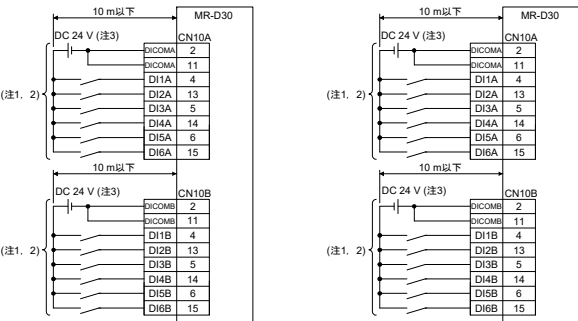


6.4 MR-D30をMR-J4シリーズサーボポンプに使用する場合
6.4.1 入力信号

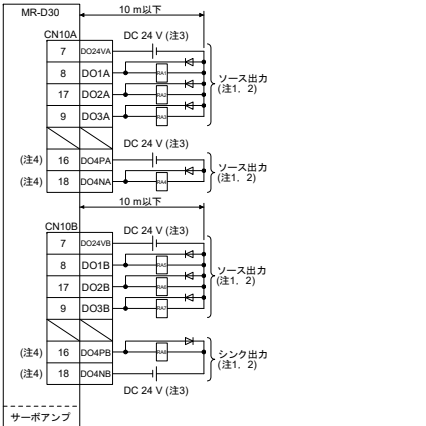


ソース入力インタフェースの場合 シンク入力インタフェースの場合
注
1. すべての外部配線を、CN10A、CN10Bの二系統に分断してください。
2. 各入力デバイスは、次の表で示した組合せのコネクタ・ピンに割り付けて使用してください。...

Table showing combinations of connectors and pins for source and sink outputs, such as DI1A (CN10A-4)/DI1B (CN10B-4), DI2A (CN10A-15)/DI2B (CN10B-15), etc.

3. インタフェース用にDC 24V ± 10%の電源を外部から供給してください。全入力点数をを使用した場合、合計0.8Aの電流量が必要で...

6.4.2 出力信号
DO1A ~ DO3A, DO1B ~ DO3BおよびDO4NAをソース出力、DO4PBをシンク出力として使用することができます。



注
1. すべての外部配線を、CN10A、CN10Bの二系統に分断してください。I/O用電源 (DC 24V, 0Vコモン) の結線についても、CN10A、CN10Bの前で別々に行ってください。...

Table showing combinations of connectors and pins for output signals, such as DO1A (CN10A-8)/DO1B (CN10B-8), DO2A (CN10A-17)/DO2B (CN10B-17), etc.

3. インタフェース用にDC 24V ± 10%の電源を外部から供給してください。全入力点数をを使用した場合、合計0.8Aの電流量が必要で...

第7章 信号

7.1 コネクタおよびピンサイン

(1) 入力デバイス
DI1 ~ DI6に [Pr. PSD02入力デバイス選択DI1] ~ [Pr. PSD07 入力デバイス選択DI6] でデバイスを割り付けてください。...

Table mapping device names (STO, SS1, SLS) to connector pins and their functions. Includes columns for device name, abbreviation, connector/pin, function, and whether the function is effective.

(2) 出力デバイス
安全監視機能の状態モニタ (SM) はDO1 ~ DO4で出力します。DO1 ~ DO4に [Pr. PSD08 出力デバイス選択DO1] ~ [Pr. PSD11 出力デバイス選択DO4] で出力デバイスを割り付けてください。...

Table mapping device names (SSM, SBC, STO, SOS, SSI, SSS) to connector pins and their functions for output devices.

(3) 電源

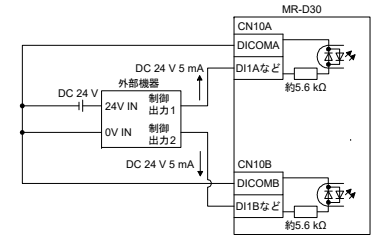
Table listing connector names, abbreviations, and pin numbers for various input and output signals, such as DI1A, DI2A, DI3A, etc.

7.2 インタフェース (ソース入出力の場合)

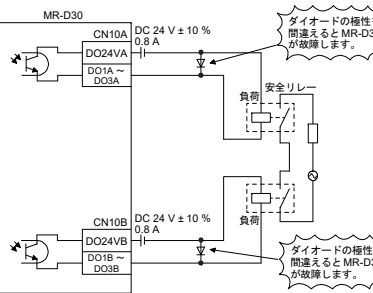
MR-D30では、入力インタフェースにソースタイプおよびシンクタイプを使用することができます。...

(1) 入力インタフェース
フォトカプラのアンロード側が入力端子になっている入力回路です。ソース (オープンコレクタ) タイプのトランジスタ出力、リレースイッチなどから信号を与えてください。...

(a) 外部機器の接続
外部機器の出力信号を、DI1_に接続してください。



(2) 出力インタフェース
出力トランジスタがオンになったときに出力端子から負荷に電流が流れるタイプです。ランプ、リレーまたはフォトカプラをドライブできます。...



7.3 CN10AおよびCN10B用コネクタの配線方法

結線時の工具の取扱いは注意してください。

- (1) ワイヤストリップ
(a) 適合電線サイズAWG 24 ~ 16 (推奨電線UL 1007) の電線を使用し...
(b) ストリップした電線に曲がり、バラケ、捻り太りがある場合は軽く振り直すなどの修正を行い...
(c) 電線切断面および絶縁体のストリップ面は平滑に加工してください。
(2) 電線の結線方法
結線作業を行う際は、必ずヘッドコネクタから、リセアセンブリを引き抜いた状態で作業してください。...
(3) コネクタの装着
コネクタは最後まで挿入されるとパチンといった音や感覚 (クリック感) がありますので、必ず最後までまっすぐに挿入してください。...

第8章 表示部

MR-D30には、4個のLED表示が実装されています。次の表に表示内容を示します。

Table mapping LED indicators (POWER, RUN, STO, ERROR) to their states and internal functions. Includes notes about error handling and power status.

注
MR-D30に対応していないサーボポンプにMR-D30を取り付けること "ERROR" が点灯します。...

各状態における表示例を次の表に示します。

Table showing LED indicator patterns (circles with different symbols) for various operational states like Power Off, Standstill, Running, and Error.

(○: 点灯/◎: 点滅/●: 消灯)
注
MR-D30に対応していないサーボポンプにMR-D30を取り付けること "ERROR" が点灯します。...

第9章 設定方法

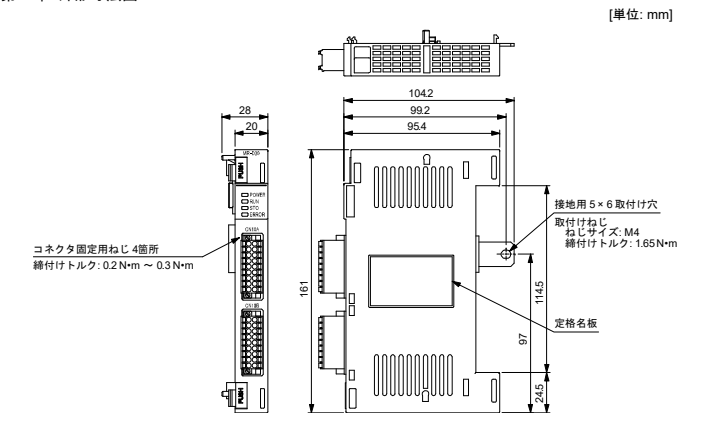
MR Configurator2を使用して設定してください。詳細については "MR-D30技術資料集" を参照してください。...

第10章 トラブルシューティング

電源が入らぬ、またはERROR LEDが点灯した場合、次の表に従って処置してください。

Table for troubleshooting steps, listing symptoms (e.g., power not on, error LED lit), possible causes, and recommended actions (e.g., check power supply, inspect connections).

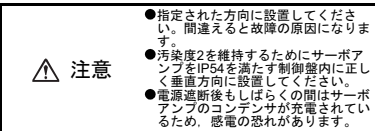
第11章 外形寸法図



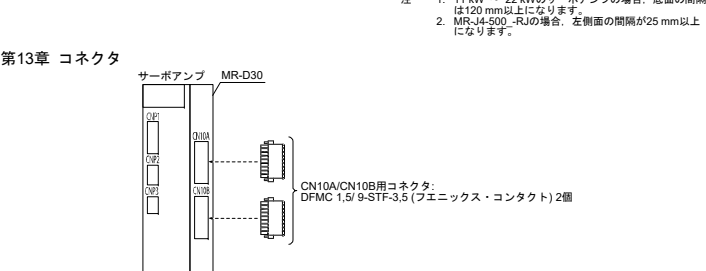
Tables providing pin assignments and numbers for CN10A and CN10B connectors. Lists terminal numbers and corresponding signal names like DC24V, DI1A, DI2A, etc.

第12章 据付け

取付け方向と間隔



第13章 コネクタ



第14章 ユーザドキュメンテーションのためのチェックリスト例



製造者/設置者のためのMR-D30設置用チェックリスト

最初の試運転までに少なくとも次の項目を満たしてください。項目中の規格は、要件に対して製造者/設置者が確認責任を持ちます。...

【品質保証内容】

1. 無償保証期間と無償保証範囲
無償保証期間中に、製品に当社側の責任による故障や理由 (以下併せて「故障」と呼びます) が発生した場合、当社はお買い上げいただきました販売店または当社サービス会社を通じて、無償で製品を修理させていただきます。...

【無償保証期間】

製品の無償保証期間は、お客様にてご購入またはご指定場所へ納入後12ヶ月とさせていただきます。...

【無償保証範囲】

- (1) 一次故障診断は、原則として貴社にて実施をお願い致します。
(2) 無償保証期間内であっても、以下の場合には無償修理とさせていただきます。
(3) 海外でのサービス
海外においては、当社の各地域FAセンターで修理受付をさせていただきます。...

4. 機台損失、二次損失などへの保証義務の除外

- 無償保証期間の内外を問わず、以下については当社責務外とさせていただきます。
(1) 当社の責に帰すことができない事由から生じた障害。
(2) 当該製品の使用方針、および適用環境などから、取扱い、運用、メンテナンスなどに関する事項。
(3) 当該製品の責任範囲に属するお客様の責任範囲。...

Functional safety unit Model MR-D30

Installation Guide

2. About safety

This chapter explains safety of users and machine operators. Please read the chapter carefully before mounting the equipment.

WARNING and CAUTION icons with text explaining the consequences of incorrect handling.

2.1 Professional engineer Only professional engineers should mount this to MR-J4 servo amplifiers.

- (1) Persons who look a proper training of related work of electrical equipment or persons who can avoid risk based on past experience. (2) Persons who have read and familiarized himself/herself with this installation guide and operating manuals for the protective devices (e.g. light curtain) connected to the safety control system.

2.2 Applications of the devices MR-D30 has a control system whose configuration is possible to be as follows. This product complies with the following standards.

An achieved safety level depends on external circuit, wiring conditions, parameter settings, sensor selections, and mounting position on the machine.

2.3 Correct use

WARNING and CAUTION icons with specific instructions regarding safety and industrial use.

Use the MR-D30 within specifications. Refer to "MR-D30 Instruction Manual" for specifications such as voltage, temperature, etc.

2.3.1 Peripheral device The followings are selected based on IEC/EN 61800-5-1, UL 508C, and CSA C22.2 No. 274.

- (1) Motor overload and Over temperature protection The overload protection of the servo motor does not include a thermal memory function, and is not speed sensitive.

2.3.2 Europe/UK compliance The CE/UKCA marking proves the compliance of the servo product with the essential requirements specified in the relevant EU Directives and UK Regulations.

- (1) EMC requirement The combination of MR-J4 servo amplifier and MR-D30 complies with EN/BS EN IEC 61800-3. As for I/O wires (max. length 10 m) and encoder cables (max. length 50 m), use shielded wires and ground the shields.

2.3.3 USA/Canada compliance The servo amplifiers on which MR-D30 is mounted are designed in compliance with UL 508C and CSA C22.2 No. 274.

- (1) Installation The minimum cabinet size is 150 % of each MR-J4 servo amplifier's volume including MR-D30. Also, design the cabinet so that the ambient temperature in the cabinet is 55 °C or less.

2.3.4 South Korea compliance Products that bear the KC mark comply with the Radio Wave Law. Please note the following to use the product.

2.4 Safety observation function compatible unit The safety observation function is executed by writing a parameter to MR-D30 in a system using an MR-J4 servo amplifier, motion CPU and safety programmable controller in the following table.

Table with 2 columns: List of safety observation function compatible unit, and rows for Servo amplifier, Programmable controller, and Motion CPU module.

Note 1. For using the safety observation function through CC-Link IE Field 2. For using the safety observation function through SSCNET I/E

(2) List of safety observation function compatible unit version (a) Servo amplifier and functional safety unit

Table mapping MR-D30 software version, Servo amplifier software version, Safety observation function, Servo motor with functional safety, and Servo amplifier model.

Note. CC-Link IE Field Network Basic communication is not supported. While CC-Link IE Field Network Basic has been set, connecting with the MR-D30 functional safety unit triggers [AL 3E.8].

Table mapping MR-D30 software version, Servo amplifier software version, Safety observation function, Servo motor with functional safety, and Servo amplifier model.

2) MR-J4-(DU)B _RJ/MR-J4-(DU)A _RJ

Table mapping MR-D30 software version, Servo amplifier software version, Safety observation function, Servo motor with functional safety, and Servo amplifier model.

Note. The servo amplifiers manufactured in November, 2014 or later is supported.

(b) Programmable controller

Table mapping Model (R_SFCPU) and Software version (07 or later).

(c) Motion controller

Table mapping Model (Q173DSCPU, Q172DSCPU), OS (SW8DNC-SV22QJ, SW8DNC-SV13QJ, SW8DNC-SV22QL, SW8DNC-SV13QL), Software version (05 or later).

2.5 General cautions for safety protection and protective measures

POINT icon with instructions: Observe the cautions for safety protection and protective measures. Observe the items in this section for proper use of MR-D30.

- (1) When mounting, installing, and using the MR-D30, always observe standards and directives applicable in the country. (2) When using an MR-D30 in an EU member state, comply with the following directives.

(3) The manufacturer and owner of machines on which an MR-D30 is used should be familiarized with all the applicable laws and regulations and should be responsible to observe them.

- (4) The contents of "MR-D30 Instruction Manual" must be observed. (5) Tests should be performed by professional engineers, especially qualified and responsible personnel, and should be recorded/documentated for a third party to rebuild and confirm the tests.

2.6 Disposal Disposal of unusable or irreparable devices should always occur in accordance with the applicable country-specific waste disposal regulations.

2.7 Risk assessment To ensure safety, users should decide all the risk assessments and residual risks in the entire machine equipment. A company and/or individual who constructed the safety related system must take full responsibility for installation and commissioning of the system.

- 2.7.1 Common residual risks in each function (1) At the shipment to end-users, check the settings of safety related components with programming tools and monitored/displayed contents on display and record and save the setting data concerning the safety observation function and the programming tools you used.

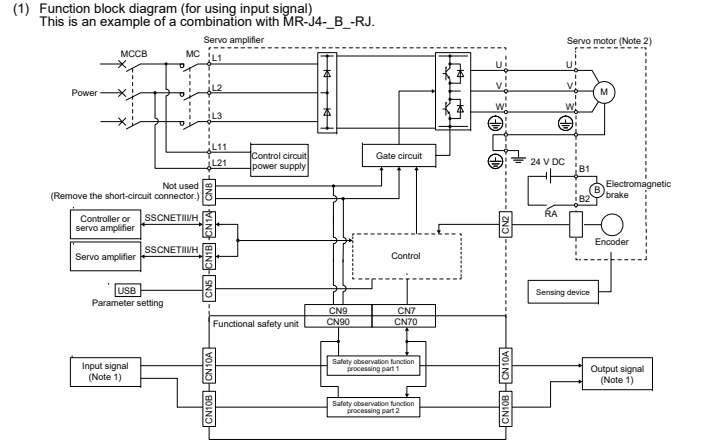
- (2) Separate the wiring for safety observation function from other signal wirings. (3) Only qualified personnel are authorized to install, start-up, repair or adjust the machines in which these components are installed. (4) Protect the cables with appropriate ways (routing them in a cabinet, using a cable guard, etc.).

2.7.2 Residual risks in each function (1) Speed monitoring (SLS) (a) Speed monitoring function guarantees the servo motor speed, but it does not guarantee the actual machine safety speed.

(2) Safe speed monitor (SSM) When SSM is used as a restart trigger, perform it according to IEC/EN 60204-1. (3) Safe brake control (SBC) This function guarantees only that power to mechanic break is properly supplied and abrasion of the brake cannot be detected.

3. Conditions of use for the product (1) MR-D30 complies with a safety standard, but this fact does not guarantee that MR-D30 will be free from any malfunction or failure.

4. Block diagram and timing chart



Note 1. Safety switch, safety relay, etc. 2. The servo motor with functional safety is required to use the SS2/SOS functions.

(2) How to use the functions To use the safety observation functions, combine MR-D30 with MR-J4. For how to use the functions, refer to "MR-D30 Instruction Manual".

5. Maintenance and disposal MR-D30 safety logic unit is equipped with LED displays to check errors for maintenance. Please dispose this unit according to your local laws and regulations.

6. Functions and configuration

- 6.1 Summary (1) Safety observation functions are available with your servo amplifier. Mounting the functional safety unit to the servo amplifier enables you to use the safety observation functions such as STO/SS1/SS2/SOS/LS/SSM/SBC without depending on a controller. (2) Drive safety compatible integrated motion controller Safety communication with motion controllers is available by using MR-D30 with MR-J4 _B _RJ. With this, the wiring which was required can be reduced for the STO signal and encoder signal for safety observation.

6.2 Transportation and storage

CAUTION icon with instructions: Transport the products correctly according to their mass. Stacking in excess of the limited number of product packages is not allowed. Install the equipment in a load-bearing place in accordance with "MR-D30 Instruction Manual". Do not put excessive load on the machine.

When you keep or use it, please fulfill the following environment.

Table of environmental specifications including Ambient temperature (0 to 55 Class 3K3), Ambient humidity (20 to 85 Class 1K4), Vibration resistance, Pollution degree (2), IP rating (IP00), and Altitude (10000 m or less).

Note. In regular transport packaging

6.3 Specifications

Table of detailed specifications for the MR-D30 model, including Output (Rated voltage 24 V DC, Rated current 0.3 A), Interface power supply (Rated voltage 24 V DC ± 10%), Safety performance (Mission time, Response performance, Safety observation function), and Compliance to global standards (CE marking).

Note 1. This is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points. 2. Time from STO input off to energy shut off. 3. To meet Category 4, PL e, SIL 3 for input signals, a diagnosis using test pulses is required.

