

# KCS01X Contactor

100A/28Vdc - 600Vdc Bi-Directional Power Switching  
 SPST-NO Form X  
 Integrated Current Sensor and Current Trip Function

## Product Facts:

- Lowest cost, smallest 100A hermetically sealed contactor in the industry with integrated Bi-directional Current Sensing and Trip Function
- Bottom mount – not position sensitive.
- Hermetically Sealed – Operates in explosive/harsh environments without oxidation or contamination of contacts, including long periods of non-operation.
- Typical applications include Ground Vehicle Power Systems, Power/motor control circuit isolation, Circuit Protection and safety. Suitable for Low Voltage up to 600Vdc power switching.
- Electronic Two-Coil Economizer with Internal Suppression



AEROSPACE,  
DEFENSE & MARINE

**Kilovac** Brand

## PRODUCTION DATA SHEET

10-18-2016 Rev

PH. 805-220-2020 FAX 805-220-2075  
 550 LINDEN AVE, CARPINTERIA, CA 93013

## KCS01X Contactor

Dimensions shown for reference only. Specifications subject to change.

CAGE CODE

18741

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NONE

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## General Specifications

Physical Data	Units	
Contact Arrangement: Main Contacts		SPST-NO (form X)
Dimensions		See Figure 1
Weight, Nominal	g	145
<b>Environmental Data</b>		
Shock, 11ms ½ sine (operating)	G peak	20
Sine Vibration, 20 G <sub>pk</sub>	Hz	55-2000
Operating Temperature Range	°C	-40 to +105
Noise Emission (at 100 mm distance)	dB(a)	70
<b>Electrical Data</b>		
Voltage Rating: Main Contacts Switching (max)	Vdc	600
Current Rating, Continuous: Main Contacts	A	100
Short Term Current (3 min)		200
Contact Resistance: Main Contacts	mΩ	0.75 max @ rated current
Resistive Load Performance:		
	Cycles	See Figure 2
600A (make only)	Cycles	10
Maximum Short Circuit Current (1/2 cycle, 60 Hz) (through closed contacts)	A	1250
Mechanical Life	Cycles	10 <sup>6</sup>
Dielectric Withstand Voltage:		
Between Open Contacts	Vrms	2200
Contacts to Coil	Vrms/Vdc	1500
Insulation resistance		
Terminal to Terminal/ Terminals to Coil	MΩ	100 min @ 500Vdc new 50 min @ 500Vdc end of life

### Coil Data @ 20C (Internal Two-Coil Economizer)

#### 12V Coil

#### 24V Coil

	Vdc	9-14	18-28
Coil Voltage Range	Vdc	9-14	18-28
Nominal Pickup Current	A	4.5	4.0
Nominal Holding Current	A	0.22	.125
Pickup Voltage	Vdc	≥ 9	≥ 18
Dropout Voltage	Vdc	≤ 5	≤ 12
Pickup Pulse (max)	ms	40	40
Coil Resistance +/-5%	Ω	2.5 Pickup/54 Hold	7.5 Pickup/210 Hold
Coil Power Holding Power	W	2.7	3.0
Main Contacts:			
Operate Time (max)	ms	20	20
Operate Bounce (max)	ms	3	3
Release time	ms	5	5
<b>Current Sensing</b>			
Sensing Range (8% accurate -40C to +105C)	A	+/- 10-150	+/- 10-150
Quiescent Output @ I = 0	Vdc	2.5	2.5
Output Voltage vs. Current	Vdc	$V(I) = +/- I(.013) + 2.5$	$V(I) = +/- I(.013) + 2.5$
Current Trip Point vs. Setpoint Resistance	A	$I = 2^*(R)^{1/2}$	
Hysteresis (-40C to + 105C)	%	8% of Full Scale Output	



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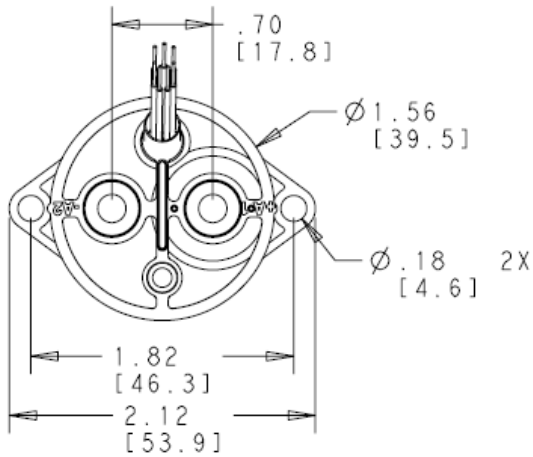
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**Figure 1**  
**Product Dimensions**

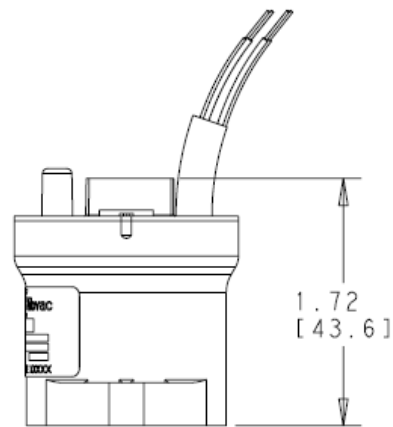
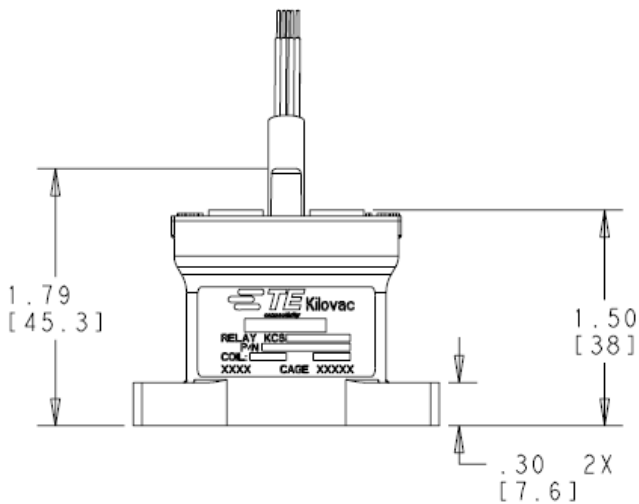


MOUNTING - 2 PLCS (HARDWARE NOT SUPPLIED)  
2 X M4 BOLT, LOCKWASHER AND WASHER  
TORQUE: 20 IN-LBS (2.3 NM) MAX

LOAD TERMINALS-2 PLCS (HARDWARE NOT SUPPLIED)  
2 X M5 BOLT, LOCKWASHER AND WASHER  
TORQUE: 30-40 IN-LBS (3.4 TO 4.5 NM)  
DEPTH: 7 THREADS MAX



OBSERVE PROPER POLARITIES FOR CONTROL LINES  
UNTERMINATED WIRES - USE ESD HANDLING PROCEDURES



LEAD LENGTH 15" +/- 0.5" FROM TOP OF TERMINAL SEAT  
26 AWG RED = +Vcoil  
26 AWG BLACK = RETURN  
26 AWG PURPLE = TRIP DELAY/DISABLE  
26 AWG ORANGE = CURRENT SENSE POWER  
26 AWG WHITE = CURRENT SENSE OUTPUT  
26 AWG BLUE = Rx CONNECTION  
26 AWG YELLOW = Rx CONNECTION



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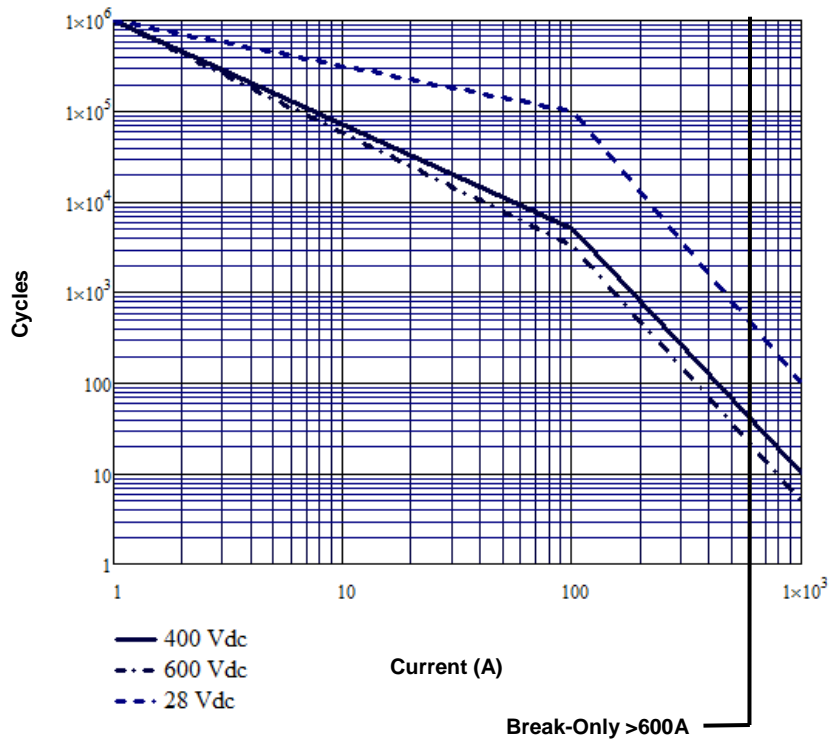
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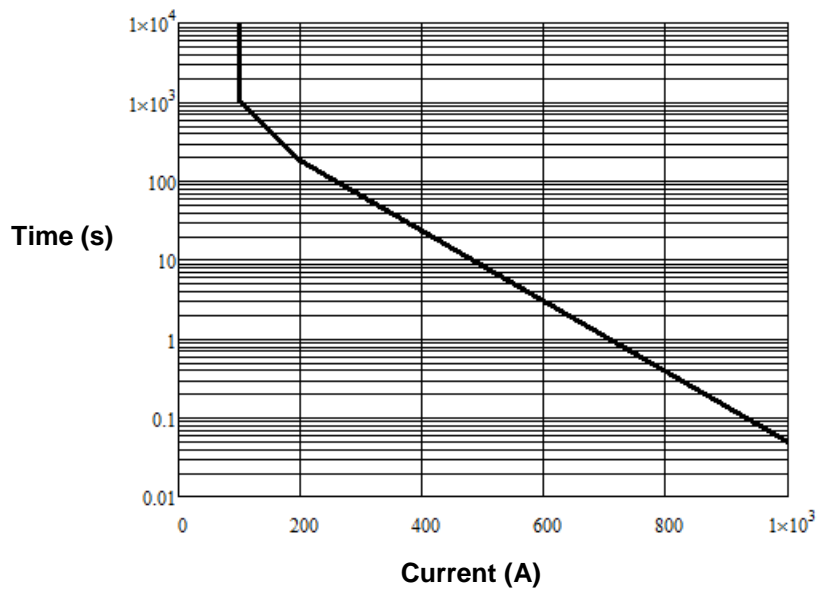
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**Figure 2**

Resistive Load Switching (make/break)



**Current Carry vs. Time**



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## Trip Function/Trip Delay

**HARNESS:**

WIRE LENGTHS 15"

ALL CONDUCTORS M22759/33, 26 AWG

RED = V+

BLACK = RTN

PURPLE = TRIP DISABLE/PROGRAM TIME DELAY

ORANGE = CONNECT TO V+ FOR TRIP SENSING AND CURRENT SENSING

WHITE = CURRENT SENSE OUTPUT,  $V(I) = 2.5+/-0.013*I$  VOLTS

BLUE = Rx

YELLOW = Rx

CONNECT Rx ACROSS BLUE AND YELLOW FOR TRIP SETPOINT

CONNECT PURPLE TO RTN TO DISABLE TRIP FUNCTION OR

CONNECT PURPLE TO EXTERNAL CAPACITOR TIED TO RTN TO DELAY TRIP, 7ms/uF

CONNECT ORANGE TO V+ TO ENABLE TRIP AND CURRENT SENSING

RESET TRIPPED CONTACTS BY CYCLING V+ OFF TO ON

INTRINSIC TRIP DELAY (BLUE/YELLOW NOT CONNECTED TO Rx) = 14ms

Input						Output	
Control (Orange)	V+ (Red)	RTN (Black)	MAIN CONTACT (CURRENT AMP)	Trip Disable/ Time delay (Purple)	Trip set Rx (Blue) Trip Set Ax (Yellow)	Hall Output (volt) (WHT)	Main Contacts Top post
0	Vnom	0	0	NON-ACTIVE	NON-ACTIVE	0	ON (NO TD)
0	0	0	0	NON-ACTIVE	NON-ACTIVE	0	OFF(NO TD)
1	0	0	0	OPEN	OPEN	2.5	OFF
1	Vnom	0	180A±7%	OPEN	30K	4.84 (2.5V when relay trip)	RELAY TRIP OPEN AFTER 14mSec.
1	0 then 1 remove and re-apply power	0	≤167	OPEN	30K	2.5	ON (NO TD)
1	Vnom	0	0	GND (TRIP DISABLE)	X	2.5	ON (NO TD)
1	Vnom	0	180A±7%	GND (TRIP DISABLE)	X	4.84	ON (NO TD)
1	0	0	0	GND (TRIP DISABLE)	X	2.5	OFF(NO TD)
1	Vnom	0	0	1uF is added between Purple and RTN	30K	2.5	ON (NO TD)
1	Vnom	0	180A±7%	10uF is added between Purple and RTN	30K	4.84 (2.5V when relay trip)	RELAY TRIP OPEN AFTER 82mSec.
1	Vnom	0	180A±7%	100uF is added between Purple and RTN	30K	4.84 (2.5V when relay trip)	RELAY TRIP OPEN AFTER 720mSec.
1	0 then Vnom remove and re-apply power	0	≤167	100uF is added between Purple and RTN	30K	2.5	ON (NO TD)



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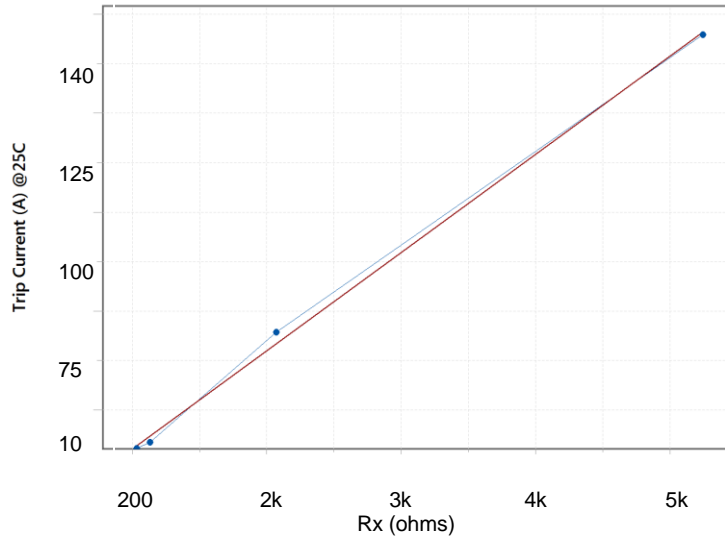
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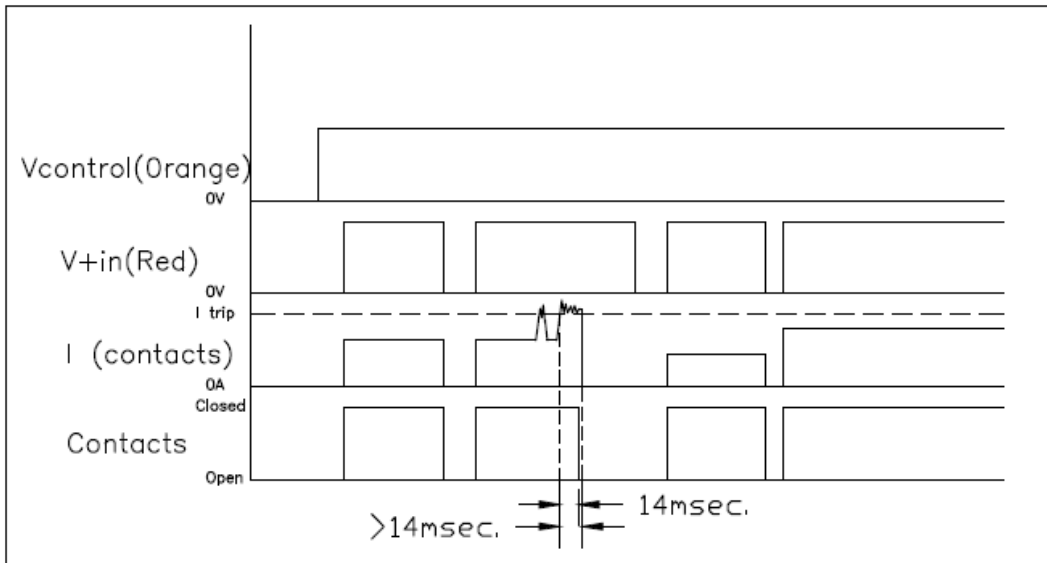
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**Trip Set Point Resistor Curve**  
**10A -150A**



**Timing Diagram**



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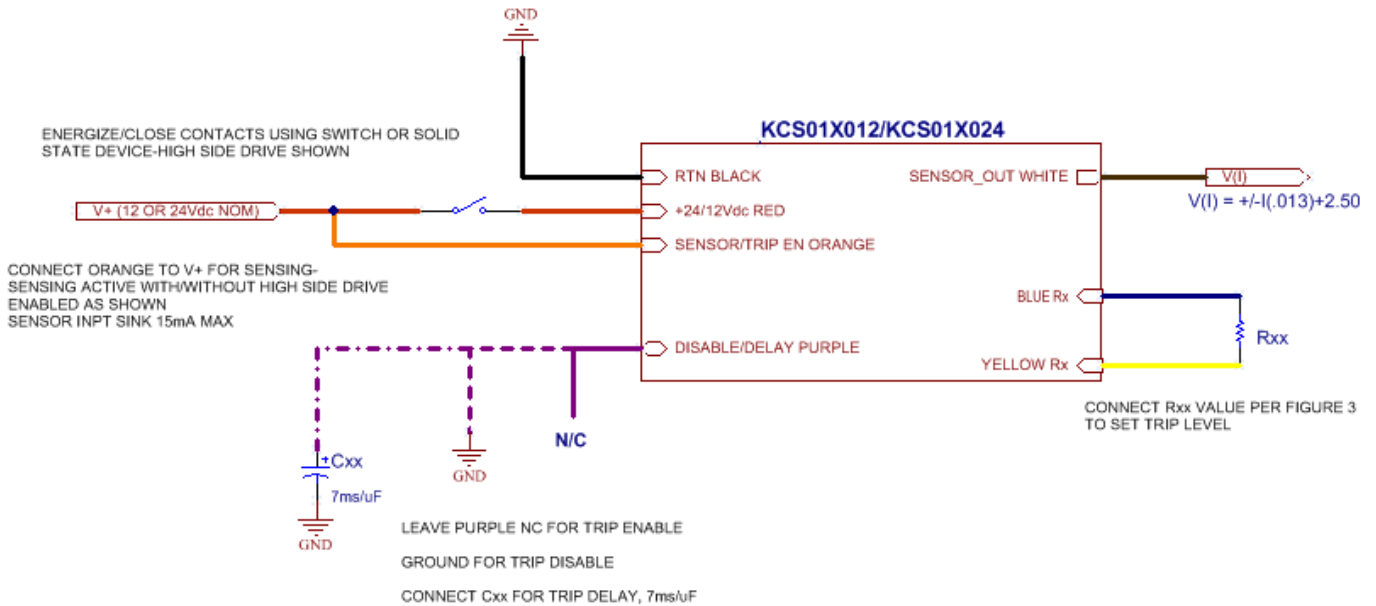
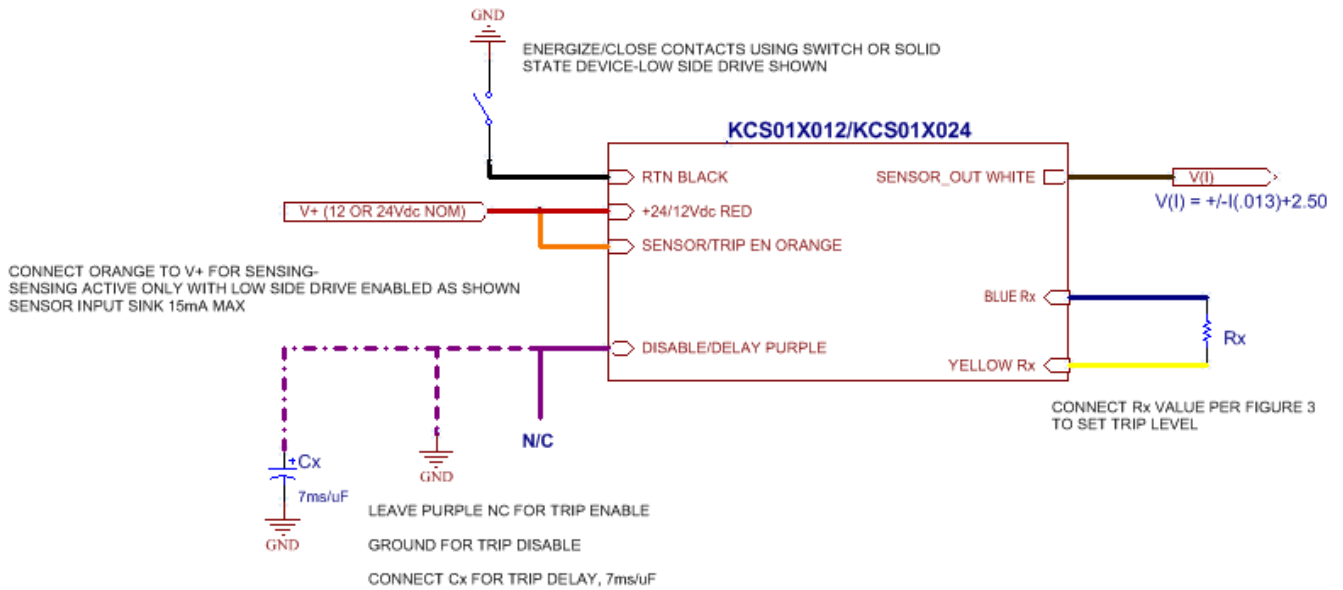
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## Connection Diagram



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### PN Selection

	K	CS	01	X	024E	A	C	A
K = Kilovac								
CS = Current Sensing								
01 = Size 01 (EV100 Package)								
X = Form X, Normally Open								
012E = 12V Coil Economized								
024E = 24V Coil Economized								
A = 15 inch coil leads								
C = M5 Female Terminals								
A = Bottom Mount								



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