

Intrinsically Safe Relays/Controllers

An Intrinsically-Safe Switch is an isolated UL913 listed device used to interface between hazardous and non-hazardous areas. The input circuitry is designed to never supply excessive energy thus greatly reducing the likelihood of a spark. Provides intrinsically-safe circuits in the following locations: Division 1 and 2, Class I, Groups A, B, C, D; Class II, Groups E, F, G and Class III hazardous locations.

Product Selection Matrix

MODEL	UL 913	1 Channel	2 Channel	3 Channel	4 Channel	5 Channel	Selectable Inverted Logic	5 Amp General Purpose	7 Amp General Purpose	8 Amp General Purpose	DIN Rail Mountable	Surface Mountable	Octal Base	Output Status Lights	Probe Resistance 10k Ohms	Probe Resistance 100k Ohms
ISS-100	•	•														
ISS-101	•	•														
ISS-102AA-DCS	•		•					•								•
ISS-105-ISO	•					•			•					•	•	
ISS-105-ISO-3	•			•			•							•	•	
ISS-105-ISO-4	•				•				•					•	•	
ISS-105-ISO-F	•					•			•					•	•	

MODEL	2 Inputs	2 Outputs	Latching Logic	Selectable Inverted Logic	5 Amp General Purpose	DIN Rail Mountable	Surface Mountable	100K Ohm Fixed	4.7-100K Ohm Adjustable	Isolated Relay	MSHA Evaluated
ISS-102C-M-LC	•	•	•	•	•	•	•	•	•	•	•
ISS-102CCI-M-MC	•	•	•	•	•	•	•	•	•	•	•

MODEL	UL 913	2 Inputs	5 Inputs	2 Outputs	5 Outputs	Latching Logic	Selectable Inverted Logic	5 Amp General Purpose	7 Amp General Purpose	DIN Rail Mountable	Surface Mountable	100k Ohm Mountable	4.7-100k Ohm Fixed	10k Ohm Adjustable	Isolated Form C Relay	Form A Relay
ISS-102A-LC	•	•				•	•	•	•	•	•	•	•	•	•	•
ISS-102ACI-MC	•	•		•		•	•	•	•	•	•	•	•	•	•	•
ISS-105	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•*

* Denotes 4 relays

Intrinsically Safe Relay

Model ISS-100 / ISS-101 single-channel intrinsically safe switch, either din rail mount (100) or 8-pin socket mount (101)



The Model ISS-100 & ISS-101

switches are UL 913 listed as an associated apparatus for interfacing between hazardous and non-hazardous areas. These units must be installed in a non-hazardous area.

For more information on the ISS-100 see: See Appendix A, page 69, Figure 11 for dimensional drawing.

For more information on the ISS-101 see: See Appendix A, page 68, Figure 8 for dimensional drawing.


Features:

ISS-100

- Compact design
- Finger-safe terminals
- DIN rail or surface mountable
- LED state indicator
- Isolated output relay for PLC or control voltage

ISS-101

- Compact design
- LED state indicator
- DIN rail or surface mountable via common octal-base package
- Pop-in replacement for other manufacturers' parts
- Isolated output relay for PLC or control voltage

Approvals: 

Auxiliary Products:

- 8-pin octal socket (P/N: CT0T08-PC)

Available Models:

ISS-100
ISS-101

Must use Model OT08 socket for UL Rating!

Specifications

Input Characteristics	
Supply Voltage	90-120VAC
Output Characteristics	
Output Contact Rating	
Pilot Duty	180VA @120VAC, C300
General Purpose	.8A @120VAC
Relay Contact Life (Electrical)	100,000 cycles min. @ rated load
Relay Contact Life (Mechanical)	10,000,000 cycles
General Characteristics	
Temperature Range	-20° to 55°C (-4° to 131°F)
Maximum Input Power	1.5 W
Wire range	.12 to 20 AWG
Terminal Torque	3.5 to 4.5 in.-lbs. (max. 6 in.-lbs.)
Provides intrinsically-safe circuits in the following locations:	Division 1 and 2 Class I, Groups A,B,C,D; Class II, Groups E,F,G; and Class III
Entity Parameters	$V_{oc} = 16.8V$ $P_o = \frac{V_{oc} \cdot I_{sc}}{4}$ $I_{sc} = 1.2mA$ $L_s = 100mH$ $C_a = 0.39\mu F$

Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI)	IEC 61000-4-3, Level 3, 10V/m
Fast Transients	IEC 61000-4-4, Level 3, 4kV input power
Safety Mark	
UL (OT08 octal socket required)	UL913 Sixth Edition (File #E233355)
Dimensions	
ISS-100	3.5" H x 2.084" W x 2.350" D (88.9 x 52.93 x 59.69mm)
ISS-101	1.750" H x 2.375" W x 4.125" D (with socket) (44.45 x 60.325 x 104.775mm)
Weight	
ISS-100	0.5 lb. (8 oz., 226.8 g)
ISS-101	0.5 lb. (8 oz., 226.8 g)
Mounting Method	
ISS-100	.35mm DIN rail or Surface Mount (#6 or #8 screws)
ISS-101	.DIN rail or surface mount (plug into OT08 socket)

Intrinsically Safe Relay

Model ISS-102

two-channel intrinsically safe switch, din rail mount, options include switch only (-DCS), single latching output (-LC), or multi-function controller (-MC)



The ISS-102

SymCom's Model ISS-102 two-channel, intrinsically-safe switch is designed for multiple uses including a pump-up/pump-down (latching) controller or two-channel switch. Two LEDs indicate the state of the intrinsically-safe inputs and output relays and user-selectable options are available including a variable resistance threshold for float inputs. The ISS-102 enclosure is surface or DIN rail mountable.

-LC Each input channel is active when the corresponding switch is closed. When the lag input (CH2) is activated, the output closes. Applying latching logic, the output contact remains closed until the lead (CH1) and the lag (CH2) inputs are deactivated. Sensitivity is fixed at 100kOhms with a debounce time delay of 2 seconds.

-DCS This dual-channel switch has a debounce delay feature of 0.5 seconds. Resistance probes or switches can be used on its inputs. Two LEDs illuminate the output state of either form A relay. Sensitivity is fixed at 100kOhms with a debounce time delay of 0.5 seconds.


-MC By selecting the proper functionality through the dip switches, you can define a pump-up or pump-down, single or dual channel non-latching switch. The sensitivity adjustment (4.7k-100kOhms) allows you to define the input impedance at which the output relays (one form A & one form C) will change state, with a debounce time delay of 0.5 or 2 seconds.

For more information see:

See Appendix A, page 69, Figure 11 for dimensional drawing.

Features:

- Compact design
- Finger-safe terminals
- DIN rail or surface mountable
- LED state indicator
- 2 input channels

Approvals: 

Available Models:

- ISS-102A-LC (Latching Controller)
- ISS-102AA-DCS (Dual Channel Switch)
- ISS-102ACI-MC (Multi-function Controller)
- ISS-102C-M-LC (MSHA* evaluated)
- ISS-102CCI-M-MC (MSHA* evaluated)

* Mine Safety and Health Administration

Specifications

Input Characteristics		Provides intrinsically-safe circuits	
Supply Voltage	120VAC	in the following locations:	Division 1 and 2
Functional Characteristics			Class I, Groups A,B,C,D;
Debounce Time	0.5 or 2 seconds		Class II, Groups E,F,G;
Output Characteristics			and Class III
Output Contact Rating		Entity Parameters	$V_{oc} = 16.8V$ $P_o = \frac{V_{oc}^2 I_{sc}}{4}$
Pilot Duty	180VA @120VAC, C150		$I_{sc} = 1.2mA$
General Purpose	5A @120VAC		$L_a = 100mH$
Relay Contact Life (Electrical)	100,000 cycles min. @ rated load		$C_a = 0.39\mu F$
Relay Contact Life (Mechanical)	10,000,000 cycles	Standards Passed	
Output Relay Type:		Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air.
ISS-102A-LC	One Form A	Radio Frequency Immunity (RFI)	IEC 61000-4-3, Level 3, 10V/m
ISS-102AA-DCS	Two Form A	Fast Transients	IEC 61000-4-4, Level 3, 4kV input power
ISS-102ACI-MC	One Form A & One isolated Form C	Safety Mark	UL913 Sixth Edition (File #E233355)
ISS-102C-M-LC	One Form C	(except Models ISS-102C-M-LC & ISS-102CCI-M-MC which have been evaluated by MSHA)	
ISS-102CCI-M-MC	Two Form C (one isolated)	Dimensions	3.5" H x 2.084" W x 2.350" D (88.9 x 52.93 x 59.69mm)
General Characteristics		Weight	0.7 lb. (11.2 oz., 317.51 g)
Temperature Range	-20° to 55°C (-4° to 131°F)	Mounting Method	.35mm DIN rail or Surface Mount (#6 or #8 screws)
Maximum Input Power	2 W		
Wire range	12 to 20 AWG		
Terminal Torque	3.5 to 4.5 in.-lbs. (max. 6 in.-lbs.)		

Intrinsically Safe Relay

five-channel intrinsically safe switch, din rail mount, programmable for alternating/control of 2, 3 or 4 pumps or 5-channel relay, optional 5-channel switch only (-ISO)

Model ISS-105



The ISS-105 IS Super Cell


is a "smart" five-channel intrinsically safe relay and pump controller. The IS Super Cell can be configured for a wide variety of applications including alternating or non-alternating duplex, duplex separate pump stop (SPS), triplex and quadplex applications. It can be set up for pump-up or pump-down applications or can be used as a five-channel relay.

The IS Super Cell has a long list of features that are needed for multiple pump applications. The IS Super Cell can indicate low, high and out-of-sequence alarms. If an out-of-sequence alarm occurs, the skipped pump(s) will be started as intended. The Model ISS-105 can be set up to do non-alternating control, alternating control and alternating control with one non-alternating pump. The non-alternating pump is intended for use with an emergency or jockey pump. The IS Super Cell can start an emergency pump once every 50 cycles to keep it working freely. Using the built-in DIP switches, individual pumps can be disabled when taken out of service for repair or maintenance.

For more information see:
See Appendix A, page 70, Figure 13 for dimensional drawing.

Features:

- 5 intrinsically-safe input channels meeting UL913 Sixth Edition
- 4 normally open output relays and 1 SPDT output relay
- Field selectable pump control options
- Duplex pump control
- Duplex SPS (separate pump stop) pump control
- Triplex pump control
- Quadplex pump control
- Out-of-sequence alarm
- High and/or low alarm options depending on the number of pumps and settings
- Audible alarm output
- Meets IEC EMC standards for Electrical Fast Transients (EFT), Electrostatic Discharge (ESD) and Radio Frequency Immunity (RFI)
- DIN rail or surface mountable
- User-selectable alternator/non-alternator option
- Non-alternating pump option for emergency or jockey applications
- Pump disable switches
- Adjustable lag pump delay for all pumping modes
- Adjustable delay-on-make/break timer in five-channel relay mode
- Finger-safe terminals

Approvals: 

Available Models:

- ISS-105 (Intrinsically-Safe & Pump Controller)
- ISS-105-ISO (Intrinsically-Safe Only)
- ISS-105-ISO-3 (3-Channel Intrinsically-Safe Only)
- ISS-105-ISO-4 (4-Channel Intrinsically-Safe Only)
- ISS-105-ISO-F (IS Only with Fast Trip Relays)

Specifications

Input Characteristics	
Supply Voltage	120VAC
Frequency	50*/60Hz
Output Characteristics	
Relay Output Rating	
Pilot Duty	480VA @ 240VAC, B300
General Purpose	.7A @ 240VAC
Relay Contact Life (Electrical)	100,000 cycles min. @ rated load
Relay Contact Life (Mechanical)	10,000,000 cycles
General Characteristics	
Temperature Range	-40° to 55°C (-40° to 131°F)
Maximum Input Power	.5 W
Wire range	.12 to 20 AWG
Recommended Terminal Torque	.35 to 4.5 in.-lbs. (max. 6 in.-lbs.)
Provides intrinsically-safe circuits in the following locations:	Division 1 and 2 Class I, Groups A,B,C,D; Class II, Groups E,F,G; and Class III
Entity Parameters	$V_{oc} = 16.8V$ $P_o = \frac{V_{oc} \cdot I_{sc}}{4}$ $I_{sc} = 1.2mA$ $L_a = 100mH$ $C_a = 0.39\mu F$

Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air.
Radio Frequency Immunity (RFI)	IEC 61000-4-3, Level 3, 10V/m
Fast Transients	IEC 61000-4-4, Level 3, 4kV input power 2kV inputs/outputs
Safety Marks	
UL	UL913 Sixth Edition (File #E233355)
Dimensions	3.703" W x 5.025" L x 2.35" H (94.06 x 127.64 x 59.69mm)
Weight	1.2 lbs. (19.2 oz., 544.31 g)
Mounting Method	.35 mm DIN rail or Surface Mount (#6 or #8 screws)

*Note: 50Hz will increase all delay timers by 20%.