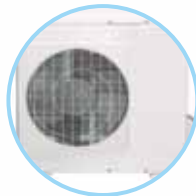


Electronic Centrifugal Switches

For single phase induction Motors



We develop and manufacture the state of the art starting switches for single phase induction motors. Our innovative and effective solutions have been successfully adopted in numerous residential and commercial machine applications throughout the world. Please feel free to contact us regarding your motor applications and discover what our revolutionary solutions can do for your specific needs.

Description

For last several decades single-phase AC motors have utilized mechanical centrifugal switches to disengage auxiliary coil from main coil. Electronic Centrifugal Switch (ECS) is a reliable solid-state switch that would duplicate the functions of the conventional centrifugal switch with additional benefits of the electronic device. Speed voltage induced in a start winding is constantly monitored by the voltage sensing circuitry of ECS, and the internal microcontroller calculates motor speed-torque curve in order to interrupt the start winding current at the point of breakdown torque detected.

At this point, the motor speed normally accelerates to 60~80% of the synchronous speed (see Figure 1 torque-speed curve). When the motor encounters overload conditions or the motor speed decreases to approximately 20~40% of the synchronous speed, ECS reconnects the start winding.

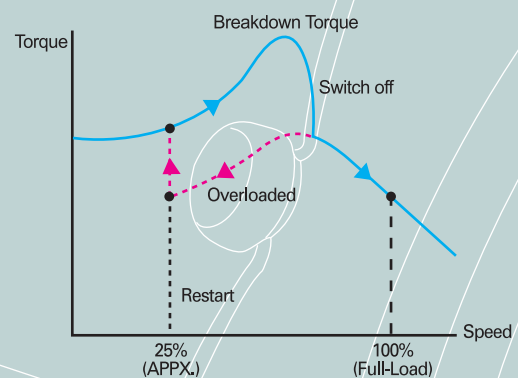


Figure 1 : Torque - Speed Curve

Design Features

- Extended life of contacts by using a reliable snubberless TRIAC
- Improved low-voltage motor starting efficiency
- Neither switching noise nor trembling of contacts
- High compatibility with general purpose motors as well as application specific motors
- Protects auxiliary winding circuits including starting capacitors from locked rotor
- Returns immediately from instant reverse rotation due to unwanted mechanical shocks
- Easy selection of part numbers, nearly independent of motor ratings or drop-out voltages
- Easy installation and maintenance, mounted on inside/outside standard motor frames
- Sealed with epoxy resin, insensitive to dirt, dust, moisture, and vibration
- Normally open contacts, no electrical braking with power interruptions
- Discharges starting capacitors (for capacitor start motors only)
- Rohs compliant



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Model chart

Model	Switching part	Motor ratings						
		Hp	Starting Type	Pole	Freq.	Certification		
ECS112P	T1235-600G	0.12 ~ 0.5hp	Capacitor start	2,4,6	50/60Hz	CQC,TUV,UL		
ECS112PS			Split phase			CQC,TUV,UL		
ECS125P	T2535-600G	0.5 ~ 3.0hp	Capacitor start			CQC,TUV,UL		
ECS125PS			Split phase			CQC,TUV,UL		
ECS125T	BTB24-600BW	0.5 ~ 3.0hp	Capacitor start			TUV,UL		
ECS125TS			Split phase			TUV,UL		
ECS124L			Capacitor start			UL		
ECS124P			Capacitor start			UL		
ECS225P			BTA24-800BW			0.5 ~ 6.0hp	Capacitor start	CQC,TUV,UL
ECS225PS							Split phase	CQC,TUV,UL
ECS225T	Capacitor start	CQC,TUV,UL						
ECS225TS	Split phase	CQC,TUV,UL						
ECS224L	Capacitor start	UL						
ECS224P	Capacitor start	UL						

Electrical characteristics (Typical ratings other than specified)

Model	112PS	112P	125PS	125P	125TS	125T	124L	124P	225PS	225P	225TS	225T	224L	224P
Non repetitive peak current @half cycle. 50/60Hz	120A		250A											
Thermal impedance @7.4sec, 25A °C / W	2.3	2.3	2.1	2.1	0.9	0.9	0.9	0.7	0.8	0.8	0.9	0.8	0.9	0.7
Switch-on delay time @50/60 Hz, unit : full cycle	1	2	2	2	1	2	2	2	1	2	1	2	2	2
*Discharge resistor (unit : KΩ)	-	12	-	12	-	5.0	5.0	8.0	-	6.0	-	6.0	8.0	30.0
**Forced switch-off locked rotor time (unit : Sec.)	60Hz	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	3.8	7.4	3.8	7.4	3.8
	50Hz	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	4.6	8.8	4.6	8.8	4.6
**Maximum Number of successive restarts	-	9	-	9	-	9	9	9	-	3	-	3	9	3
Forced switch-off starting coil voltage	200V ~ 250V								300V ~ 350V					
line voltage, VL	100 ~ 120V								200V ~ 250V					
Dielectric strength, between case and pins	> 2500VDC								> 3750VDC					
Insulation resistance, between case and pins	> 10MΩ													
Ambient air temperature	- 20°C ~ 60°C													

*For frequent (high duty) restarts, it is recommended to connect an additional resistor in parallel with starting capacitor.

**These can be initialized by either power interruptions or successful motor run states.



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Typical wiring

Model	100~120VAC 50/60Hz Motor Operation	200~240VAC 50/60Hz Motor Operation
ECS112PS ECS125PS ECS125TS		
ECS112P ECS125P ECS124P		
ECS125T ECS124L *		
ECS225PS ECS225TS	Not applicable	
ECS224P	Not applicable	
ECS225P ECS225T ECS224L * ECS224P	Not applicable	


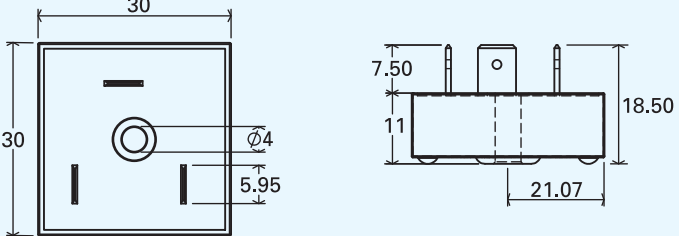

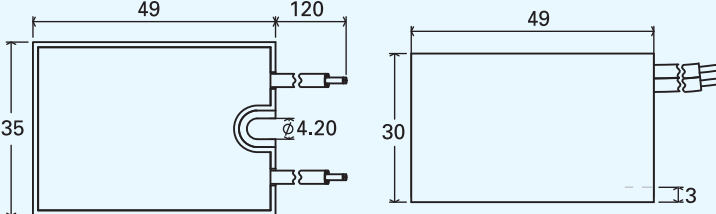

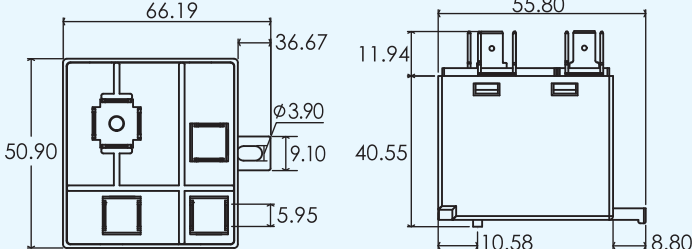

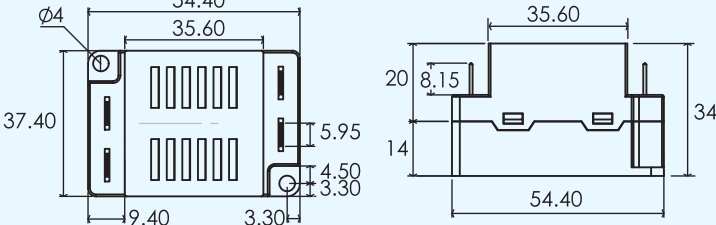

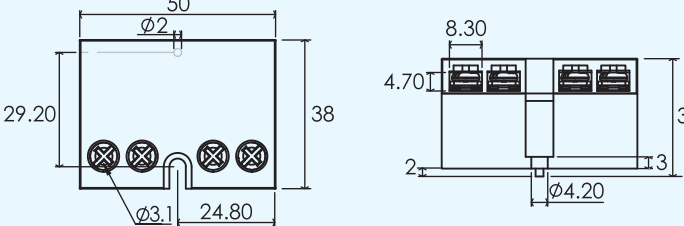

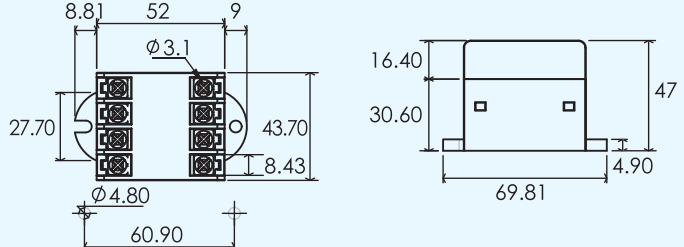
*pin matching : 1-Red 2-White 4-Black 5-Blue

Cr : Run Capacitor, Cs : Start Capacitor, M1, M2 : Main Coil, ST : Auxiliary Coil

Electronic Centrifugal Switches

For single phase induction Motors


Dimension


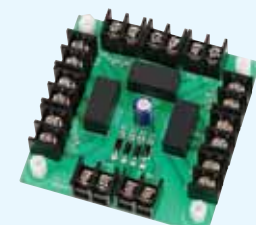
Model	Type	Dimension	Weight (g)
ECS112P ECS112PS ECS125P ECS125PS			15
ECS124L ECS224L			48 / 62
ECS124P ECS224P			60 / 82
ECS225P ECS225PS			58
ECS125T ECS125TS ECS225T ECS225TS			52 / 58
ECS124T			92

Electronic Centrifugal Switches

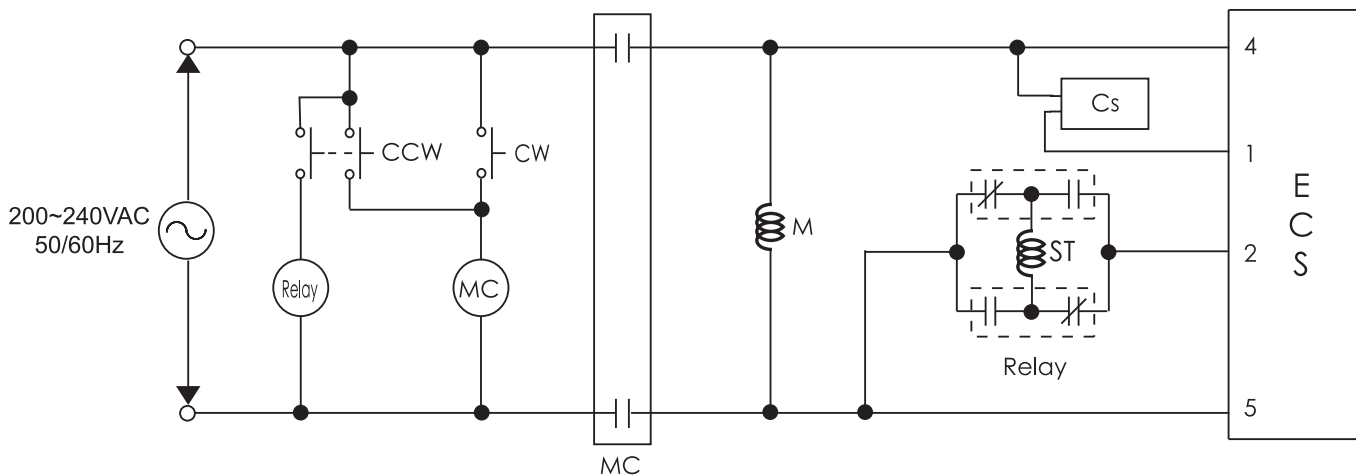
For single phase induction Motors

Accessories

Start Capacitor			Run Capacitor		
	110V	100uF		250V	10uF
		200uF			20uF
		300uF			30uF
		400uF			50uF
	220V	100uF		400V	10uF
		150uF			20uF
		200uF			30uF
		250uF			50uF

Power Relay & Socket			I/O			
	Coil	AC 220V		Input	AC 220V	
		AC 110V			AC 110V	
		DC 24V			AC 24V	
	Contact	10A 250VAC		RELAY	Output	1A 120VAC
		10A 30VDC				2A 24VDC
	Pole	2C		Pole	6C	

Example: Typical wiring for a bi-directional (hoist) Motor



Applications

Compressors

Shredders

Hoists

Washing machines

Fans and Blowers

Refrigerators

Ice makers

Mixers

Gate lifts

Pumps

Sprayers

Tapping machines



Certification



IEC/ EN 60730-1(Automatic electrical controls for household and similar use)

IEC/ EN 60730-2-10(particular requirements for motor-starting relays)

Patent No.(Kor)

0889186 , 0929064, 0957681

Selection

ECS - 1 **25** **P** **S**

① ② ③ ④ ⑤

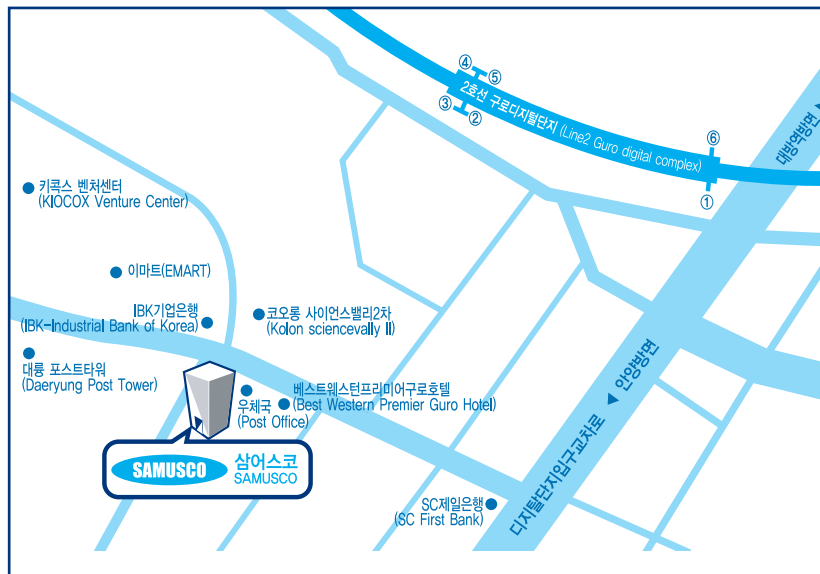
① **Basic Designation**
ECS(Electronic Centrifugal Switch)

② **Input Voltage**
1 – AC 120V
2 – AC 240V

③ **Auxiliary coil current**
12 – 12A
24 – 24A
25 – 25A

④ **Connector type**
L – Lead wire type
T – Screwed terminal type
P – Pin type

⑤ **Motor starting type(optional)**
S – Split phase start
Blank – capacitor start



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