

Dicam : Ridder Motors

Introduction

Dicam controls Ridder motors using “dead reckoning”. That means, the controller is configured with the full stroke time of the motor and calculates the required run times to reach the desired position.

At startup (or mains recovery), the program initialises the motor to a known starting position (either open or closed) by running for a full stroke time in that direction.

Output Type

To control Ridder motors, there are two methods :

RAM output type (using one output channel)

SHAFT output type (using two output channels)

Ram Output Type : *You require :*

1 x 24VAC50 (24Vac transformer)

1 x POD2 (positioning driver)

2 x CA4-9 24Vac contactors (or equiv)

A 24AC50 can power up to 12 contactors (6 motors). A POD2 has two separate channels, and can control two separate shafts. You need 2 x CA4-9 24Vac contactors per motor.

Shaft Output Type : *You require :*

1 x 24AC50 (24Vac transformer)

2 x CTR2 24Vac contactor modules

A 24AC50 can power up to 12 contactors (6 motors). You need 2 x CA4-9 24Vac contactors per motor.

For more information on RAM and SHAFT output types, please see the main Dicam installation manual.

Installation

- 1 Determine correct wiring diagram and number of conductors.
- 2 Connect motor for correct direction travel
- 3 Determine and adjust limit switches
- 4 Choose Output Type. Measure run time and set up Dicam output channel
- 5 Set up flap table/vent table

Warning : Setting up requires equipment to be operated with the covers removed. This exposes live terminals. It must only be carried out by qualified and experienced personnel taking adequate precautions to prevent risk of electric shock.

Warning : It is most important to make sure that limit switches are associated with correct direction of travel. Failure to do so may cause damage to flaps, shafts, bearings and motor. Please follow these instructions carefully.

1 Connection Diagram

The connection diagram and number of wires depends on the type of motor :

Motor Type	Motor wiring	Limit switches
3 phase (all types)	3 wires + E	3 wires (24Vac)
RW45/RW241 single phase	3 wires + E	3 wires (24Vac)
RW243/RW245 single phase	5 wires + E	3 wires (24Vac)

Following are the wiring diagrams depending on the type of motor.

The motor and limit switch wiring to the motor are identical whether SHAFT or RAM type. It is only the contactor control that differs.

POD2 connection is only shown for one type of motor, but it can be used with any of the types of motor (adjust limit switch/contactor coil wiring accordingly).

On POD2 diagram, only Channel 1 is shown. Wiring for Channel 2 is identical, other than position of terminals.

Warning : Before connecting contactor coils, make sure you have selected the correct output type. Connecting a CTR *directly* to an output which is set to RAM type will burn out the coil.

2 Check direction of travel

Make sure limit switch operator (a, b, etc. as on diag with motor) is clear of ends of travel, and grub screws a and b are loose.

Make sure the motor/shaft is safe to operate in both directions (without damage to flaps, etc.).

Operate the OPEN contactor by using the [I-O] slide switch/indicator on top of the contactor - push to the [I] position). Check the motor/shaft is moving in the correct direction to open the flap. Repeat, this time for Close.

Warning : When operating the contactors manually in this way, there is nothing to limit travel - take care to avoid damage to motor, flaps and limit switch mechanism.

If it is going the wrong way, reverse connections to V1 and W1. (V1 & W2 on 5 wire motor.)

Please clearly label the contactors.

3 Limit switches

Determine which limit switch on the mechanism is which :

Make sure the motor/shaft is safe to operate in both directions (without damage to flaps, etc.) and then operate the OPEN contactor as above.

Observe direction of travel of limit mechanism.

If limit switch operator (a, b, etc.) moves towards microswitch I, then limit switch connection diagram shown is correct.

If it moves towards microswitch II, then swap connections to terminals 1 and 7.

Now adjust the limit switches :

Operate the contactor until the motor reaches the maximum closed position.

Turn the knurled nut (2) at the determined side hand-tight to the end of travel.

Turn the adjusting ring (3) so that the “working” microswitch is just operated.

Now fix the adjusting ring by tightening grub screws (a) and (b).

Now repeat the process for the fully closed position.

4 Dicam setting up

See instructions in installation manual on Setting Up Rams & Shafts. Measure the Run Time and set this in the Output Set for the RAM channel, or the primary (SHAFT) output channel.

5 Flap/Vent Table

Many programs which use positioning outputs have a VENT TABLE, FLAP TABLE or similar, for example, to match the flap/curtain opening to the ventilation level. Please read the additional information supplied.

Explanation

Either one or the other contactor is switched on by the Dicam unit (either directly, or through the POD2). Please note : The circuits shown have no protection against both contactors being energised at once.

This energises the motor to run one way or the other. The exact motor terminations depending on whether it is a three phase (reverse one phase to reverse direction), single phase capacitor run motor, or single phase capacitor start motor.

The limit switch mechanism functions in the 24Vac common return to the contactors.

For each direction of travel, an arm rotates when the mechanism meets the end limit, moving across to operate the “capstan”. In each direction, there are two limit switches.

Limit Switch 1 (on each side) is the “working limit switch” - the one that normally limits motor movement. The operating capstan is shaped so that this switch is triggered before the Backup Limit Switch 2.

When Limit 1 is reached, terminal 1 (or 7) is disconnected from terminal 3 (or 12).

This disconnects the 24Vac return to the CTR2 circuit board/CA-5 A2 of the contactor for that direction, and prevents further travel in that. The limit switch circuit for the opposite direction allows the other con-

tactor to operate, so the motor can come back the other way.

However, if the second limit switch (Backup Limit Switch) is operated, it prevents further movement in either direction. (This is intended, so that in the event of a limit switch failing, there is a clear indication, because motor operation is then “locked out”.)

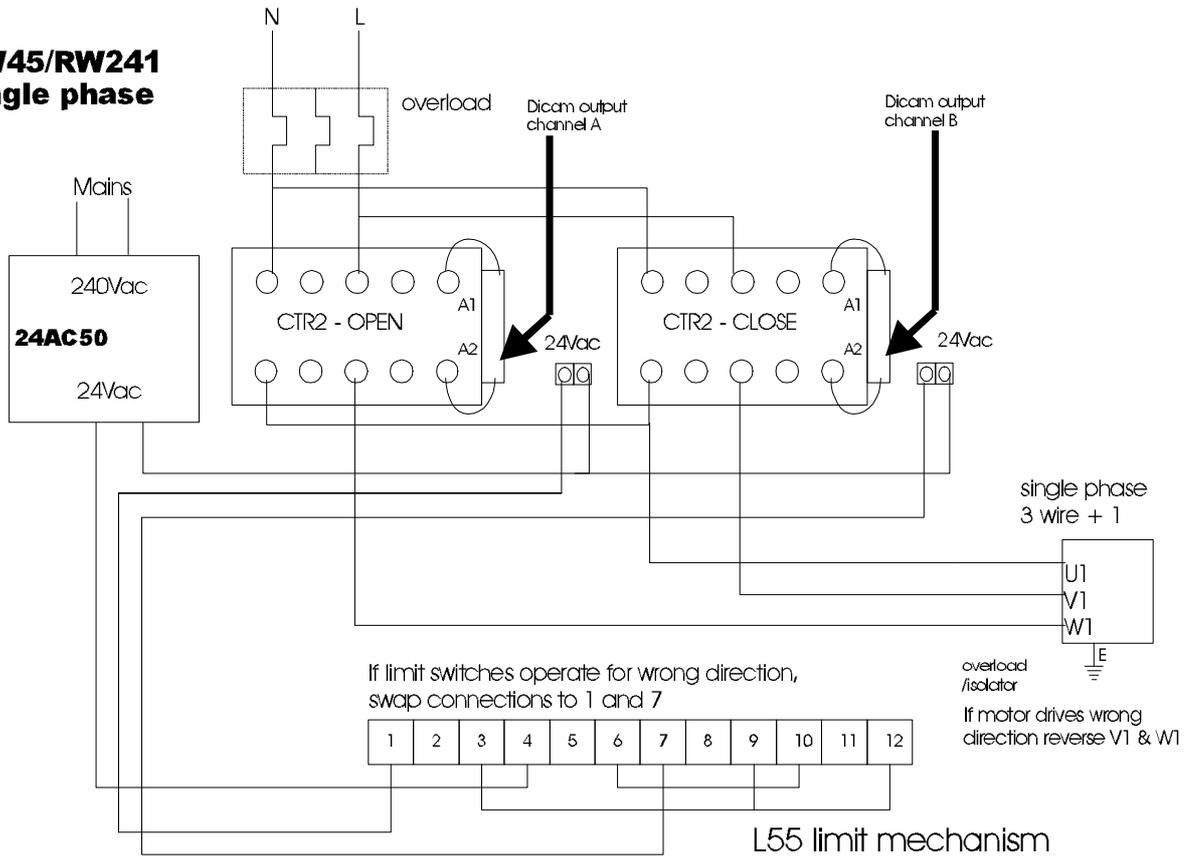
If motor lockout occurs, it can be released by either temporarily connecting terminal 10 to terminal 12, or by operating the opposite contactor manually, by pressing the “manual override” actuator on the contactor.

Service note : Motor Lockout

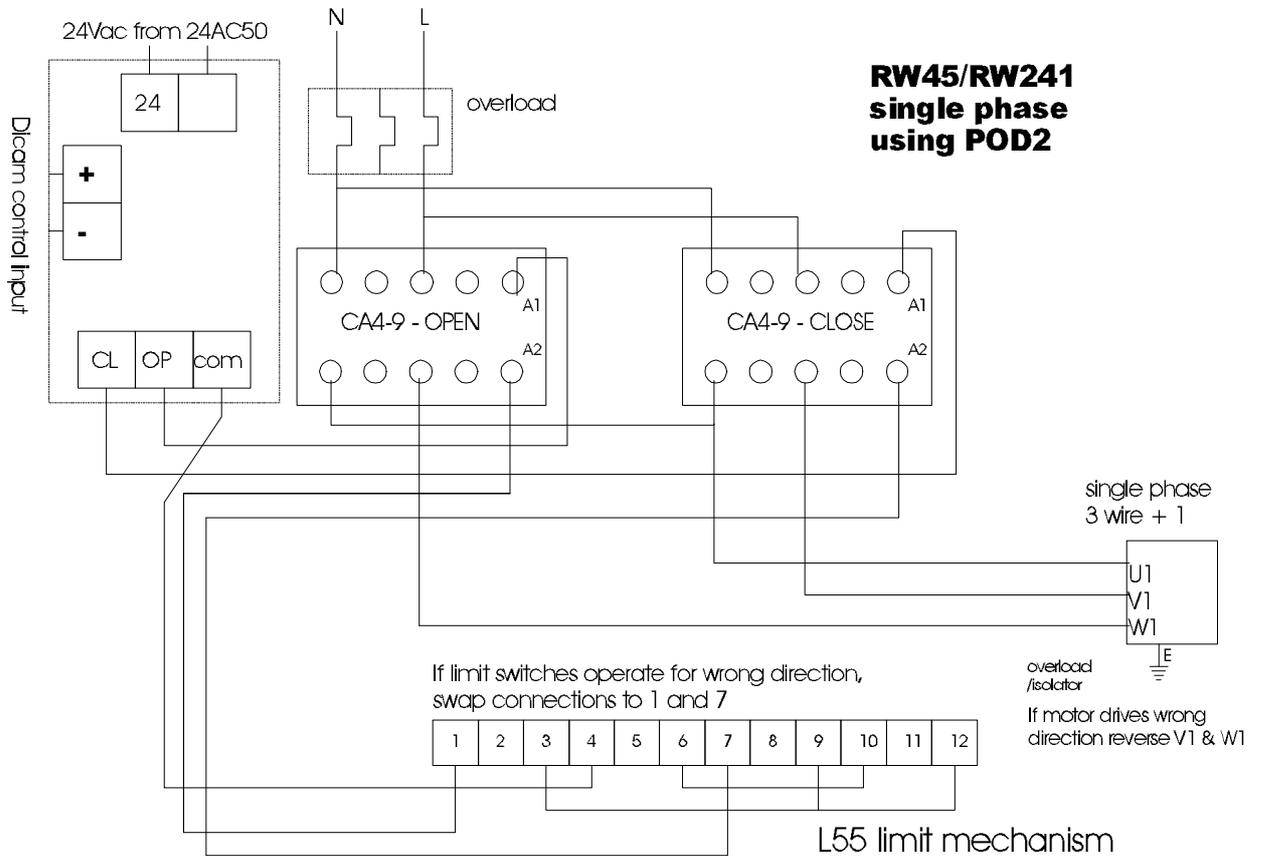
Motor lockout occurs when the Backup Limit Switch is triggered. For an explanation see above.

This may occur if a microswitch fails or gets worn out, but it sometimes occurs on a newly installed motor. The reason being that the microswitch operating arms are incorrectly set. Instead of operating only the first microswitch, the capstan is operating the second as well.) To cure the problem, bend the first microswitch operating arm, outwards slightly, so it is always operated **before** the backup limit switch.

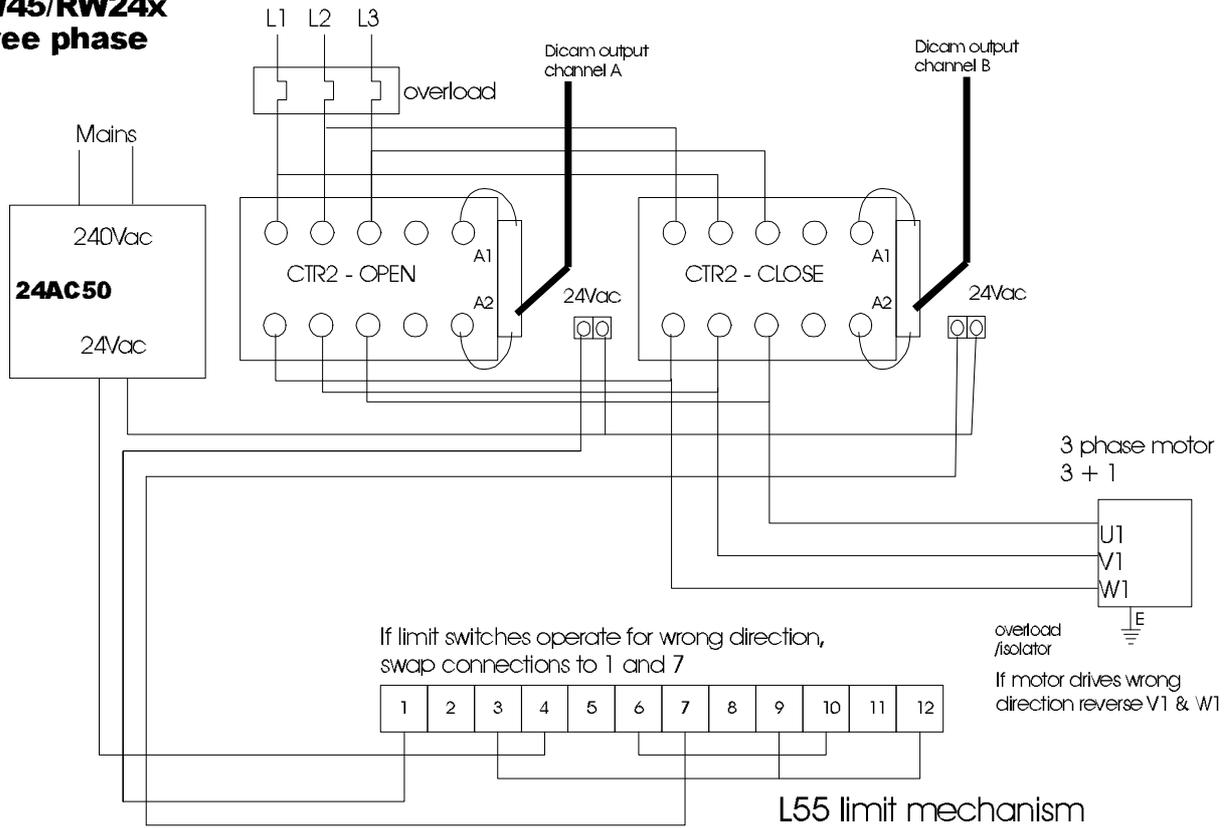
**RW45/RW241
single phase**



**RW45/RW241
single phase
using POD2**



**RW45/RW24x
three phase**



**RW243/RW245
single phase**

