

CC4 Series Safe Control & Load Holding Double Valves

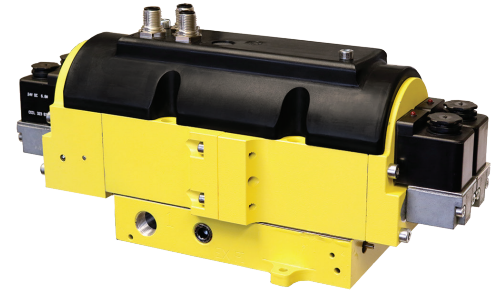
Supplemental Service and Troubleshooting Guide



This guide is intended to be a quick reference to frequently asked questions and is not intended to provide complete details for valve installation, operation, and integration into the electrical safety control system.

VALVE FUNCTION

The CC4 Series CROSSCHECK™ double valve is externally monitored. The CC4 valve is a redundant, 4-port, 3-position, closed center valve. Its function is that of a 4/3, closed center, double-solenoid pilot-operated valve. However, because the valve is redundant it has four operating solenoids: two for extending a cylinder and two for retracting. When the valve is de-actuated, all 4 ports on the valve are closed (inlet port 1, outlet port 2, outlet port 4, & exhaust port 3). Due to its unique internal crosscheck design any instance of one internal element not shifting correctly will result in the blocking of all ports. The two independent internal valve sensors will indicate internal position status and requires the electrical safety system to monitor these signals to indicate valve faults and take appropriate action.



For detailed valve operation instructions follow link: <https://www.rosscontrols.com/literature>

For valve integration guide follow link: <https://www.rosscontrols.com/literature>

WIRING

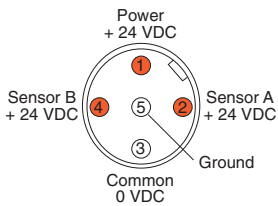
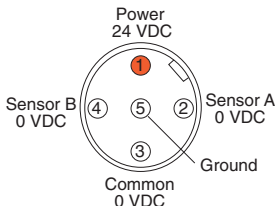
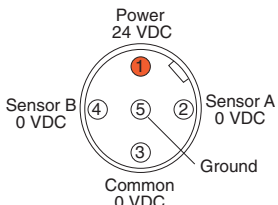
What if I connect my CC4 cables incorrectly?

The CC4 valve electrical connections to the solenoids are made with two male 5-pin M12 receptacles and the sensors are made with one 5-pin M12 female receptacle. If the cable that typically controls 12A and 14A is switched with the one controlling 12B and 14B the valve will still operate normally.

In order to eliminate potential electrical noise in the sensor circuit, both sensors MUST be grounded.

VALVE RESET

Because the CC4 valve requires external monitoring via the safety controller it is considered to be an automatic reset valve. If both sides are energized and only one side shifts correctly the valve will block all ports but one sensor output will be high and one will be low indicating a fault. The safety controller should detect this discordance and de-energize the valve. De-energizing the valve solenoids should result in both sides of the valve returning to the at-rest state which should result in both sensors going high. At this point the valve is reset (off) and ready to be energized. If the sensors remain out of synch, with one high and one low, the valve should be replaced. The assumption is that the monitoring is working properly. See valve test procedure in the Installation Instructions manual and the monitoring validation procedure in the Integration Guide.

CC4 Solenoids Lights (Operation)	
Valve De-energized Pressure applied to port 1, but all solenoids OFF. All ports (1, 2, 3, & 4) are blocked. 	
Valve Energized Solenoids 12A & 12B energized, Port 2 pressurized. 	
Valve Energized Solenoids 14A & 14B energized, Port 4 pressurized. 	

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VALVE TROUBLESHOOTING MATRIX

Solenoid Light Status*				Sensor Status		Cylinder Motion	Issue	Troubleshooting	Summary
12 A	12 B	14 A	14 B	A	B				
Off	Off	Off	Off	High	High	No	Correct; all ports blocked		Correct Operation
On	On	Off	Off	Low	Low	Yes	Correct		
Off	Off	On	On	Low	Low	Yes	Correct		
Off	Off	Off	Off	Low	Low	No	No power to sensors	Incorrect wiring?	Miswired
On	On	Off	Off	High	High	No	Both sides not shifting	Below minimum operating pressure, monitor should detect this and turn off solenoids	Solenoids operate, nothing happens to sensors or cylinder, below minimum operation
Off	Off	On	On	High	High	No	Both sides not shifting	Below minimum operating pressure, monitor should detect this and turn off solenoids	
Off	Off	Off	Off	High	Low	No	One side is faulted	Internal is off seat, sensor or sensor wiring issue	Solenoids OFF, one sensor high
Off	Off	Off	Off	Low	High	No	One side is faulted	Internal is off seat, sensor or sensor wiring issue	
On	On	Off	Off	High	Low	No	One side is faulted, unshifted	One side is unshifted, monitor should detect this and turn off solenoids	Solenoids ON, one sensor high, no motion, one side not shifted
Off	Off	On	On	Low	High	No	One side is faulted, unshifted	One side is unshifted, monitor should detect this and turn off solenoids	
On	On	Off	Off	High	Low	Yes	One side is faulted	One sensor malfunction, monitor should detect this and turn off solenoids	Solenoids ON, one sensor high, cylinder does move, one sensor not working
Off	Off	On	On	Low	High	Yes	One side is faulted	One sensor malfunction, monitor should detect this and turn off solenoids	

* Solenoid light status may not indicate solenoid operation.
Side is defined as pilot, internal component, and sensor system. Fault could be in any of those components.

Notes
