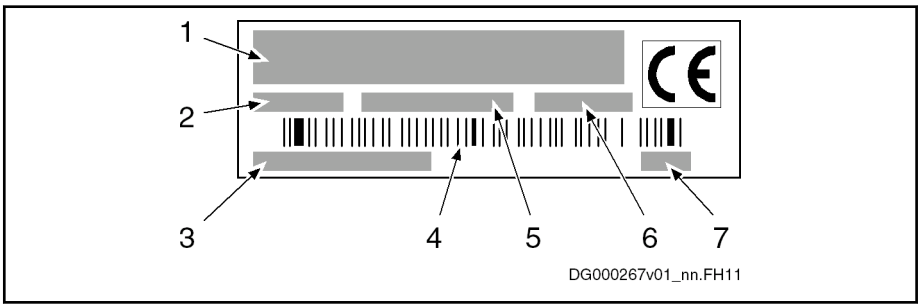


Fig.2-1: Type Code HCS04.2

Identification

2.2 Type Plates

Type Plate (Power Sections, Supply Units)



1	Device type
2	Part number
3	Serial number
4	Bar code
5	Country of manufacture
6	Production week; e.g. 08W23 meaning year 2008, week 23
7	Hardware index

Fig.2-2: Type Plate (Power Sections, Supply Units)

2.3 Scope of Supply

The scope of supply includes:

- HCS04.2E incl. control section
- Connector X2
- Connector X6
- Connector X7
- Documentation

3 Ratings and Dimensions

3.1 HCS04.2E-W0350 ... W0640

UL Ratings and Dimensions

Description	Symbol	Unit	HCS04.2E-W0350-_-04	HCS04.2E-W0420-_-04	HCS04.2E-W0520-_-04	HCS04.2E-W0640-_-04
Listing according to UL standard (UL)			UL 508 C			
Listing according to CSA standard (UL)			Canadian National Standard(s) C22.2 No. 14-10			
UL files (UL)			E 134201			
Pollution degree (UL)			2			
Ambient temperature with nominal data (UL)	T_{amax}	°C	40			
Ambient temperature with reduced nominal data (UL)	T_{amax_red}	°C	55			
Mass	m	kg	74,00	80,00	110,00	140,00
Device height (UL)[1)]	H	mm	782	950		
Device depth (UL)[2)]	T	mm	380			
Device width (UL)[3)]	B	mm	350	330	430	585
Minimum distance on the top of the device[4)]	d_{top}	mm	200			
Minimum distance on the bottom of the device[5)]	d_{bot}	mm	200			
Horizontal spacing on the device[6)]	d_{hor}	mm	-			
Rated control voltage input (UL)[7)]	U_{N3}	V	24 ±20%			
Rated power consumption control voltage input at U_{N3} (UL) [8)]	P_{N3}	W	72			
Short circuit current rating (UL)	SCCR	A rms	42000			
Rated input voltage, power (UL) [9)]	U_{LN_nenn}	V	3 x AC 400...480			
Tolerance rated input voltage (UL)		%	+10 -15			
Input frequency (UL)	f_{LN}	Hz	50...60			
Tolerance input frequency (UL)		Hz	3			
Rated input current (UL)	I_{LN}	A	226,0	271,0	338,0	418,0
Branch circuit protection fuse (UL)[10)]			350	400	450	600
Required wire size according to EN 60204-1[11)]	A_{LN}	mm^2	185	2 x 120		2 x 150
Last modification: 2011-07-27						

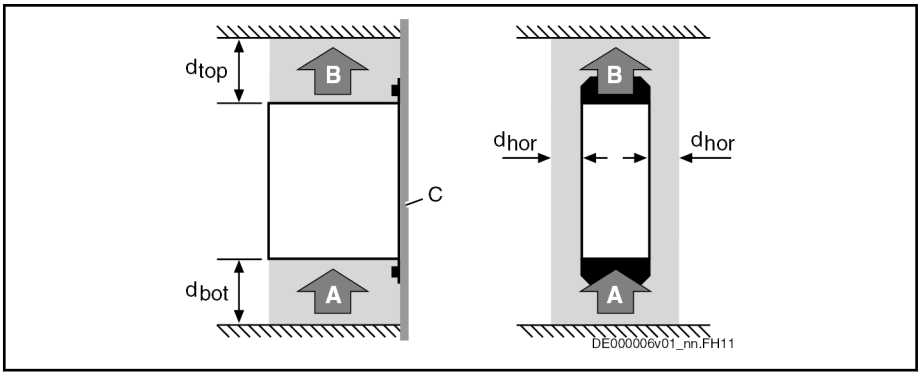
Ratings and Dimensions

Description	Symbol	Unit	HCS04.2E-W0350-_-04	HCS04.2E-W0420-_-04	HCS04.2E-W0520-_-04	HCS04.2E-W0640-_-04
Required wire size according to UL 508 A (internal wiring); (UL)[12)]	A_{LN}	AWG	2 x AWG4/0	2 x 250 MCM	2 x 350 MCM	3 x 250 MCM
Field wiring material (material; conductor temperature; class)			Cu; 60/75 °C; 1			
Output voltage (UL)	U_{out}	V	3 x AC 0...480			
Output current (UL)	I_{out}	A	259,0	300,0	366,0	459,0
Output frequency range (UL)[13)]	f_{out}	Hz	0...1000			
Power dissipation at continuous current and continuous DC bus power respectively (UL)[14)]	P_{Diss_cont}	W	3330,00	3710,00	4450,00	5890,00
Last modification: 2011-07-27						

1) 2) 3) Housing dimension; see also related dimensional drawing
4) 5) 6) See fig. "Air Intake and Air Outlet at Device"
7) Observe supply voltage for motor holding brakes
8) HMS, HMD, HCS plus motor holding brake and control section; HCS01 including control section
9) DC bus L+, L-; mains input L1, L2, L3
10) Use listed AC input line fuses (class J; 600 V AC) or listed circuit breakers (600 V AC) at the mains supply
11) Copper wire; PVC-insulation (conductor temperature 70 °C); installation method B1; table 6
12) Copper wire; PVC-insulation (conductor temperature 90 °C); table 28.1; Ta ≤ 40 °C
13) Depending on switching frequency which was set in parameter P-0-0001
14) Plus dissipation of braking resistor and control section

Fig.3-1: HCS - UL Ratings and Dimensions

Distances



A Air intake
B Air outlet
C Mounting surface in control cabinet
d_{top} Distance top
d_{bot} Distance bottom
d_{hor} Distance horizontal

Fig.3-2: Air Intake and Air Outlet at Device

3.2 HCS04.2E-W0790 … W1540

UL Ratings and Dimensions

Description	Symbol	Unit	HCS04.2E-W0790-_-04	HCS04.2E-W1010-_-04	HCS04.2E-W1240-_-04	HCS04.2E-W1540-_-04
Listing according to UL standard (UL)			UL 508 C			
Listing according to CSA standard (UL)			Canadian National Standard(s) C22.2 No. 14-10			
UL files (UL)			E 134201			
Pollution degree (UL)			2			
Ambient temperature with nominal data (UL)	T_{amax}	°C	40			
Ambient temperature with reduced nominal data (UL)	T_{amax_red}	°C	55			
Mass	m	kg	140,00	215,00	225,00	300,00
Device height (UL)[1)]	H	mm	950	1150		
Device depth (UL)[2)]	T	mm	380			
Device width (UL)[3)]	B	mm	585	880		1110
Minimum distance on the top of the device[4)]	d_{top}	mm	200			
Minimum distance on the bottom of the device[5)]	d_{bot}	mm	200			
Horizontal spacing on the device[6)]	d_{hor}	mm	-			
Rated control voltage input (UL)[7)]	U_{N3}	V	24 ±20%			
Rated power consumption control voltage input at U_{N3} (UL) [8)]	P_{N3}	W	72			
Short circuit current rating (UL)	SCCR	A rms	42000			
Rated input voltage, power (UL) [9)]	U_{LN_nenn}	V	3 x AC 400...480			
Tolerance rated input voltage (UL)		%	+10 -15			
Input frequency (UL)	f_{LN}	Hz	50...60			
Tolerance input frequency (UL)		Hz	3			
Rated input current (UL)	I_{LN}	A	527,0	660,0	834,0	1037,0
Branch circuit protection fuse (UL)[10)]			800	2 x 450	2 x 600	2 x 800
Required wire size according to EN 60204-1[11)]	A_{LN}	mm^2	2 x 185	3 x 185	4 x 185	4 x 240
Required wire size according to UL 508 A (internal wiring); (UL)[12)]	A_{LN}	AWG	3 x 350 MCM	4 x 350 MCM	4 x 500 MCM	6 x 500 MCM
Last modification: 2011-05-11						

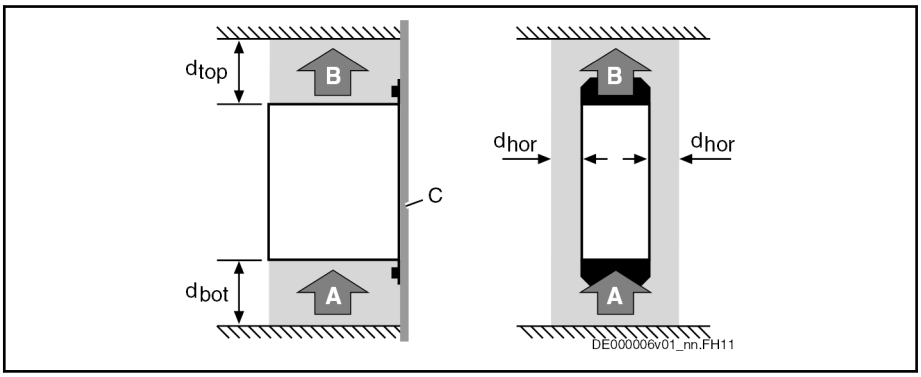
Ratings and Dimensions

Description	Symbol	Unit	HCS04.2E-W0790-_-04	HCS04.2E-W1010-_-04	HCS04.2E-W1240-_-04	HCS04.2E-W1540-_-04
Field wiring material (material; conductor temperature; class)			Cu; 60/75 °C; 1			
Output voltage (UL)	U_{out}	V	3 x AC 0...480			
Output current (UL)	I_{out}	A	586,0	720,0	894,0	1126,0
Output frequency range (UL)[13)]	f_{out}	Hz	0...1000			
Power dissipation at continuous current and continuous DC bus power respectively (UL)[14)]	P_{Diss_cont}	W	7250,00	8810,00	11150,00	13830,00
Last modification: 2011-05-11						

1) 2) 3) Housing dimension; see also related dimensional drawing
4) 5) 6) See fig. "Air Intake and Air Outlet at Device"
7) Observe supply voltage for motor holding brakes
8) HMS, HMD, HCS plus motor holding brake and control section; HCS01 including control section
9) DC bus L+, L-; mains input L1, L2, L3
10) Use listed AC input line fuses (class J; 600 V AC) or listed circuit breakers (600 V AC) at the mains supply
11) Copper wire; PVC-insulation (conductor temperature 70 °C); installation method B1; table 6
12) Copper wire; PVC-insulation (conductor temperature 90 °C); table 28.1; Ta ≤ 40 °C
13) Depending on switching frequency which was set in parameter P-0-0001
14) Plus dissipation of braking resistor and control section

Fig.3-3: HCS - UL Ratings and Dimensions

Distances



A Air intake
B Air outlet
C Mounting surface in control cabinet
d_{top} Distance top
d_{bot} Distance bottom
d_{hor} Distance horizontal

Fig.3-4: Air Intake and Air Outlet at Device

4 Documentations

4.1 Drive Systems, System Components

Title Rexroth IndraDrive …	Documentation type	Document typecode[1)] DOK-INDRV*-…	Part number R911…
Drive Controllers HCS04.2E	Project Planning Manual	HCS04.2****-PRxx-EN-P	327334
Drive Controllers Control Sections CSB01, CSH01, CDB01	Project Planning Manual	CSH********-PRxx-EN-P	295012
Additional Components and Accessories	Project Planning Manual	ADDCOMP****-PRxx-EN-P	306140

1) In the document typecodes, "xx" is a wild card for the current edition of the documentation (example: PR01 is the first edition of a Project Planning Manual)

Fig.4-1: Documentations – Overview

4.2 Motors

Title Rexroth IndraDyn …	Documentation type	Document typecode[1)] DOK-MOTOR*-…	Part number R911…
A Asynchronous Motors MAD / MAF	Project Planning Manual	MAD/MAF****-PRxx-EN-P	295781
H Synchronous Kit Spindle Motors	Project Planning Manual	MBS-H******-PRxx-EN-P	297895
L Synchronous Linear Motors	Project Planning Manual	MLF********-PRxx-EN-P	293635
S Synchronous Motors MSK	Project Planning Manual	MSK********-PRxx-EN-P	296289
T Synchronous Torque Motors	Project Planning Manual	MBT********-PRxx-EN-P	298798

1) In the document typecodes, "xx" is a wild card for the current edition of the documentation (example: PR01 is the first edition of a Project Planning Manual)

Fig.4-2: Documentations – Overview

4.3 Cables

Title	Documentation type	Document typecode[1)] DOK-…	Part number R911…
Rexroth Connection Cables IndraDrive and IndraDyn	Selection Data	CONNEC-CABLE*INDRV-CAxx-EN-P	322949

1) In the document typecodes, "xx" is a wild card for the current edition of the documentation (example: CA02 is the second edition of the documentation "Selection Data")

Fig.4-3: Documentations – Overview

Documentations

4.4 Firmware

Title Rexroth IndraDrive …	Documentation type	Document typecode[1)] DOK-INDRV*-…	Part number R911…
Firmware for Drive Controllers MPH-, MPB-, MPD-, MPC-08	Functional Description	MP*-08VRS**-APxx-EN-P	332643
Firmware for Drive Controllers MPH-, MPB-, MPD-, MPC-07	Functional Description	MP*-07VRS**-FKxx-EN-P	328670
Drive Controllers MPx-02 to MPx-08	Parameter Description	GEN-**VRS**-PAxx-EN-P	297317
MPx-02 to MPx-08 and HMV	Troubleshooting Guide	GEN-**VRS**-WAxx-EN-P	297319

1) In the document typecodes, "xx" is a wild card for the current edition of the documentation (example: PA02 is the second edition of a Parameter Description)

Fig.4-4: Documentations – Overview

5 Instructions for Use

5.1 General Information on How to Install the Drive Controller

⚠ WARNING **Lethal electric shock by live parts with more than 50 V!**

Before working on live parts: De-energize installation and secure power switch against unintentional or unauthorized re-energization.

Wait at least **30 minutes** after switching off the supply voltages to allow **discharging**.

Check whether voltage has fallen below 50 V before touching live parts!

Damage can be caused to the drive controller or circuit boards if electrostatic charging present in people and/or tools is discharged across them. For this reason, please observe the following information:

NOTICE **Electrostatic charges can cause damage to electronic components and interfere with their operational safety!**

Exposed conductive parts coming into contact with components and circuit boards must be discharged by means of grounding. Otherwise errors may occur when controlling motors and moving elements.

Such exposed conductive parts include:

- The copper bit when soldering
- The human body (ground connection by touching a conductive, grounded object)
- Parts and tools (place them on a conductive support)

Endangered components may only be stored or dispatched in conductive packaging.

☞ Rexroth connection diagrams are only to be used for producing installation circuit diagrams! The machine manufacturer's installation circuit diagrams must be used for wiring the installation!

- Lay signal lines separately from the load resistance lines because of the occurrence of interference.
- Transmit analog signals (e.g. command values, actual values) via shielded lines.
- Do not connect mains, DC bus or power cores to low voltages or allow them to come into contact with these.
- When carrying out a high voltage test or an applied-overvoltage withstand test on the machine's electrical equipment, disconnect all connections to the devices. This protects the electronic components (allowed in accordance with EN 60204-1). During their routine testing, Rexroth drive components are tested for high voltage (in accordance with EN 61800-5-1:2007, section 5.2.3.2) and insulation (in accordance with EN 60204-1:2006, section 18.3).

Instructions for Use

NOTICE **Risk of damage to the drive controller by connecting and disconnecting live connections!**

Do not connect and disconnect live connections.

5.2 Overcurrent Protection

Protect the components against overcurrent:

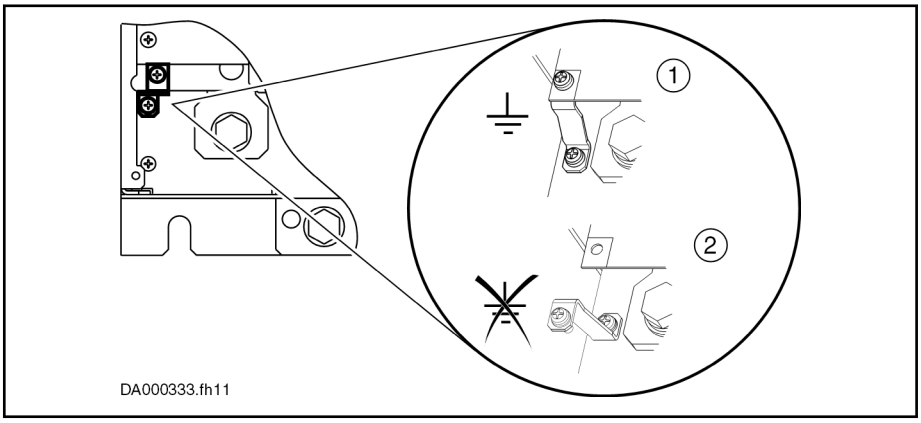
- Branch circuit protection has to be provided externally
- Dimension the branch circuit protection according to the data "Branch circuit protection fuse (UL)" (see Ratings and Dimensions)

5.3 Connection Points

5.3.1 Ungrounded Mains

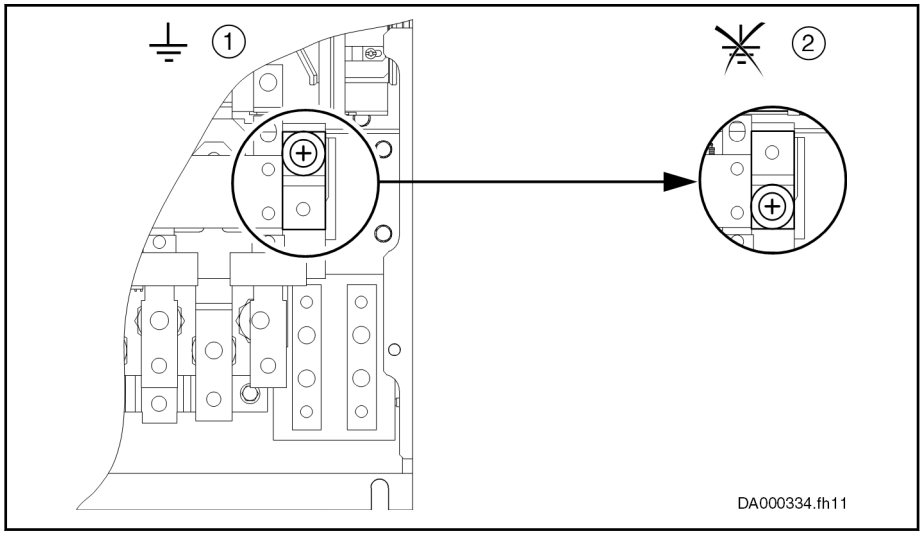
Use is generally allowed in all mains variants.

☞ For ungrounded mains (typically for industrial mains), the integrated radio interference filter must be adjusted by disconnecting/ reconnecting. In this case, the maximum allowed clock frequency is 4 kHz.

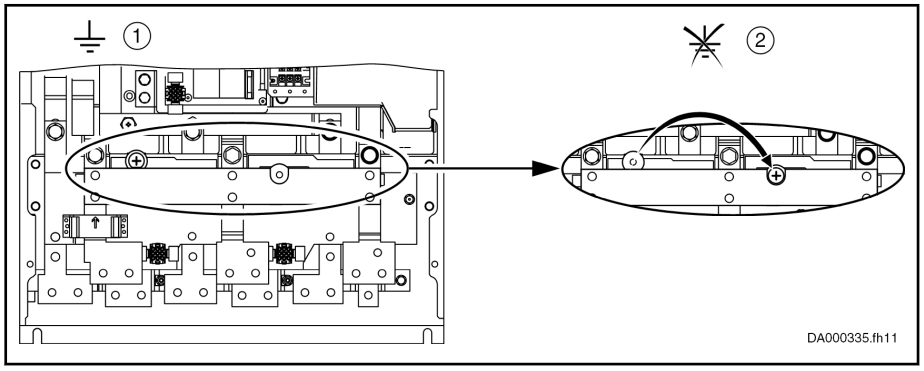


① TN or TT mains (factory setting)
② IT mains or corner-grounded

Fig.5-1: IndraDrive HCS04.2E-W0350



① TN or TT mains (factory setting)
② IT mains or corner-grounded
Fig.5-2: IndraDrive HCS04.2E-W0420; HCS04.2E-W0520



① TN or TT mains (factory setting)
② IT mains or corner-grounded
Fig.5-3: IndraDrive HCS04.2E

With ungrounded mains, a single-pole ground fault in the supplying mains does not influence the function of the converter. If the ground fault occurs in the motor or motor cable, the converter switches off. The ground fault detection, however, strongly depends on the capacitance to ground of the mains.

⚠ WARNING **The option HNF01.1B filter is not suited for IT mains!**

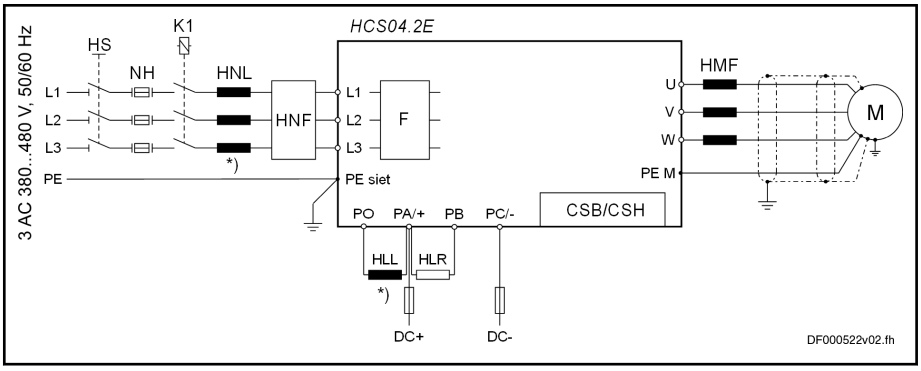
In IT mains it is only allowed, for reasons of personal protection, to use special radio interference filters with very low leakage current (increasing the capacitances to ground, ...).

5.3.2 Wiring Diagram

IndraDrive HCS04.2E-W0350... - W0520

The figures below show the typical wiring of the converters, including the options, which can be required to protect the installation or device, depending on the application.

Instructions for Use

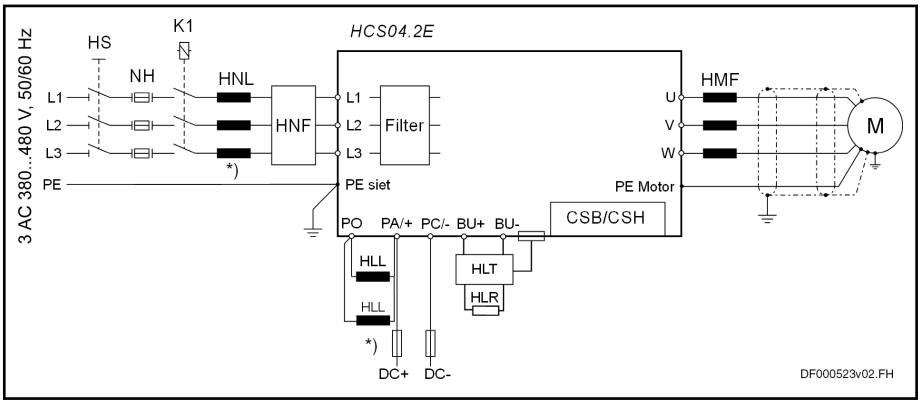


*) Alternative options

Fig.5-4: Wiring Diagram: IndraDrive HCS04.2E-W0350... -W0520

F	Filter
PE M	PE motor
HS	Main switch (is used if required and according to the local regulations)
NH	Mains fuses according to table (absolutely required)
K1	Mains contactor (is used if required and according to the local regulations)
HNL01.1E	Mains choke option for mains-side reduction of the current harmonics caused by the DC bus; used as an alternative to option HLL
HNF01.1B	Radio interference filter option for using the converter as per category C1 or C2 in accordance with EN 61800-3 "Use in 1st environment - residential area"
Internal filter	Radio interference filter integrated as a standard; corresponds to category C3 in accordance with EN 61800-3 "Use in industrial areas"
HMF01.1N	Output motor filter option to reduce the voltage peaks at the motor in the case of long motor cables
HLL	DC choke option to reduce current harmonics; used as an alternative to option "HNL01.1E". Available as an option to be mounted.
HLR01.1	Braking resistor option for rapid deceleration or temporary regenerative loads.
DC+ / DC-	Energy supply from a DC bar; as an alternative to 3AC mains supply

IndraDrive HCS04.2E-W0640... -W1010



*) Alternative options

Fig.5-5: Wiring Diagram: IndraDrive HCS04.2E-W0640... -W1010

F	Filter
PE M	PE motor
HCS04.2E	Converter
HS	Main switch (is used if required and according to the local regulations)
NH	Mains fuses according to table (absolutely required)
K1	Mains contactor (is used if required and according to the local regulations)
HNL01.1E	Mains choke option for mains-side reduction of the current harmonics caused by the DC bus; used as an alternative to option HLL
HNF01.1B	Radio interference filter option for using the converter as per category C2 in accordance with EN 61800-3 "Use in 1st environment - residential area"
Internal filter	Radio interference filter integrated as a standard; corresponds to category C3 in accordance with EN 61800-3 "Use in industrial areas"
HMF01.1N	Output motor filter option to reduce the voltage peaks at the motor in the case of long motor cables
HLL	DC choke, option to be mounted, to reduce current harmonics; used as an alternative to option HNL01.1E
HLT	External braking unit option for HCS04.2E-W0640-N-04-NNNN… HCS04.2E-W1540-N-04-NNNN
HLR01.1	Braking resistor option for rapid deceleration or temporary regenerative loads.
DC+ / DC-	Energy supply from a DC bar; as an alternative to 3AC mains supply

IndraDrive HCS04.2E-W1240... -W1540

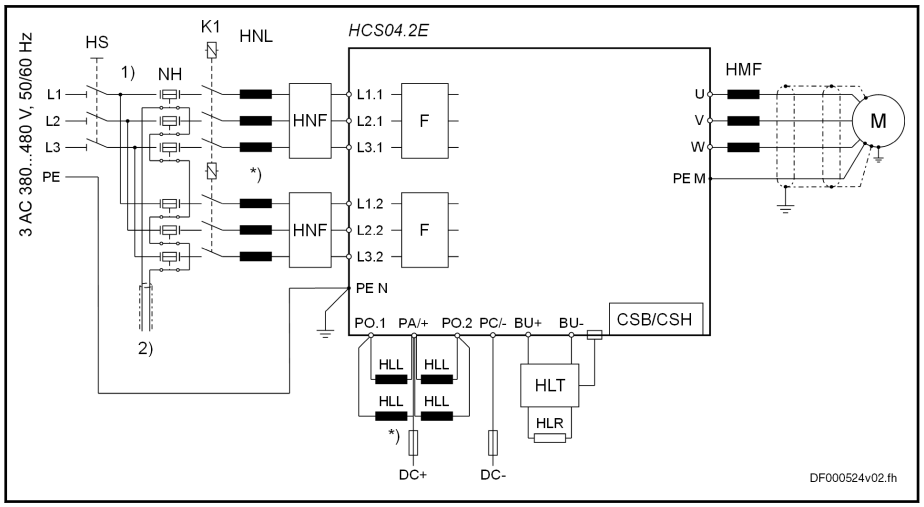


Fig.5-6: Wiring Diagram: IndraDrive HCS04.2E-W1240... -W1540

F	Filter
PE M	PE motor
PE N	PE mains
HCS04.2E	Converter
HS	Main switch (is used if required and according to the local regulations)

Instructions for Use

NH	Mains fuses according to table (absolutely required)
K1	Mains contactor (is used if required and according to the local regulations)
TR	Transformer with two phase-displaced secondary windings (e.g. Yy6 d5)
TS	Disconnector (is used according to the local regulations)
Internal filter	Radio interference filter integrated as a standard; corresponds to category C3 in accordance with EN 61800-3 "Use in industrial areas"
HMF01.1N	Output motor filter option to reduce the voltage peaks at the motor in the case of long motor cables
HLT	External braking unit option for HCS04.2E-W0640-N-04-NNNN… HCS04.2E-W1540-N-04-NNNN
HLR01.1	Braking resistor option for rapid deceleration or temporary regenerative loads.
DC+ / DC-	Energy supply from a DC bar; as an alternative to 3AC mains supply
1.	Energy supply from a DC bar; as an alternative to 3AC mains supply
2.	Fuse monitoring protects the rectifier against unequal load. Fuse monitoring must act on the mains contactor. Monitoring is not obligatory, because the converter monitors the mains voltage.

☞ For devices with 2 rectifiers (size W1240/W1540), bit 3 to bit 5 must be set to "000" in the control section (P-0-0118). This ensures that an error reaction takes place when an error occurs in one of the rectifiers.

Instructions for Use

IndraDrive HCS04.2E-W1240... -W1540 (12-Pulse Rectification)

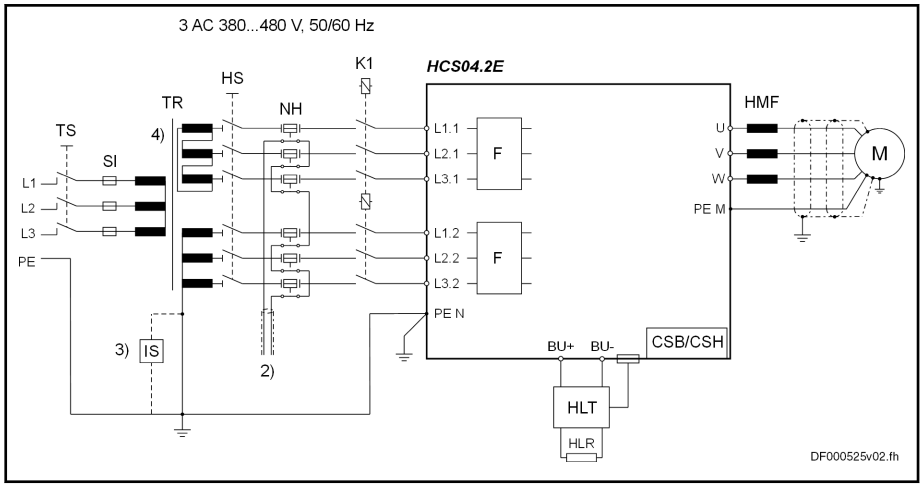


Fig.5-7: Wiring Diagram: IndraDrive HCS04.2E-W1240... -W1540

F	Filter
PE M	PE motor
PE N	PE mains
HCS04.2E	Converter
HS	Main switch (is used if required and according to the local regulations)
NH	Mains fuses according to table (absolutely required)
K1	Mains contactor (is used if required and according to the local regulations)
TS	Transformer with two phase-displaced secondary windings (e.g. Yy6 d5)
TR	Disconnector (is used according to the local regulations)
Internal filter:	Radio interference filter integrated as a standard; corresponds to category C3 in accordance with EN 61800-3 "Use in industrial areas"
HMF01.1N	Output motor filter option to reduce the voltage peaks at the motor in the case of long motor cables
HLT	External braking unit option for HCS04.2E-W0640-N-04-NNNN… HCS04.2E-W1540-N-04-NNNN
HLR01.1	Braking resistor option for rapid deceleration or temporary regenerative loads.
DC+ / DC-	Energy supply from a DC bar; as an alternative to 3AC mains supply

- Fuse monitoring protects the rectifier against unequal load. Fuse monitoring must act on the mains contactor. Monitoring is not obligatory, because the converter monitors the mains voltage.
- For supply via a three-winding transformer, the neutral point can be grounded or optionally provided with an insulation monitoring relay.
- To ensure constant current distribution, the transformer must comply with the tolerance values: Tolerance of the transformation ratios: 0.3 % of $ü_{NOM}$

  Tolerance of the relative short-circuit voltage: 5.0 % of u_{K_NOM}

Instructions for Use

The nominal output voltage of a transformer is defined at no-load operation. Therefore, this value must be approx. 5% higher than the rated voltage of the drive.

DC Coupling

DC coupling of several HCS04.2E-W... with a mains contactor

For applications which must generate full motive power, but also are to work in regenerative operation by exchanging energy via the DC bus, it is recommended that you use DC coupling (e.g., for roller tables, belt conveyors, ...).

☞ DC coupling is only allowed for the combination of "HCS04.2/HCS04.2" devices. It is **not** allowed for the combination of "HCS04.2/HCS03.1" or "HCS04.2/HCS02.1" devices.

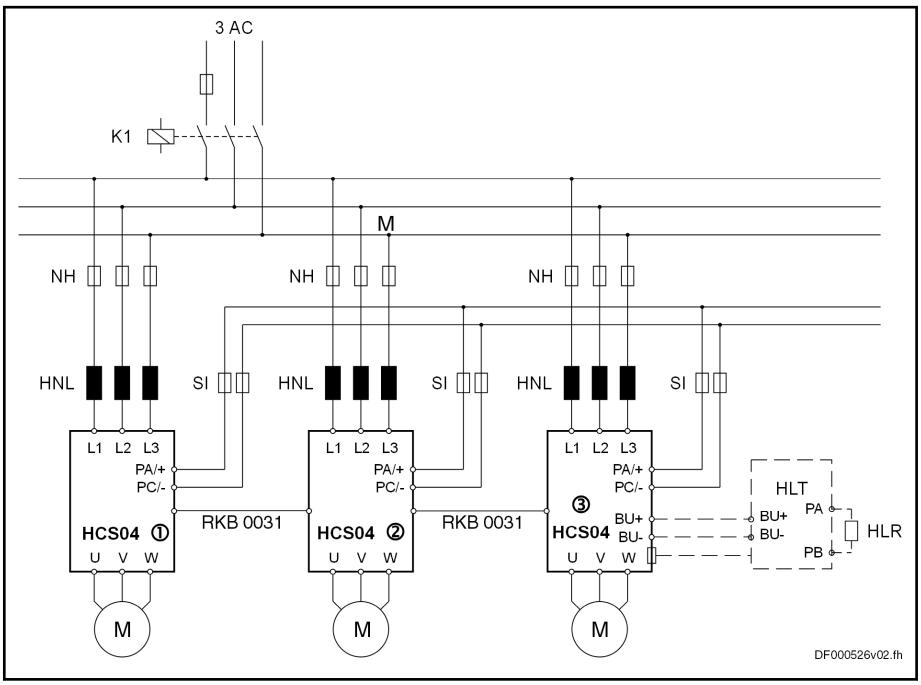


Fig.5-8: DC Coupling of Several HCS04.2E-W...

K1	Mains contactor: Due to the design with a common mains contactor, the charging circuits of the individual converters work in parallel when power is switched on and therefore cannot be overloaded.
NH	Mains-side device protection: To protect the individual rectifiers against overload, comply with the fuse recommendations contained in the chapter. Fuse monitoring which acts on the mains contactor can prevent consequential damage in the charging circuit when power is switched on.
SI	Fuse in the DC bus in accordance with table
① ② ③	HCS04.2E converter in standard design: Basically, the number of devices and their sizes can be freely selected. However, it is only possible to combine devices of a maximum of three sizes. **Example:** When using HCS04.2E-W0790 as the biggest device, the smallest size that can be used is HCS04.2E-W0520.
HNL01.1E	The mains choke HNL01.1E option or DC choke option is absolutely necessary!

HLT01.1A/ HLR01.1	Braking unit and braking resistor for short-time reduction of regenerative power: For example, if all drives are to be decelerated simultaneously, the released energy can be reduced in the braking resistor. Using a braking unit is not obligatory.
RKB0031	Ensures the module bus connection between several HCS04.2E devices or between HCS04.2E and other IndraDrive axes. For mounting you have to make sure that the 8-pin end is connected to HMS or the HCS02/03 devices. (The RKB0031 cable is supplied with the appropriate mounting bracket.)

DC Coupling of a Main Drive with Slave(s) at the DC Bus

Applications in which drives work in regenerative form (in deceleration mode) while one or several drives run in motive form, can work very efficiently due to DC supply (e.g., winders/unwinders, levelling machines, testing stands, roller tables, lifting gear, travelling gear, ...).

☞ However, the required motive power mustn't ever exceed the motive power necessary for the rectifier of the main drive (e.g., 250 kW + 20 % for 60 s with HCS04.2E-W0640).

☞ It is not allowed to switch on DC-supplied drives during operation!

☞ Switching elements mustn't be installed in the DC bus!

☞ When an HCS04.2E device is supplied via the DC bus, the three-phase current fans of the converter must be supplied externally.

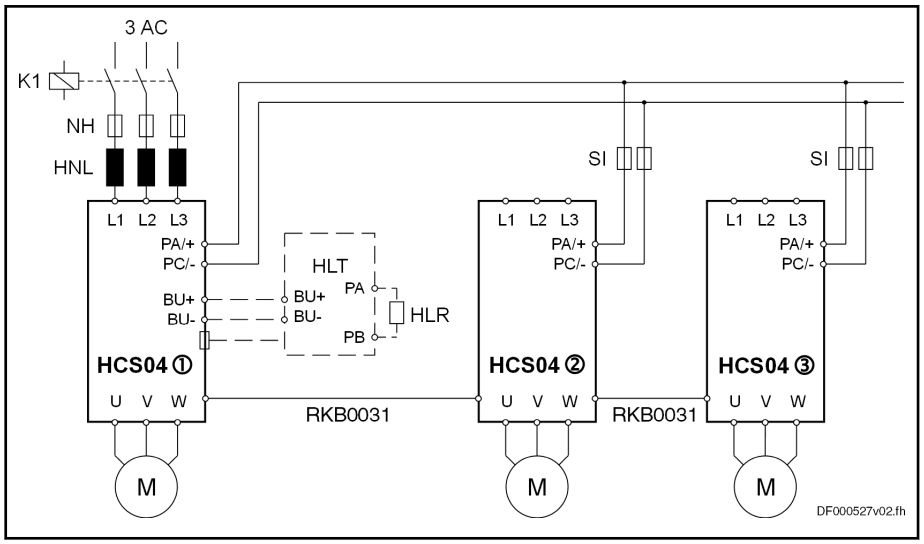


Fig.5-9: DC Coupling of a Main Drive with Slave(s) HCS04.2E

HCS04.2E (main drive)

① This converter determines the maximum possible motive power of the entire drive group. The converter can charge three devices of the same size (or several smaller devices of the same total power).

DC-supplied HCS04.2E converters (slave[s])

② ③ In the case of supply via the DC bus, the three-phase current fans of the converter must be supplied externally.

Instructions for Use

HNL	The HNL mains choke option or HLL DC choke option is absolutely necessary! Super-fast fuse according to table in chapter "Fuses for DC-Coupled Converters", page 39
SI	It does not make sense to use switching devices in the DC circuit, because the switching duty will cause the fuses to trip due to the high charging current.
HLT/HLR	Braking unit and braking resistor for short-time reduction of regenerative power. For example, if all drives are to be decelerated simultaneously, the released energy can be reduced in the braking resistor. Using a braking unit is not obligatory.
RKB0031	Ensures the module bus connection between several HCS04.2E devices or between HCS04.2E and other IndraDrive axes. For mounting you have to make sure that the 8-pin end is connected to HMS or the HCS02/03 devices. (The RKB0031 cable is supplied with the appropriate mounting bracket.)

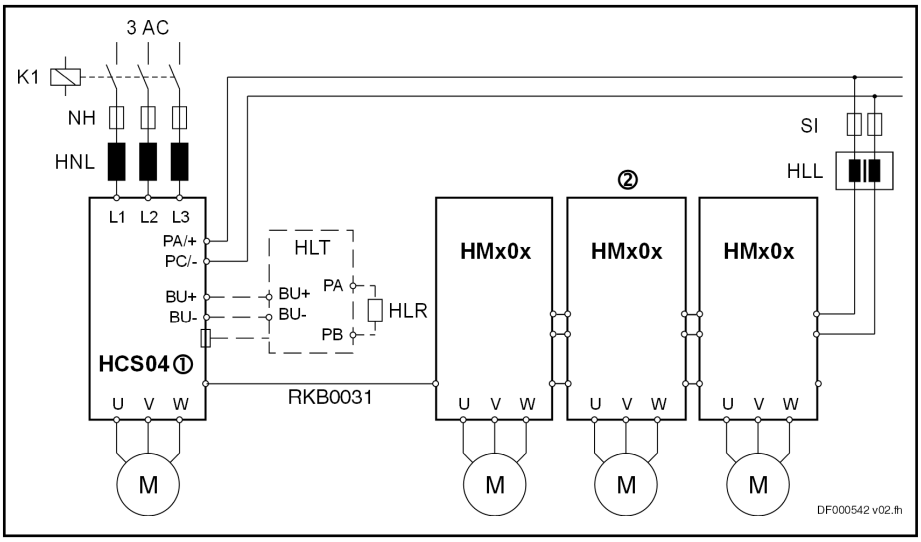


Fig.5-10: DC Coupling of a Main Drive with Slave(s) IndraDrive M

	HCS04.2E (main drive)
①	This converter determines the maximum possible motive power of the entire drive group. The converter can charge three devices of the same size (or several smaller devices of the same total power).
②	DC-supplied IndraDrive devices
HLL	Current-compensated DC bus choke
HNL	The HNL mains choke option or HLL DC choke option is absolutely necessary! Super-fast fuse according to table in chapter "Fuses for DC-Coupled Converters", page 39
SI	It does not make sense to use switching devices in the DC circuit, because the switching duty will cause the fuses to trip due to the high charging current.
HLT/HLR	Braking unit and braking resistor for short-time reduction of regenerative power. For example, if all drives are to be decelerated simultaneously, the released energy can be reduced in the braking resistor. Using a braking unit is not obligatory.

☞ In the case of operation as central supply, converters of the HCS04.2 line can additionally charge the triple capacitance value of the DC bus capacitance installed in the converter. This must be taken into account for the project planning of the additional axes!

☞ With this kind of interconnection, the total leakage capacitance mustn't exceed 100 nF.

If the total leakage capacitance of the application exceeds the value of 100 nF, it is obligatory that you use a current-compensated DC bus choke of the "HLL" type. When such an "HLL choke" is used, the total leakage capacitance can increase up to 500 nF. If the total leakage capacitance exceeds the value of 500 nF, another DC bus string using another "HLL choke" is required.

Fuses for DC-Coupled Converters

Only super-fast fuses are suited for DC applications. Due to their design, they can switch off both direct voltage and alternating voltage.

DC mains supply	400 V	440 V	460 V
Nominal voltage	560 V DC	620 V DC	680 V DC
Voltage range	405... 650 V DC	450... 685 V DC	490... 745 V DC
Overvoltage cut-off	1.50 x U_{N-DC}	1.35 x U_{N-DC}	1.25 x U_{N-DC}
Nominal current DC (approx.)	1.15 x I_{MOTOR}	1.15 x I_{MOTOR}	1.15 x I_{MOTOR}
Fuse type, nominal voltage	690 V sf	690 V sf	690 V sf

HCS04.2E converter	Mains fuse Converter protection "sf"	Lines in control cabinet (per phase)
HCS04.2E-W0350	400 A	185 mm^2
HCS04.2E-W0420	500 A	2 x 120 mm^2
HCS04.2E-W0520	630 A	2 x 150 mm^2
HCS04.2E-W0640	700 A	3 x 120 mm^2
HCS04.2E-W0790	900 A	3 x 150 mm^2
HCS04.2E-W1010	1,250 A	4 x 150 mm^2
HCS04.2E-W1240	1,400 A	6 x 120 mm^2
HCS04.2E-W1540	1,600 A	6 x 150 mm^2

5.3.3 Protecting the Installation

Responsibility

☞ It is the user's responsibility to include the IndraDrive HCS04.2E converters in the protection and safety concept of the installation or machine.

Therefore, all the circuit recommendations and notes on project planning are only suggestions; they must be adjusted to the on-site conditions and regulations with regard to the installation and use.

In particular, this applies to the safety regulations for machines, the EMC regulations and the general regulations for personal protection.

Frequencies > 60 Hz

☞ To operate motors and drives with frequencies of more than 60 Hz, you must check whether the components used are suitable.

Always consult the manufacturer of the motor and/or machine first. 4... 8-pole motors are generally suited for operation up to 100 Hz.

Residual-Current-Operated Circuit-Breakers

Converters, especially those with additional HNF01.1B radio interference filters and shielded motor cables, carry an increased leakage current against ground.

The leakage current depends on:

- The length of the motor cable
- The way the cable is routed, and whether it is shielded or not
- The clock frequency which has been set
- The use of the additional HNF01.1B radio interference filter
- The grounding of the motor on site (grounded or not grounded)

⚠ CAUTION **At the moment of switching on, the residual-current-operated circuit breaker can be accidentally triggered, especially by the capacitors of the filter.**

It can also be accidentally triggered in operation by the capacitances to ground. On the other hand, it is possible to block the switch-off function through components of direct current, with mains rectification at the converter input.

Therefore, you should observe the following aspects:

- Only use short-time-delay and pulse-current-sensitive residual-current-operated circuit breakers with a higher nominal triggering current.
- Protect other loads by individual residual-current-operated circuit breakers.
- Residual-current-operated circuit breakers before a converter do not provide absolute protection in the case of direct contact! Therefore, they should always be used in combination with other protective measures.
- "IndraDrive HCS04.2E" converters do not have a current-limiting function (in the case of fault currents) and therefore they do not violate the grounding specifications.

In installations with great cable lengths, the leakage current can be greater than 100 mA, depending on the conditions!

⚠ WARNING **The built-in ground fault detection does not have a current-limiting effect.**

It is a device protection and **not a personal protection**.

Switching the Motor Off and On

A safety switch or a motor contactor can be used to switch the motor off and on. The converter detects the respective switching status and the risk of destruction or disconnection on faults is excluded.

Suppressor Circuit

☞ All inductances, such as relays, contactors, magnetic brakes, must be equipped with a suppressor circuit. It prevents malfunction of the conventional device control and of the field bus.

Provide a free-wheeling diode for DC control circuits.

For AC control circuits, the RC circuit is better than a circuit with varistors, because it not only reduces the crest value of the overvoltage, but also the rise times.

Instructions for Use

External Fan Supply

With devices of the HCS04.2 line, the power sections are cooled by three-phase current fans. In the condition as supplied, the fans are supplied by the converter's mains supply. Power supply can also be external (e.g., when the converter is supplied via a DC bus).

Technical data:

3 AC 380 V -10% to 440 V +10%, 50 Hz ± 5%

3 AC 380 V -10% to 480 V +10%, 60 Hz ± 5%

Power:	HCS04.2E-W0350... -W0520	550 VA
	HCS04.2E-W0640... -W0790	1100 VA
	HCS04.2E-W1010... -W1240	1650 VA *)
	HCS04.2E-W1540	2200 VA *)
	*) HLT01.1A-400K-N-007-NNNN	550 VA

When the external fan supply is used, the connectors X1 and X4 at the fan supply module must be interchanged.

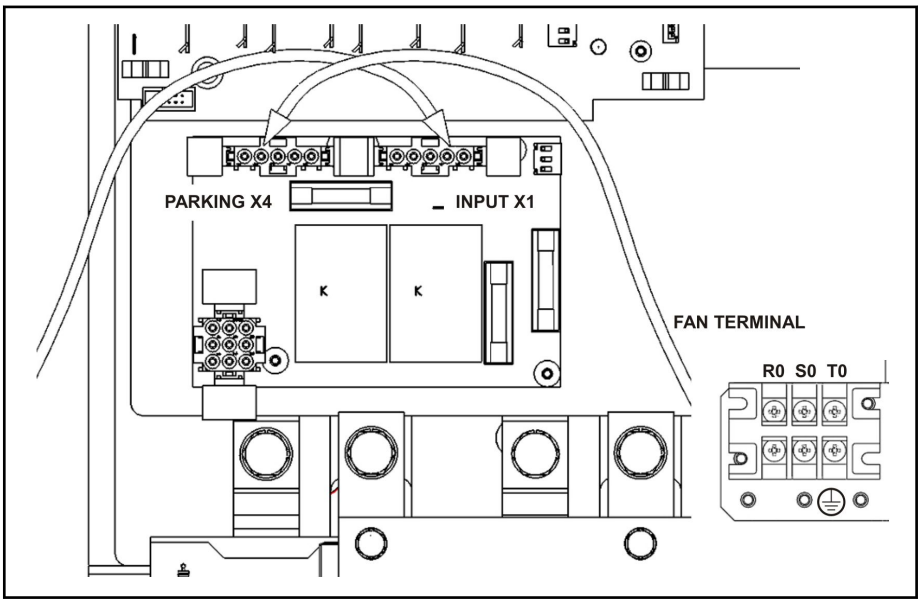


Fig.5-11: Internal Supply of the Three-Phase Current Fans

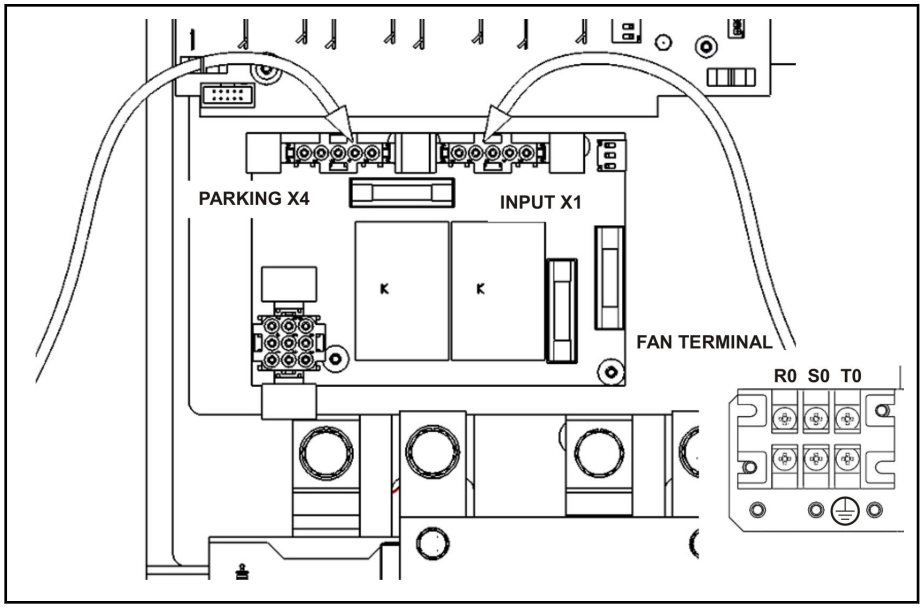


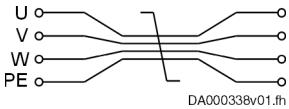
Fig.5-12: External Supply of the Three-Phase Current Fans

Service life of the DC fans:	30,000 hours
Service life of the three-phase current fans:	48,000 hours

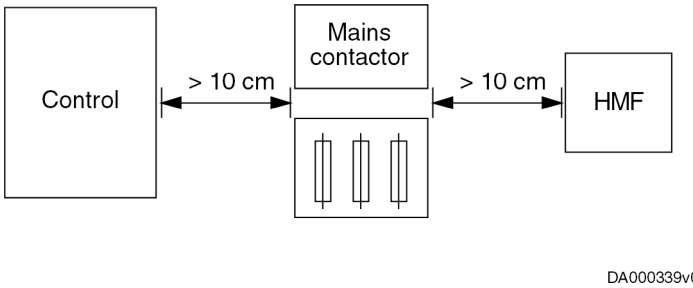
The fans for the control section start running as soon as the converter is under voltage (does not apply to devices of size ...-W0350). As a matter of precaution, you should therefore replace the fans after five years!

General Notes on Connection

1. Power lines with single wires, especially motor lines, should always be laid as close to the corresponding PE conductor as possible.

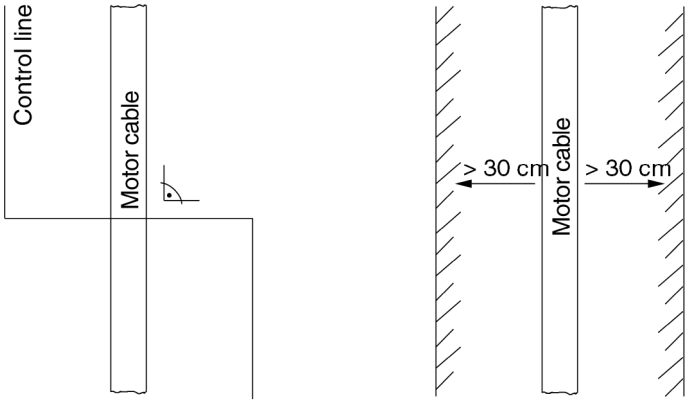


2. Control, mains supply and motor lines should be separated from each other, if possible.



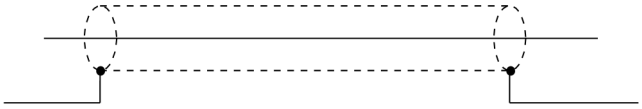
3. Never lay control lines, supply feeders and motor cables in the same cable duct!

Instructions for Use



DA000340v01.FH

4. Only use shielded control lines (exception: relay contacts and possibly digital inputs, if they are completely separated from the power cables). Always ground the shield at both ends (exception: in the case of problems with ground loops caused by compensating currents that heat the shield, ground only on the signal input side or use a parallel compensating line).



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5. Implement EMC grounding of the HNF01.1B filter, the mounting plate and the control cabinet.

☞ Since mains disturbances and the actual influence on other loads are measured with reference to the ground potential, the inductance of the grounding is essential. This means that large-surface ground connections, which can run in parallel to the yellow/green protective grounding PE, are very important.

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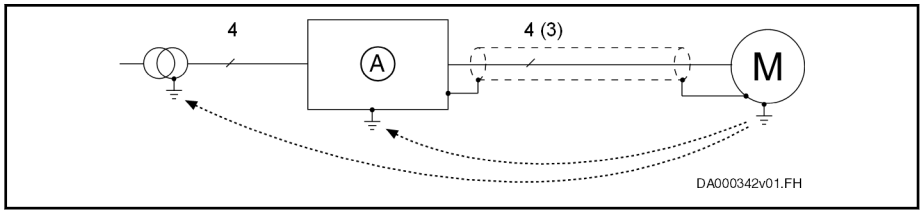
6. Free cores in the motor cable (e.g., a blue N conductor) must be connected to the PE motor at least on the converter side. Otherwise, they could carry dangerous voltages.

7. The motor cable shield prevents the dissipation of interference currents via the grounded motor (motor foundation). It leads them back to the mains filter of the converter.

Its second task is to reduce the interfering radiation and to reduce interference injection to neighboring lines.

Therefore, shielded 4-pin motor cables should be used, and the shield should be connected at both ends in accordance with the valid HF rules. The type of shield material (copper or steel) is less important than a good connection at both ends. Alternatively, a closed and continuously connected cable duct made of metal and of good electroconductive properties can be used.



Ⓐ Converter and filter

Fig.5-13: Shielding

A low-price possibility for large line cross sections (use in industrial areas) is to use power cables with a concentric equipment grounding conductor (e.g., NYCY or NYCWY). The equipment grounding conductor has the same protective function as the PE conductor, as well as the shielding effect.

Connection design for NYCY motor cables:

Because of the dual function of the PE conductor, it is necessary to implement the cable connection on the converter side and motor side correctly:

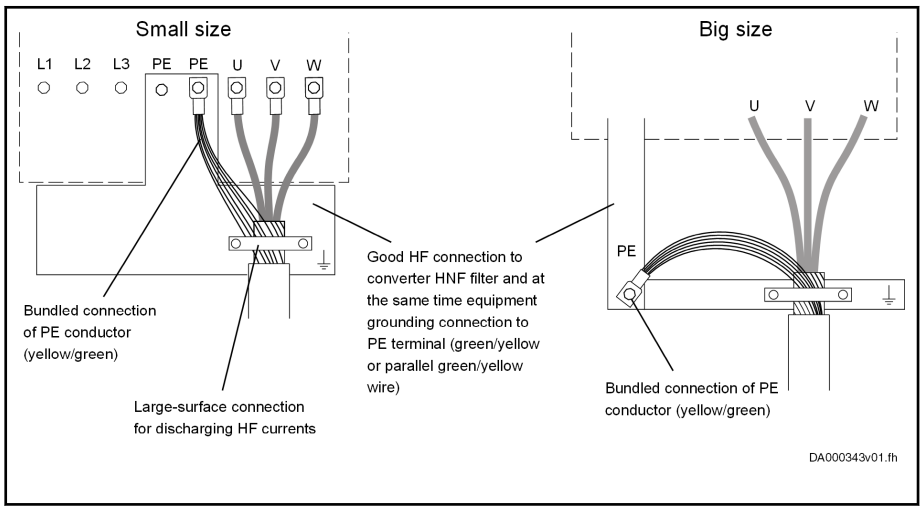


Fig.5-14: Cable Connection

Equipment grounding conductor function: Bundled connection of the PE conductor for a safe and corrosion-proof connection, e.g. using a ring terminal

Shielding function: Connection of the PE conductor over a large surface area for a low HF resistance with good induction of the interference currents into the HNF01.1B filter, e.g. using a clip

Instructions for Use

Wiring the Power Connections

How to access the power terminals

To access the power terminals, remove the front panel.

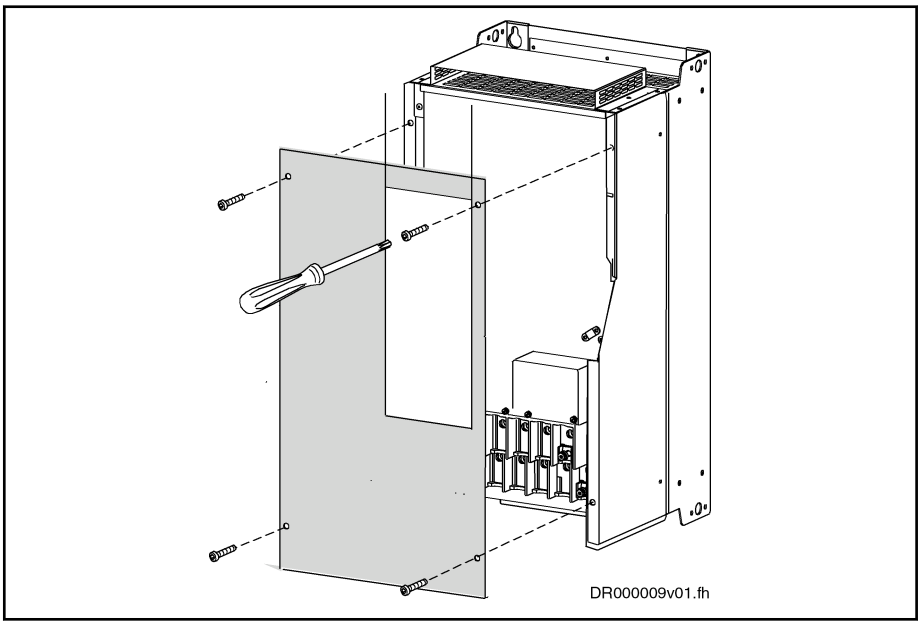


Fig.5-15: Front Panel

Control Cabinet Mounting IP23

The specified power dissipations and minimum air-inlet cross sections refer to the converter. Other heat sources, such as HLL, HNL01.1E, HMF01.1N, fuses and contactors must be additionally taken into account. The device-internal power section fan ventilates the control cabinet. The air flow mustn't be impeded by built-in components or filter mats. For the HCS04.2 devices, seal off the power section air to avoid internal air short circuits.

Control cabinet mounting in degree of protection IP23 of the HCS04.2 line

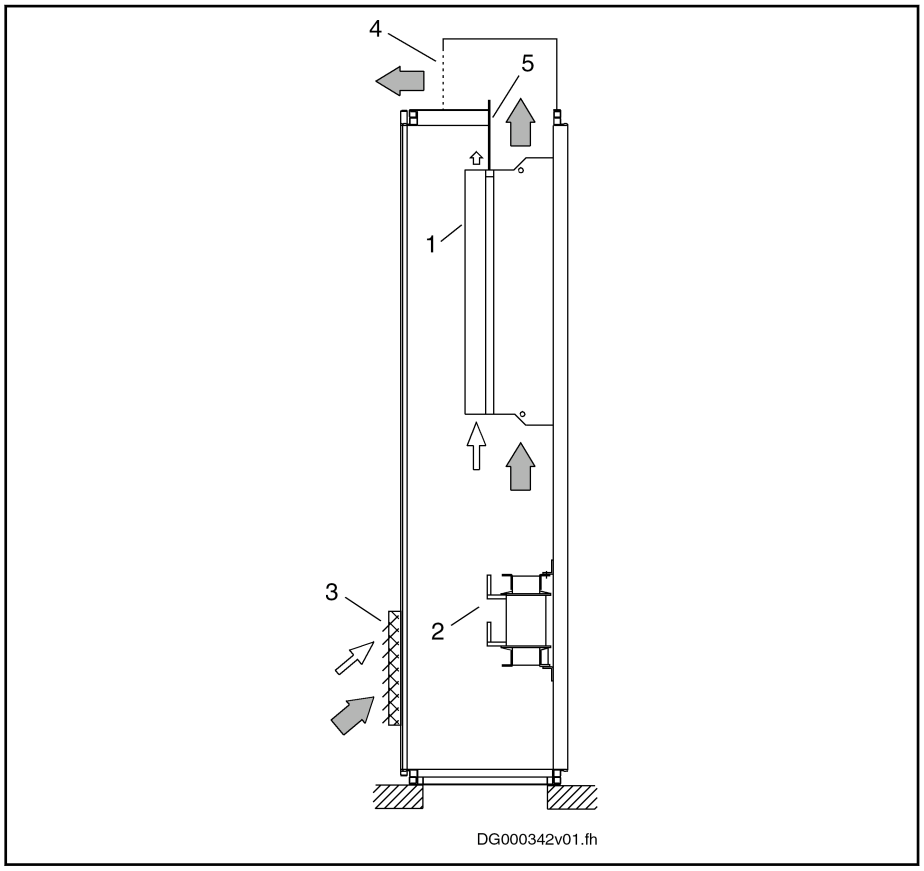


Fig.5-16: Degree of Protection IP23

- Mains choke option HNL01.1E
- Air inlet grid (without filter mat) for control section and power section
- Cover plate with splash guard
- Sealing wall to avoid internal air short circuits

  Degree of protection: IP23
- Ambient temperature: -10... +40°C

An optional assembly kit for RITTAL TS8 control cabinets is available.

Instructions for Use

Control Cabinet Mounting IP54

Control cabinet mounting IP54 with separate air flow or flange assembly:

The power section has been designed in IP54 for all devices and sealed off from the control electronics. With control cabinet mounting, a base is required for separate air flow. The power section losses (external) are dissipated by the device-internal power section fan. The control section losses must be dissipated by means of filter fans or a sufficiently large control cabinet surface. The values specified in the technical data apply to the power dissipation and cooling air volume of the converter including "HLL01.1A". Other heat sources, such as HLL, HNL01.1E, HMF01.1N, fuses and contactors must be additionally taken into account.

Control cabinet mounting in degree of protection IP54 for converters of the HCS04.2 line

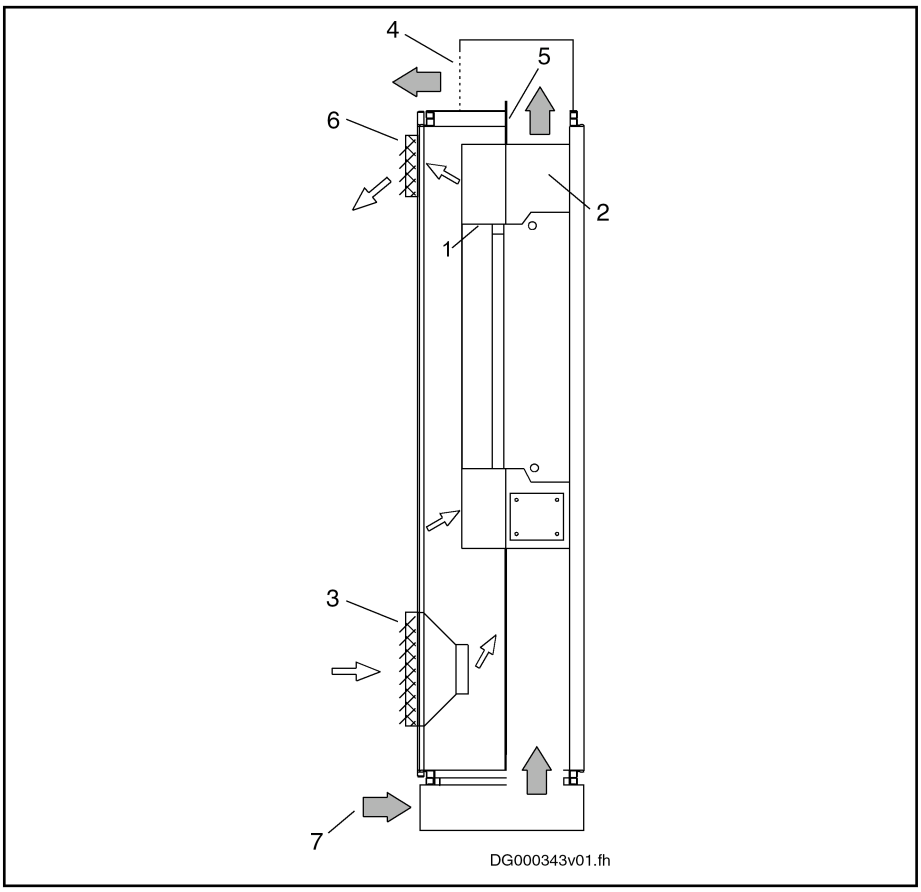


Fig.5-17: Control Cabinet Mounting in Degree of Protection IP54

1. IndraDrive HCS04.2E
2. HLL01.1A
3. Air inlet grid (with filter fan) for control section
4. Cover plate with splash guard
5. Sealing wall to avoid internal air short circuits
6. Air outlet (with filter mat) for control section
7. Cooling air for power section

Degree of protection: IP54

Ambient temperature: -10... +40°C

Instructions for Use

IndraDrive HCS04.2E-W0350

Dimensions

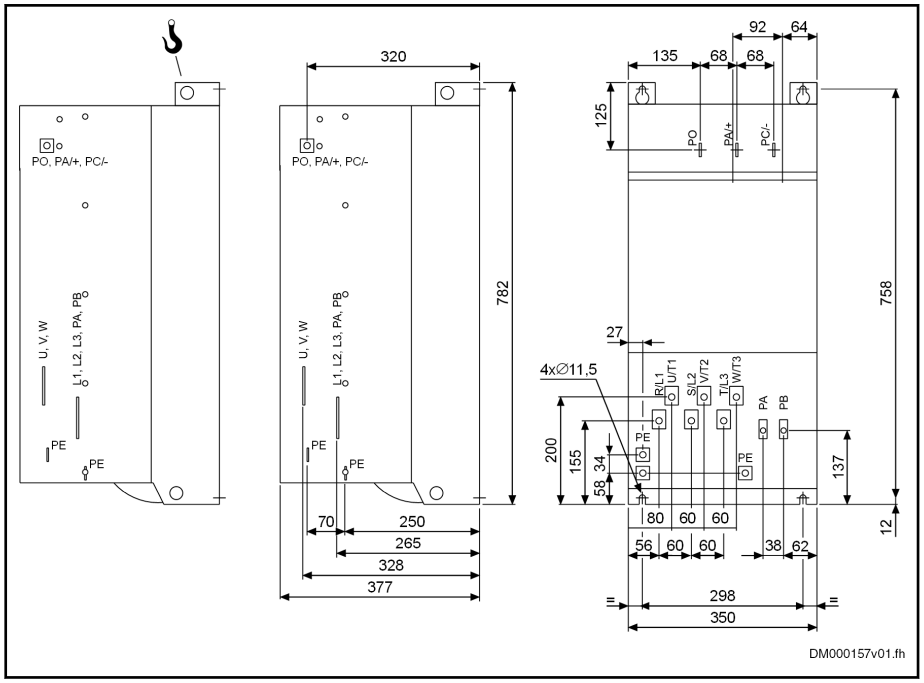


Fig.5-18: IndraDrive HCS04.2E-W0350

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
PA, PB	M8	12 Nm
Mains and motor	M10	24 Nm
PE	M10	24 Nm

Technical data

IndraDrive HCS04.2E	-W0350
Power dissipation at 100% I_N (P1/P2)	2520 W / 3330 W
Cooling air volume (IP23)	600 m^3/h
Min. air inlet/outlet (IP23)	7 dm^2
Internal power dissipation	260 W / 300 W
External power dissipation	2460 W / 3280 W
Cooling air volume (IP54)	145 m^3/h
Mass	74 kg

Instructions for Use

IndraDrive HCS04.2E-W0420

Dimensions

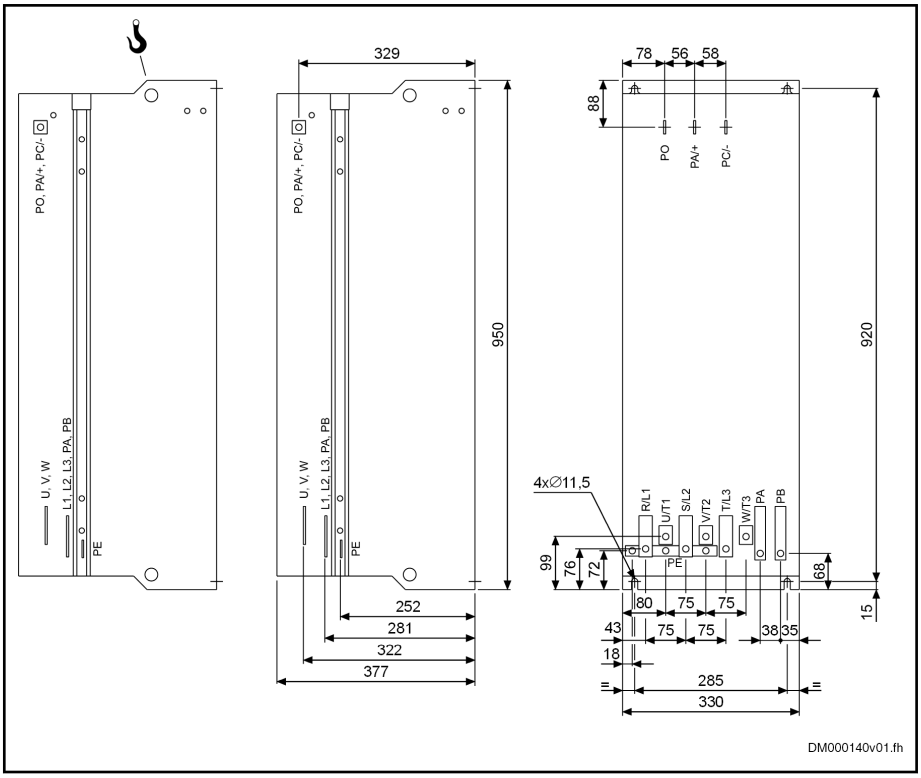


Fig.5-19: Dimensions IndraDrive HCS04.2E-W0420

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
PA, PB	M10	24 Nm
Mains and motor	M10	24 Nm
PE	M10	24 Nm

Technical data

IndraDrive HCS04.2E	-W0420
Power dissipation at 100% I_N (P1/P2)	2950 W / 3710 W
Cooling air volume (IP23)	600 m^3/h
Min. air inlet/outlet (IP23)	7 dm^2
Internal power dissipation	300 W / 360 W
External power dissipation	2900 W / 3670 W
Cooling air volume (IP54)	165 m^3/h
Mass	80 kg

IndraDrive HCS04.2E-W0520

Dimensions

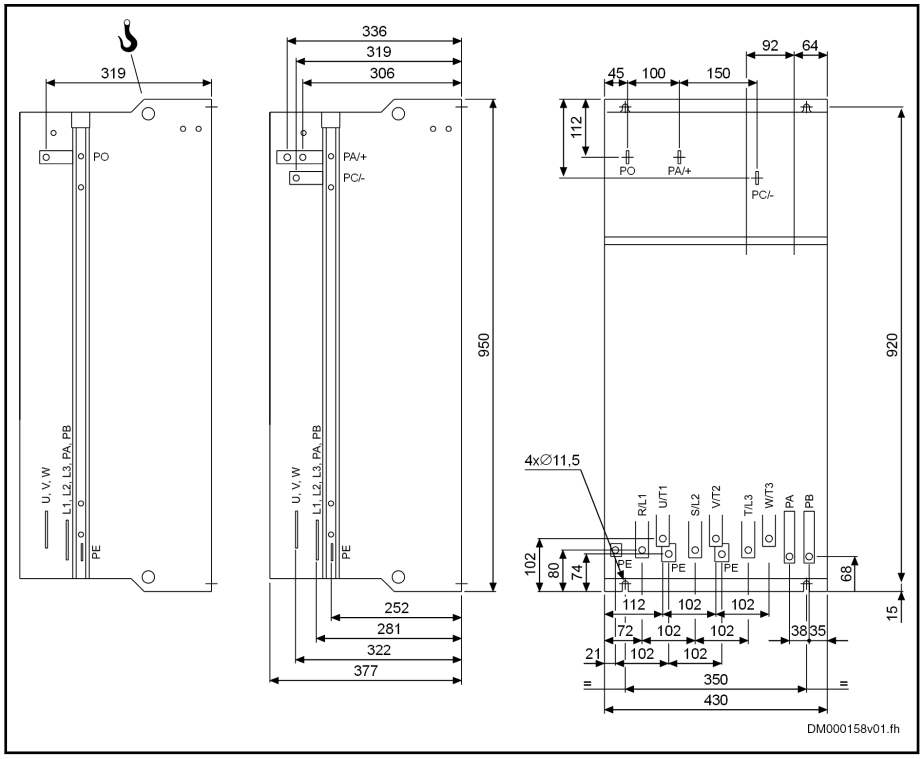


Fig.5-20: IndraDrive HCS04.2E-W0520

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
BU+, BU-	M10	24 Nm
Mains and motor	M12	41 Nm
PE	M12	41 Nm

Technical data

IndraDrive HCS04.2E	-W0520
Power dissipation at 100% I_N (P1/P2)	3490 W / 4450 W
Cooling air volume (IP23)	800 m^3/h
Min. air inlet/outlet (IP23)	8 dm^2
Internal power dissipation	350 W / 430 W
External power dissipation	3460 W / 4450 W
Cooling air volume (IP54)	200 m^3/h
Mass	110 kg

Instructions for Use

IndraDrive HCS04.2E-W0640; HCS04.2E-W0790

Dimensions

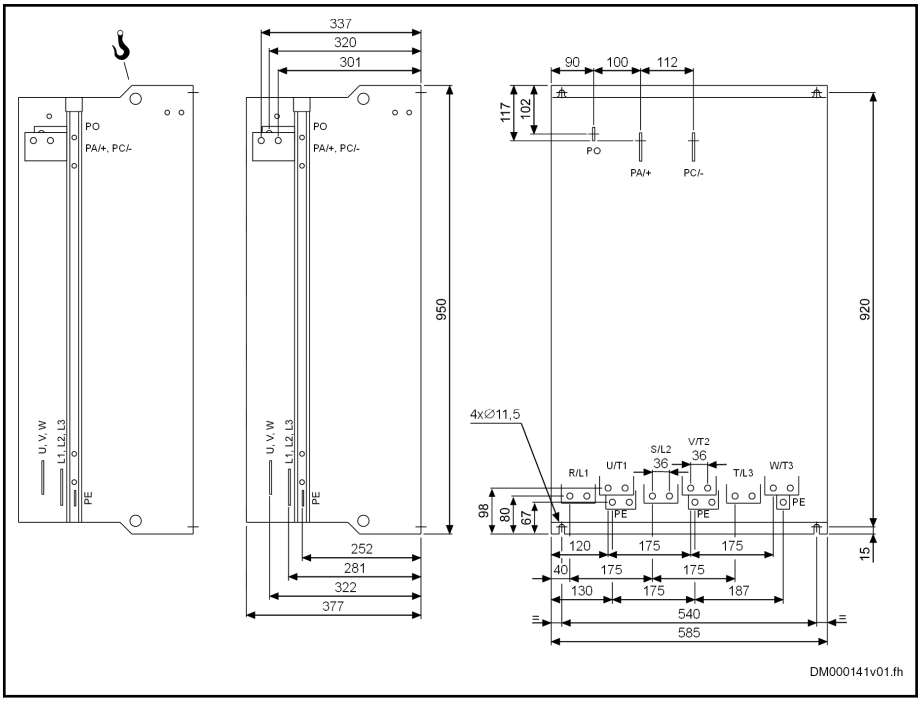


Fig.5-21: Dimensions IndraDrive HCS04.2E-W0640; HCS04.2E-W0790

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
BU+, BU-	M10	24 Nm
Mains and motor	M12	41 Nm
PE	M12	41 Nm

Technical data

IndraDrive HCS04.2E	-W0640	-W0790
Power dissipation at 100% I_N (P1/P2)	4560 W / 5890 W	5430 W / 7250 W
Cooling air volume (IP23)	1,200 m^3/h	1,200 m^3/h
Min. air inlet/outlet (IP23)	10 dm^2	10 dm^2
Internal power dissipation	490 W / 610 W	600 W / 770 W
External power dissipation	4440 W / 5770 W	5290 W / 7100 W
Cooling air volume (IP54)	270 m^3/h	330 m^3/h
Mass	140 kg	140 kg

IndraDrive HCS04.2E-W1010

Dimensions

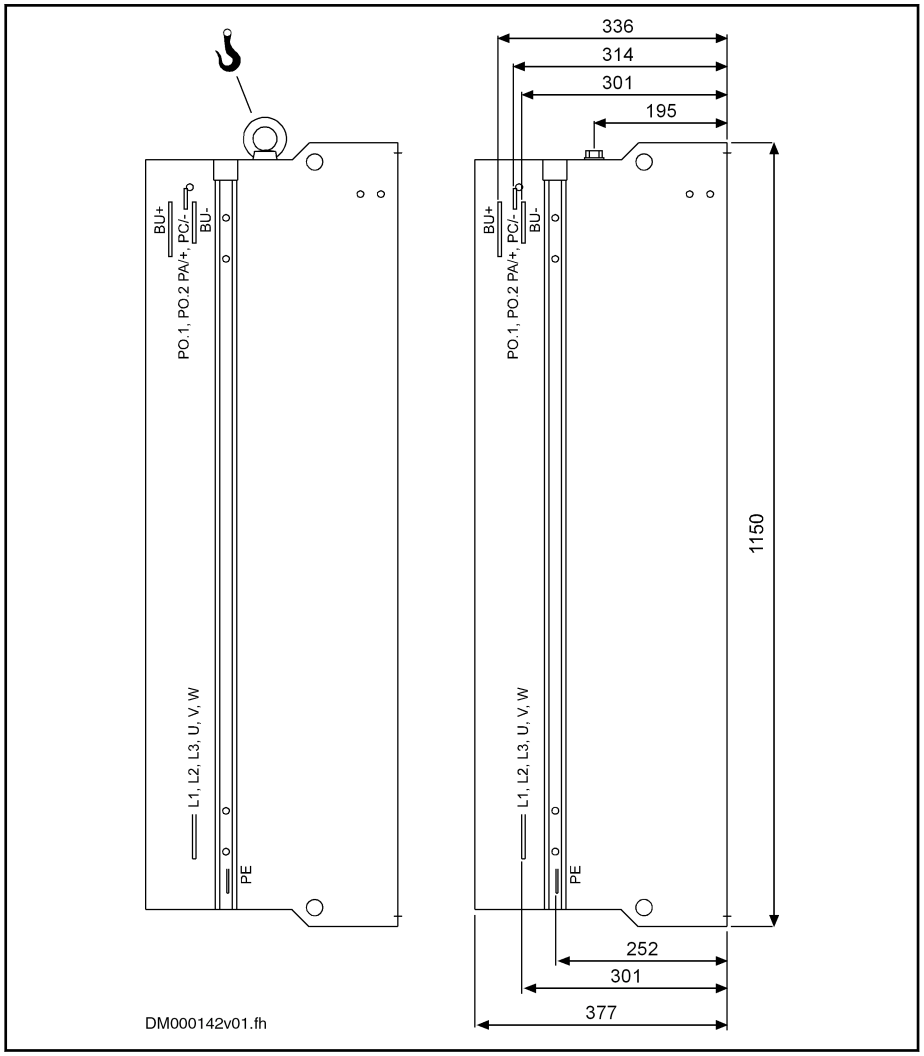


Fig.5-22: Dimensions IndraDrive HCS04.2E-W1010

Technical data

IndraDrive HCS04.2E	-W1010
Power dissipation at 100% I_N (P1/P2)	6880 W / 7660 W
Cooling air volume (IP23)	1,800 m^3/h
Min. air inlet/outlet (IP23)	15 dm^2
Internal power dissipation	770 W / 860 W
External power dissipation	6680 W / 7470 W
Cooling air volume (IP54)	450 m^3/h
Mass	215 kg

Instructions for Use

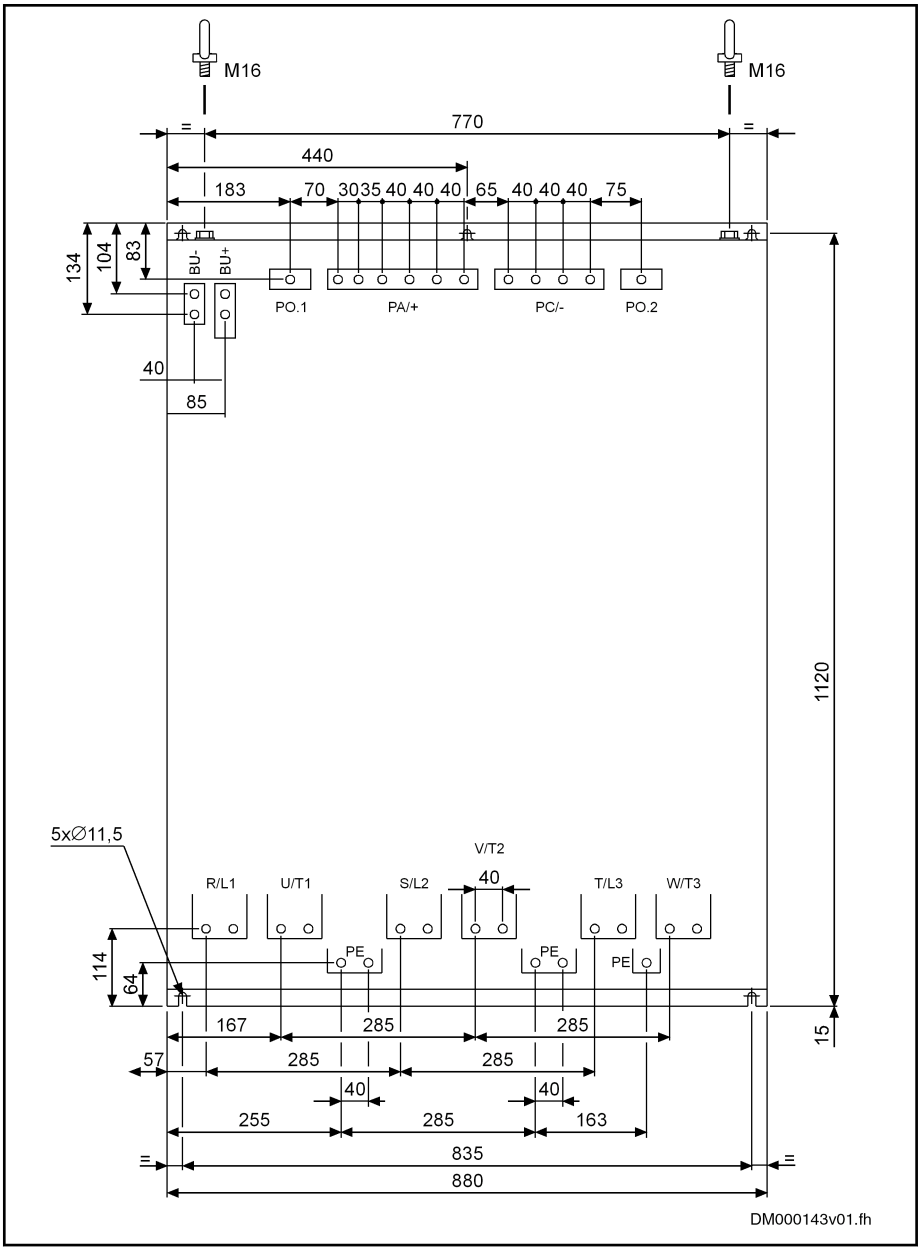


Fig.5-23: Connections

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
BU+, BU-	M12	41 Nm
Mains and motor	M12	41 Nm *)
PE	M12	41 Nm

*) To improve the access to phase V/T2, observe the information on page 59

IndraDrive HCS04.2E-W1240

Dimensions

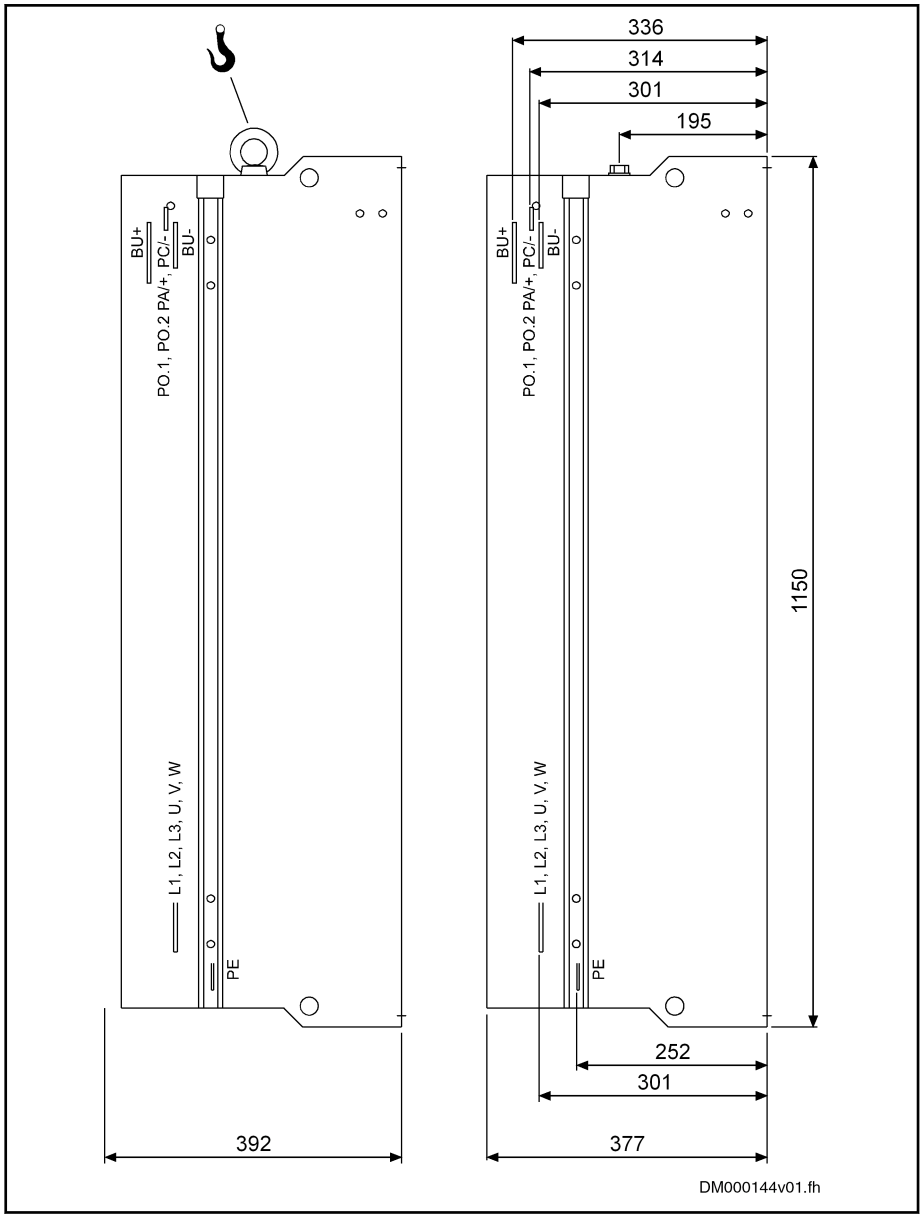


Fig.5-24: Dimensions IndraDrive HCS04.2E-W1240

Technical data

IndraDrive HCS04.2E	-W1240
Power dissipation at 100% I_N (P1/P2)	8630 W / 11150 W
Cooling air volume (IP23)	1,800 m^3/h
Min. air inlet/outlet (IP23)	15 dm^2
Internal power dissipation	930 W / 1190 W
External power dissipation	8360 W / 10870 W

Instructions for Use

Cooling air volume (IP54)	500 m^3/h
Mass	225 kg

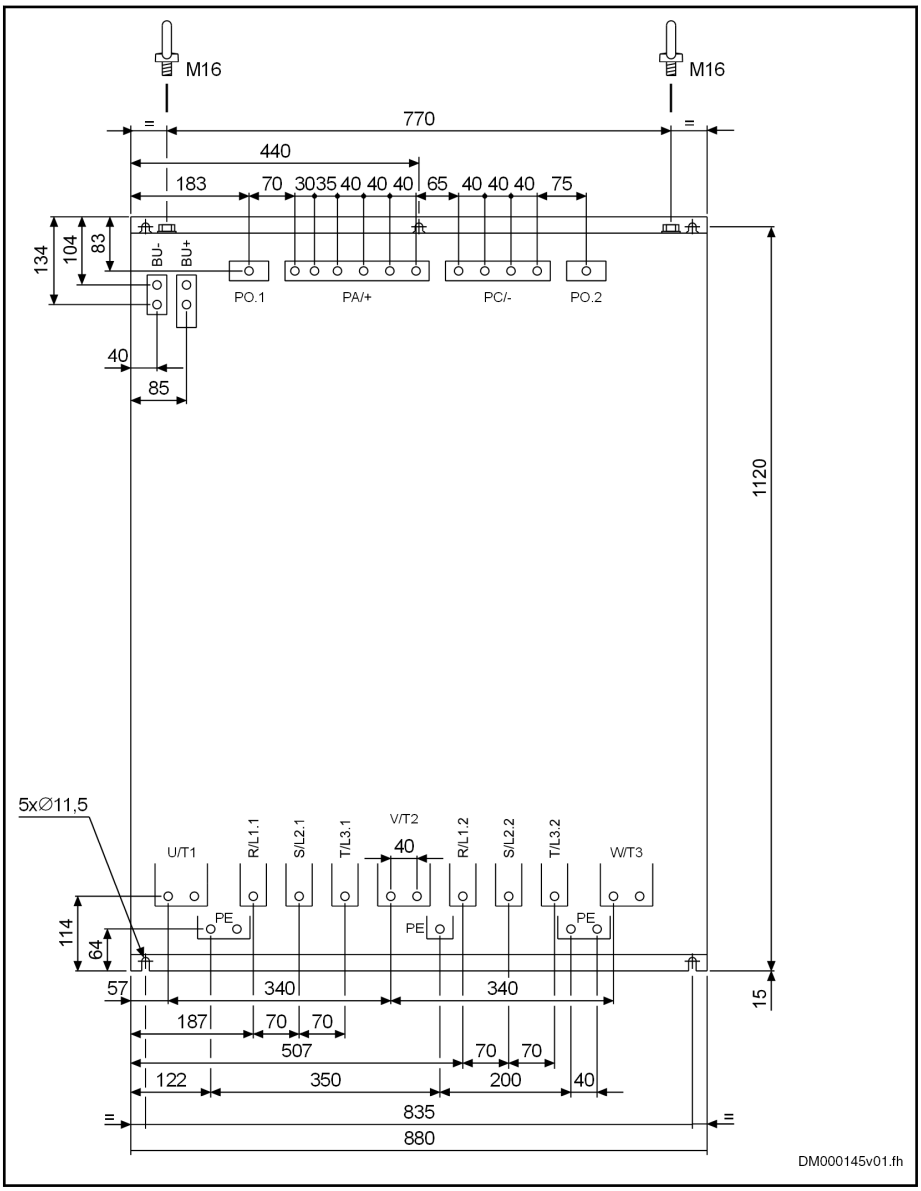


Fig.5-25: Connections

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
BU+, BU-	M12	41 Nm
Mains and motor	M12	41 Nm *)
PE	M12	41 Nm

*) To improve the access to phase V/T2, observe the information on page 59

IndraDrive HCS04.2E-W1540

Dimensions

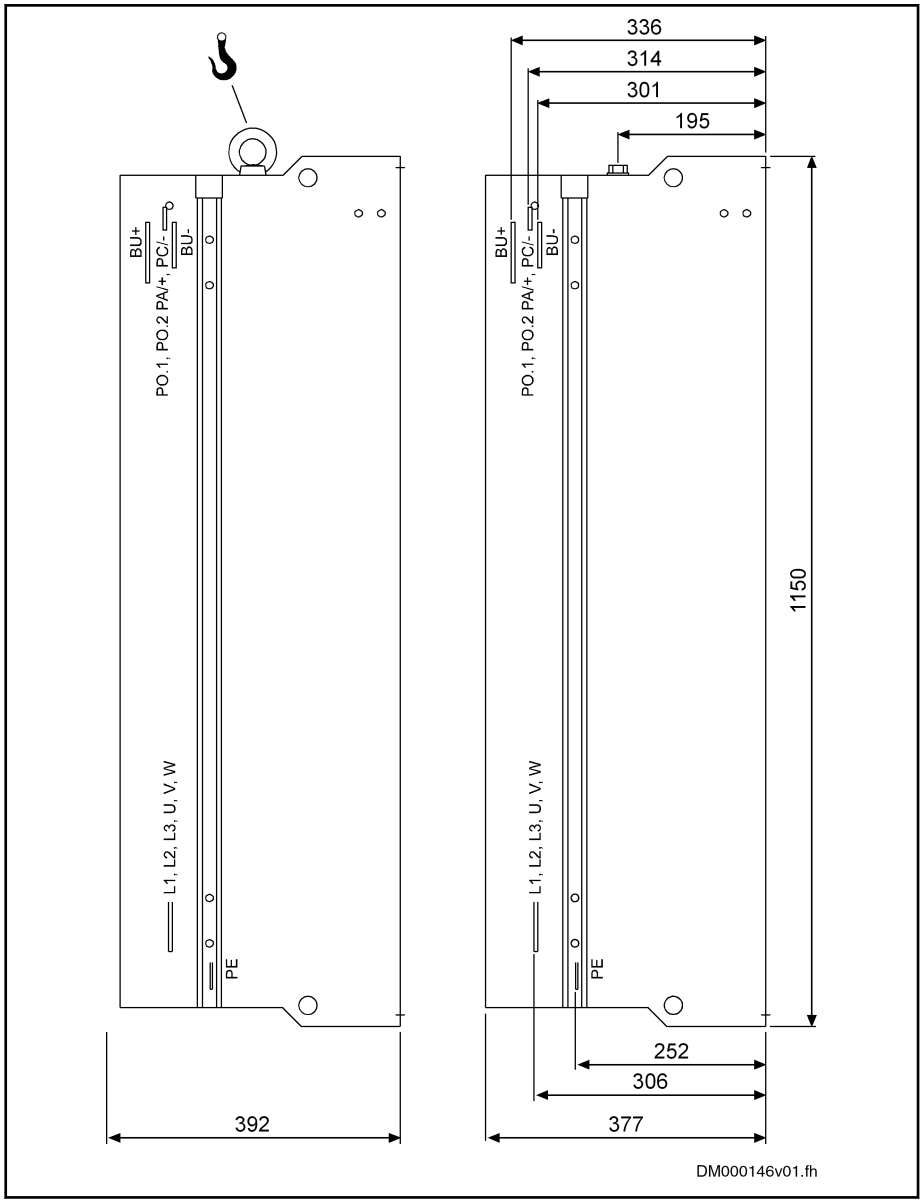


Fig.5-26: Dimensions IndraDrive HCS04.2E-W1540

Technical data

IndraDrive HCS04.2E	-W1540
Power dissipation at 100% I_N (P1/P2)	10530 W / 13830 W
Cooling air volume (IP23)	2,400 m^3/h
Min. air inlet/outlet (IP23)	20 dm^2
Internal power dissipation	1150 W / 1500 W
External power dissipation	10,230 W / 13,510 W
Cooling air volume (IP54)	660 m^3/h
Mass	300 kg

Instructions for Use

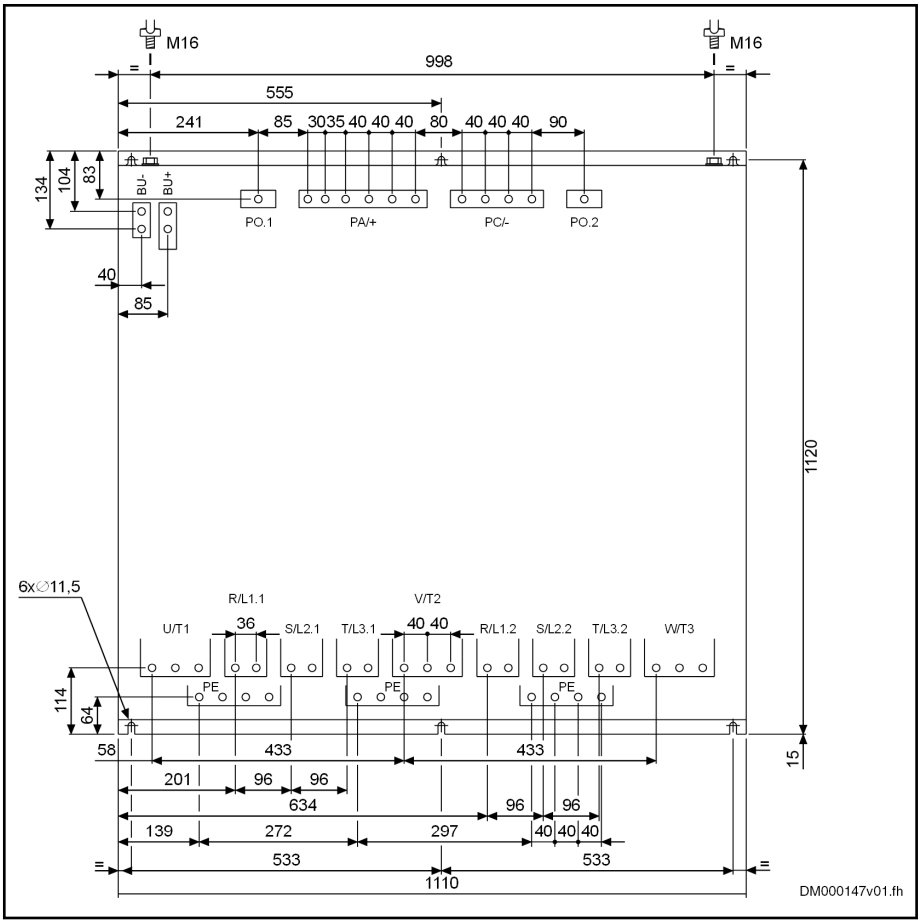


Fig.5-27: Connections

Power connections

Description	Connection	Tightening torque
PO, PA/+ and PC/-	M12	41 Nm
BU+, BU-	M12	41 Nm
Mains and motor	M12	41 Nm *)
PE	M12	41 Nm

*) To improve the access to phase V/T2, observe the information on page 59

Accessing Phase V/T2

To access phase V/T2, remove the lower part of the center bar.

Required tool: Torx TX30

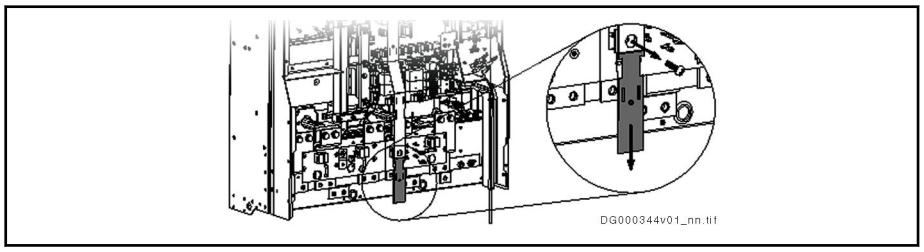


Fig.5-28: Accessing Phase V/T2

6 EMC Measures for Design and Installation

6.1 Rules for Design of Installations With Drive Controllers in Compliance With EMC

The following rules are the basics for designing and installing drives in compliance with EMC.

Mains filter

Correctly use a mains filter recommended by Rexroth for radio interference suppression in the supply feeder of the drive system.

Control Cabinet Grounding

Connect all metal parts of the cabinet with one another over the largest possible surface area to establish a good electrical connection. This, too, applies to the mounting of the mains filter. If required, use serrated washers which cut through the paint surface. Connect the cabinet door to the control cabinet using the shortest possible grounding straps.

Line Routing

Avoid coupling routes between lines with high potential of noise and noise-free lines; therefore, signal, mains and motor lines and power cables have to be routed separately from another. Minimum distance: 10 cm. Provide separating sheets between power and signal lines. Ground separating sheets several times.

The lines with high potential of noise include:

- Lines at the mains connection (incl. synchronization connection)
- Lines at the motor connection
- Lines at the DC bus connection

Generally, interference injections are reduced by routing cables close to grounded sheet steel plates. For this reason, cables and wires should not be routed freely in the cabinet, but close to the cabinet housing or mounting panels. Separate the incoming and outgoing cables of the radio interference suppression filter.

Interference Suppression Elements

Provide the following components in the control cabinet with interference suppression combinations:

- Contactors
- Relays
- Solenoid valves
- Electromechanical operating hours counters

Connect these combinations directly at each coil.

Twisted Wires

Twist unshielded wires belonging to the same circuit (feeder and return cable) or keep the surface between feeder and return cable as small as possible. Wires that are not used have to be grounded at both ends.

Lines of Measuring Systems

Lines of measuring systems must be shielded. Connect the shield to ground at both ends and over the largest possible surface area. The shield may not be interrupted, e.g. using intermediate terminals.

Digital Signal Lines

Ground the shields of digital signal lines at both ends (transmitter **and** receiver) over the largest possible surface area and with low impedance. In the case of bad ground connection between transmitter and receiver, additionally route a bonding conductor (min. 10 mm^2). Braided shields are better than foil shields.

Analog Signal Lines

Ground the shields of analog signal lines at one end (transmitter **or** receiver) over the largest possible surface area and with low impedance. This avoids low-frequency interference current (in the mains frequency range) on the shield.

EMC Measures for Design and Installation

Connecting the Mains Choke

Keep connection lines of the mains choke at the drive controller as short as possible and twist them.

Installing the Motor Power Cable

- Use shielded motor power cables or run motor power cables in a shielded duct
- Use the shortest possible motor power cables
- Ground shield of motor power cable at both ends over the largest possible surface area to establish a good electrical connection
- Run motor lines in shielded form inside the control cabinet
- Do not use any steel-shielded lines
- The shield of the motor power cable mustn't be interrupted by mounted components, such as output chokes, sine filters or motor filters

6.2 EMC-Optimal Installation in Facility and Control Cabinet

6.2.1 General Information

For EMC-optimal installation, a spatial separation of the interference-free area (mains connection) and the interference-susceptible area (drive components) is recommended, as shown in the figures below.

☞ Recommendation: For EMC-optimal installation in the control cabinet, use a separate control cabinet panel for the drive components.

6.2.2 Division Into Areas (Zones)

Exemplary arrangements in the control cabinet: See section Control Cabinet Design According to Interference Areas - Exemplary Arrangements, page 64.

We distinguish three areas:

1. Interference-free area of control cabinet **(area A)**:

   This includes:

   - Supply feeder, input terminals, fuse, main switch, mains side of mains filter for drives and corresponding connecting lines
   - Control voltage or auxiliary voltage connection with power supply unit, fuse and other parts unless connection is run via the mains filter of the AC drives
   - All components that are not electrically connected with the drive system

2. Interference-susceptible area **(area B)**:

   - Mains connections between drive system and mains filter for drives, mains contactor
   - Interface lines of drive controller

3. Strongly interference-susceptible area **(area C)**:

   - Motor power cables including single cores

Never run lines of one of these areas in parallel with lines of another area so that there isn't any unwanted interference injection from one area to the other and that the filter is jumpered with regard to high frequency. Use the shortest possible connecting lines.

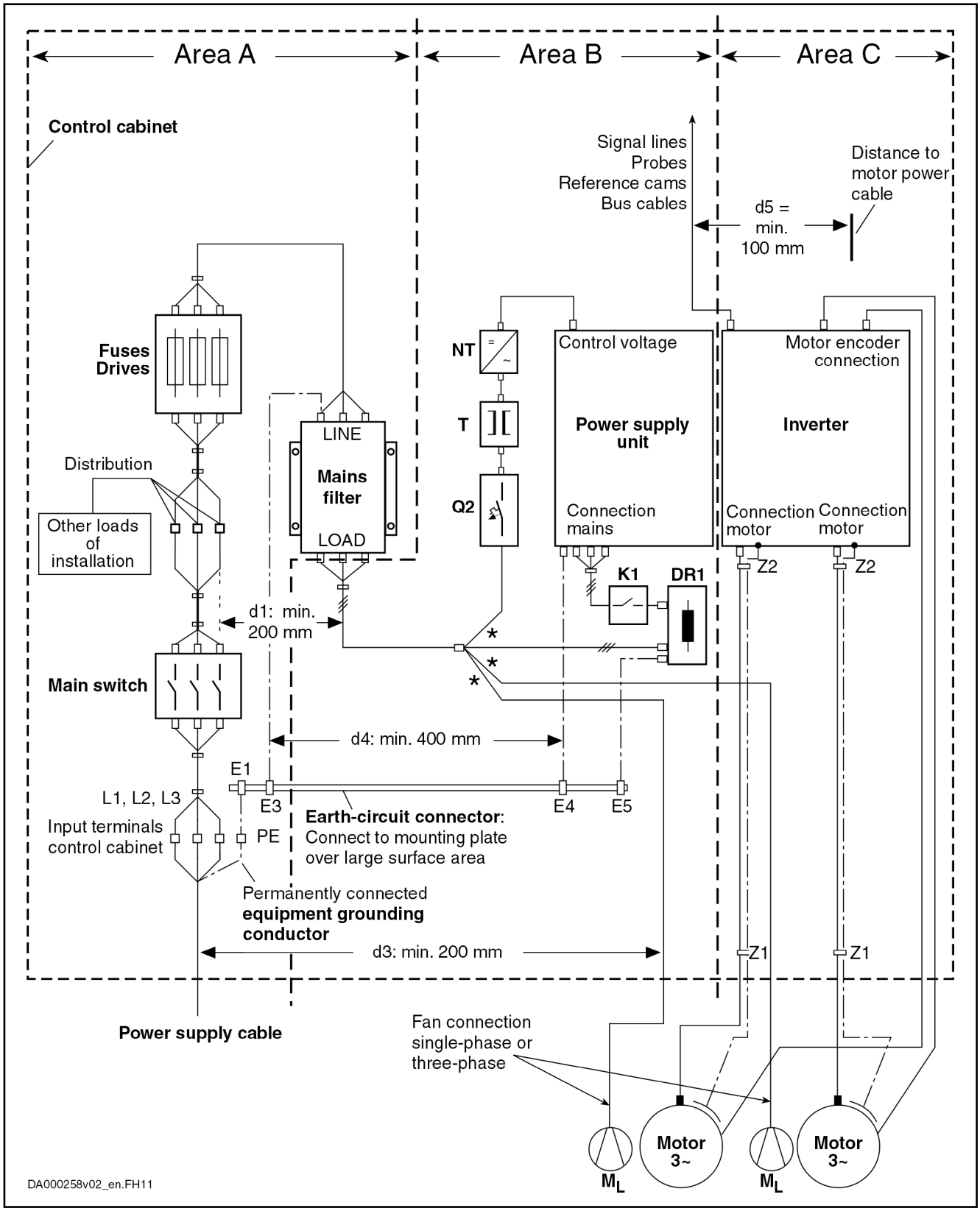
Recommendation for complex systems: Install drive components in one cabinet and the control units in a second, separate cabinet.

Badly grounded control cabinet doors act as antennas. Therefore, connect the control cabinet doors to the cabinet on top, in the middle and on the bottom via short equipment grounding conductors with a cross section of at least 6 mm^2 or, even better, via grounding straps with the same cross section. Make sure connection points have good contact.

EMC Measures for Design and Installation

6.2.3 Control Cabinet Design According to Interference Areas - Exemplary Arrangements

Infeeding Supply Unit or Converter



DR1 Mains choke (optional)

E1…E5	Equipment grounding conductor of the components
K1	External mains contactor for supply units and converters without integrated mains contactor
M_L	Motor fan
NT	Power supply unit
Q2	Fusing
T	Transformer
Z1, Z2	Shield connection points for cables
*	Not allowed at HNF mains filter

Fig.6-1: Infeeding Supply Unit or Converter – EMC Areas in the Control Cabinet

6.2.4 Design and Installation in Area A - Interference-Free Area of Control Cabinet

Arranging the Components in the Control Cabinet

Comply with recommended distance of at least **200 mm** (distance d1 in the figure):

- Between components and electrical elements (switches, pushbuttons, fuses, terminal connectors) in the interference-free area A and the components in the two other areas B and C

Comply with recommended distance of at least **400 mm** (distance d4 in the figure):

- Between magnetic components (such as transformers, mains chokes and DC bus chokes that are directly connected to the power connections of the drive system) and the interference-free components and lines between mains and filter including the mains filter in area A

If these distances are not kept, the magnetic leakage fields are injected to the interference-free components and lines connected to the mains and the limit values at the mains connection are exceeded in spite of the installed filter.

Cable Routing of the Interference-Free Lines to the Mains Connection

Comply with recommended distance of at least **200 mm** (distance d1 and d3 in the figure):

- Between supply feeder or lines between filter and exit point from the control cabinet in area A and the lines in area B and C

If this is impossible, there are two alternatives:

1. Install lines in shielded form and connect the shield at several points (at least at the beginning and at the end of the line) to the mounting plate or the control cabinet housing over a large surface area.
2. Separate lines from the other interference-susceptible lines in areas B and C by means of a grounded distance plate vertically attached to the mounting plate.

Install the shortest possible lines within the control cabinet and install them directly on the grounded metal surface of the mounting plate or of the control cabinet housing.

Mains supply lines from areas B and C must not be connected to the mains without a filter.

In case you do not observe the information on cable routing given in this section, the effect of the mains filter is totally or partly neutralized. This will cause the noise level of the interference emission to be higher within the range of 150 kHz to 40 MHz and the limit values at the connection points of the machine or installation will thereby be exceeded. Consider the specified distances to be recommended data, provided that the dimensions of the control cabinet allow installing the lines accordingly.

Routing and Connecting a Neutral Conductor (N)

If a neutral conductor is used together with a three-phase connection, it must not be installed unfiltered in zones B and C, in order to keep interference off the mains.

Motor Fan at Mains Filter

Single-phase or three-phase supply lines of motor fans, that are usually routed in parallel with motor power cables or interference-susceptible lines, must be filtered:

- In drive systems with **regenerative supply units**, via a separate single-phase (NFE type) or three-phase filter (HNF type) near the mains connection of the control cabinet
- In drive systems with **only infeeding supply units**, via the available three-phase filter of the drive system

When switching power off, make sure the fan is not switched off.

When switching power off, make sure the fan is not switched off.

Loads at Mains Filter of Drive System

☞ **Only operate allowed loads at the mains filter of the drive system!**

At the three-phase filter for the power connection of regenerative supply units, it is only allowed to operate the following loads:

- HMV supply unit with mains choke and, if necessary, mains contactor

Do not operate any motor fans, power supply units etc. at the mains filter of the drive system.

Shielding Mains Supply Lines in Control Cabinet

If there is a high degree of interference injection to the mains supply line within the control cabinet, although you have observed the above instructions (to be found out by EMC measurement according to standard), proceed as follows:

- Only use shielded lines in area A
- Connect shields to the mounting plate at the beginning and the end of the line by means of clips

The same procedure may be required for long cables of more than 2 m between the point of power supply connection of the control cabinet and the filter within the control cabinet.

Mains Filters for AC Drives

Ideally mount the mains filter on the parting line between the areas A and B. Make sure the ground connection between filter housing and housing of the drive controllers has good electrically conductive properties.

If **single-phase** loads are connected on the load side of the filter, their current may be a maximum of 10% of the three-phase operating current. A highly imbalanced load of the filter would deteriorate its interference suppression capacity.

If the mains voltage is more than 480 V, connect the filter to the output side of the transformer and not to the supply side of the transformer.

Grounding

In the case of bad ground connections in the installation, the distance between the lines to the grounding points E1, E2 in area A and the other grounding points of the drive system should be at least d4 = 400 mm, in order to minimize interference injection from ground and ground cables to the power input lines.

See also 6.2.2 Division Into Areas (Zones), page 62.

Point of Connection for Equipment Grounding Conductor at Machine, Installation, Control Cabinet

The equipment grounding conductor of the power cable of the machine, installation or control cabinet has to be **permanently connected** at point PE and have a **cross section of at least 10 mm²** or to be complemented by a second equipment grounding conductor via separate terminal connectors (according to EN 61800-5-1:2007, section 4.3.5.5.2). If the cross section of the outer

conductor is bigger, the cross section of the equipment grounding conductor must be accordingly bigger.

6.2.5 Design and Installation in Area B - Interference-Susceptible Area of Control Cabinet

Arranging Components and Lines

Modules, components and lines in area B should be placed at a distance of at least **d1 = 200 mm** from modules and lines in area A.

Alternative: Shield modules, components and lines in area B by distance plates mounted vertically on the mounting plate from modules and lines in area A or use shielded lines.

Only connect power supply units for auxiliary or control voltage connections in the drive system to the mains via a mains filter. See 6.2.2 Division Into Areas (Zones), page 62.

Install the shortest possible lines between drive controller and filter.

Control Voltage or Auxiliary Voltage Connection

Only in exceptional cases should you connect power supply unit and fusing for the control voltage connection to phase and neutral conductor. In this case, mount and install these components in area A far away from the areas B and C of the drive system. For details see section 6.2.4 Design and Installation in Area A - Interference-Free Area of Control Cabinet, page 65.

Run the connection between control voltage connection of the drive system and power supply unit used through area B over the shortest distance.

Line Routing

Run the lines along grounded metal surfaces, in order to minimize radiation of interference fields to area A (transmitting antenna effect).

6.2.6 Design and Installation in Area C - Strongly Interference-Susceptible Area of Control Cabinet

Area C mainly concerns the motor power cables, especially at the connection point at the drive controller.

Influence of the Motor Power Cable

The longer the motor power cable, the greater its leakage capacitance. To comply with a certain EMC limit value, the allowed leakage capacitance of the mains filter is limited. For the calculation of the leakage capacitance, see the documentation on the drive system of the drive controller used.

- Run the shortest possible motor power cables.
- Only use **shielded** motor power cables by Rexroth.

Routing the Motor Power Cables and Motor Encoder Cables

Route the motor power cables and motor encoder cables along grounded metal surfaces, both inside the control cabinet and outside of it, in order to minimize radiation of interference fields. If possible, route the motor power cables and motor encoder cables in metal-grounded cable ducts.

Route the motor power cables and motor encoder cables

- with a distance of at least **d5 = 100 mm** to interference-free lines, as well as to signal cables and signal lines

  (alternatively separated by a grounded distance plate)
- in separate cable ducts, if possible

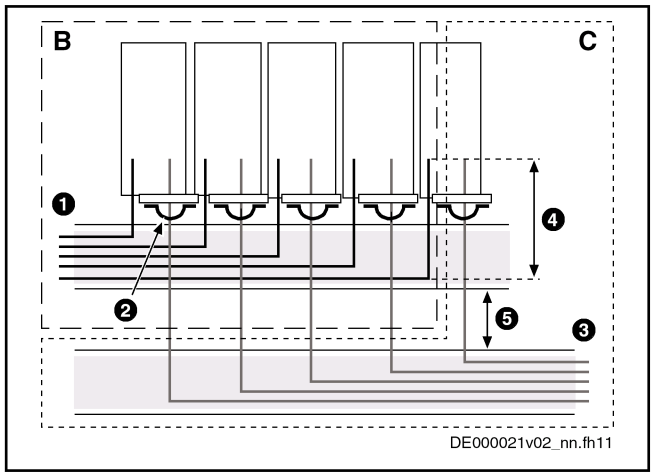
Routing the Motor Power Cables and Mains Connection Lines

For converters (drive controllers with individual mains connection), route motor power cables and (unfiltered) mains connection lines **in parallel for a maximum distance of 300 mm**. After that distance, route motor power cables and power supply cables in opposite directions and preferably in separate **cable ducts**.

Ideally, the outlet of the motor power cables at the control cabinet should be provided in a distance of at least **d3 = 200 mm** from the (filtered) power supply cable.

Converter - Routing the Motor Power Cables

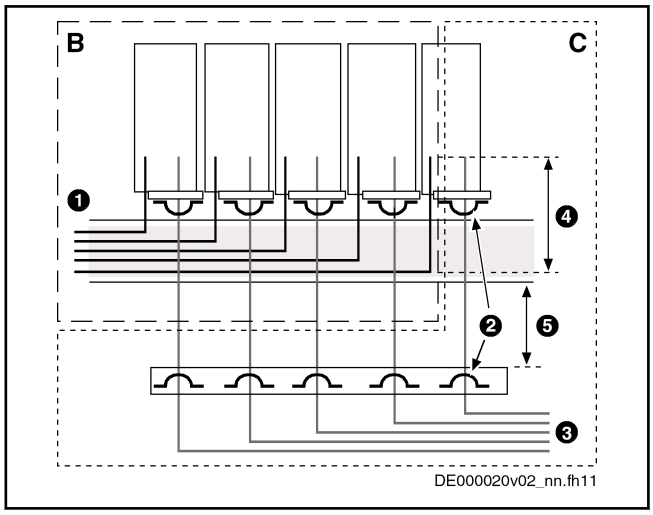
With cable duct



B	Area B
C	Area C
1	Cable duct for mains connection lines
2	Shield connection of motor power cable via clips at least at one point; alternatively, at the device or on mounting plate at control cabinet
3	Cable duct for motor power cables
4	Parallel routing of mains connection lines and motor power cables over a maximum of 300 mm
5	Distance of at least 100 mm or separated by a grounded distance plate

Fig.6-2: Routing of Motor Power Cables With Cable Duct

Without cable duct



B	Area B
C	Area C
1	Cable duct for mains connection lines
2	Shield connection of motor power cable via clips at least at one point; alternatively, at the device or on mounting plate at control cabinet
3	Control cabinet outlet of motor power cables
4	Parallel routing of mains connection lines and motor power cables over a maximum of 300 mm
5	Distance of at least 100 mm or separated by a grounded distance plate

Fig.6-3: Routing of Motor Power Cables Without Cable Duct

Fig.6-4: Routing of Cables for Converter

6.3 Ground Connections

Housing and Mounting Plate

By means of appropriate ground connections, it is possible to avoid the emission of interference, because interference is discharged to ground on the shortest possible way.

Ground connections of the metal housings of EMC-critical components (such as filters, devices of the drive system, connection points of the cable shields, devices with microprocessor and switching power supply units) have to be well contacted over a large surface area. This also applies to all screw connections between mounting plate and control cabinet wall and to the mounting of a ground bus to the mounting plate.

The best solution is to use a zinc-coated mounting plate. Compared to a lacquered plate, the connections in this case have a good long-time stability.

Connection Elements

For lacquered mounting plates, always use screw connections with tooth lock washers and zinc-coated, tinned screws as connection elements. At the connection points, remove the lacquer so that there is safe electrical contact over a large surface area. You achieve contact over a large surface area by

means of bare connection surfaces or several connection screws. For screw connections, you can establish the contact to lacquered surfaces by using tooth lock washers.

Metal Surfaces

Always use connection elements (screws, nuts, plain washers) with good electroconductive surface.

Bare zinc-coated or tinned metal surfaces have **good electroconductive properties**.

Anodized, yellow chromatized, black gunmetal finish or lacquered metal surfaces have **bad electroconductive properties**.

Ground Wires and Shield Connections

For connecting ground wires and shield connections, it is not the cross section but the size of contact surface that is important, as the high-frequency interference currents mainly flow on the surface of the conductor.

Always connect cable shields, especially shields of the motor power cables, to ground potential over a large surface area.

6.4 Installing Signal Lines and Signal Cables

Line Routing

For measures to prevent interference, see the Project Planning Manuals of the respective device. In addition, we recommend the following measures:

- Route signal and control lines separately from the power cables with a minimum distance of **d5 = 100 mm** (see 6.2.2 Division Into Areas (Zones), page 62) or with a grounded separating sheet. The optimum way is to route them in separate cable ducts. If possible, lead signal lines into the control cabinet at one point only.
- If signal lines are crossing power cables, route them in an angle of 90° in order to avoid interference injection.
- Ground spare cables, that are not used and have been connected, at least at both ends so that they do not have any antenna effect.
- Avoid unnecessary line lengths.
- Run cables as close as possible to grounded metal surfaces (reference potential). The ideal solution are closed, grounded cable ducts or metal pipes which, however, is only obligatory for high requirements (sensitive instrument leads).
- Avoid suspended lines or lines routed along synthetic carriers, because they are functioning like reception antennas (noise immunity) and like transmitting antennas (emission of interference). Exceptional cases are flexible cable tracks over short distances of a maximum of 5 m.

Shielding

Connect the cable shield immediately at the devices in the shortest and most direct possible way and over the largest possible surface area.

Connect the shield of **analog signal lines** at one end over a large surface area, normally in the control cabinet at the analog device. Make sure the connection to ground/housing is short and over a large surface area.

Connect the shield of **digital signal lines** at both ends over a large surface area and in short form. In the case of potential differences between beginning and end of the line, run an additional bonding conductor in parallel. This prevents compensating current from flowing via the shield. The guide value for the cross section is 10 mm^2.

You absolutely have to equip separable connections with connectors with grounded metal housing.

In the case of non-shielded lines belonging to the same circuit, twist feeder and return cable.

6.5 General Measures of Radio Interference Suppression for Relays, Contactors, Switches, Chokes and Inductive Loads

If, in conjunction with electronic devices and components, inductive loads, such as chokes, contactors, relays are switched by contacts or semiconductors, appropriate interference suppression has to be provided for them:

- By arranging free-wheeling diodes in the case of d.c. operation
- In the case of a.c. operation, by arranging usual RC interference suppression elements depending on the contactor type, immediately at the inductance

Only the interference suppression element arranged immediately at the inductance does serve this purpose. Otherwise, the emitted noise level is too high which can affect the function of the electronic system and of the drive.

7 Accessories

Accesso-ries	Brief Description
HAS07.1	Mounting frame to mount the converter in push-through technology (heat sink outside of control cabinet)
HAS08.1	Control cabinet assembly kit for mounting the converter in a Rittal TS8 control cabinet

8 Service and Support

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

Service Germany

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

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

Phone:	**+49 9352 40 5060**
Fax:	**+49 9352 18 4941**
E-mail:	service.svc@boschrexroth.de
Internet:	http://www.boschrexroth.com

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

Service worldwide

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

Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances resulting in the malfunction
- Type plate name of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your email address)

9 Environmental Protection and Disposal

9.1 Environmental Protection

Production Processes

The products are made with 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 the case of appropriate use. Normally, our products will not have any negativ influences on the environment.

Significant Components

Basically, our products contain the following components:

Electronic devices
- steel
- aluminum
- copper
- synthetic materials
- electronic components and modules

Motors
- steel
- aluminum
- copper
- brass
- magnetic materials
- electronic components and modules

9.2 Disposal

Return of Products

Our products can be returned to our premises free of charge for disposal. It is a precondition, however, that the products are free of oil, grease or other dirt.

Furthermore, the products returned for disposal must 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

The packaging materials consist of cardboard, wood and polystyrene. These materials 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.

The end user within the EU is legally obligated to return used batteries. Outside the validity of the EU Directive 2006/66/EC keep the stipulated directives.

Used batteries can contain hazardous substances, which can harm the environment or the people´s health when they are improper stored or disposed of.

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

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 modules.

Environmental Protection and Disposal

Metals contained in electric and electronic modules 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.

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Bosch Group

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