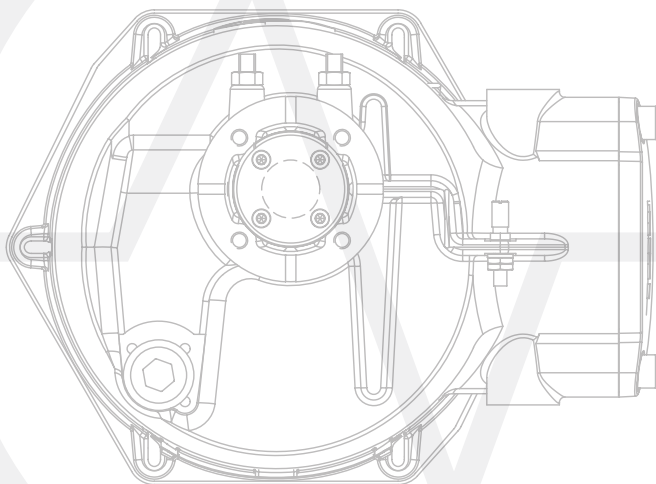


Electric Actuators and Control Systems

rotork® Process Controls

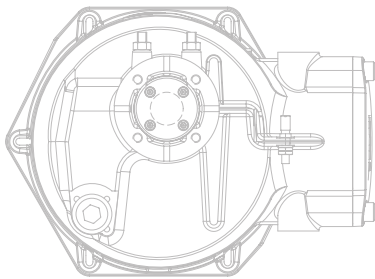
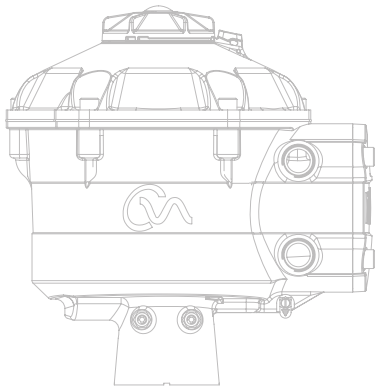
Established Leaders in Valve Actuation



CVA Range

Control and Monitoring Facilities

Linear and Quarter-turn
Control Valve Actuators



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This brochure provides a comprehensive overview of the applications and associated functions available with Rotork CVA actuators – comprising CVL linear and CVQ quarter-turn actuators.

For information about CVA actuators and an explanation of their features see Section 1. For detailed technical specifications and performance data see Section 2.

Building on Rotork's historical success with innovative technology, the CVA offers a highly accurate and responsive method of automating control valves, without the complexity and cost of a pneumatic supply. With an increased focus on production costs and efficiency, accurate control of product through the pipeline is paramount. With resolution figures better than 0.1% and the ability to eliminate position overshoot, the Rotork CVA range helps to maximise product quality and plant capacity.

In keeping with Rotork's 'sealed-for-life' philosophy, all setup and calibration is carried out non-intrusively via a Bluetooth® enabled device (not supplied) using the freely downloadable Rotork Enlight software, so that no access is required to the main electronics compartment during commissioning. Additionally the terminal compartment is separately sealed, thus minimising the risk of moisture ingress during installation.



CVA - In control

CVA – the revolution in electric control valve application, removes the need for inefficient high maintenance compressed air. Utilising Bluetooth technology, all settings, diagnostics and analysis can be carried out non-intrusively using the easy-to-use Enlight software.

Enlight – Configuration and Analysis Tool

Enlight PC and PDA software allows all CVA set-up configuration and datalogger information to be reviewed, analysed and reconfigured. This visually interactive application is a stand-alone program running under Microsoft Windows and Pocket PC operating systems. Intuitive and clear menus make analysing data from the CVA simple and fast.

Data Logging & Configuration

Every CVA includes an on board datalogger. The datalogger captures and stores valve, actuator and control signal and status data, which can be viewed using Enlight.

Features

- Actuator configuration
- Valve torque / thrust profile
- Number of operations
- Control option configuration
- Valve and actuator position starts log
- Operation signal log
- Status log
- Statistics

Terminal Block

The CVA range actuators incorporate a terminal block assembly containing segregated metric screw terminal inserts. M4 pan head screws are provided for both power and control terminals.

Control Specification

A non-intrusive selector is supplied at the top of the actuator's control cover to chose between different modes of operation; RUN, STOP or TEST.

RUN – this makes the actuator available for full remote control (see available options below).

STOP – prevents any unwanted operation, including any command initiated by the Enlight program.

TEST – this initiates a short 2% step test to make sure the actuator is working correctly.

Power Supplies

Single-phase AC – 100 to 240 VAC 50/60 Hz

Direct current – 24 VDC optional power supply can be configured on request.

Remote Control

Analogue and network control

The standard form of control is via a 4-20 mA current loop. Feedback is achieved by a loop powered 4-20 mA signal and one volt free contact for status. Other optional control methods are available including Profibus, Foundation Fieldbus and HART. These network type options are covered by the relevant systems publications.

Hardwired discrete control

For discrete hardwired control, the optional RIRO (Remote in Remote out) can be fitted. The option allows the user to hardwire a discrete digital control (24 VDC nominal or 120 VAC nominal) for open and close operation. The option also allows up to four extra relay contacts to be available.

Control Specification

Remote Input Electrical Characteristics

Voltage ranges

DC – 20 to 60 V (24 V nominal)

AC – 60 to 125 V (110 V nominal)

Voltage / Current specifications

The following table describes the requirements for correct hardwired remote control. This table allows the user to correctly specify the input voltage / current required to operate the actuator.

		Guaranteed OFF	Guaranteed ON	Maximum Permissible
DC	24 V nom	8	16	60
	mA	2	8	-
AC 50/60 Hz	110 V nom	40	80	160
	mA	2	8	-

Signal Pulse Specification

The signal pulse duration is programmable using Rotork Enlight software. The range will be selectable between 20 ms and 1 s. Units will be shipped set to the default 20 ms.

Control and Feedback

Control Functions

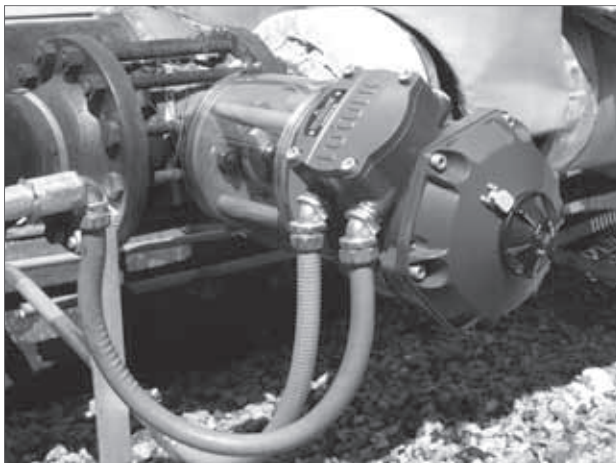
The following table of remote inputs are available with the RIRO option: -

Function	Description
Open	Actuator is driven towards the Open Limit when active
Close	Actuator is driven towards the Close Limit when active
ESD	Actuator is given an ESD command (actual action defined by the Actuator Controller)
Maintain	Travel is maintained for Open and Close when active
Test	The 2% Step Test is initiated when active

Control and Feedback Configuration Options

With the same RIRO PCB a number of different control & indication functions can be selected. The following is a table showing the various configurable options available. In order to have the correct configuration, the required option must be detailed at time of order. Contact Rotork for other optional configurations.

Terminal	Option 1	Option 2	Option 3	Option 4
1	4-20 mA command	4-20 mA command	Remote Input 1	4-20 mA command
2	4-20 mA command	4-20 mA command	Remote Input 2	4-20 mA command
3	Common screen 4-20 mA in & out	Screen	Common –	Screen 4-20 mA in
4	Relay 1	Relay 1	Relay 1	Remote Input 1 +
5	Relay 2	Relay 2	Relay 2	Remote Input 1 –
6	Relay common	Relay common	Relay common	Screen 4-20 mA out
7	4-20 mA position	Relay 4	Relay 4	4-20 mA position
8	4-20 mA position	Relay 3	Relay 3	4-20 mA position



Relay Functions

Each of the four extra relays can be set to one of the following functions: -

Function	Description
Availability	Active when the CVA is available for remote control - selector set to RUN and no faults present that would inhibit operation (all critical faults)
Fault	Active when a fault has been detected with the actuator, control or valve
Open Limit	Active when the actuator is at the Fully Open position
Closed Limit	Active when the actuator is at the Fully Closed position
Opening Load Trip	Active when the opening thrust / torque (at any position) reaches the value set
Closing Load Trip	Active when the closing thrust / torque (at any position) reaches the value set
Thrust/Torque Trip	Active when the thrust / torque (at any position) reaches the value set -independent of direction
Failsafe	Active when the actuator is performing its Failsafe action
Intermediate Position	Active if the actuator passes an intermediate position (open or close direction)
Actuator closing	Active when actuator is moving in the Close direction
Actuator opening	Active when actuator is moving in the Open direction
Actuator output Moving	Active when output is moving regardless of direction
Motor Running	Active when the motor is in motion
Motor Stalled	Active when the motor fails to move after a valid command has been sent
Hand operation	Active when the output shaft is being driven by hand
Blinker	Indicates (on and off) that the output shaft is moving
Local Stop	Active when local STOP is selected
ESD signal present	Active when an ESD signal is present
Relay parity	This is a fault indication function and ensures that the number of relays that are open at any time is even
Monitor	Active when actuator has no faults (including non-critical faults)
Mains Fail	Active when the mains power fails
CVA Run Selected	Active when RUN is selected on the control selector
CVA Test Selected	Active when TEST is selected on the control selector
CVA Test Failed	Active if a test sequence fails

Standard Control

Contact Type

Each switch is a SPST (single pole single throw) type. For each of the above relay functions, the contact can be set to either NO (normally open) or NC (normally closed). All control and indication functions can be setup using the Enlight program available for free download at www.rotork.com

Contact Ratings

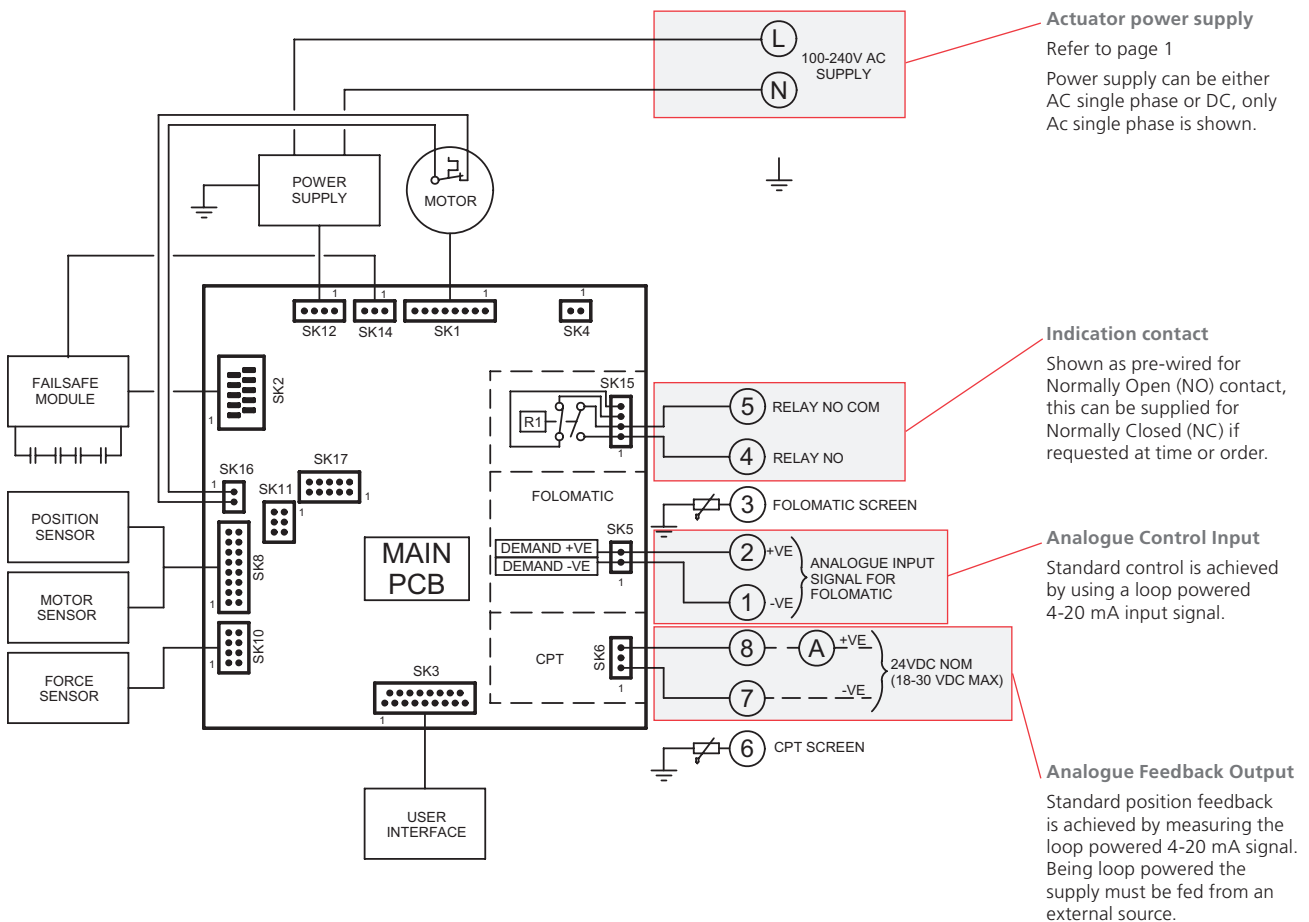
Each relay contact has a maximum rating of 250 VAC, however due to the constraints of the Low Voltage Directive; the maximum allowable voltage that can be applied to the Control & Indication terminals is 150 VAC. For DC the maximum voltage is 125 VDC and is not constrained further by the LV directive.

The absolute maximum current that can be switched is 5 amps, however consideration should also be made with regards to the maximum switching power: -

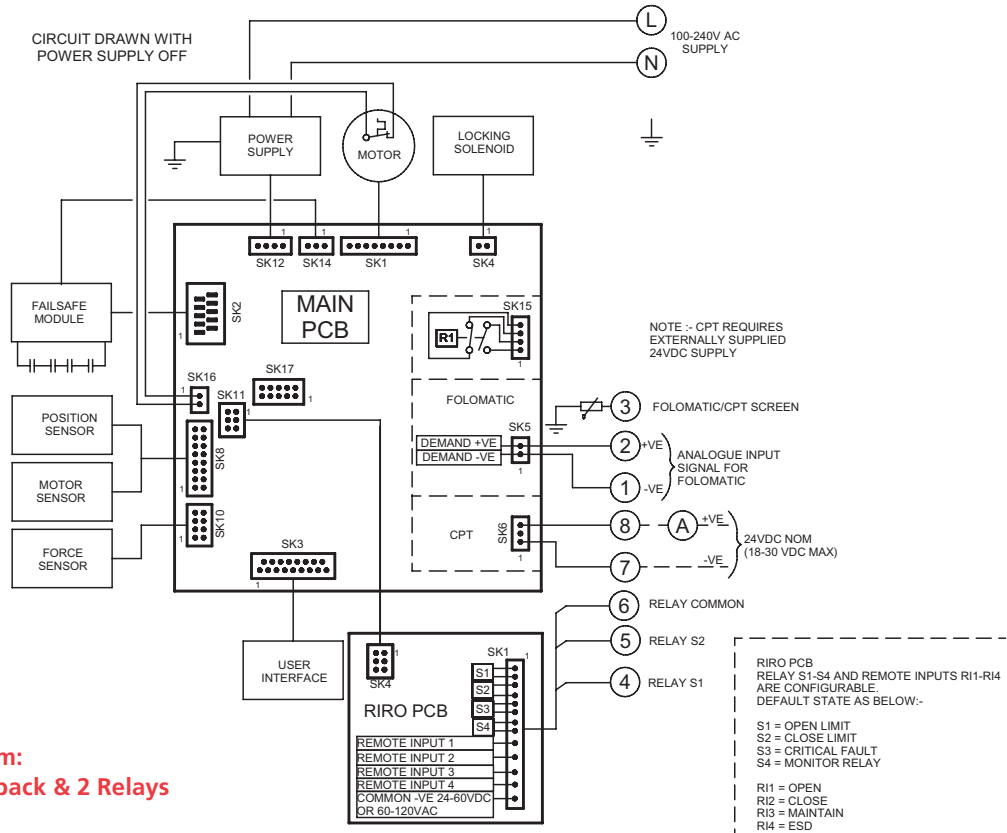
For inductive circuits this is limited to 60 W

For resistive circuits this is limited to 150 W

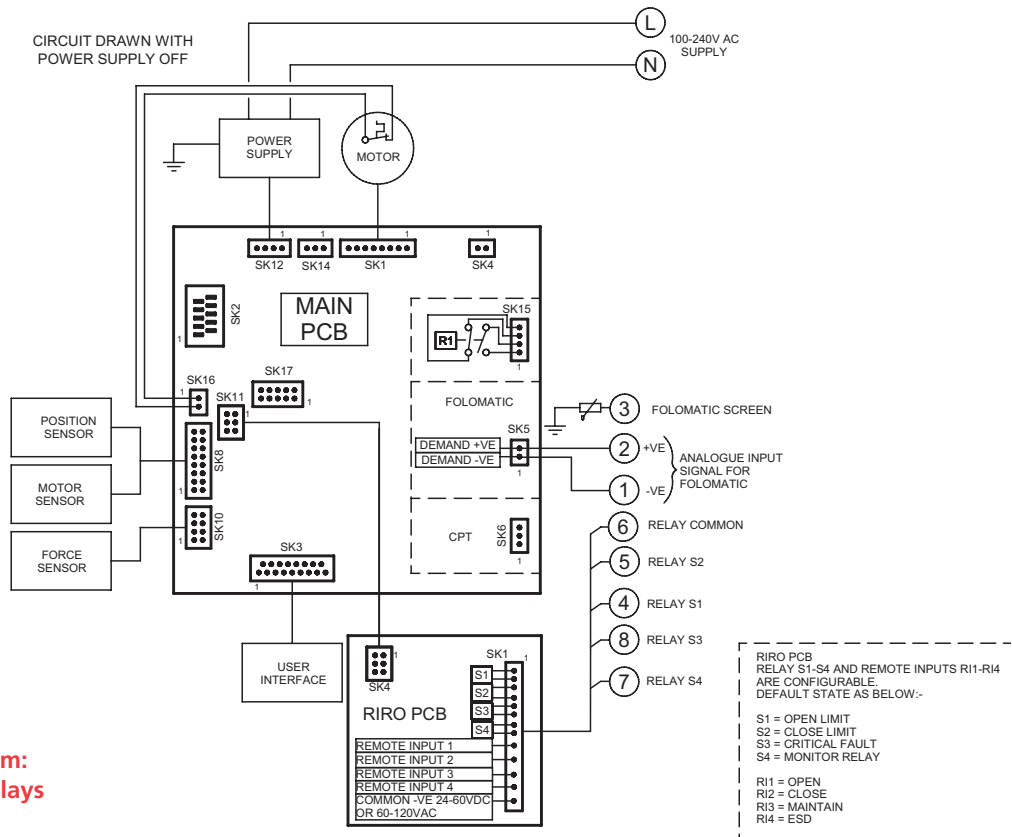
Standard Control Wiring Diagram without RIRO card



Optional RIRO Control and Feedback Wiring Diagrams

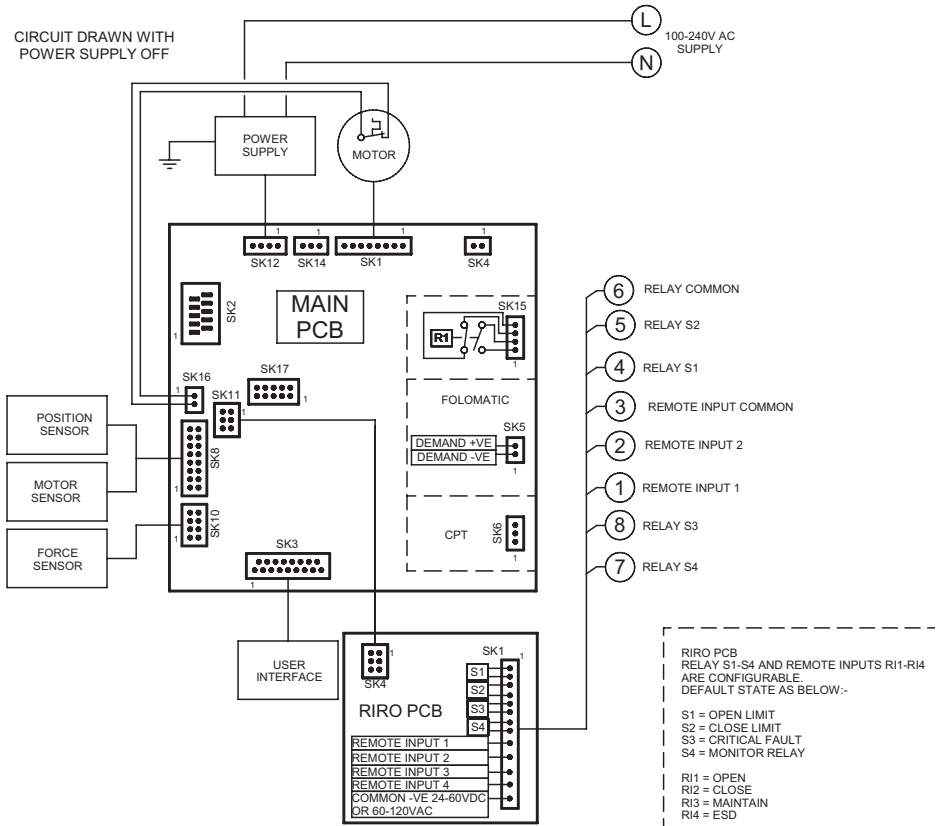


**RIRO Card Wiring Diagram:
Analogue Control / Feedback & 2 Relays
Option 1**

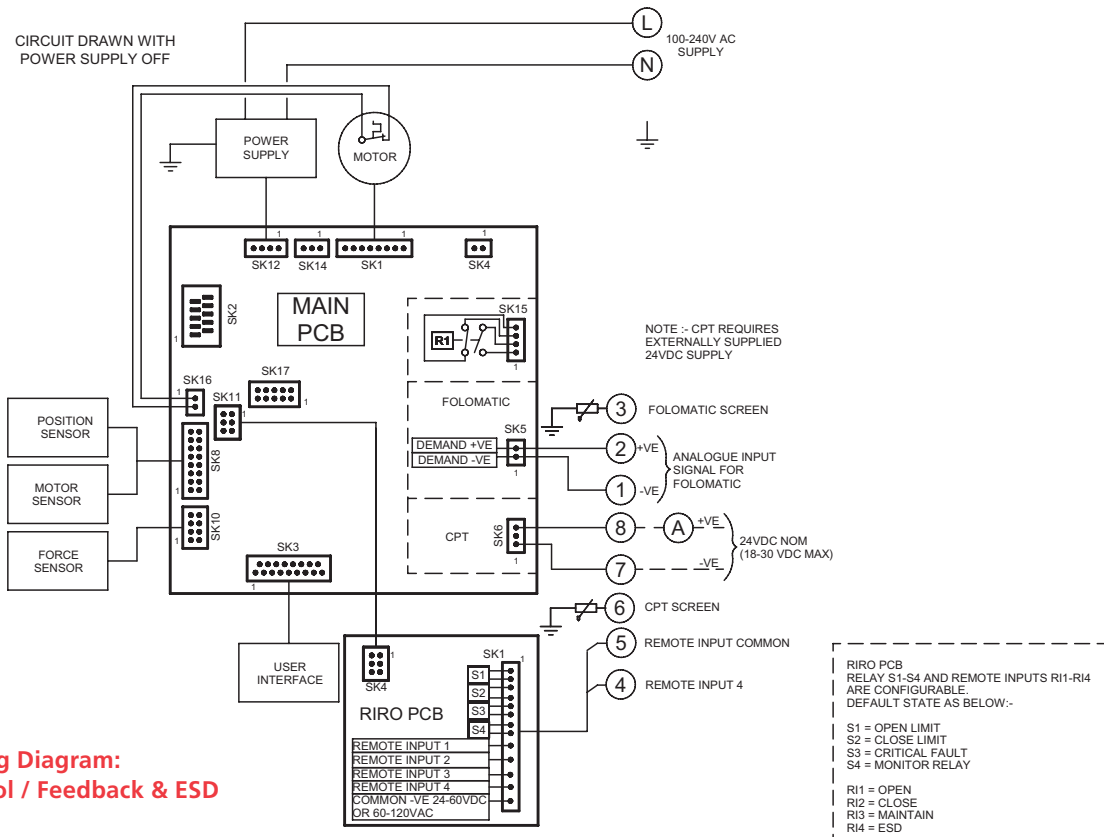


**RIRO Card Wiring Diagram:
Analogue Control & 4 Relays
Option 2**

Optional RIRO Control and Feedback Wiring Diagrams



**RIRO Card Wiring Diagram:
2 Hardwired Inputs & 4 Relays
Option 3**



**RIRO Card Wiring Diagram:
Analogue Control / Feedback & ESD
Option 4**

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Process Controls

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