



**Complete Functional Safety with
Enhanced Reliability.**

ASCO™ Redundant Control System (RCS)
Providing process reliability and valve diagnostics, for safety
instrumented applications up to SIL 3.



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Offering Complete Functional Safety With Enhanced Reliability

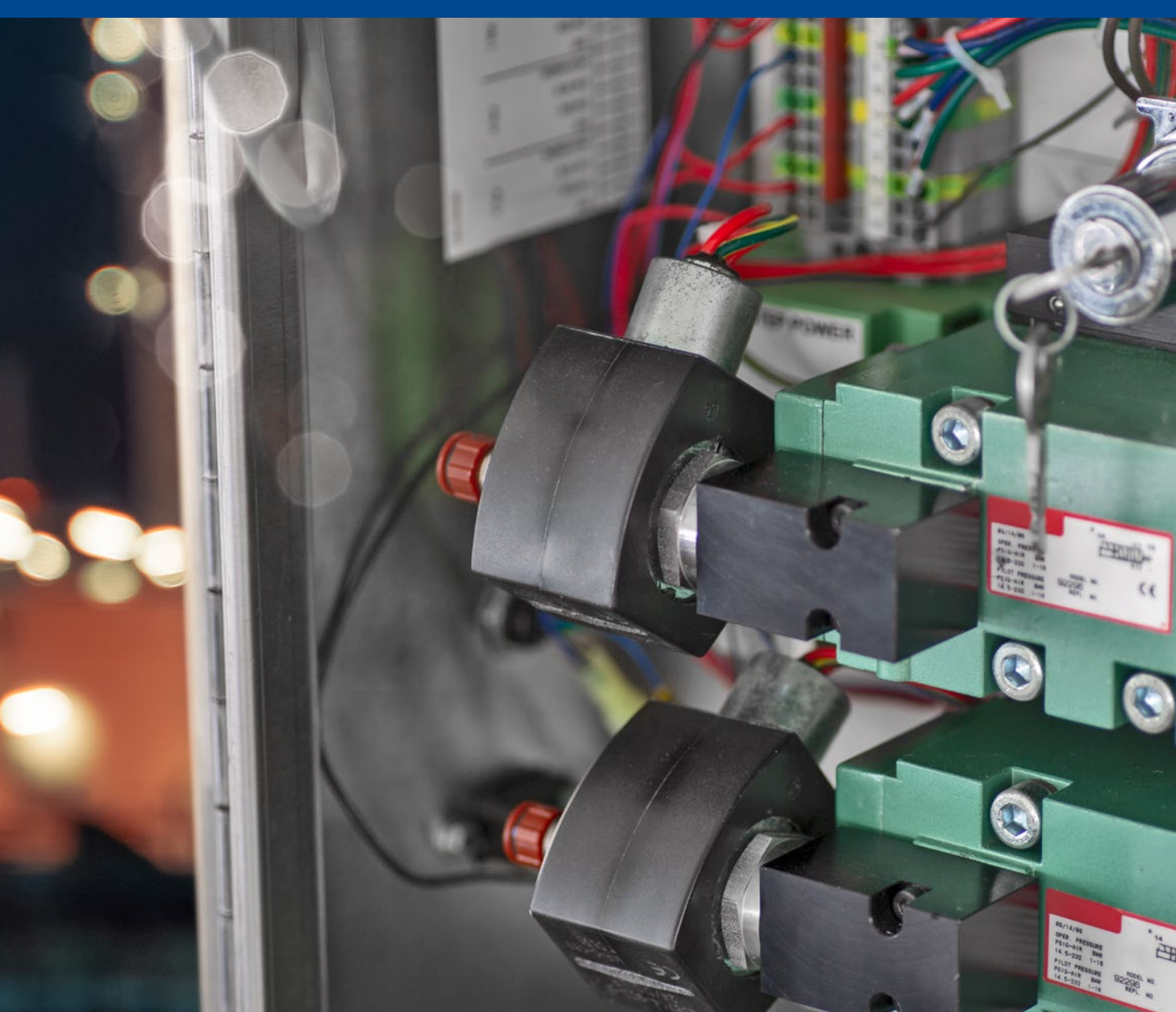


The Redundant Control System (RCS) is a pilot valve system that has no single point of failure that could result in an unwanted closure of the process valve. The Redundant Control System is fit for use in SIL 3 applications and greatly reduces spurious trip rates. RCS achieves a higher level of process safety and reliability by using a redundant, fault tolerant architecture, high diagnostic coverage, and automated testing. A keyed bypass allows on-line maintenance of the RCS without process interruption. The RCS is available in a variety of constructions that provide valve diagnostics through automated, on-line testing.

The availability and reliability of RCS provides the industry's best choice for process valve diagnostics and actuation.

Advantages include:

- No nuisance trips
- Easy on-line maintenance
- High availability
- Automated solenoid testing
- Known technology
- Automated partial stroke testing
- Industry's best choice for valve actuation & automated testing



The ASCO RCS is a pilot valve system with no single point of failure that can result in unwanted closure of the process valve.

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RCS Solenoid Architectures

2oo2D (with Diagnostics)

- 2oo2 architecture w/diagnostics allows for increased operational reliability and functional safety

Comprised of:

- Two solenoid valves mounted in 2oo2 configuration inside a Fiberglass, 304 or 316 stainless steel enclosure
- Comes standard with three pressure switches for diagnostic feedback/ online testing
- Optional GO™ Switches available
- Standard pneumatic maintenance bypass switch for online maintenance
- Online diagnostic testing (SOV and PST) capable
- Easy online maintenance
- Two operational modes available based on customer driven logic – either 1oo1HS or 2oo2D
- Available in Normally Closed, Normally Open, or Double Acting construction

2oo3 Basic

- 2oo3 architecture allows for increased operational reliability and functional safety

Comprised of:

- Three solenoid valves mounted in 2oo3 configuration inside a 304 or 316 stainless steel enclosure
- No Diagnostic feedback
- No pneumatic maintenance bypass for online maintenance
- Available in Normally Closed construction only

2oo3D (with Diagnostics)

- 2oo3 architecture w/ diagnostics allows for increased operational reliability and functional safety

Comprised of:

- Three solenoid valves mounted in 2oo3 configuration inside a 316 stainless steel enclosure
- Comes standard with four GO Switches for diagnostic feedback and online testing
- Standard pneumatic maintenance bypass switch for online maintenance
- Online diagnostic testing (SOV and PST) capable
- Easy online maintenance
- Available in Normally Closed construction only

Configuration

Normally Closed

- The Normally Closed RCS operates like a standard 3-Way Normally Closed solenoid operated valve
- Used for single acting actuators
- Available for 2oo2D, 2oo3 Basic and 2oo3D architectures

Normally Open

- The Normally Open RCS operates like a standard 3-Way Normally Open solenoid operated valve
- Used for single acting actuators
- Available for 2oo2D architecture only

Double Acting

- The Double Acting RCS operates similarly to a 4-Way solenoid operated valve
- One solenoid valve operates as a 3/2 NC valve controlling air to one side of the actuator. The second solenoid valve operates as a 3/2 NO valve controlling air to the other side of the actuator.
- Used for double acting actuators
- User must determine desired fail-safe position of the process valve (Open or Closed)
- Available for 2oo2D architecture only

Note: The Double Acting RCS has operational conditions where:

- A) both outlet ports (C1 & C2) are open to exhaust, allowing both sides of the actuator to vent
- B) both outlet ports (C1 & C2) supply pressure to both sides of the actuator

If the process valve can change position under either condition, the standard Double Acting RCS should not be used. Please contact us for more information on this type of application.

Optional Features

Emerson offers many standard optional features including:

- Door mounted local interface with indicator lights and/or push buttons
- Panel mounted versions (2oo3 Basic only)
- 316SS valve bodies and manifold (2oo2D only)

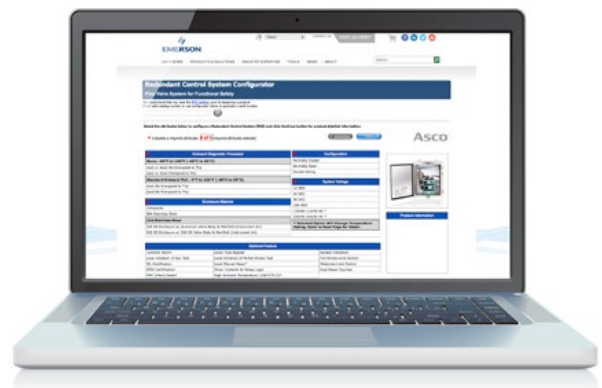
Special constructions containing customer specified features may also be available – please contact your Emerson representative for more detail.

RCS Configurator

We have simplified the RCS product selection process with an online catalog number configurator. Once you have determined the features required, you can easily construct a catalog number by clicking on each feature required and then clicking the **View Details** button. A second screen appears providing the product catalog number, product attributes, and various drawings. The configurator is programmed to accept only valid constructions.

In addition to creating a catalog number, the configurator can also decipher a catalog number. Type a valid 5RC catalog number into the window next to the Enter Catalog Number button (CAPs only). The configurator automatically highlights the appropriate construction features.

[Click Here](#) to use the online RCS configurator.



General Specifications

- **Total weight:** 2oo2D - 75 lbs (standard unit) 2oo2D - 120 lbs (unit w/stainless steel internals)
2oo3 Basic - 65 lbs 2oo3D - 106 lbs
- **Media:** Dry instrument air
- **Filtration Requirement:** Dry instrument air, filtered to 40 microns maximum (5 micron particulate and .3 micron coalescing filtration recommended)
- **Ambient Temperatures:** -40 °F to 140 °F (-40 °C to 60 °C)
- **Wiring:** Maximum wiring size 14 awg
- **CV:** 2.0 for 2oo2D, 3.0 for 2oo3 Basic, 2.3 for 2oo3 Premium (Process to Exhaust Cv typical for Normally Closed constructions)
- **Assembly Approvals:** ATEX - Ex d e mb IIC Gb

Enclosure

304 or 316 Stainless Steel, Fiberglass Type 4, 4X, IP56

Solenoid Valve (2 or 3 Units)

- **Body Material:** Die-cast Aluminum (Standard); 316 Stainless Steel (optional)
- **Solenoid Operators:** 1.4 watt (DC), 1.8 watt (DC for 316SS construction only), 10.1 watt (AC), UL listed, CSA certified Class I, Division 2, Groups A,B,C, & D - Nonincendive (DC only)
Class I, Division 1, Groups A,B,C, & D - Explosion-proof AC & DC
CE (Emc Directive 2014/30/Eu)

Pressure Switch

- **Housing Material:** Aluminum (Standard); 316 Stainless Steel (optional)
- **Wetted Parts:** Stainless Steel
- **Electrical Rating:** Gold contacts (standard) 1 amp suppressed resistive load; .5 amp inductive load @ 28 VDC
Silver contacts (optional) 5 amps suppressed resistive load; 3 amps inductive load @ 28 VDC
- **Area classification:** UL and CSA Class I, Div 2, Groups A,B,C & D; FM, CSA, ATEX: Ex d IIC, CE (PED directive 2014/68/EU)

Proximity Switches (GO™ Switch)

- **Housing Material and Wetted Parts:** 316 Stainless Steel
- **Switch Type:** SPDT switches, hermetically sealed
- **Switch Contact Rating:** Silver contacts
- **Resistive load:** 4 Amps @ 120 VAC 3 Amps @ 24 VDC
2 Amps @ 240 VAC 1.25 Amps @ 12 VDC
- **Area classification:** CSA Class I, Div 2 Groups A, B, C & D; Class II, Div 2 Groups E, F & G; Class III

SIL 3 Capable

RCS in 1oo1HS, 2oo2D and 2oo3 configurations are fit for use in SIL 3 applications per IEC 61508:2010 for low demand mode applications. Third party certified by Exida. For more information, consult the RCS safety manual.

Pneumatic Connections

Recommended piping for the inlet and outlet pneumatic connections to the RCS is 1/2" stainless steel tubing. The length of tubing between the RCS and the process valve should be kept as short as possible for the fastest response of the process valve actuator.

Normally Closed / Normally Open

Inlet: 1/2" NPT, 3-150 psi max. ①
Pilot: 1/8" NPT, 40-150 psi max
Process: 1/2" NPT
Exhaust: 1/2" NPT

Double Acting

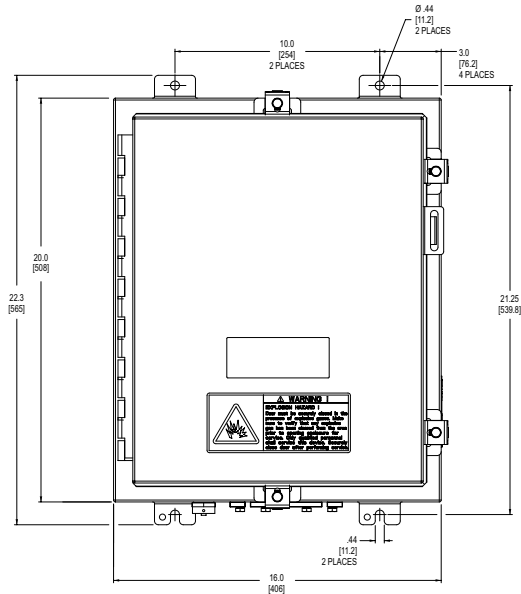
Inlet: 1/2" NPT, 3-150 psi max. ①
Pilot: 1/8" NPT, 40-150 psi max.
Process: (2) 1/2" NPT
Exhaust: 1/2" NPT

① GO Switch option is 0-150 psi max.

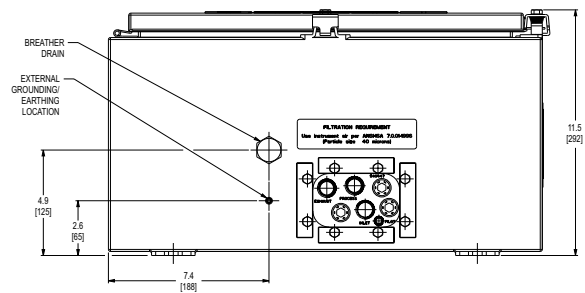
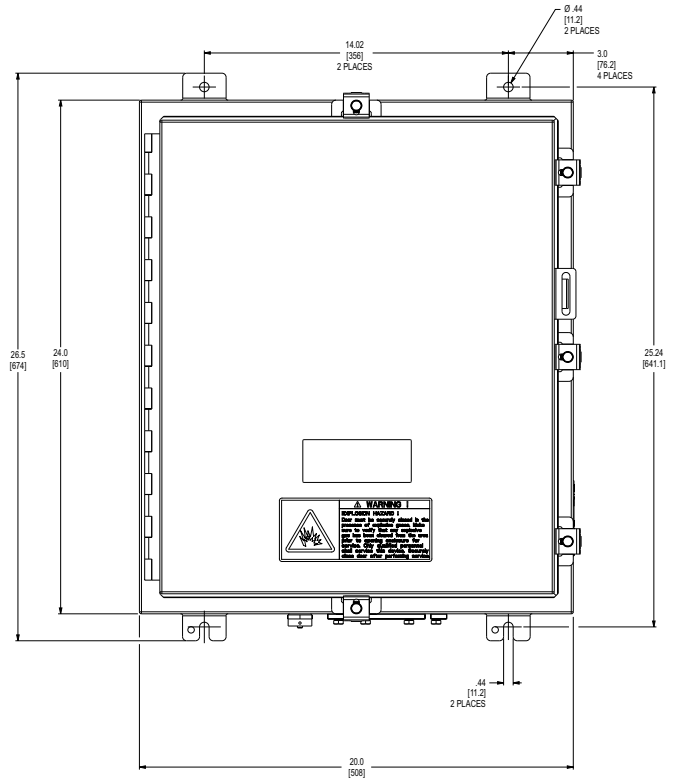
Operational relationship of the RCS to the process valve

	Normally Closed	Normally Open	Double Acting
De-energize to Trip			
Coils Energized (Normal)	Supplies air to Process Valve	Exhaust Process Valve	Supplies air to (C2), Exhaust (C1)
Coils De-energized (Trip)	Exhaust Process Valve	Supplies air to Process Valve	Exhaust (C2), Supplies air to (C1)
Bypass	Supplies air to Process Valve	Exhaust Process Valve	Supplies air to (C2), Exhaust (C1)
Energize to Trip			
Coils De-energized (Normal)	Supplies air to Process Valve	Exhaust Process Valve	Supplies air to (C2), Exhaust (C1)
Coils Energized (Trip)	Exhaust Process Valve	Supplies air to Process Valve	Exhaust (C2), Supplies air to (C1)
Bypass	Supplies air to Process Valve	Exhaust Process Valve	Supplies air to (C2), Exhaust (C1)

2002D and 2003 Basic Configuration



2003D Configuration



Providing the industry's best choice for process valve diagnostics and actuation.




ASCO™

The best choice for process valve diagnostics and actuation. Achieve a higher level of process reliability while maintaining required safety levels in a variety of process industries.


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