LASERMET

WIRING CONTACTORS TO AN ICS-5 OR ICS-6

WIRING MANUAL

Issue 2

LASERMET ICS Contactors
Wiring Manual

Contents

1 Safety Warnings

This device is intended to be used as part of a safety system which may be used to protect personnel and equipment from possible injury, damage, or loss.

As such it must be installed and wired according to these instructions and tested by suitably qualified persons. No attempt may be made to tamper with the parts, open them, or use them outside of the parameters contained herein.

The units are only designed to be fixed to surfaces using their inbuilt fixing holes. They must not come into contact with each other or any other moving part when in use. The parts should never be subject to impact or mechanical strain.

Safety switches should never be defeated or bypassed. It is imperative that all steps are taken to ensure that any spare actuators are made unavailable, such that they cannot be used to defeat the switch or reduce the protection offered by the system in any way.

2 Concept

When it is necessary for a Lasermet ICS-5 or ICS-6 Interlock Control Panel to switch the mains power to a laser or other controlled equipment the internal contacts of the ICS may not be sufficiently rated to switch high powers. In these situations, Lasermet offer a power contactor box.

The contactors are wired so that the supply is turned on when the 'Arm Laser' button is pressed and the system arms and turned off when the system is disarmed e.g. by opening a door or setting the ICS keyswitch to 'Disable'.

In general, Lasermet supply either 18A or 32A four-pole contactors. The ratings for each type are as follows:

18A type AC-3 Rating 18A AC-1 Rating 32A
230V 4kW
400V 7.5kW
690V 10kW

32A type AC-3 Rating 32A AC-1 Rating 50A
230V 7.5kW
400V 15kW
690V 18.5kW

The box contains two contactors whose line contacts are pre-wired in series such that the power to the load is cut if either or both contactors open. The ICS monitors both contactors and if one of them fails to open when the system is disarmed, the ICS cannot be re-armed. This provides protection against the 'dangerous' failure of a single contactor.

The contactor box needs to be wired to the line and load cables to be switched, and the box may conveniently be located near these.

All wiring to the contactor main terminals must be made using wire of current and voltage rating appropriate to the power to be carried.

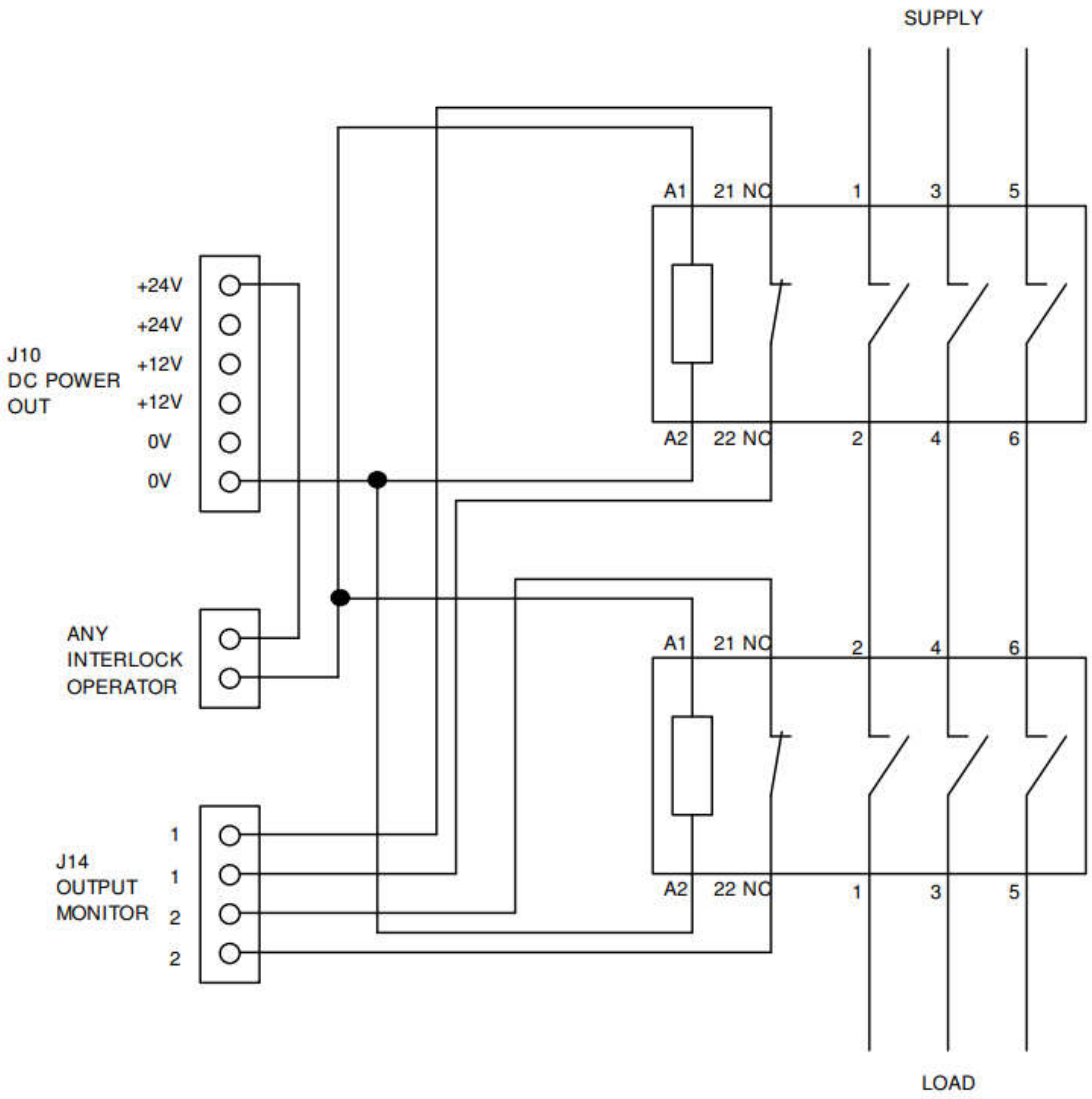
Overcurrent protection devices must be provided on the supply side of the main contacts to protect the load, contactors and wiring against excessive current under fault conditions.

The contactors are provided with four-line contacts. For a single-phase installation, use two of the contacts only to switch live and neutral. For three-phase installation, use three contacts for the three phase lines and the fourth for the neutral.

NOTE: Ensure that earth continuity is maintained at all times between line and load cables using separate earth terminals. The earth must not be switched through the contactors.

It is then necessary to run either one 6-core or two 4-core cables between the ICS-5 / ICS-6 and the contactor box. These cables will carry low current 24V control signals, and cables with 7/0.2mm stranded copper cores are ideal. Lasermet can supply suitable miniature double-insulated cable with a 250V insulation rating, which allows the cables to be run in proximity to 110V/240V mains cables if needed.

The control wiring is shown below.



Lasermet provides a full range of laser interlock equipment including control systems, interlock switches, illuminated warning signs, laser shutters, door locks, external power supplies etc. which can be connected to provide a complete laser interlock system. Full support, design and installation is available from Lasermet, please contact us for any queries. Contact details are given at the end of this manual.

3 Testing

Testing should only be undertaken by a qualified electrical engineer.

A suitably rated tester is required to verify presence/absence of mains electrical power on the contactor terminals and any socket outlets or load equipment connected to the contactor output. During the tests hazardous voltages will be present inside the contactor box and on controlled outlet sockets or load equipment. Use appropriately insulated test equipment and keep unauthorised personnel clear of the test area.

During testing power will be fed to any connected equipment. Ensure that this will not present a hazard.

Turn on the ICS power switch and confirm the ICS is powered (lights on front panel or power switch). Set the ICS ready for arming, with all monitored doors closed. Set the ICS keyswitch to 'Enable'. The 'Arm' button should be illuminated blue.

Turn on the mains supply to the contactor box and confirm that voltage is present on the input line terminals of the contactors.

Verify that the contactors are not energised and that there is no voltage on the output (load) terminals of the contactors, or on any outlet sockets or at the controlled device (e.g. laser) supply input terminals.

Press the 'Arm Laser' button on the ICS and confirm the 'Laser Armed' indication is lit.

Verify that both contactors are energised and that the correct voltage is present on all controlled socket outlets and/or load equipment supply terminals.

Disarm the ICS by opening a controlled door or set the keyswitch to 'Disable' and confirm that both contactors are de-energised and there is no voltage on the controlled sockets or equipment.

Isolate the electrical supply to the contactor box. Remove the wire from terminal 21 of one of the contactors. Set the ICS keyswitch to 'Enable', press the 'Arm Laser' button and confirm that the ICS does not arm, the 'Arm Laser' button does not light, and the contactors are not energised.

Replace the wire to terminal 21 of the first contactor, remove the wire from terminal 21 of the other contactor and repeat the test.

Refit the wire to terminal 21 of the second contactor. Repeat the test and confirm that the ICS does arm, the 'Laser Armed' light is lit, and the contactors are energised.

Set the ICS keyswitch to 'Disarm' and turn off the ICS power switch. Fit the cover to the contactor box and restore the supply to the contactor box.

Testing is complete.

4 Specifications

Safety Performance	Up to PL'e' to EN ISO 13849-1:2008 when wired as detailed in this instruction.
Supply Voltage	24VDC nominal.
Power Consumption	12W typical (32A contactors).
Output Contact Rating	Refer to markings on contactor bodies.
Ingress Protection	IP40
Operating Conditions	0° to 55°C, 0% - 95% relative humidity non-condensing.
Size	180mm wide X 182mm high X 163mm deep

Dimensions are approximate. Values given as 'typical' are average values measured across a number of samples and are not guaranteed. Lasermet reserve the right to alter any specification without prior notice.

5 Warranty

Lasermet provide a 12-month warranty for defects in materials and manufacture, from the date of installation or delivery. Installations completed by Lasermet are covered against defects in workmanship for 12 months.

Damage or defects caused by other factors are not covered. For example, industrial contamination, incorrect cleaning, storm damage. Consequential loss is not covered under warranty. Compensation for indirect or direct loss or damage is expressly excluded. Rectification of the defects or a replacement does not initiate a new warranty period.

For all deliveries, payments and other legal transactions, English law takes precedence for any litigation.

6 Contact Details

Lasermet provide a full range of laser interlock equipment including interlock switches, illuminated warning signs, laser shutters, entry keypads with built-in fail-safe override timer, door locks, external power supplies etc. which can be interconnected to provide a complete system. We also supply equipment and consultancy covering all aspects of laser safety. Full support, design, and installation is available from Lasermet, please contact us for any queries.

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