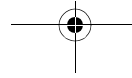
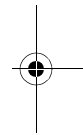
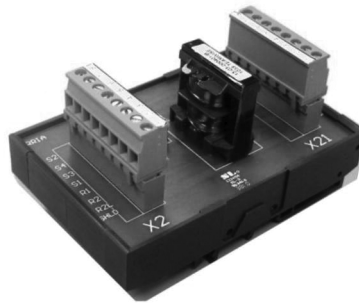
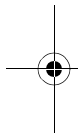




ABB Drives

User's Manual Resolver Signal Conditioning Module RSCM-01

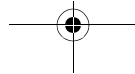
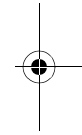
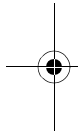
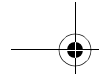


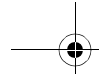
ABB





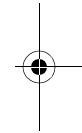
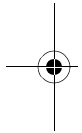
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Resolver Signal Conditioning Module RSCM-01

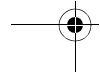
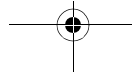
User's Manual



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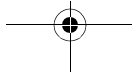
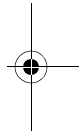
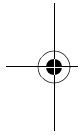
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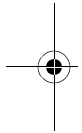
Safety instructions

Overview

This chapter states the general safety instructions that must be followed when installing and operating the RRIA-01 Resolver Interface module.

The material in this chapter must be studied before attempting any work on, or with, the unit.

In addition to the safety instructions given below, read the complete safety instructions of the specific drive you are working on.



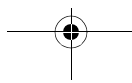
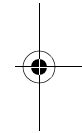
General safety instructions

WARNING! All electrical installation and maintenance work on the drive should be carried out by qualified electricians.

The drive and adjoining equipment must be properly earthed.

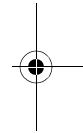
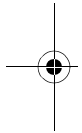
Do not attempt any work on a powered drive. After switching off the mains, always allow the intermediate circuit capacitors 5 minutes to discharge before working on the frequency converter, the motor or the motor cable. It is good practice to check (with a voltage indicating instrument) that the drive is in fact discharged before beginning work.

The motor cable terminals of the drive are at a dangerously high voltage when mains power is applied, regardless of motor operation.

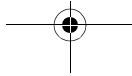




There can be dangerous voltages inside the drive from external control circuits even when the drive mains power is shut off. Exercise appropriate care when working on the unit. Neglecting these instructions can cause physical injury or death.



Safety instructions



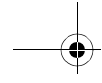
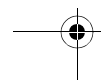
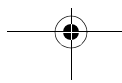
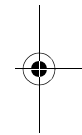
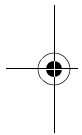


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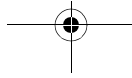
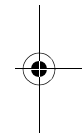
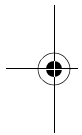
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Introduction

Intended audience

The manual is intended for the people who are responsible for commissioning and using an RSCM-01 Resolver Signal Conditioning module with the ACS800 drive. The reader is expected to have a basic knowledge of electrical fundamentals, electrical wiring practices and how to operate the drive.

Before you start

It is assumed that the drive is installed and ready to operate before starting the installation of the extension module.

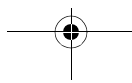
In addition to conventional installation tools, have the drive manuals available during the installation as they contain important information not included in this manual. The drive manuals are referred to at various points of this document.

What this manual contains

This manual contains information on the wiring, configuration and use of the RSCM-01 module.

Safety instructions are featured in the first few pages of this manual.

Overview contains a short description of the RSCM-01 Resolver Signal Conditioning module, a delivery checklist and warranty information.

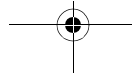
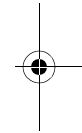
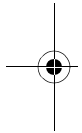




Installation contains instructions for module hardware settings, mounting and cabling.

Fault tracing explains fault tracing and the LED indications of the RRIA-01 module.

Technical data contains information on the physical dimensions, configurable settings, and connectors of the module.





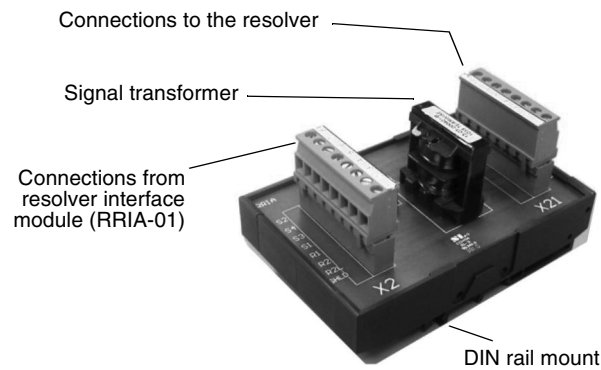
Overview

Overview

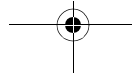
This chapter contains a short description of the RSCM-01 Resolver Signal Conditioning module and a delivery checklist.

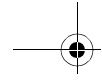
The RSCM-01 module

The RSCM-01 is designed to amplify the voltage of the excitation signal of an incoming resolver (R1-R2) which then amplifies the voltage of the signals coming back (S1-S3, S2-S4). The purpose is to provide signals with voltage that is within the usable range of the RRIA-01 resolver interface module (1.4 to 3.5 Vrms, 2.0 to 5.0 Vpp max.).



Overview





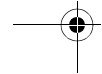
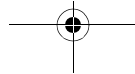
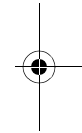
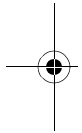
Delivery check

The option package contains:

- RSCM-01 module
- This manual.

Compatibility

The RSCM-01 is compatible with the RRIA-01 resolver interface module. It is used to amplify the voltage of the S1-S3 and S2-S4 signals from the resolver.





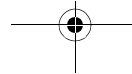
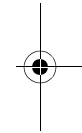
Installation



WARNING! Follow the safety instructions given in this guide and the drive manuals.

Mounting

The board is to be panel-mounted to the user's control panel within an enclosure. The board is equipped with DIN-rail mounting. Locate it such that the cable length between the resolver and the RRIA-01 through the signal conditioning board does not exceed 328 ft (100 m). It is recommended that the signal conditioning board be placed within 15 ft (3 m) of the RRIA-01.



Terminal designations

X2 RRIA	Marking	Description
1	SHLD	For grounding the resolver cable shields
2	R2L	Signal transformer bypassed. When R2 from the RRIA-01 is connected to this terminal, output voltage at X21-R2 will be equal to this voltage
3	R2	When R2 from the RRIA-01 is connected to this terminal, output voltage at X21-R2 will be amplified by a factor of 2.0 by the signal transformer, also amplifying S1-S3 and S2-S4 by the same factor
4	R1	Output common
5	S1	Cosine winding input 1
6	S3	Cosine winding input 2
7	S4	Sine winding input 1
8	S2	Sine winding input 2

Installation

X21 Resolver	Marking	Description
1	SHLD	For grounding the resolver cable shields
2		
3	R2	Excitation signal output
4	R1	Output common
5	S1	Cosine winding input 1
6	S3	Cosine winding input 2
7	S4	Sine winding input 1
8	S2	Sine winding input 2

Installation

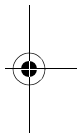
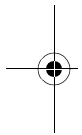


Resolver wiring

General

The resolver should be connected to the RSCM-01 module with a cable specified below. Use this same type of cable to connect the RSCM-01 to the RRIA-01 module.

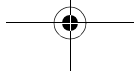
Cable construction	4 × (2+1) Twisted pair cable with individual and overall shields.
Conductor cross-sectional area	0.5 to 1.0 mm ²
Maximum cable length	328 ft (100 m) total from resolver to RRIA-01 through RSCM-01



Note: The cable shields should be earthed only at the RSCM-01 and RRIA-01 modules if the resolver is not isolated from the motor and earth. However, if the resolver is isolated from the motor and earth, the cable shields are to be connected to the resolver housing also.

Note: Do not route the resolver cables parallel to power (eg. motor) cables.

Installation

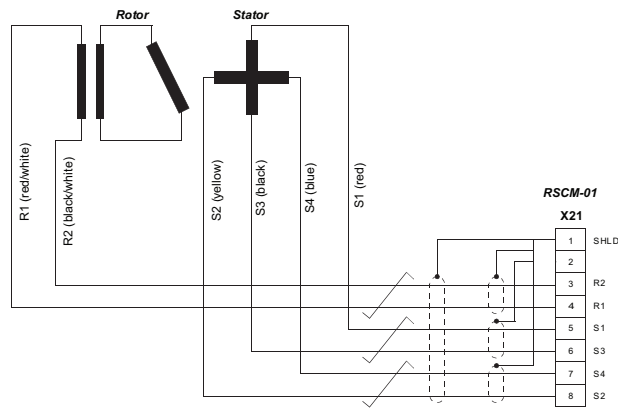


Phasing

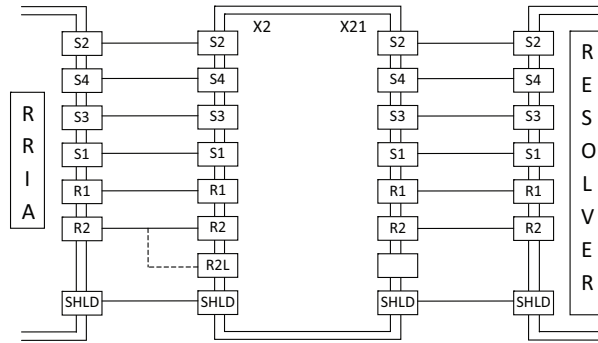
When the resolver is connected correctly, running the drive in the *Forward* (positive speed reference) direction should produce a positive resolver speed feedback.

Wiring diagram

Note: The wire colors given apply to common types of resolver. Check the correct wiring with the resolver documentation.



Installation



Note: Moving RRIA wire R2 from terminal R2 to R2L will bypass the signal transformer (X21:R2 = X2:R2L).

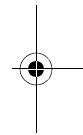
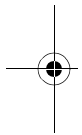
Start-up procedure

1. Connect the RRIA Resolver Module and the Resolver to the RSCM-01 as indicated above, with R2 of the RRIA module going to X2-R2 of the RSCM-01 module.
2. Locate the red LED (fault) on the RRIA module.
3. Apply power to the drive.
4. Rotate the resolver several times while monitoring the red LED.
 - a. If the red LED stays off, then start up of this board is complete.

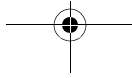
Installation

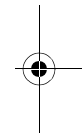
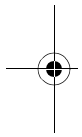
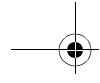


b. If the red LED blinks or stays on, then disconnect power to the drive. Move the wire from X2:R2 (terminal 3) to X2:R2L (terminal 2). Repeat above procedure. The red LED should then stay off.

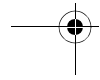
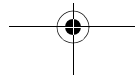


Installation





Installation



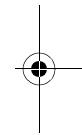
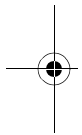


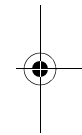
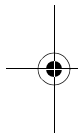
Fault tracing

The excitation signal R1-R2 is generated by the RRIA-01 resolver module. The resolver transforms this to two signals, S1-S3 and S2-S4, which are returned to the RRIA-01 and used to determine resolver position and/or speed.

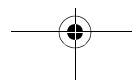
As the resolver turns within a revolution, the RMS voltage across S1-S3 and S2-S4 vary from zero to a peak value. For the RRIA-01 resolver module, the peak value should be between 1.4 and 3.5 Vrms. If the voltage exceeds 4.0 Vrms or fails to reach 1.4 Vrms, the red "EER" LED will turn on, indicating a fault.

The RMS voltage across S1-S3 and S2-S4 can be measured by a quality multimeter to verify the signals are within this required range. Connect the probes to terminals S1 and S3 (or S2 and S4) on terminal block X2 or X21 and slowly rotate the resolver. Observe the peak value within a single revolution. If the RMS voltage fails to reach the lower limit (1.4 V), amplify the voltage by connecting wire R2 (from RRIA-01) to terminal X2:R2. If it exceeds the upper limit (3.5 V), lower the voltage by connecting wire R2 to terminal X2:R2L.





Fault tracing

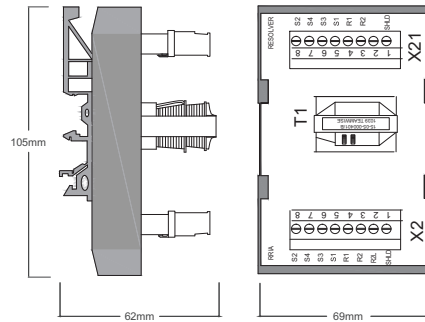




Technical data

RSCM-01 data

Dimensions:

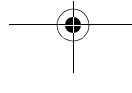


Mounting: The board is to be DIN-rail mounted to the user's control panel.

Degree of protection: UL Type Open (IP20)

Ambient conditions: The applicable ambient conditions specified for the drive in its *Hardware Manual* are in effect.

Hardware settings: None





Connectors:

- Two (2) 8-pole detachable screw-type terminal blocks for max. 12 ga. (2.5 mm²) wire.

Max. power consumption: 8.8 mA at 5 kHz

Estimated min. lifetime: 100,000 h

Voltage Amplification Ratio

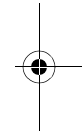
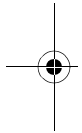
- $X_{21}:R_2 = 2.0 * X_{2}:R_2$ (volts)

or

- $X_{21}:R_2 = 1.0 * X_{2}:R_{2L}$ (volts)

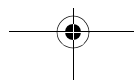
Miscellaneous:

- All materials UL/CSA-approved
- Complies with EMC standards EN 50081-2 and EN 50082-2



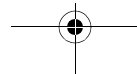
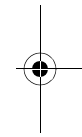
Resolver recommendation

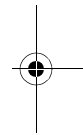
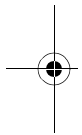
See *RRIA-01 User's Manual*.





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