

Control & Protection

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1 Phase SSR

KSR Series



Part Number Description

KSR - 1 2 3 4 5

① Load Voltage	2 : 90 ~ 240VAC (Low Voltage)			5 : 90 ~ 480VAC (High Voltage)
② Load Current	005 : 5A	015 : 15A	030 : 30A	040 : 40A
	050 : 50A	060 : 60A	080 : 80A	
③ Function	Z : Zero Cross			
④ Control Voltage	D : 24 VDC (4 ~ 32VDC)		A : 220 VAC (90 ~ 240VAC 50/60Hz)	
⑤ Heatsink	No mark : Standard (without Heatsink)		H : Heatsink Type	HF : Heatsink + Fan Type

	Load Voltage Range	Model	Function	Rated Control Voltage	Heatsink
Low Voltage	5A 90 ~ 240VAC	KSR 2005□□□□	Z : zero cross	D : 24VDC A : 220VAC	No mark : Standard Type H : Heatsink Type HF : Heatsink + Fan Type
	15A 90 ~ 240VAC	KSR 2015□□□□			
	30A 90 ~ 240VAC	KSR 2030□□□□			
	40A 90 ~ 240VAC	KSR 2040□□□□			
	50A 90 ~ 240VAC	KSR 2050□□□□			
	60A 90 ~ 240VAC	KSR 2060□□□□			
	80A 90 ~ 240VAC	KSR 2080□□□□			
High Voltage	15A 90 ~ 480VAC	KSR 5015□□□□		A : 220VAC	HF : Heatsink + Fan Type
	30A 90 ~ 480VAC	KSR 5030□□□□			
	40A 90 ~ 480VAC	KSR 5040□□□□			
	50A 90 ~ 480VAC	KSR 5050□□□□			
	60A 90 ~ 480VAC	KSR 5060□□□□			
	80A 90 ~ 480VAC	KSR 5080□□□□			

General Specification

► Input Ratings (Ambient Temperature 25°C)

Control Voltage Levels				
Rated Control Voltage	Control Voltage Range	Pick-up Voltage	Drop-out Voltage	Input Current
24VDC	4 ~ 32VDC	Min. 4VDC	Max. 1.4VDC	10±3mA
220VAC	90 ~ 240VAC	Min. 90VAC	Max. 50VAC	10±5mA

► Load Ratings

Type		Low Voltage					High Voltage			
Item		5A	15A	30A	40A	50A	15A	30A	40A	50A
Rated Load Current										
Rated Load Voltage		220VAC (50/60Hz)					440VAC (50/60Hz)			
Load Voltage Range		90 - 240VAC (50/60Hz)					90 - 480VAC (50/60Hz)			
Load Current Range		0.5A - Rated Current (Ambient Temperature 25°C)								
Peak Voltage		600V					1,200V			
Single Cycle		84	260	420	420	520	250	370	370	500
Surge Current Resistance										

General Specification

► General Ratings

Item	Type	Low Voltage	High Voltage
Pick-up Times		Cycle of ½ Load + Max. 1 ms	
Drop-out Times		Cycle of ½ Load + Max. 1 ms	
Output On Voltage Drop		Max. 1.6V (RMS)	Max. 1.8V (RMS)
Leakage Current		Max. 10mA (200VAC)	Max. 20mA (480VAC)
Insulation Resistance		Min. 100MΩ (500VDC)	
Dielectric Strength		5,000VAC, 50/60Hz for 1 minute	
Vibration Resistance		10 - 55 - 10Hz Peak Amplitude 0.35mm (Durable Amplitude 0.7mm)	
Shock Resistance		294m/s ²	
Storage Temperature		-30 to +100°C (with no icing or condensing)	
Ambient Temperature		-30 to +80°C (with no icing or condensing)	
Ambient Humidity		45 to 85%RH (with no condensing)	

► Over Temperature Alarm Specification

Output Type		NPN Open Collector
Normal State		Closed
Maximum Switching Current		50mADC
Alarm Voltage Drop	Typical	2.8VDC
	Maximum	4VDC
Indication		Red LED

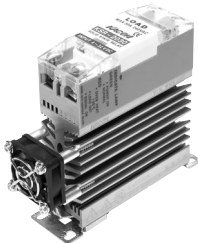
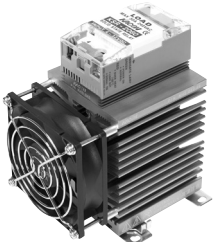
Product Selection

		Description	Load	Input	Load Current	Output Voltage Type	Part Number	
							90 ~ 240VAC (Low Voltage)	90 ~ 480VAC (High Voltage)
	Standard Type	terminal	3.5 - 4.0	2.0 - 3.5	5A	DC	KSR-2005ZD	
		screw	M4.0	M3.5		AC	KSR-2005ZA	
		torque max /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSR-2015ZD	KSR-5015ZD
		screw	M4.0	M3.5		AC	KSR-2015ZA	KSR-5015ZA
		torque max /N·m	1.2	0.8				
	Standard Type	terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSR-2030ZD	KSR-5030ZD
		screw	M4.0	M3.5		AC	KSR-2030ZA	KSR-5030ZA
		torque max /N·m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSR-2040ZD	KSR-5040ZD
		screw	M6.0	M3.5		AC	KSR-2040ZA	KSR-5040ZA
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSR-2050ZD	KSR-5050ZD
		screw	M6.0	M3.5		AC	KSR-2050ZA	KSR-5050ZA
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSR-2060ZD	KSR-5060ZD
		screw	M6.0	M3.5		AC	KSR-2060ZA	KSR-5060ZA
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSR-2080ZD	KSR-5080ZD
		screw	M6.0	M3.5		AC	KSR-2080ZA	KSR-5080ZA
		torque max /N·m	2.5	0.8				

1 Phase SSR

KSR Series

Product Selection

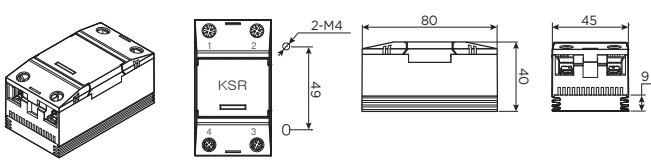
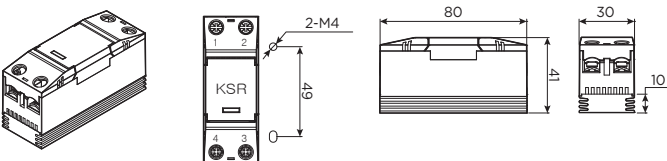
		Description	Load	Input	Load Current	Output Voltage Type	Part Number	
							90 ~ 240VAC (Low Voltage)	90 ~ 480VAC (High Voltage)
	Heatsink type	terminal	3.5 - 4.0	2.0 - 3.5	5A	DC	KSR-2005ZDH	
		screw	M4.0	M3.5		AC	KSR-2005ZAH	
		torque max /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSR-2015ZDH	KSR-5015ZDH
		screw	M4.0	M3.5		AC	KSR-2015ZAH	KSR-5015ZAH
		torque max /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSR-2030ZDH	KSR-5030ZDH
		screw	M4.0	M3.5		AC	KSR-2030ZAH	KSR-5030ZAH
		torque max /N·m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSR-2040ZDH	KSR-5040ZDH
		screw	M6.0	M3.5		AC	KSR-2040ZAH	KSR-5040ZAH
		torque max /N·m	2.5	0.8				
terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSR-2050ZDH	KSR-5050ZDH		
screw	M6.0	M3.5		AC	KSR-2050ZAH	KSR-5050ZAH		
torque max /N·m	2.5	0.8						
terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSR-2060ZDH	KSR-5060ZDH		
screw	M6.0	M3.5		AC	KSR-2060ZAH	KSR-5060ZAH		
torque max /N·m	2.5	0.8						
terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSR-2080ZDH	KSR-5080ZDH		
screw	M6.0	M3.5		AC	KSR-2080ZAH	KSR-5080ZAH		
torque max /N·m	2.5	0.8						
	Heatsink + Fan Type	terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSR-2015ZDHF	KSR-5015ZDHF
		screw	M4.0	M3.5		AC	KSR-2015ZAHF	KSR-5015ZAHF
		torque max /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSR-2030ZDHF	KSR-5030ZDHF
		screw	M4.0	M3.5		AC	KSR-2030ZAHF	KSR-5030ZAHF
		torque max /N·m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSR-2040ZDHF	KSR-5040ZDHF
		screw	M6.0	M3.5		AC	KSR-2040ZAHF	KSR-5040ZAHF
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSR-2050ZDHF	KSR-5050ZDHF
		screw	M6.0	M3.5		AC	KSR-2050ZAHF	KSR-5050ZAHF
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSR-2060ZDHF	KSR-5060ZDHF
		screw	M6.0	M3.5		AC	KSR-2060ZAHF	KSR-5060ZAHF
		torque max /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSR-2080ZDHF	KSR-5080ZDHF
		screw	M6.0	M3.5		AC	KSR-2080ZAHF	KSR-5080ZAHF
		torque max /N·m	2.5	0.8				

Dimension

(mm)

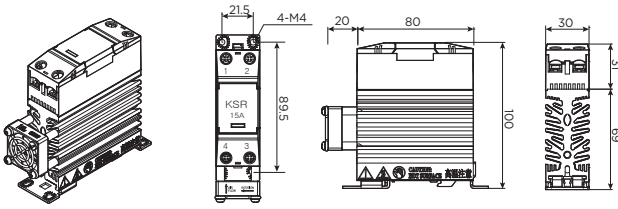
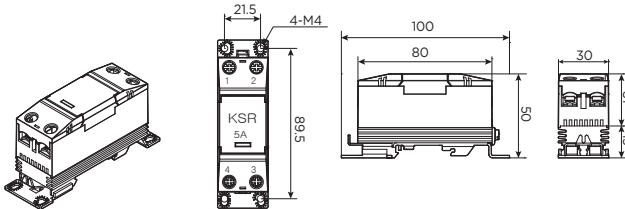
Standard Type 5 / 15 / 30A

Standard Type 40 / 50 / 60 / 80A

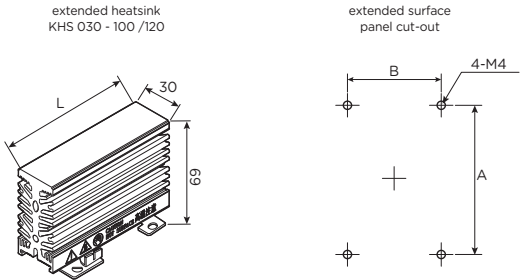


Heatsink Type 5A

Heatsink + Fan Type 15 / 30A

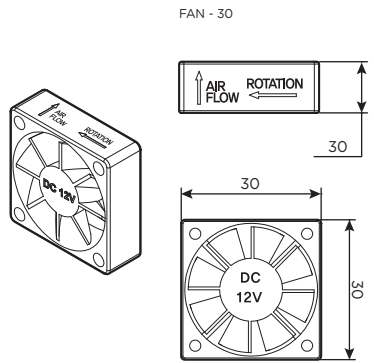


Heatsink + Fan Type



• rated voltage : 12VDC only

	L	A	B
KHS 030-	100	65	38
	120		



- Install the extended heatsink KHS 030-100/120 and FAN-30 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed :

- Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- Maximized heat radiation efficiency/doubled device life/safety ensured

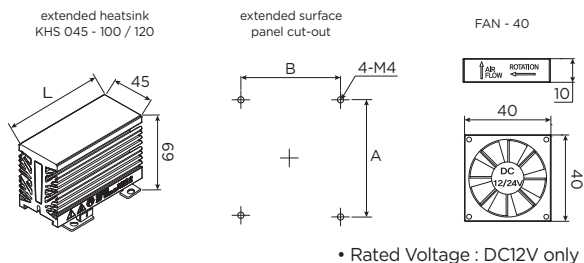
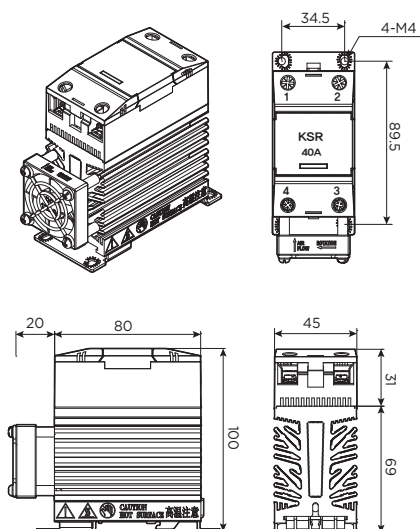
1 Phase SSR

KSR Series

Dimension

(mm)

Heatsink + Fan Type 40A



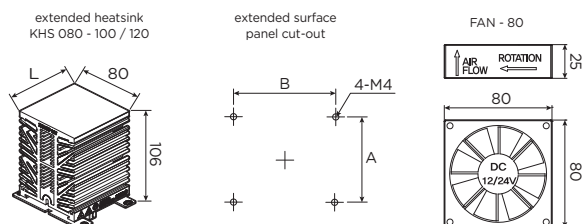
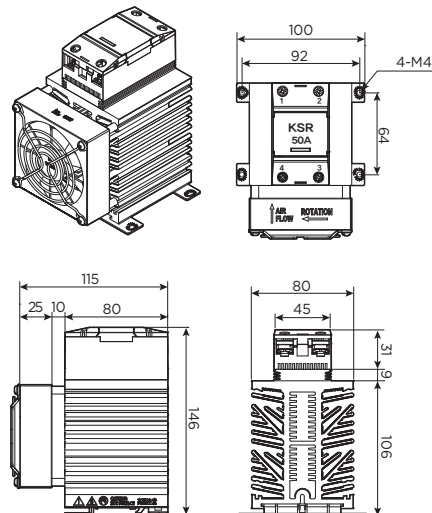
	L	A	B
KHS 045-	100	65	53
	120		

- Install the extended heatsink KHS 045-100/120 and fan-40 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating
(At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Heatsink + Fan Type 50A



	L	A	B
KHS 080-	100	64	92
	120		

Rated Voltage :
DC12V/DC24V
AC110V/AC220V
(50/60Hz)
Material : Al alloy

- Install the extended heatsink KHS 080-100/120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

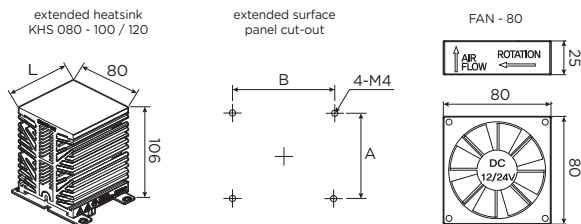
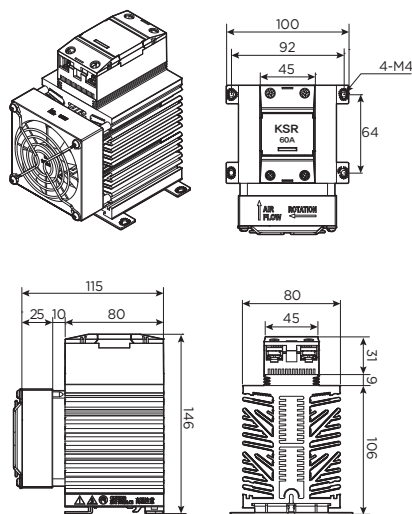
When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating
(At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Dimension

(mm)

Heatsink + Fan Type 60A



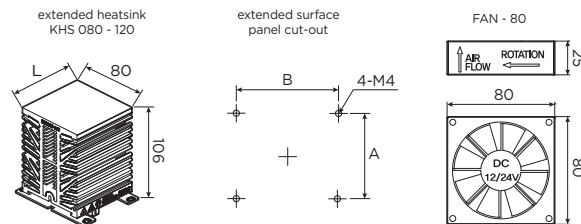
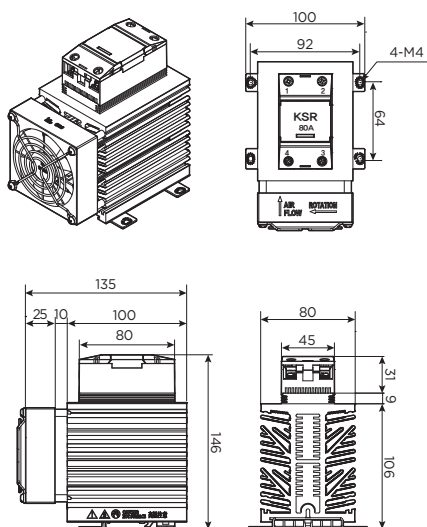
	L	A	B	
KHS 080-	100	64	92	Rated Voltage : DC12V-DC24V AC110V-AC220V (50/60Hz)
	120			Material : Al alloy

- Install the extended heatsink KHS 080-100/120 and Fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow Fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Heatsink +Fan Type 80A



	L	A	B	
KHS 080-	120	64	92	Rated Voltage : DC12V-DC24V AC110V-AC220V (50/60Hz)
				Material : Al alloy

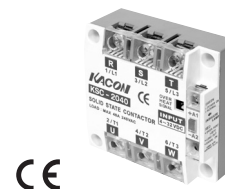
- Install the extended heatsink KHS 080-120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed:

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

3 Phase SSR

KSC Series



Part Number Description

KSC - **1** **2** **3** **4** **5**

❶ Load Voltage	2 : 90 ~ 240VAC (Low Voltage)		5 : 90 ~ 480VAC (High Voltage)			
❷ Load Current	015 : 15A	030 : 30A	040 : 40A	050 : 50A	060 : 60A	080 : 80A
❸ Function	Z : Zero Cross					
❹ Control Voltage	D : 24 VDC (4 ~ 32VDC)		A : 220 VAC (90 ~ 240VAC 50/60Hz)			
❺ Heatsink	No mark : Standard (without Heatsink) Type		H : Heatsink Type		HF : Heatsink + Fan Type	

General Specification

	Load Voltage Range	Model	Function	Rated Control Voltage	Heatsink
Low Voltage	15A 90 ~ 240VAC	3 KSC 2015□□□	Z : zero cross	D : 24VDC	No mark : Standard Type
	30A 90 ~ 240VAC	3 KSC 2030□□□			
	40A 90 ~ 240VAC	3 KSC 2040□□□			
	50A 90 ~ 240VAC	3 KSC 2050□□□			
High Voltage	15A 90 ~ 480VAC	3 KSC 5015□□□		A : 220VAC	H : Heatsink Type
	30A 90 ~ 480VAC	3 KSC 5030□□□			
	40A 90 ~ 480VAC	3 KSC 5040□□□			
	50A 90 ~ 480VAC	3 KSC 5050□□□			

► Input Ratings (ambient temperature 25°C)

Control Voltage Levels				
Control Voltage	Control Voltage Range	Pick-up Voltage	Drop-out Voltage	Input Current
24VDC	4 ~ 32VDC	Min. 4VDC	Max. 1.4VDC	30±3mA
220VAC	90 ~ 240VAC	Min. 90VAC	Max. 50VAC	30±5mA

► Load Ratings

Type Item	Low Voltage				High Voltage			
Rated Load Current	15A	30A	40A	50A	15A	30A	40A	50A
Rated Load Voltage	220VAC (50/60Hz)				440VAC (50/60Hz)			
Load Voltage Range	90 ~ 240VAC (50/60Hz)				90 ~ 480VAC (50/60Hz)			
Load Current	0.5A ~ rated current (ambient temperature 25°C)							
Peak Voltage	600V				1,200V			
Single Cycle	260	420	420	520	250	370	370	500
Surge Current Resistance								

General Specification

► General Ratings

Item	Type	Low Voltage	High Voltage
Pick-up Time		Cycle of Load ½ + Max. 1ms	
Drop-out Time		Cycle of Load ½ + Max. 1ms	
Output On Voltage Drop		Max. 1.6V (RMS)	Max. 1.8V (RMS)
Leakage Current		Max. 10mA (AC200VAC)	Max. 20mA (AC480V)
Insulation Resistance		Min. 100MΩ (DC500VDC)	
Dielectric Strength		5,000VAC, 50/60Hz for 1 minute	
Vibration Resistance		10 - 55 - 10Hz Peak Amplitude 0.35mm (Durable Amplitude 0.7mm)	
Shock Resistance		294m/s ²	
Storage Temperature		-30 ~ +100°C (with no icing or condensing)	
Ambient Temperature		-30 ~ +80°C (with no icing or condensing)	
Ambient Humidity		45 ~ 85%RH (no condensing)	

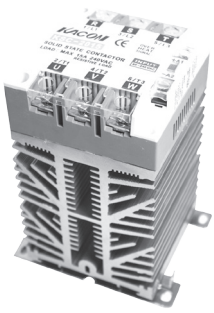
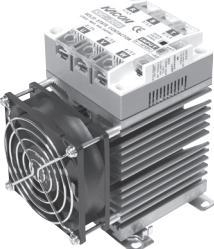
Product Selection

		Description	Load	Input	Load Current	Output Voltage Type	Part Number	
							90 ~ 240VAC (Low Voltage)	90 ~ 480VAC (High Voltage)
	Standard Type	terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSC-2015ZD	KSC-5015ZD
		screw	M4.0	M3.5		AC	KSC-2015ZA	KSC-5015ZA
		torque max /N-m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSC-2030ZD	KSC-5030ZD
		screw	M4.0	M3.5		AC	KSC-2030ZA	KSC-5030ZA
		torque max /N-m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSC-2040ZD	KSC-5040ZD
		screw	M6.0	M3.5		AC	KSC-2040ZA	KSC-5040ZA
		torque max /N-m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSC-2050ZD	KSC-5050ZD
		screw	M6.0	M3.5		AC	KSC-2050ZA	KSC-5050ZA
		torque max /N-m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSC-2060ZD	KSC-5060ZD
		screw	M6.0	M3.5		AC	KSC-2060ZA	KSC-5060ZA
		torque max /N-m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSC-2080ZD	KSC-5080ZD
		screw	M6.0	M3.5		AC	KSC-2080ZA	KSC-5080ZA
		torque max /N-m	2.5	0.8				

3 Phase SSR

KSC Series

Product Selection

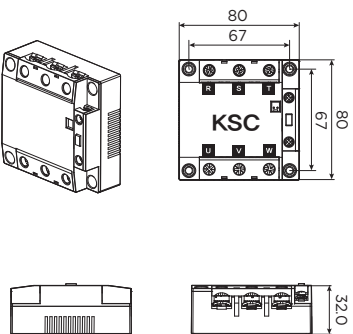
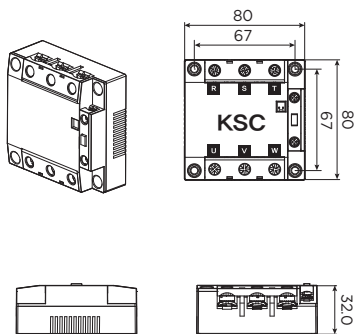
		Description	Load	Input	Load Current	Control Voltage Type	Part Number	
							90 ~ 240VAC (Low Voltage)	90 ~ 480VAC (High Voltage)
	Heatsink Type	terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSC-2015ZDH	KSC-5015ZDH
		screw	M4.0	M3.5		AC	KSC-2015ZAH	KSC-5015ZAH
		torque max. /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSC-2030ZDH	KSC-5030ZDH
		screw	M4.0	M3.5		AC	KSC-2030ZAH	KSC-5030ZAH
		torque max. /N·m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSC-2040ZDH	KSC-5040ZDH
		screw	M6.0	M3.5		AC	KSC-2040ZAH	KSC-5040ZAH
		torque max. /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSC-2050ZDH	KSC-5050ZDH
		screw	M6.0	M3.5		AC	KSC-2050ZAH	KSC-5050ZAH
		torque max. /N·m	2.5	0.8				
terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSC-2060ZDH	KSC-5060ZDH		
screw	M6.0	M3.5		AC	KSC-2060ZAH	KSC-5060ZAH		
torque max. /N·m	2.5	0.8						
terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSC-2080ZDH	KSC-5080ZDH		
screw	M6.0	M3.5		AC	KSC-2080ZAH	KSC-5080ZAH		
torque max. /N·m	2.5	0.8						
	Heatsink + Fan Type	terminal	3.5 - 4.0	2.0 - 3.5	15A	DC	KSC-2015ZDHF	KSC-5015ZDHF
		screw	M4.0	M3.5		AC	KSC-2015ZAHF	KSC-5015ZAHF
		torque max. /N·m	1.2	0.8				
		terminal	3.5 - 4.0	2.0 - 3.5	30A	DC	KSC-2030ZDHF	KSC-5030ZDHF
		screw	M4.0	M3.5		AC	KSC-2030ZAHF	KSC-5030ZAHF
		torque max. /N·m	1.2	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	40A	DC	KSC-2040ZDHF	KSC-5040ZDHF
		screw	M6.0	M3.5		AC	KSC-2040ZAHF	KSC-5040ZAHF
		torque max. /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	50A	DC	KSC-2050ZDHF	KSC-5050ZDHF
		screw	M6.0	M3.5		AC	KSC-2050ZAHF	KSC-5050ZAHF
		torque max. /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	60A	DC	KSC-2060ZDHF	KSC-5060ZDHF
		screw	M6.0	M3.5		AC	KSC-2060ZAHF	KSC-5060ZAHF
		torque max. /N·m	2.5	0.8				
		terminal	14.0 - 6.0	2.0 - 3.5	80A	DC	KSC-2080ZDHF	KSC-5080ZDHF
		screw	M6.0	M3.5		AC	KSC-2080ZAHF	KSC-5080ZAHF
		torque max. /N·m	2.5	0.8				

Dimension

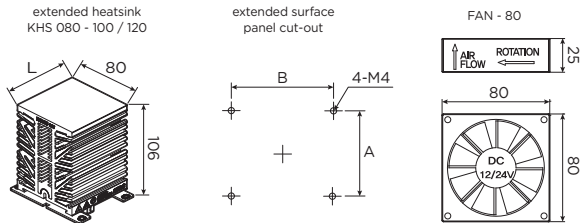
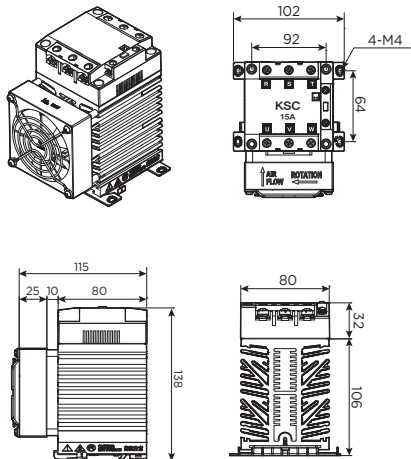
(mm)

Standard Type 15 / 30A

Standard Type 40 / 50 / 60 / 80A



Heatsink Type 15A



	L	A	B	
KHS 080-	100	64	92	Rated Voltage : DC12V-DC24V AC110V-AC220V (50/60Hz)
	120			Material : Al alloy

- Install the extended heatsink KHS 080-100/120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed:

- Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- Maximized heat radiation efficiency/doubled device life/safety ensured

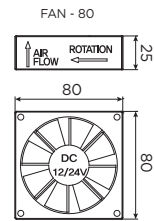
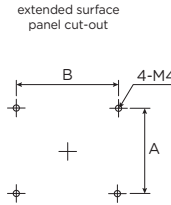
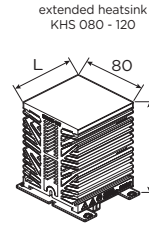
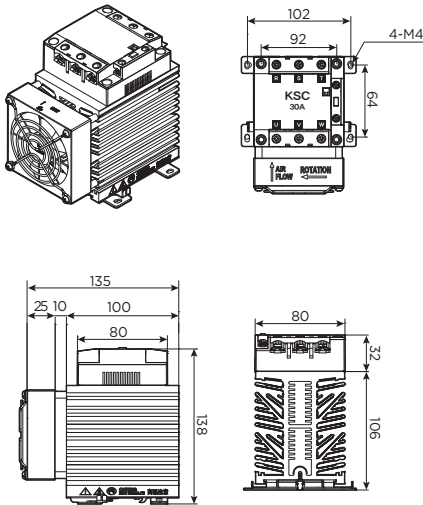
3 Phase SSR

KSC Series

Dimension

(mm)

Heatsink Type 30A



	L	A	B
KHS 080-	120	64	92

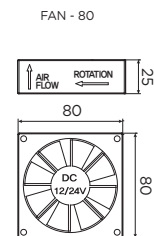
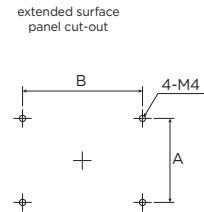
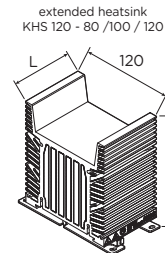
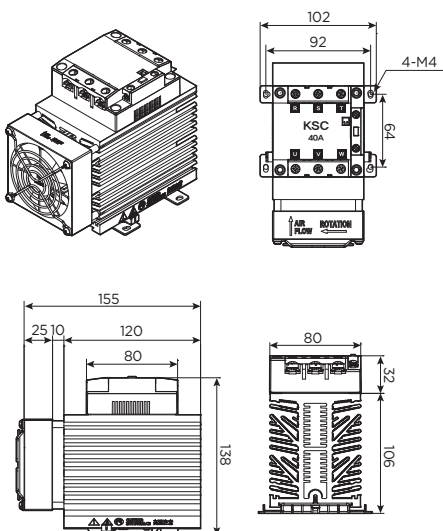
Rated Voltage :
DC12V-DC24V
AC110V-AC220V
(50/60Hz)
Material : Al alloy

- Install the extended heatsink KHS 080-120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Heatsink Type 40A



	L	A	B
KHS 120-	80		
	100	64	134
	120		

Rated Voltage :
DC12V-DC24V
AC110V-AC220V
(50/60Hz)
Material : Al alloy

- Install the extended heatsink KHS 120-80/100/120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

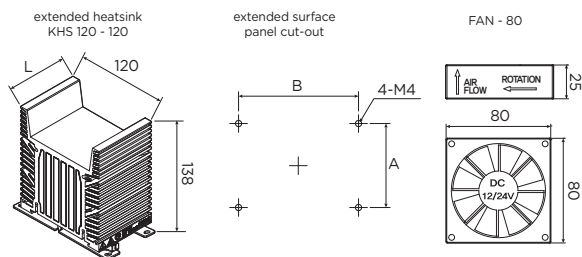
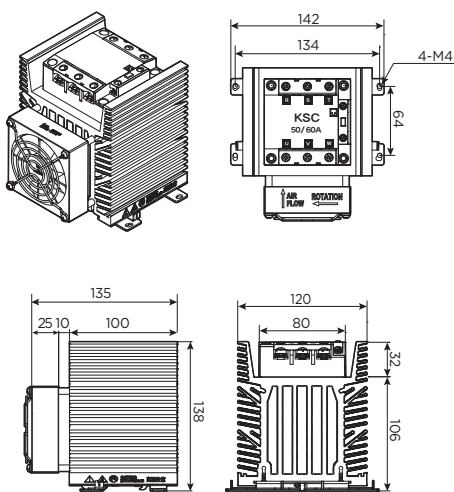
When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating (At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Dimension

(mm)

Heatsink Type 50 / 60A



	L	A	B
KHS 120-	120	64	134

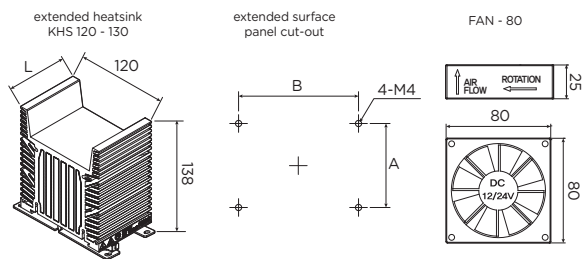
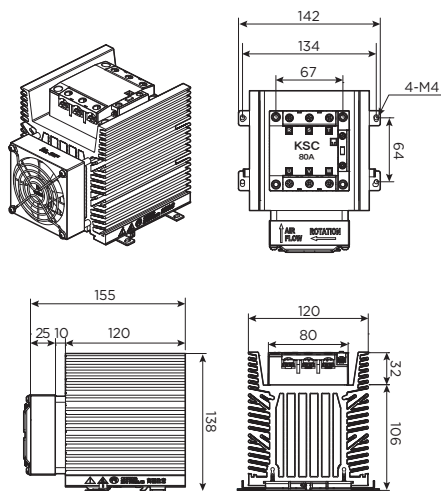
· Rated Voltage :
DC12V-DC24V
AC110V-AC220V
(50/60Hz)
· Material : Al alloy

- Install the extended heatsink KHS 120-120 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating
(At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Heatsink Type 80A



	L	A	B
KHS 120-	130	64	134

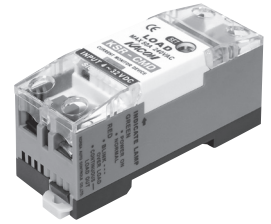
· Rated Voltage :
DC12V-DC24V
AC110V-AC220V
(50/60Hz)
· Material : Al alloy

- Install the extended heatsink KHS 120-130 and fan-80 depending on installation conditions (convection and ventilation in the panel) and opening/closing frequency or 'ON'duration.

When the air blow fan is installed :

- ▶ Improvement of reduced load capacity due to horizontal installation. 50% → 80 - 100% of rating
(At the ambient temperature of 40°C or less)
- ▶ Maximized heat radiation efficiency/doubled device life/safety ensured

Solid State Relay Current Monitor KSR CMD



KSR Current Monitoring Detector

- Short circuit and overload monitoring
- Overload level control
- NPN open collector output
- Two-color chip wide window
 - Red: Overheating alarm
 - Green: Normal operation
- Din-rail or surface-mounted
- Combined use of KSR & KSC

General Specification

► Input Ratings (Ambient Temperature 25°C)

Rated Control Voltage	12 ~ 24VDC
Control Voltage Range	9.6 ~ 30VDC
Input Current	15mA

► Load Ratings

Rated Load Voltage	100 ~ 240VAC (50 / 60 Hz)
Maximum Switching Current	50A
Minimum Switching Current	3A

► Alarm Ratings

Off-State Collector Dielectric Voltage	Maximum 30VDC
Maximum Switching Current	0.1A
Output Type	NPN Open Collector

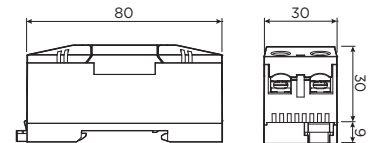
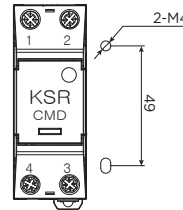
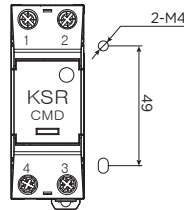
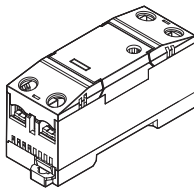
► General Ratings

Insulation Resistance	100MΩ DC 500V
Dielectric Strength	2,500VAC, 50/60Hz
Vibration Resistance	10 ~ 55 ~ 10Hz Side Vibration 0.35mm (Both Vibration 0.7mm)
Shock Resistance	294m/s ²
Storage Temperature	-30 ~ 70°C (with no icing or condensing)
Ambient Temperature	-20 ~ 60°C (with no icing or condensing)
Ambient Humidity	45 ~ 85%RH (no condensing)

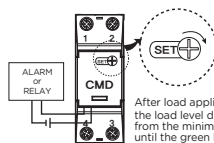
	Load	Input
Terminal	3.5 - 4.0	2.0 - 3.5
Screw	M4.0	M3.5
Torque Max / N·m	1.2	0.8

Dimension & Diagram

(mm)



• NPN Open Output Collector & Overload Level Control



After load application, rotate the load level dial clockwise from the minimum position until the green LED is ON.

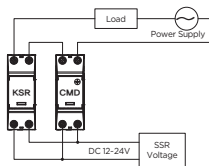
► Monitoring Function

- Normal operation: Green lamp on
- Short circuit: Red lamp on / NPN Open Collector output
- Overload: Red lamp flashing / NPN Open Collector output

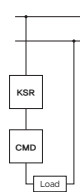
► Caution

- Use the same power supply for KSR / KSC and CMD input. Otherwise, the short circuit monitoring function does not work.
- The input voltage must be within the range of rating, without fluctuation. Otherwise, the monitoring level (load current value) set by the user may change and operating errors may occur.
- The alarm output is NPN Open Collector output. Use the product at 0.1A/30VDC or less.

• Wiring

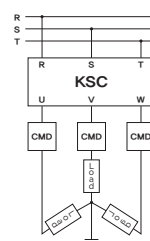


1 Phase

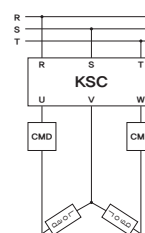


• Wiring Diagram

3 Phase star Wiring



3 Phase V Wiring

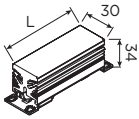


Solid State Relay Current Monitor

KSR & KSC Series

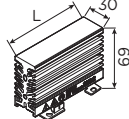
Heatsink

KHS 015 - L□



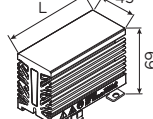
L : 80 / 100 / 120

KHS 030 - L□



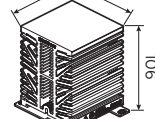
L : 80 / 100 / 120

KHS 045 - L□



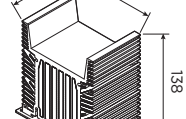
L : 80 / 100 / 120

KHS 080 - L□



L : 80 / 100 / 120

KHS 120 - L□



L : 80 / 100 / 120 / 130

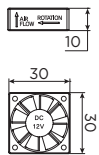
- Maximized heat-radiating surface area via innovative design
- Exclusive advanced Al alloy material for heat radiation
- Special thermal processing for high efficiency use
- Anti-corrosion anodizing surface treatment
- Easily removable structure of air blow fan

- Provision of multiple extended types
- Optimal heat radiator selectable
- For diverse environment

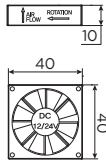
- In-house production
- Stable quality and supply
- Quick response to special products

Fan

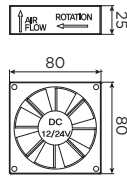
(mm)



12 VDC



12 / 24 VDC

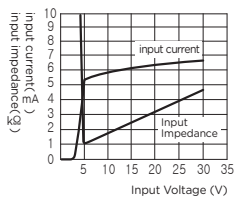


12 / 24VDC
100 / 220VAC (50 - 60Hz)
Material : Al alloy (Only AC Type)

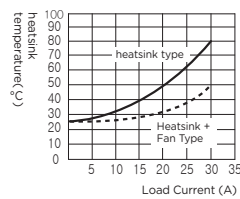
- Easily removable structure
- High-performance ball-bearing type
- Low noise
- Prolonged life
- Doubled device life

Technical Data

Input Current &
Input Impedance

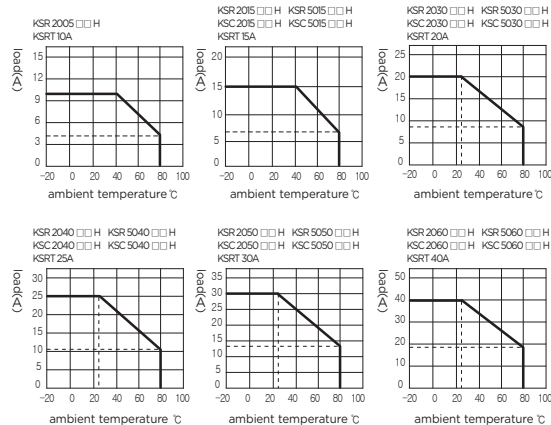


Heatsink Type &
Heatsink + Fan Type



※ (ambient temperature 25°C)
vertical mounting

Ambient Temperature-Load Current



► Caution

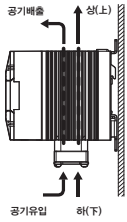
- The radiator fan reduces the radiator temperature by up to 35 - 40 % (ambient temperature of 25°C / vertical mounting)
- In the design process, note that the load current characteristic worsens with the increase in the ambient temperature.
- With the high-voltage type, design the system at 80 % of the rating or less.
- The device life is prolonged when the temperature decreases.

Solid State Relay Current Monitor

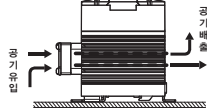
Considerations

Heatsink Type

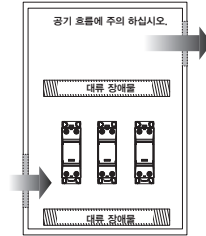
Vertical Mounting



Horizontal Mounting

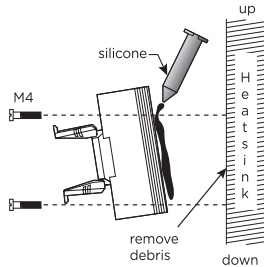


Panel Mounting



- Direct the fan in the lower direction for vertical installation, and in the air inlet direction for horizontal direction.
- If the horizontally mounted device does not have an integrated fan, use it at 50% of the rated current or less.
- Pay attention to the increase in the ambient temperature from the heating of the device. Especially when mounting the device in the panel, be sure to install a fan for sufficient ventilation.
- Remove any obstacles for air flow around the air inlet and outlet.

General Type

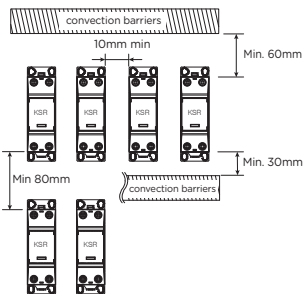


※ silicone grease to provide.

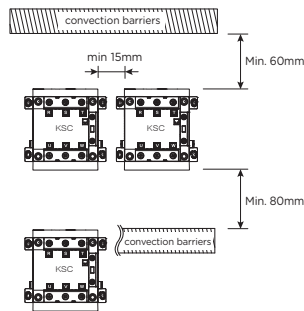
- Be sure to attach the normal KSR/KSC to the heatsink with a high heat radiation performance.
- Do not attach them to low-thermal-conductivity materials, including glass, wood and plastic.
 - Otherwise, it may cause damage to the device and fire.
- Remove the foreign matters from the mounting surface of the radiator or heatsink, and apply silicon grease for heat radiation to the surface.
- The heat radiation effect greatly depends on the mounting condition and silicon grease application. Poor treatment may cause damage to the device.
- The heat radiation effect is ensured when the device and radiator are vertically mounted with good ventilation.
- Tighten the fixing bolts at the specified torque for fixing the device to the radiator.

※ KSR, KSC fixing bolt M4-tightening torque 1.2 N·m

KSR Mounting Distance

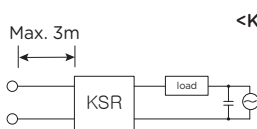


KSC Mounting Distance

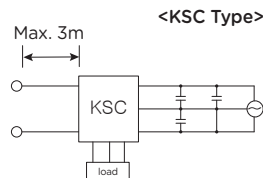


- The heat radiation effect decreases when there is not much room. Limit the load current below the rating.
- Install the device as far as possible from a heating unit, if there is any.
- Allow the longest distance possible between the device and other unit.

EMC Wiring



<KSR Type>

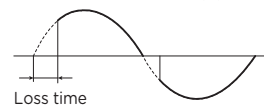


<KSC Type>

- Connect the film condenser at the Power in Parallel
- Limit the input wire length Maximum 3 m.

Time Loss

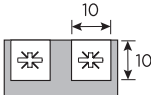
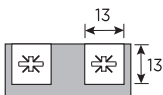
- Note that low voltage and current of the load increases time loss. Check if any problem exists.

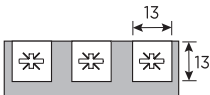
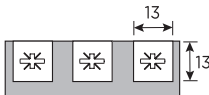


Terminal

(mm)

•When using crimp terminals, refer to the terminal specifications for terminal part spaces.

KSR Input Terminal	KSR Load Terminal	
	5 / 15 / 30A Type	40 / 50 / 60 / 80A Type
		
	M4	M6
KSC Input Terminal	KSC Load Terminal	

	15 / 30A Type	40 / 50 / 60 / 80A Type
		
	M4	M6



	Model	Bolt	A (mm)	B (mm)	C (mm)	Terminal	Wire Ø	Torque Max N·m
load	KSR 5 / 15 / 30A	M4.0	3.0	8.3	4.3	3.5-4.0	2.0	1.2
	KSR 40 / 50 / 60A	M6.0	5.8	12.0	6.4	14.0-6.0	4.2	2.5
	KSR 80A	M6.0	5.8	12.0	6.4	14.0-6.0	5.3	2.5
	KSC 15 / 30A	M4.0	3.0	8.3	4.3	3.5-4.0	2.0	1.2
	KSC 40 / 50 / 60A	M6.0	5.8	12.0	6.4	14.0-6.0	4.2	2.5
input	all	M3.5	2.3	6.6	3.7	2.0-3.5	2.0	0.8

☞ input terminal Color : ⊕ red, ⊖ black

- Be sure to conduct wiring only after switching off the power.
- Select the wire size according to the current.
- Tighten screws firmly at the specified torques.
- Applying an excessive torque may cause the screw to fail. Pay attention especially when using an electric driver.
- The screw at the output terminal must not be loosened. Abnormal heating at the terminal may cause fire.
- After wiring, be sure to lock the terminal safety cover in the closed position to prevent an electric shock or a short circuit.

Single Phase Zero Switching

KSRT Series



Part Number Description

KSRT - 1 2 3 4

① Control Voltage	D : 4 - 32VDC	A : 90 - 265VAC				
② Output Type	S : Single Phase	D : DC				
③ Load Current	010 : 10A	015 : 15A	020 : 20A	025 : 25A	030 : 30A	040 : 40A
④ Load Voltage	2 : 90 - 240VAC	4 : 90 - 480VAC				

General Specification

Insulation Resistance	100M Ω / 500VDC(between Terminal and Case)
Dielectric Strength	3000VAC(50/60Hz 1 minute)
Vibration Resistance	10 - 55Hz, amplitude : 1.5mm,x,y,z each axis 2hour
Shock Withstand	1000 m/s ² ,x,y,z each axis 3times)
Storage Temperature	-30°C - 90°C (with no icing or condensing)
Temperature Ambient	-25°C - 70°C (with no icing or condensing)
Ambient Humidity	45 - 85% R.H (no condensing)

Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less 85°C under worst case ambient temperature and load conditions.
- The module should be mounted to the heatsink using two#10 screws.

Part Number		DS0102	DS0152	DS0202	DS0252	DS0302	DS0402	
DC Input / AC Output (90 - 240VAC)	Input Ratings	Rated Control Voltage			4 - 32VDC			
		Pick-up Voltgae			Min. 3VDC			
		Drop-out Voltgae			Max. 1.5VDC			
		Input Current			3 - 35mA			
	Output Ratings	Rated Load Voltage			90 - 240VAC			
		Repetitive Blocking Voltage(Minimum)			600V			
		Rated Load Current	10A	15A	20A	25A	30A	40A
		Frequency			47 - 63Hz			
		Single cycle Surge Current Resistance		170A	250A	315A		
		Output Leakage Current (Maximum)	10mA	15mA				
		Output On Voltage Drop (Maximum)			1.5V			
		Minimum Switching Current			1A			
		Pick-up / Drop-out time			1/2 cycle Max. 1ms			

General Specification

Part Number		DS0104	DS0154	DS0204	DS0254	DS0304	DS0404	
DC Input / AC Output (90 - 480VAC)	Input Ratings	Rated Control Voltage		4 - 32VDC				
		Pick-up Voltgae		Min. 3VDC				
		Drop-out Voltgae		Max. 1.5VDC				
		Input Current		3 - 35mA				
	Output Ratings	Rated Load Voltage		90 - 480VAC				
		Peak Voltage	800V	1200V				
		Rated Load Current	10A	15A	20A	25A	30A	40A
		Frequency		47 - 63Hz				
		Single cycle Surge Current Resistance		170A	250A		350A	370A
		Output Leakage Current (Maximum)		20mA				
		Output on Voltage Drop (Maximum)	1.3V	1.6V	1.8V			
		Minimum Switching Current		1A				
		Pick-up / Drop-out time		1/2 cycle Max. 1ms				
		Part Number		AS0102	AS0152	AS0202	AS0252	AS0302
AC Input / AC Output (90 - 240VAC)	Input Ratings	Rated Control Voltage		90 - 265VAC				
		Pick-up Voltage		Min. 72VAC				
		Drop-out Voltage		Max. 60VAC				
		Input Current		Max. 15mA				
	Output Ratings	Rated Load Voltage		90 - 240VAC				
		Peak Voltage	600V					
		Rated Load Current	10A	15A	20A	25A	30A	40A
		Frequency		47 - 63Hz				
		Single cycle Surge Current Resistance		170A	250A	315A		
		Output Leakage Current (Maximum)	10mA	15mA				
		Output on Voltage Drop (Maximum)		1.5V				
		Minimum Switching Current		1A				
		Pick-up / Drop-out Time		1/2 cycle Max. 1ms				
		Part Number		AS0104	AS0154	AS0204	AS0254	AS0304
AC Input / AC Output (90 - 480VAC)	Input Ratings	Rated Control Voltage		90 - 265VAC				
		Pick-up Voltgae		Min. 72VAC				
		Drop-out Voltgae		Max. 60VAC				
		Input Current		Max. 15mA				
	Output Ratings	Rated Load Voltage		90 - 480VAC				
		Peak Voltage	800V	1200V				
		Rated Load Current	10A	15A	20A	25A	30A	40A
		Frequency		47 - 63Hz				
		Single cycle Surge Current Resistance		170A	250A		350A	370A
		Leakage Current (Maximum)		20mA				
		Output on Voltage Drop (Maximum)	1.3V	1.6V	1.8V			
		Minimum Switching Current		1A				
		Pick-up / Drop-out Time		1/2 cycle Max. 1ms				

Single Phase Zero Switching

KSRT Series

Product Selection

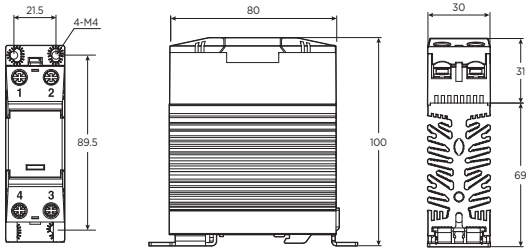
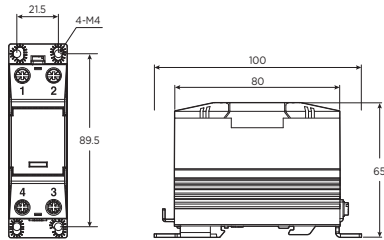
	Control Voltage	Output Voltage Type	Load Current	Load Voltage	Part Number
	4 - 32VDC	Single phase AC	10A	90 - 240VAC	KSRT-DS0102
			15A		KSRT-DS0152
			20A		KSRT-DS0202
			25A		KSRT-DS0252
			30A		KSRT-DS0302
			40A		KSRT-DS0402
	90 - 264VAC	Single phase AC	10A	90 - 480VAC	KSRT-AS0102
			15A		KSRT-AS0152
			20A		KSRT-AS0202
			25A		KSRT-AS0252
			30A		KSRT-AS0302
			40A		KSRT-AS0402
	90 - 264VAC	Single phase AC	10A	90 - 240VAC	KSRT-AS0102
			15A		KSRT-AS0152
			20A		KSRT-AS0202
			25A		KSRT-AS0252
			30A		KSRT-AS0302
			40A		KSRT-AS0402
	90 - 264VAC	Single phase AC	10A	90 - 480VAC	KSRT-AS0104
			15A		KSRT-AS0154
			20A		KSRT-AS0204
			25A		KSRT-AS0254
			30A		KSRT-AS0304
			40A		KSRT-AS0404

Dimensions

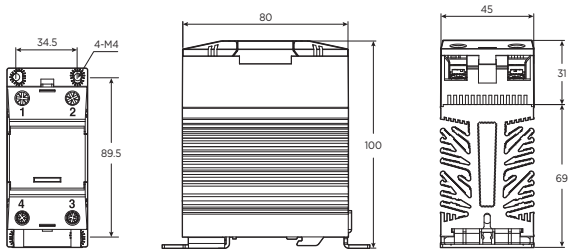
(mm)

KSRT 10A, 15A

KSRT 20A, 25A, 30A

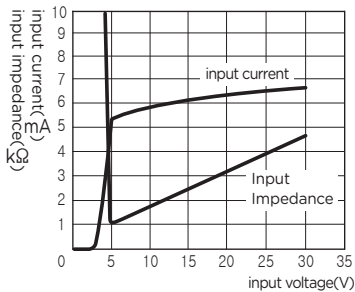


KSRT 40A

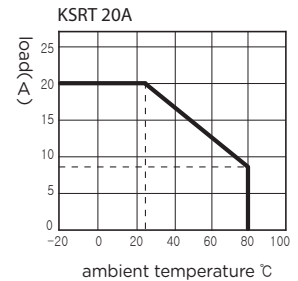
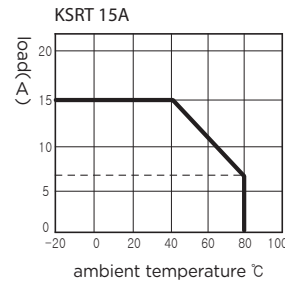
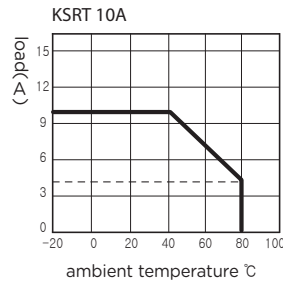


Technical Data

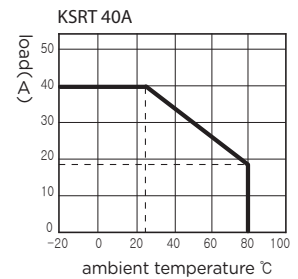
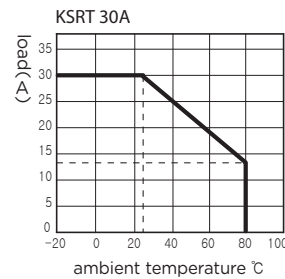
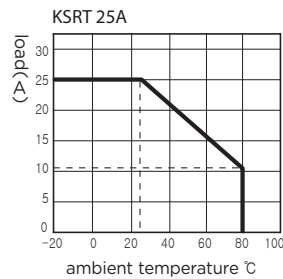
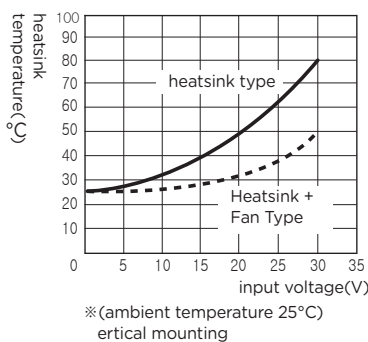
Input Current & Input Impedance



Ambient Temperature-Load Current



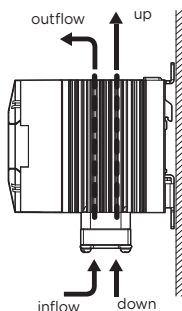
Heatsink Type Vs Heatsink + Fan Type



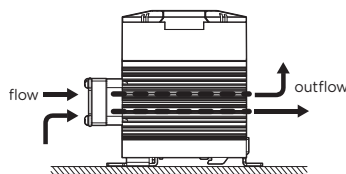
- The radiator fan reduces the radiator temperature up to 35 - 40 % (ambient temperature of 25°C / vertically attached)
- In the design process, note that the load current characteristic diminishes with the increase in the ambient temperature.
- With the high-voltage type, design the system at 80 % of the rating or less.
- The device life is prolonged with proper temperature circumstance.

Mounting

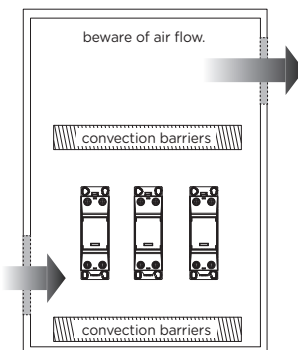
Vertical Mounting



Horizontal Mounting



Panel Mounting



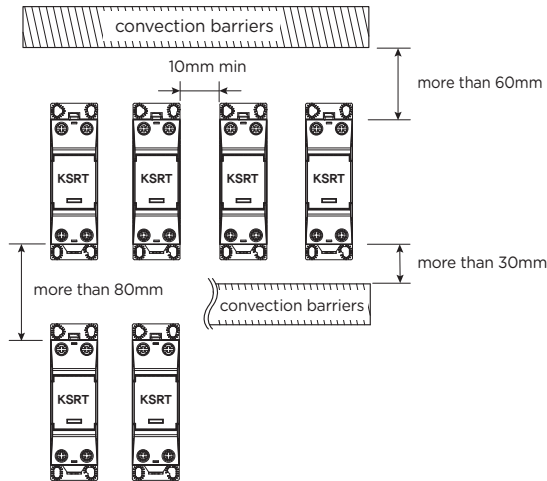
- Direct the fan in the lower direction for vertical installation, and in the air inlet direction for horizontal direction.
- If the horizontally mounted device does not have an integrated fan, use it at 50% of the rated current or less.
- Pay attention to the increase in the ambient temperature from the heating of the device. Especially when mounting the device in the panel, be sure to install a fan for sufficient ventilation.
- Remove any obstacles for air flow around the air inlet and outlet.

Single Phase Zero Switching

KSRT Series

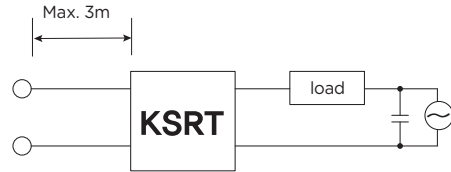
Mounting

KSRT Mounting Distance



- The heat radiation effect decreases when there is not much room. Limit the load current below the rating.
- Install the device as far as possible from a heating unit, if there is any.
- Allow the longest distance possible between the device and other unit.

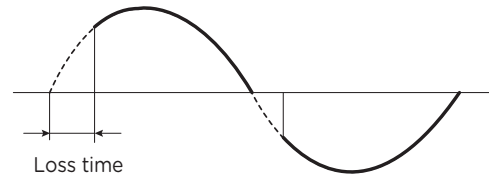
EMC Wiring



- Connect the film condenser at the two load output ends.
- Limit the input wire length Max. 3 m.

Time Loss

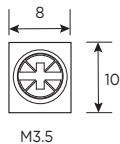
- Note that low voltage and current of the load increases time loss. Check if any problem exists.



Terminal

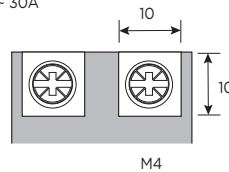
- When using crimp terminals, refer to the terminal specifications for terminal part spaces.

KSRT Input Terminal

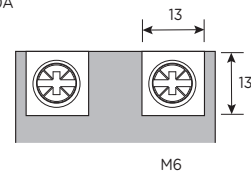


KSRT Load Terminal

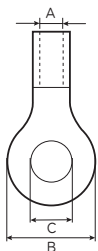
10 - 30A



40A



Terminal Specification



	Model	Bolt	A	B	C	Terminal	Wire Ø	Torque Max N·m
LOAD	10 - 30	M4.0	3.0	8.3	4.3	3.5-4.0	2.0	1.2
	40	M6.0	5.8	12.0	6.4	14.0-6.0	4.2	2.5
INPUT	All	M3.5	2.3	6.6	3.7	2.0-3.5	2.0	0.8

⊕ input terminal : ⊕ red, ⊖ black

- Be sure to conduct wiring only after switching off the power.
- Select the wire size according to the current.
- Tighten screws firmly at the specified torques.
- Applying an excessive torque may cause the screw to fail. Pay attention especially when using an electric driver.
- The screw at the output terminal must not be loosened. Abnormal heating at the terminal may cause fire.
- After wiring, be sure to lock the terminal safety cover in the closed position to prevent an electric shock or a short circuit.

Economical Single Phase SSR

KMSR Series



Part Number Description

KMSR

- **1** **2** **3** **4**

1 Control Voltage		D : 4 - 32VDC	A : 90 - 265VAC			
2 Output Type		S : Single Phase	D : DC			
3 Load Current		005 : 5A *	010 : 10A	020 : 20A	025 : 25A	030 : 30A
		050 : 50A	060 : 60A	100 : 100A		040 : 40A
4 Load Voltage	AC	2 : 90 - 240VAC	4 : 90 - 480VAC			
	DC	5 : 50VDC	1 : 100VDC **	4 : 400VDC **		

* DC output type only.

** 100VDC, 400VDC are available at custom order. Please contact HQ sales team for detail information.

General Specification

► General Ratings

Insulation Resistance	100MΩ/ 500VDC(between Terminal and Case)
Dielectric Strength	2500VAC(50/60Hz 1 minute)
Vibration Resistance	10 - 55Hz, amplitude : 1.5mm,x,y,z each axis 2 hours
Shock Resistance	1000 m/s ² ,x,y,z each axis 3times
Storage Temperature	-30°C - 90°C (with no icing or condensing)
Ambient Temperature	-25°C - 70°C (with no icing or condensing)
Ambient Humidity	45 - 85% R.H (no condensing)
Weight	Approx 100g

	Part Number	DS0102	DS0202	DS0252	DS0302	DS0402	DS0502	DS0602	DS1002		
DC Input AC Output (90 ~ 240VAC)	Input Ratings	Rated Control Voltage				4 - 32VDC					
		Pick-up Voltage				Min. 3VDC					
		Drop-out Voltage				Max. 1.5VDC					
		Input Current				3 - 35mA					
	Output Ratings	Rated Load Voltage				90 - 240VAC					
		Peak Voltage				600V		800V			
		Rated Load Current		10A	20A	25A	30A	40A	50A	60A	100A
		Frequency				47 - 63Hz					
		Single Cycle Surge Current Resistance		170A	250A	315A		580A			
		Output Leakage Current (Maximum)		10mA	15mA						
		Output on Voltage Drop (Maximum)				1.5V					
		Minimum Switching Current				1A					
		Pick-up / Drop-out Time				1/2 cycle Max. 1ms					

* Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less 85°C under worst case ambient temperature and load conditions.
- The module should be mounted to the heatsink using two#10 screws.

Economical Single Phase SSR

KMSR Series

General Specification

	Part Number	DS0104	DS0204	DS0254	DS0304	DS0404	DS0504	DS0604	DS1004											
DC Input / AC Output (90 ~ 480VAC)	Input Ratings	Rated Control Voltage	4 - 32VDC																	
		Pick-up Voltage	Min. 3VDC																	
		Drop-out Voltage	Max. 1.5VDC																	
		Input Current	3 - 35mA																	
	Output Ratings	Rated Load Voltage	90 - 480VAC																	
		Peak Voltage	800V	1200V																
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A										
		Frequency	47 - 63Hz																	
		Single Cycle Surge Current Resistance	170A	250A		350A	370A	580A												
		Output Leakage Current (Maximum)	20mA																	
		Output on Voltage Drop (Maximum)	1.3V	1.6V	1.8V															
		Minimum Switching Current	1A																	
		Pick-up / Drop-out Time	1/2 cycle Max. 1ms																	
		DC Input / DC Output (4 ~ 32VDC)	Part Number	DD0055	DD0105	DD0205	DD0305	DD0405	DD0505	DD0051	DD0101	DD0201	DD0301	DD0401	DD0501	DD0054	DD0104	DD0204	DD0304	DD0404
Input Ratings	Rated Control Voltage		4 - 32VDC																	
	Pick-up Voltage		Min. 3VDC																	
	Drop-out Voltage		Max. 1.5VDC																	
	Input Current		5 - 20mA																	
Output Ratings	Rated Load Voltage		10 - 50VDC									10 - 100VDC					10 - 400VDC			
	Rated Load Current		5A	10A	20A	30A	40A	50A	5A	10A	20A	30A	40A	50A	5A	10A	20A	30A	40A	50A
	Drop-out Voltage		2.0VDC																	
AC Input / AC Output (90 ~ 240VAC)	Part Number		AS0102	AS0202	AS0252	AS0302	AS0402	AS0502	AS0602	AS1002										
	Input Ratings		Rated Control Voltage	90 - 265VAC																
		Pick-up Voltage	Min. 72VAC																	
		Drop-out Voltage	Max. 60VAC																	
		Input Current	Max. 15mA																	
	Output Ratings	Rated Load Voltage	90 - 240VAC																	
		Peak Voltage	600V					800V												
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A										
		Frequency	47 - 63Hz																	
		Single Cycle Surge Current Resistance	170A	250A	315A			580A												
		Output Leakage Current (Maximum)	10mA	15mA																
		Output on Voltage Drop (Maximum)	1.5V																	
		Minimum Switching Current	1A																	
		Pick-up / Drop-out time	1/2 cycle Max. 1ms																	

General Specification

Part Number		AS0104	AS0204	AS0254	AS0304	AS0404	AS0504	AS0604	AS1004	
AC Input / AC Output (90 - 480VAC)	Input Ratings	Rated Control Voltage			90 - 265VAC					
		Pick-up Voltage			Min. 72VAC					
		Drop-out Voltage			Max. 60VAC					
		Input Current			Max. 15mA					
	Output Ratings	Rated Load Voltage			90 - 480VAC					
		Peak Voltage	800V	1200V						
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A
		Frequency			47 - 63Hz					
		Single Cycle Surge Current Resistance	170A	250A		350A	370A	580A		
		Output Leakage Current (Maximum)			20mA					
		Output On Voltage Drop (Maximum)	1.3V	1.6V	1.8V					
		Minimum Switching Current			1A					
		Pick-up / Drop-out Time			1/2 cycle Max. 1ms					

Product Selection

	Control Voltage	Output Voltage Type	Load Voltage	Load Current	Part Number	Load Voltage	Load Current	Part Number
	4 ~ 32VDC	Single phase AC	90 ~ 240VAC	10A	KMSR-DS0102	90 ~ 480VAC	10A	KMSR-DS0104
				20A	KMSR-DS0202		20A	KMSR-DS0204
				25A	KMSR-DS0252		25A	KMSR-DS0254
				30A	KMSR-DS0302		30A	KMSR-DS0304
				40A	KMSR-DS0402		40A	KMSR-DS0404
				50A	KMSR-DS0502		50A	KMSR-DS0504
				60A	KMSR-DS0602		60A	KMSR-DS0604
				100A	KMSR-DS1002		100A	KMSR-DS1004
	90 - 265VAC	Single phase AC	90 ~ 240VAC	10A	KMSR-AS0102	90 ~ 480VAC	10A	KMSR-AS0104
				20A	KMSR-AS0202		20A	KMSR-AS0204
				25A	KMSR-AS0252		25A	KMSR-AS0254
				30A	KMSR-AS0302		30A	KMSR-AS0304
				40A	KMSR-AS0402		40A	KMSR-AS0404
				50A	KMSR-AS0502		50A	KMSR-AS0504
				60A	KMSR-AS0602		60A	KMSR-AS0604
				100A	KMSR-AS1002		100A	KMSR-AS1004

Economical Single Phase SSR

KMSR Series

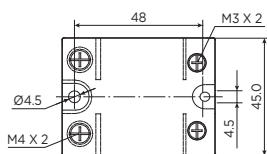
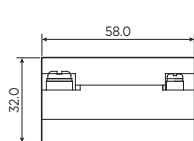
Product Selection

	Control Voltage	Load Voltage Type	Load Voltage	Load Current	Part Number	Load Voltage	Load Current	Part Number	Load Voltage	Load Current	Part Number
	4 - 32VDC	DC	10 - 50VDC	5A	KMSR-DD0055	10 - 100VDC	5A	KMSR-DD0051	10 - 400VDC	5A	KMSR-DD0054
				10A	KMSR-DD0105		10A	KMSR-DD0101		10A	KMSR-DD0104
				20A	KMSR-DD0205		20A	KMSR-DD0201		20A	KMSR-DD0204
				30A	KMSR-DD0305		30A	KMSR-DD0301		30A	KMSR-DD0304
				40A	KMSR-DD0405		40A	KMSR-DD0401		40A	KMSR-DD0404
				50A	KMSR-DD0505		50A	KMSR-DD0501		50A	KMSR-DD0504

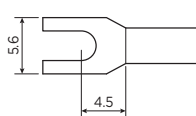
Dimension

(mm)

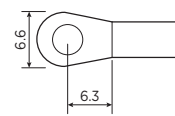
Outline Dimensions



Input



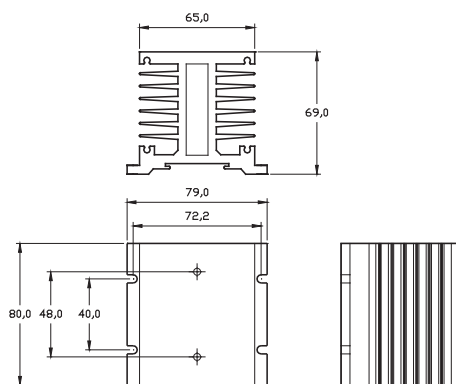
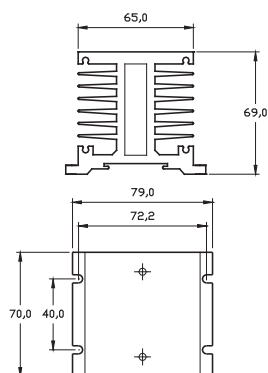
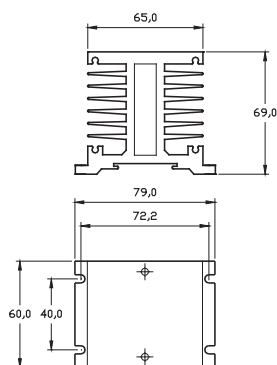
Output



KHS-A015 (10A, 15A)

KHS-A025 (20A, 25A)

KHS-A040 (30A, 40A)



Other specifications are available at custom order.

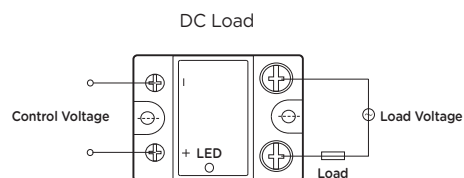
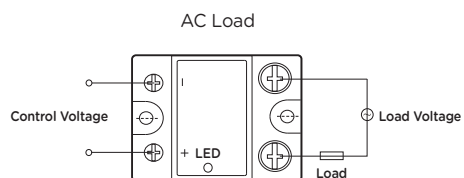
Diagram

(mm)

Terminal

(mm)

Connecting Diagrams



Economical Three Phase SSR

KMSR Series



Part Number Description

KMSR - **1** **2** **3** **4**

① Control Voltage	D : 4 ~ 32VDC	A : 90 ~ 265VAC			
② Output Type	T : Three phase				
③ Load Current	010 : 10A	020 : 20A	025 : 25A	030 : 30A	040 : 40A
	050 : 50A	060 : 60A	100 : 100A		
④ Load Voltage	2 : 90 ~ 240VAC	4 : 90 ~ 480VAC			

General Specification

Insulation Resistance	100M Ω / 500VDC(between Terminal and Case)
Dielectric Strength	2500VAC(50/60Hz 1minute)
Vibration Resistance	10 ~ 55Hz, amplitude : 1.5mm,x,y,z each axis 2 hours
Shock Resistance	1000 m/s ² ,x,y,z each axis 3times
Storage Temperature	-30°C ~ 90°C (with no icing or condensing)
Ambient Temperature	-25°C ~ 80°C (with no icing or condensing)
Ambient Humidity	45 ~ 85% R.H (no condensing)
Weight	Approx. 530g

DC Input / AC Output (90 ~ 240VAC)	Part Number	DT0102	DT0202	DT0252	DT0302	DT0402	DT0502	DT0602	DT1002		
	Input Ratings	Rated Control Voltage				4 ~ 32VDC					
		Pick-up Voltage				Min. 3VDC					
		Drop-out Voltage				Max. 1.5VDC					
		Input Current				Max. 25mA					
	Output Ratings	Rated Load Voltage				90 ~ 240VAC					
		Peak Voltage				600V			800V		
		Rated Load Current		10A	20A	25A	30A	40A	50A	60A	100A
		Frequency				47 ~ 63Hz					
		Single Cycle Surge Current Resistance		125A	260A	315A			580A		
		Output Leakage Current (Maximum)				10mA					
		Output On Voltage Drop (Maximum)				1.5V					
		Minimum Switching Current				1A					
Pick-up / Drop-out Time				1/2 cycle Max. 1ms							

* Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less 85°C under worst case ambient temperature and load conditions.
- The module should be mounted to the heatsink using two#10 screws.

Economical Three Phase SSR

KMSR Series

General Specification

Part Number		DT0104	DT0204	DT0254	DT0304	DT0404	DT0504	DT0604	DT1004	
DC Input / AC Output (90 ~ 480VAC)	Input Ratings	Rated Control Voltage				4 - 32VDC				
		Pick-up Voltage				Min. 3VDC				
		Drop-out Voltage				Max. 1.5VDC				
		Input Current				Max. 25mA				
	Output Ratings	Rated Load Voltage				90 - 480VAC				
		Peak Voltage	800V	1200V						
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A
		Frequency				47 - 63Hz				
		Single Cycle Surge Current Resistance	170A	250A		350A		580A		
		Output Leakage Current (Maximum)				10mA				
		Output On Voltage Drop (Maximum)				1.5V				
		Minimum Switching Current				1A				
		Pick-up / Drop-out Time				1/2 cycle Max. 1ms				
		Part Number		AT0102	AT0202	AT0252	AT0302	AT0402	AT0502	AT0602
AC Input / AC Output (90 ~ 240VAC)	Input Ratings	Rated Control Voltage				90 - 265VAC				
		Pick-up Voltage				Min. 72VAC				
		Drop-out Voltage				Max. 60VAC				
		Input Current				Max. 15mA				
	Output Ratings	Rated Load Voltage				90 - 240VAC				
		Peak Voltage				600V		800V		
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A
		Frequency				47 - 63Hz				
		Single Cycle Surge Current Resistance	125A	260A	315A		580A			
		Output Leakage Current (Maximum)				10mA				
		Output On Voltage Drop (Maximum)				1.5V				
		Minimum Switching Current				1A				
		Pick-up / Drop-out Time				1/2 cycle Max. 1ms				

General Specification

Part Number		AT0104	AT0204	AT0254	AT0304	AT0404	AT0504	AT0604	AT1004	
AC Input / AC Output (90 ~ 480VAC)	Input Ratings	Rated Control Voltage				90 ~ 265VAC				
		Pick-up Voltage				Min. 72VAC				
		Drop-out Voltage				Max. 60VAC				
		Input Current				Min. 15mA				
	Output Ratings	Rated Load Voltage				90 ~ 480VAC				
		Peak Voltage	800V	1200V						
		Rated Load Current	10A	20A	25A	30A	40A	50A	60A	100A
		Frequency				47 ~ 63Hz				
		Single Cycle Surge Current Resistance	170A	250A		350A		580A		
		Output Leakage Current (Maximum)				10mA				
		OutputOn Voltage Drop (Maximum)				1.5V				
		Minimum Switching Current				1A				
		Pick-up / Drop-out Time				1/2 cycle Max. 1ms				

Product Selection

Control Voltage	Output Voltage Type	Load Voltage	Load Current	Part Number	Control Voltage	Load Voltage	Load Current	Part Number
 4 - 32VDC	Three phase	90 - 240VAC	10A	KMSR-DT0102	90 - 265VAC	90 - 240VAC	10A	KMSR-AT0102
			20A	KMSR-DT0202			20A	KMSR-AT0202
			25A	KMSR-DT0252			25A	KMSR-AT0252
			30A	KMSR-DT0302			30A	KMSR-AT0302
			40A	KMSR-DT0402			40A	KMSR-AT0402
			50A	KMSR-DT0502			50A	KMSR-AT0502
			60A	KMSR-DT0602			60A	KMSR-AT0602
			100A	KMSR-DT1002			100A	KMSR-AT1002
		90 - 480VAC	10A	KMSR-DT0104		90 - 480VAC	10A	KMSR-AT0104
			20A	KMSR-DT0204			20A	KMSR-AT0204
			25A	KMSR-DT0254			25A	KMSR-AT0254
			30A	KMSR-DT0304			30A	KMSR-AT0304
			40A	KMSR-DT0404			40A	KMSR-AT0404
			50A	KMSR-DT0504			50A	KMSR-AT0504
			60A	KMSR-DT0604			60A	KMSR-AT0604
			100A	KMSR-DT1004			100A	KMSR-AT1004

Rev. 2/14

Data subject may change without notice.

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Industrial Controls Catalog

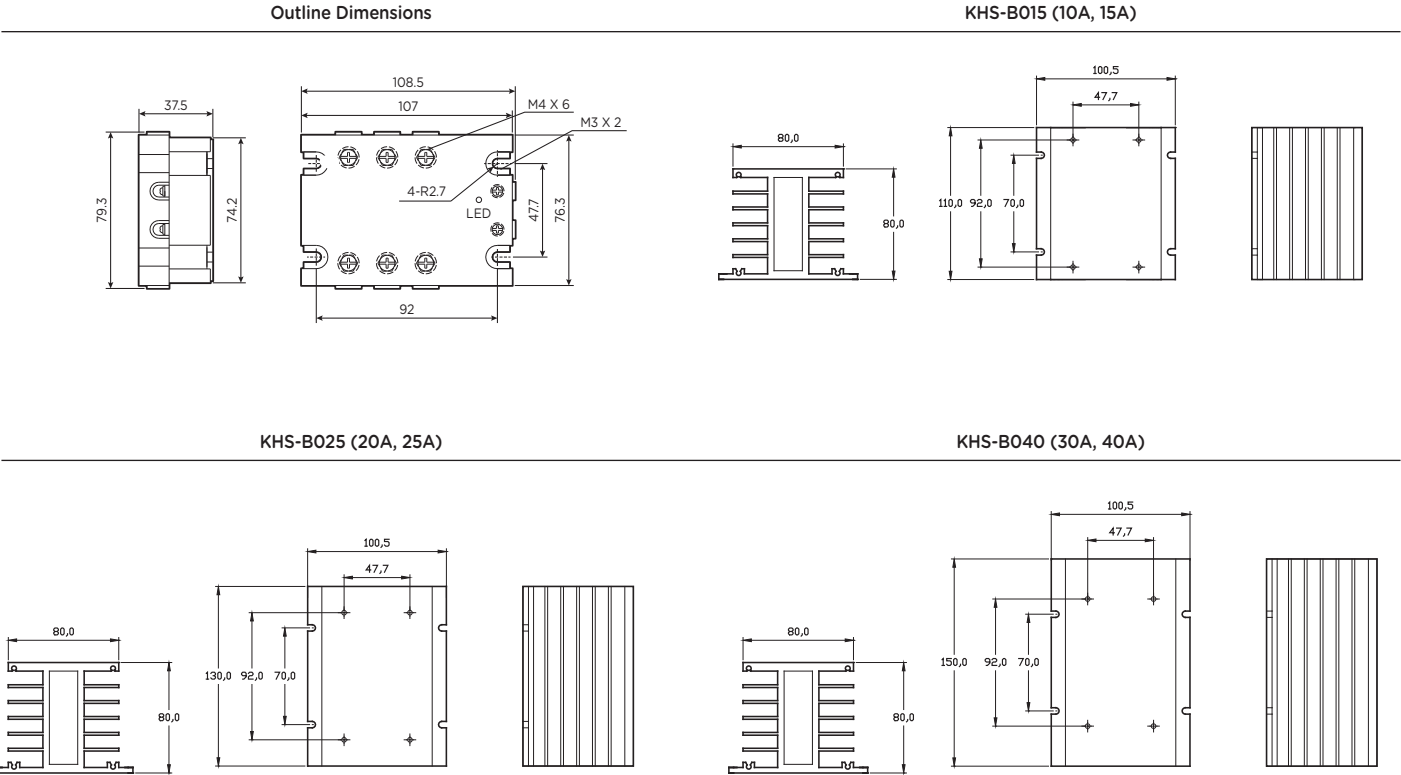
I - 29

Economical Three Phase SSR

KMSR Series

Dimension

(mm)

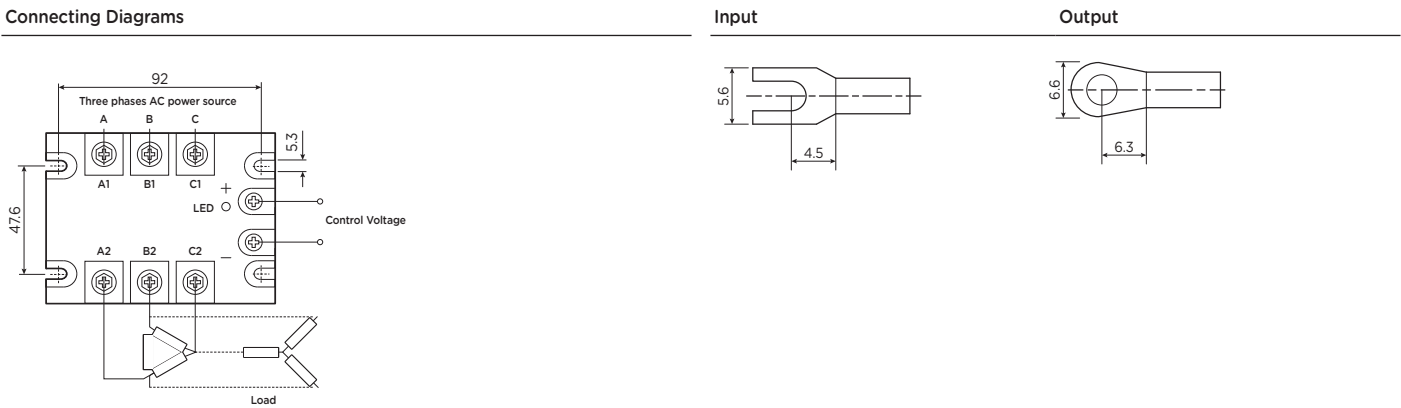


Diagram

(mm)

Terminal

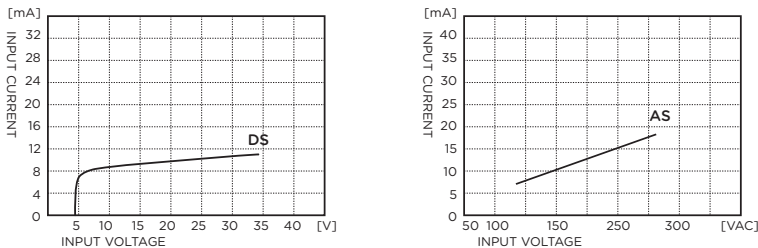
(mm)



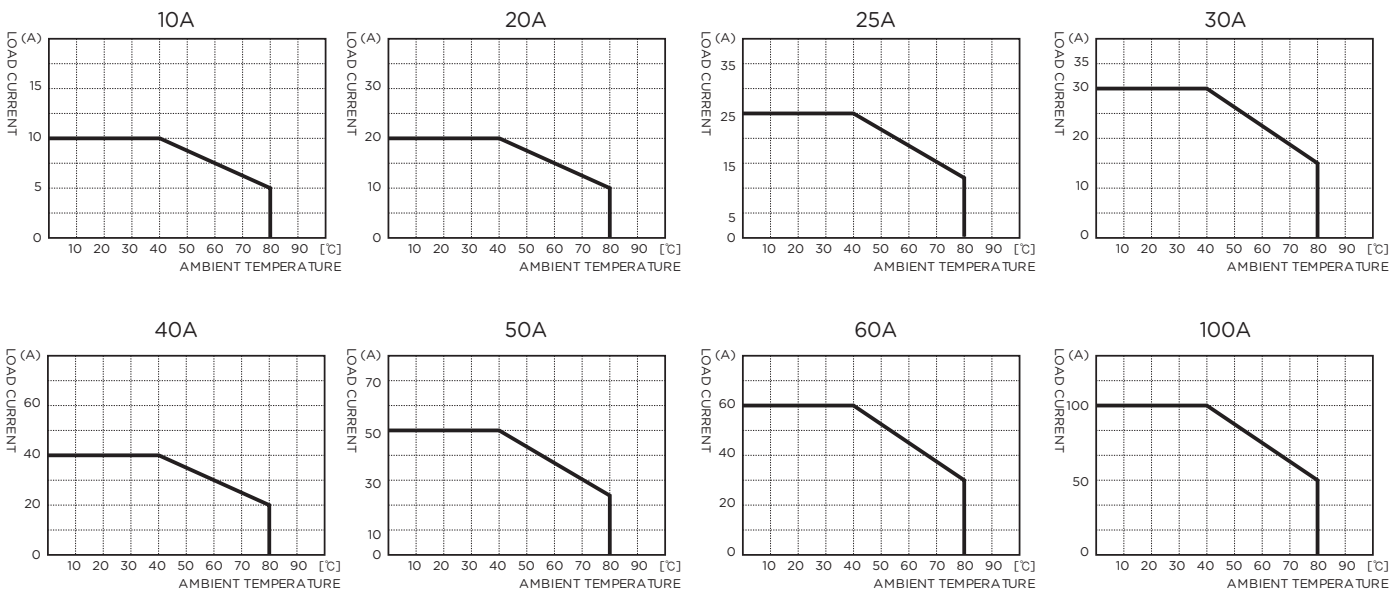
Solidstate Relay

Technical Data

Input Voltage Vs Current



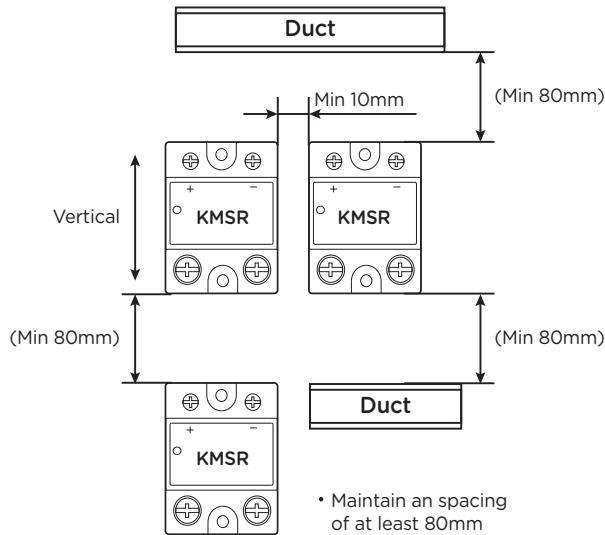
Maximum Allowable Current vs Ambient Temperature



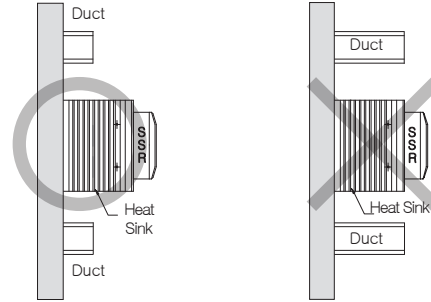
Solidstate Relay

Mounting

Panel Mounting Method



Panel Mounting according to the height of duct.



Install ducts lower than Heatsink.

If the duct is same or higher than heatsink, SSR needs to have a support metal for AIR ventilation.



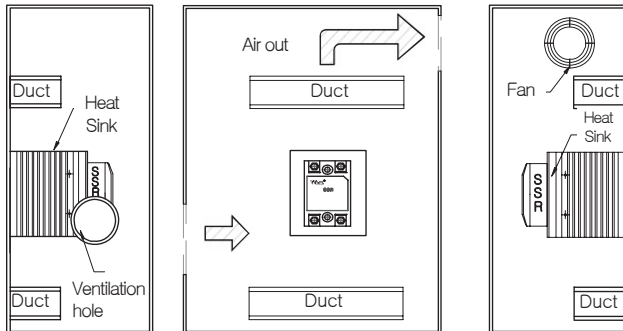
- The heat radiation effect decreases when there is not much room. Limit the load current below the rating.
- Install the device as far as possible from a heating unit, if there is any.
- Allow the longest distance possible between the device and other unit.

Heatsink Installation caution

- If there is no ventilation even when standard heat sink are used, it may cause damage to SSR
- In general, power element of SSR is damaged when the maximum temperature of the 125 °C or higher. Since the power element temperature is close to 125 °C when the temperature of the surface of heat sink is 80 °C or higher, check the temperature of heat sink too during operation
- Remove the foreign material from the mounting surface of the heatsink, and apply silicon grease to the surface.
- The heat radiation effect greatly depends on the mounting condition and silicon grease application.
- Tighten the fixing bolts at the specified torque for fixing the device to the radiator

Caution

< How to control the temperature of KMSR in a panel >



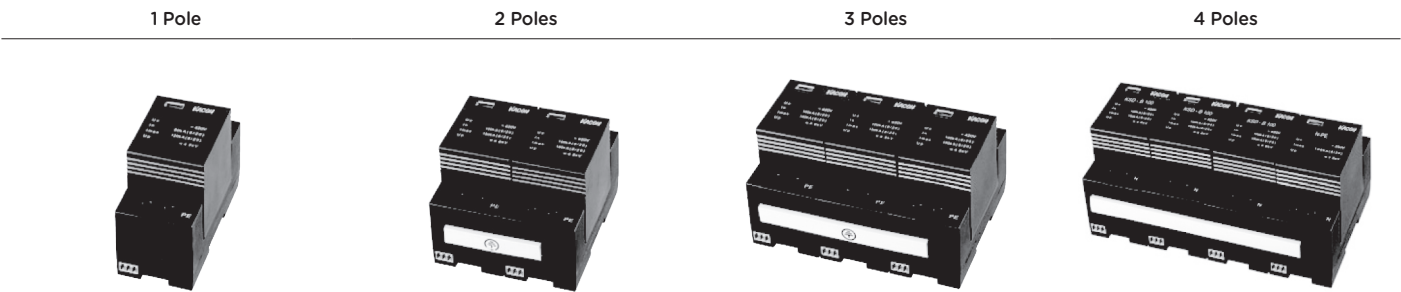
- If filters are installed in a ventilation hole, it needs to have a regular cleaning for proper ventilation.
- The rated current is the value calculated at SSR's ambient temperature of 40°C
- Direct the fan in the lower direction for vertical installation, and in the air inlet direction for horizontal direction.
- If the horizontally mounted device does not have an integrated fan, use it at 50% of the rated current or less.
- Pay attention to the increase in the ambient temperature from the heating of the device. Especially when mounting the device in the panel, be sure to install a fan for sufficient ventilation.
- Remove any obstacles for air flow around the air inlet and outlet.

Surge Protectors Device

KSD Series

- Designed to improve users' safety
- Excellent convenience in construction and everyday use
- Large capacity nominal current
- Employs a signal connector exclusively for external monitoring

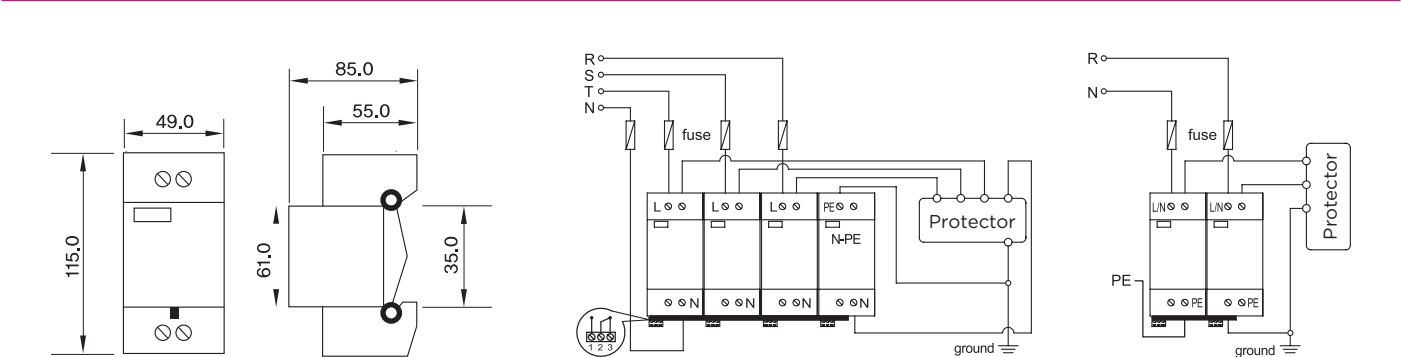
Nominal Current 100KA (Standard Discharge Current 100KA)



Product Specification

Part Number	Number of Pole	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Up (KV) Voltage Protection Level	Nominal Current (KA)	Max. Discharge Current (KA)	Response Time (ns)	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-B1100 420	1	380VAC	420VAC	≤ 3.2	100	150	< 25	≥ 35	≤ 100A
KSD-B2100 420	2								
KSD-B3100 420	3								
KSD-B4100 420	3N								

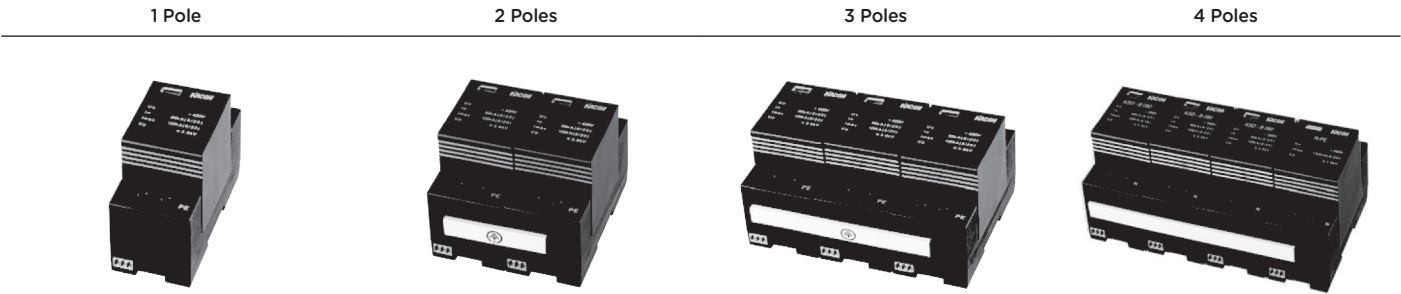
Dimensions and Wiring



Surge Protectors Device

KSD Series

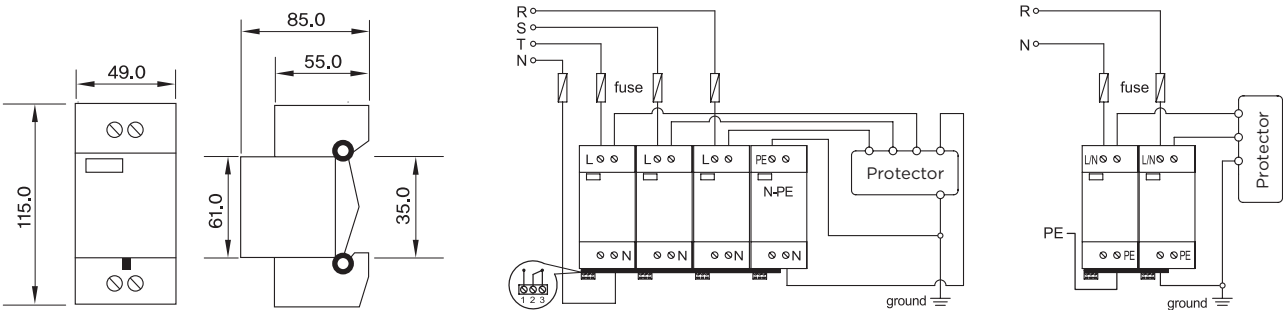
Nominal Current 80KA (Standard Discharge Current 80KA)



Product Specification

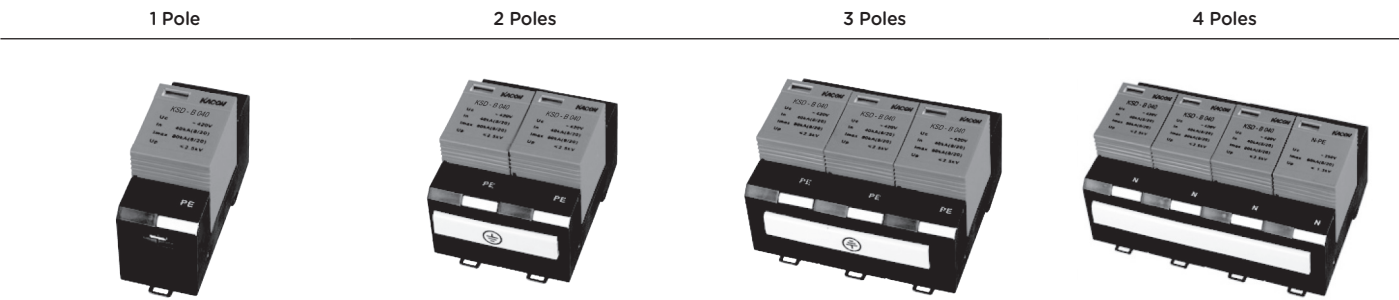
Part Number	Number of Pole	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Up (KV) Voltage Protection Level	Nominal Current (KA)	Max. Discharge Current (KA)	Response Time (ns)	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-B1080 385	1	220VAC	385VAC	≤ 2.4	80	120	< 25	≥ 35	≤ 100A
KSD-B2080 385	2								
KSD-B3080 385	3								
KSD-B4080 385	3N								
KSD-B1080 420	1	380VA	420VAC	≤ 2.8	80	120	< 25	≥ 35	≤ 100A
KSD-B2080 420	2								
KSD-B3080 420	3								
KSD-B4080 420	3N								

Dimensions and Wiring



- Designed to improve users' safety
- Excellent convenience in construction and everyday use
- Compact and pleasing appearance

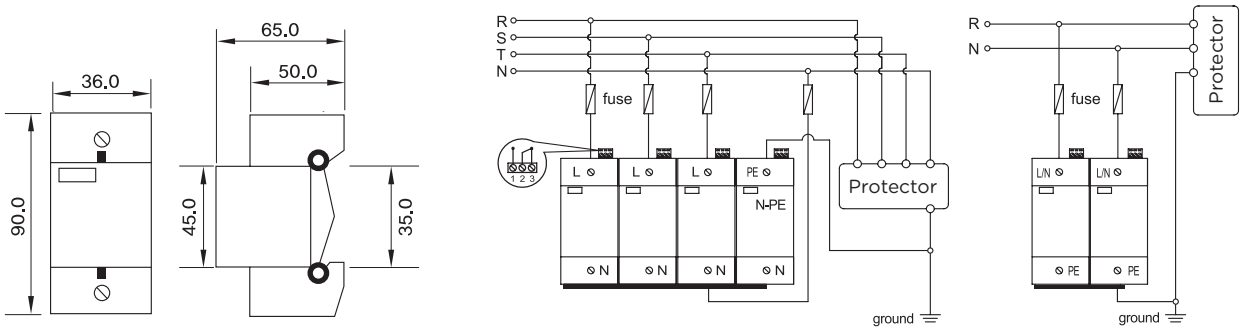
Nominal Current 40KA (Standard Discharge Current 40KA)



Product Specification

Part Number	Number of Pole	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Up (KV) Voltage Protection Level	Nominal Current (KA)	Max. Discharge Current (KA)	Response Time (ns)	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-B1040 385	1	220VAC	385VAC	≤ 2.0	40	80	< 25	≥ 35	≤ 40A
KSD-B2040 385	2								
KSD-B3040 385	3								
KSD-B4040 385	3N								
KSD-B1040 420	1	380VAC	420VAC	≤ 2.2	40	80	< 25	≥ 35	≤ 40A
KSD-B2040 420	2								
KSD-B3040 420	3								
KSD-B4040 420	3N								

Dimensions and Wiring

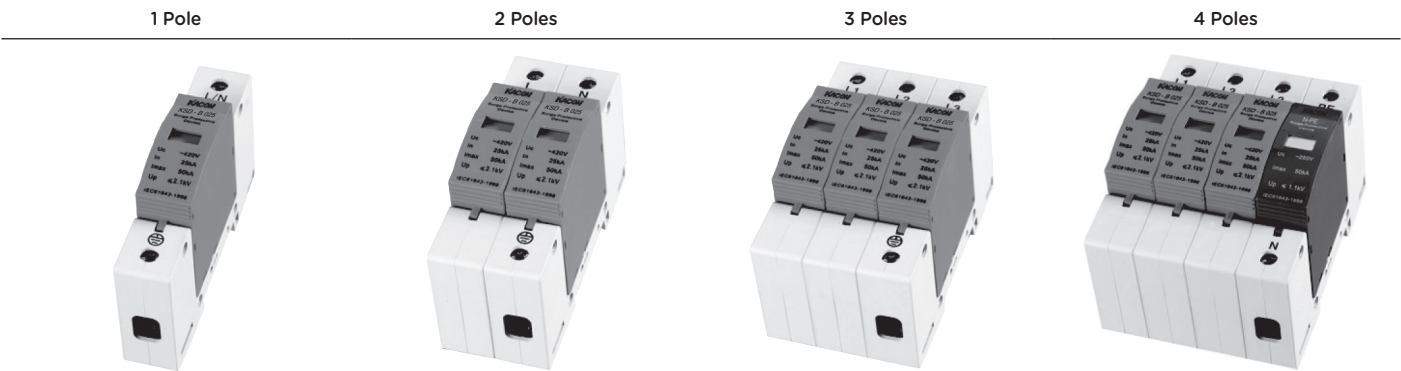


Surge Protectors Device

KSD Series

- Designed to improve users' safety
- Excellent convenience in construction and everyday use
- Compact and pleasing appearance

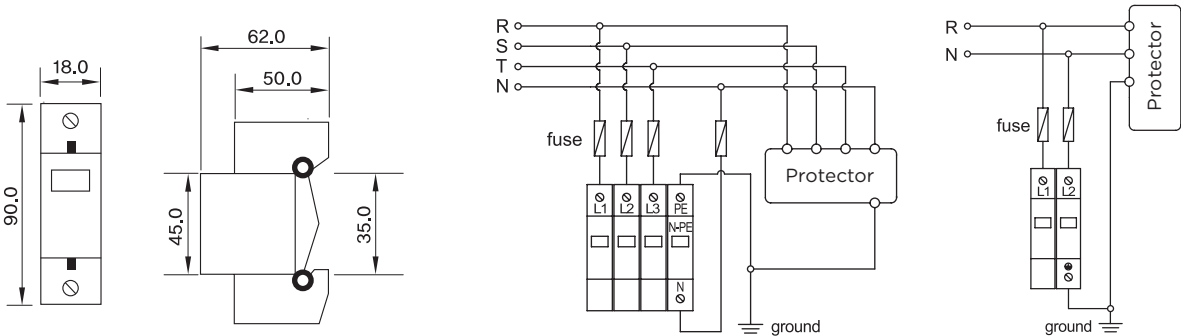
Nominal Current 25KA (Standard Discharge Current 25KA)



Product Specification

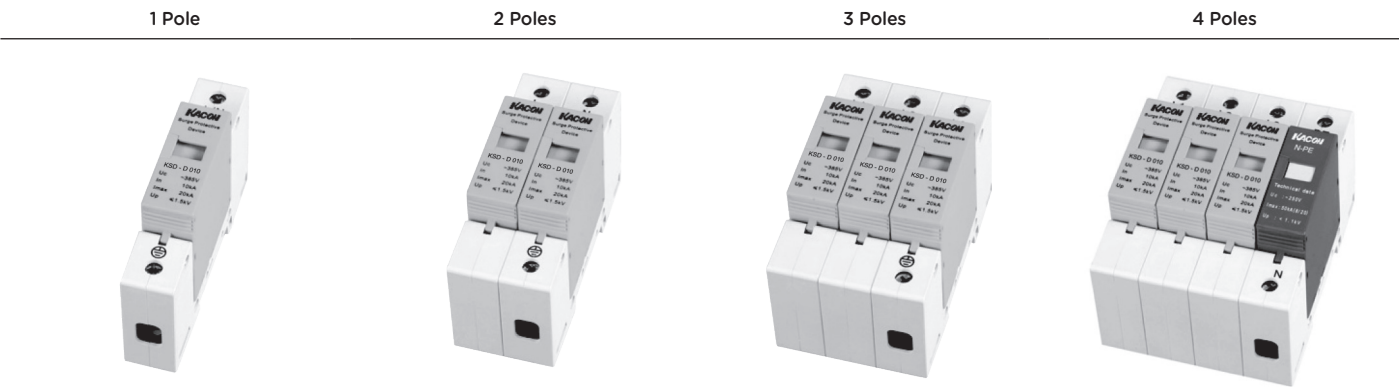
Part Number	Number of Pole	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Up (KV) Voltage Protection Level	Nominal Current (KA)	Max. Discharge Current (KA)	Response Time (ns)	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-B1025 385	1	220VAC	385VAC	≤ 1.9	25	50	< 25	≥ 16	≤ 20A
KSD-B2025 385	2								
KSD-B3025 385	3								
KSD-B4025 385	3N								
KSD-B1025 420	1	380VAC	420VAC	≤ 2.0	25	50	< 25	≥ 16	≤ 20A
KSD-B2025 420	2								
KSD-B3025 420	3								
KSD-B4025 420	3N								

Dimensions and Wiring



- Designed to improve users' safety
- Excellent convenience in construction and everyday use
- Compact and pleasing appearance

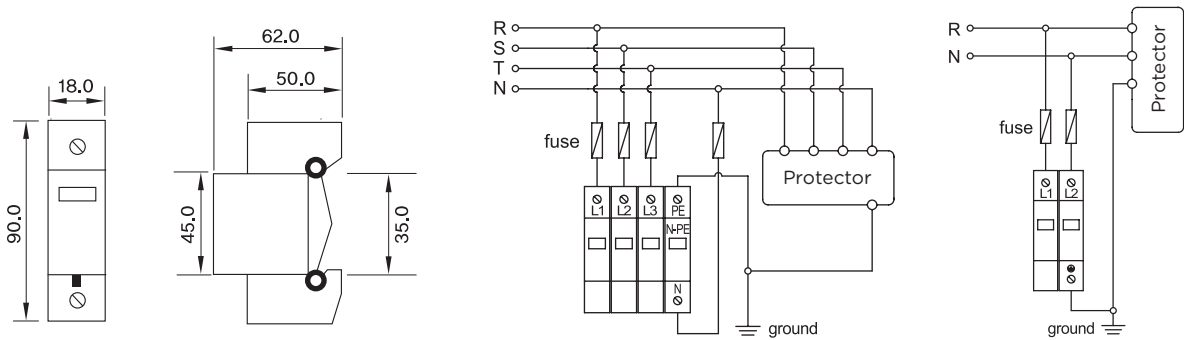
Nominal Current 10KA (Standard Discharge Current 10KA)



Product Specification

Part Number	Number of Pole	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Up (KV) Voltage Protection Level	Nominal Current (KA)	Max. Discharge Current (KA)	Response Time (ns)	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-D1010 385	1	220VAC	385VAC	≤ 1.5	10	20	< 25	≥ 10	≤ 16A
KSD-D2010 385	2								
KSD-D3010 385	3								
KSD-D4010 385	3N	380VAC	420VAC	≤ 1.6	10	20	< 25	≥ 10	≤ 16A
KSD-D1010 420	1								
KSD-D2010 420	2								
KSD-D3010 420	3								
KSD-D4010 420	3N								

Dimensions and Wiring

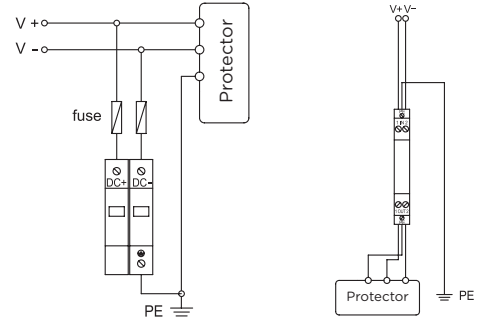
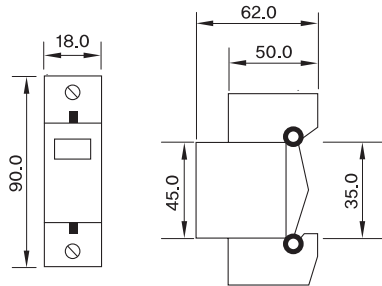


Surge Protectors Device

KSD Series

DC SURGE PROTECTOR

Dimensions and Wiring

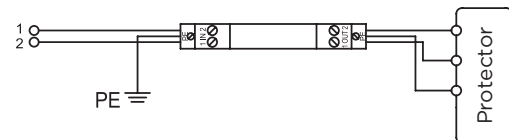
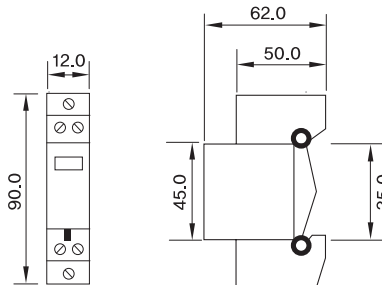


Product Specification

Part Number	Nominal Current (KA)	Max. Discharge Current (KA)	Up (V) Voltage Protection Level	Un (V) Rated Voltage	Uc (V) Continuous Operating Voltage	Cable (mm2)	Overheating Protection Fuse (A) in Series
KSD-0524	5KA	10KA	150	24VDC	32VDC	≥6	10A
KSD-1024	10KA	20KA	200	24VDC	32VDC	≥6	16A
KSD-2048	20KA	40KA	350	48VDC	62VDC	≥10	16A

COMMUNICATION SURGE PROTECTOR

Dimensions and Wiring



Product Specification

Part Number	Rated Voltage (Un)	Nominal Current (KA)	Voltage Limit (VDC)	Transmission Speed (Mbps)	Plug-in Damage (dB)	Connection Method
KSD-CH06	6VDC	5KA	7VDC	10	≤ 0.5	1,2
KSD-CH12	12VDC		15VDC			1,2
KSD-CH24	24VDC		28VDC			1,2

Precautions in Installations

- o Be sure to read the instruction manual and safety precautions before using the product.
- o Please make the product instruction manual available to the next user or to the repair manager.

• Safety Precautions

Be aware of the safety precautions, dangers, etc. before handling, wiring, manipulating, and conducting inspections.
Please observe the details regarding safe handling of the product.

• Danger

Always follow the instructions. Failure to follow the instructions may result in death or serious injury.

1. Make sure that the upstream breaker is turned OFF at all times. There are dangers of electric shock during installation.
2. Be careful not to get in contact with the exposed parts of the terminals. It can cause electric shocks or short circuits.
3. Be careful not to get in contact with two exposed live wires. It can cause electric shock.

• Precautions

Observe the following to avoid to avoid injury.

1. Make sure to read the precautions before installation, and follow the instructions during installation.
2. A faulty installation can lead to a malfunction of the product and/or accident. Installation, maintenance, and repairs of surge protectors should be conducted by qualified personnel (electric technicians).
3. Please avoid installations at places exposed to rain, oil, dust, direct sunlight, etc. There are dangers of an electric shock, electric leakage, short circuit, fire, malfunction, etc.
- 1) Application temperature: 40 ~ 70°C 2) Relative humidity: 40 ~ 85% 3) Altitude: Lower than 2000 m
- 4) Do not install the product at places susceptible to abnormal vibration, impact, excessive moisture, oil, smog, dust, corrosive gas, etc.
4. Connect the product to the rated power. Unrated power can lead to a malfunction or breakdown.
5. Insufficient fastening torque can cause excessive heat or fire. Firmly affix the terminal units in accordance with the specified fastening torque in the instruction manual of the product.
6. Install the connecting conductors parallel to each phase when fixing the terminals. Otherwise, there are dangers of short circuits between phases.
7. Do not conduct insulation resistance measurements, or withstand voltage tests between phases. Detach the product from the circuits when conducting the said tests on the circuit lines. Otherwise, there are high risks of breakdowns.
8. Be sure to ground the earth terminals of the electric devices.
9. Unearthed terminals can cause electric shock or fire.
10. Do not conduct unauthorized remodeling of the product.
11. Discard the product in accordance with the Wastes Control Act.

Considerations in Installations

- o The performance of the surge protectors may differ, depending on the installation methods.
- o Please consider the following details for the installation.

1) Protection and Installation Method

To protect various power distribution systems, the installation of surge protectors with sufficient surge capacities at the entrance of the panelboards are highly recommended if the devices and equipment to be protected have sufficient overvoltage withstanding capacity.

2) Reciprocal Vibration Phenomena

In cases where the devices and equipment to be protected are far distant from the surge protectors, about two-fold limit voltages of the surge protectors can occur to said equipment due to reciprocal vibrations of plunging surges. Such reciprocal vibrations of surges can be disregarded if the wirings are shorter than 10 m; however, as two-fold voltage can occur even in wirings shorter than 10 m, surge absorbers and protectors inside the devices and equipment must be harmonized.

3) Connection Wire Length

To achieve the best possible overvoltage protection, the connection wires for the surge protector should be shortened to restrict inductive voltages.

4) Necessity of Additional Protection

When comparatively low lightning surge voltages plunge into the devices and equipment to be protected, it may be enough to install surge protectors at building entrances. If a magnetic field occurs within the building due to lightning discharging electricity, additional protective devices can be used to protect precision equipment, such as computers that are positioned far from the surge protectors installed at the entrance.

5) Selection of Surge Protector Installation Places Based on Rating Tests

It is highly recommended to select surge protectors with appropriate specifications by considering lightning surge voltages or overvoltages due to low-voltage wiring systems.

6) Concept of Protection Area

In the designs and applications of appropriate surge protectors, it is most recommended to classify the protection areas based on the protection areas regulated in IEC, departmentalize the wiring systems, and install surge protectors at the boundaries of the protection areas.

Surge Protectors Device

KSD Series

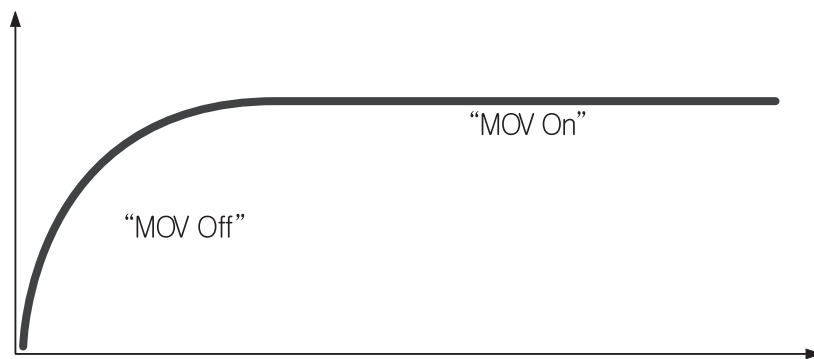
Characterisitics of surge Protectors

MOV is the most reliable technology for attenuating surge voltages. The clamping characteristics of MOV allow it to be applied in more than 95% of SPD for power supplies.

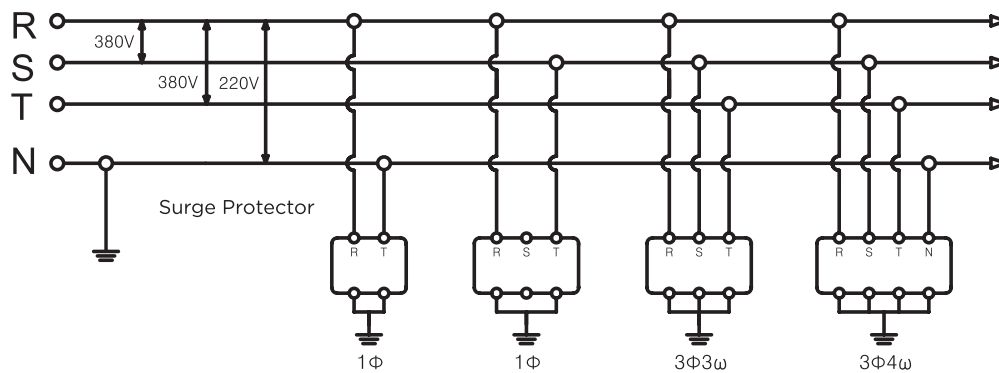
The silicon avalanche diodes (SAD) are frequently used in data cables and communication lines.

The following are the representative characteristics of MOV:

- Almost no current leakage at ceiling voltages.
- The higher the voltage is, the more the current leaks.
- The voltage drop will not increase even at higher current flows.



SPD Voltage and Current Characteristic Curves



- When 380V is applied between phases, the voltage changes to 220V at the surge protector due to the earth potential difference since the earth protector is grounded.

The surge protector should be selected and installed after considering the maximum continuous operating voltage (MCOV) and the voltage protection level (Up).

Over Current Relay

iOCR Series



Part Number Description

Description	05 : 0.5 ~ 6A	20 : 5 ~ 25A	20 : 5 ~ 25A
	10 : 1 ~ 12A	40 : 8 ~ 40A	

Specification

Rated Current	Type		Setting Range (S05,S30 Type)	Setting Range (P10,P20 Type)	Setting Range (P40 Type)
			05 : 0.5 ~ 6A	10 : 1 ~ 12A	40 : 8 ~ 40A
			30 : 3 ~ 30A	20 : 5 ~ 25A	
Time Set	Delay Time	D-time	10 ~ 30 sec		0.5 ~ 30 sec
	Operate Time	O-time	1 ~ 10 sec	1 ~ 15 sec	0.5 ~ 10 sec
Reset			Manual / Electrical		
Operating Time Characteristics			Definite Time		
Tolerance	Current		±10%		
	Time		±15%		
Rated Supply Voltage			AC90 ~ 260V 50/60 Hz		
Auxiliary Contact	Type		2N/O+2N/C	1N/O+1N/C	2N/O+2N/C
	Status	R Type	Normal Device (95 ~ 96 Open)		
		N Type Normally	Magnetized (95 ~ 96 Close)		
	Rating		250VAC / 3A Resistive Load		
Insulation Resistance	Between Case & Circuit		500VDC Megger 100MΩ		
Dielectric Strength	Between Case & Circuit		2.0kV Frequency 1 minute		
	Between Contact		1.0kV Frequency 1 minute		
	Between Circuit		2.0kV Frequency 1 minute		
Storage Temperature			-30 ~ 80°C (with no icing or condensing)		
Ambient Temperature			-20 ~ 60°C (with no icing or condensing)		
Ambient Humidity			30 ~ 85% RH (no condensing)		
Power Consumption			1.4W (Apparent Power 8.58VA)		

Over Current Relay

iOCR Series

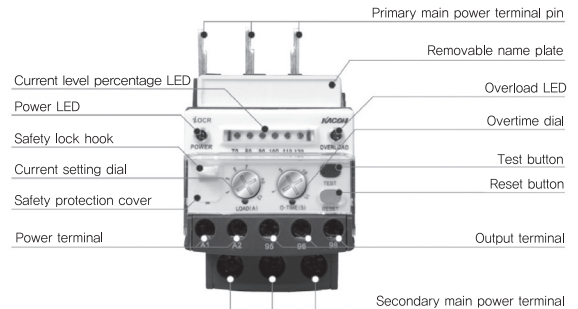
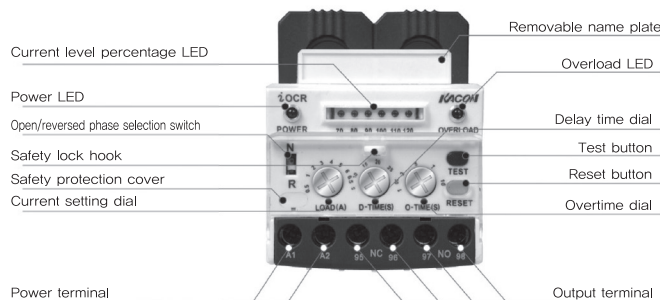
Product Setting

Item	Dial	Method
Delay Time	D-time	rotate the dial for the setting according to the motor starting time (*iOCR-P40 type)
Operating Time	O-time	rotate the dial for the setting of required operating time
Current	Load	after load-starting the motor, rotate the load dial counterclockwise gradually from the maximum to find the setting value with the percentage indicator LED lighted. The normal setting range is 75% - 90% of the rated current.

Product Selection

	Description	Current Range	Part Number		Description	Current Range	Part Number
	Tunnel Type	0.5 - 6A	iOCR-S05		Terminal Type	1 - 12A	iOCR-P10
		3 - 30A	iOCR-S30			5 - 25A	iOCR-P20
						8 - 40A	iOCR-P40

General Function



Features

Part	Function
Power LED	Indicates the power supply status by flashing from the motor starting until it is stabilized and by illuminating when there is no motor starting or the motor is stabilized.
Overload LED	Indicates the abnormal status of the motor starting by flashing under the over load (110%) and illuminating after the set O-TIME.
Percentage Indicator LED	- Indicates the current flow level. Flashes one time at the initial power application to show the operation status. - N/R dip switch • Selection of open or close by N or R position - R: Demagnetized when normal (regardless of power application, 95-96 close, 97-98 open) - N: Magnetized when normal (after the operating power application, 95-96 open, 97-98 close)
Test Button	Overload test switch. As soon as pressing this switch, the green lamp is turned on and turned off after D-TIME. Then the red lamp flashes and is turned off after O-TIME, at which the output contact operates.
Reset Button	- After the output contact operated due to overcurrent, pushing this switch resets the contact immediately. - Pushing this switch completes the shift in the case of N/R dip switch shift.
Load (A) Dial	Sets the current value that is the reference for trip operation. The value is generally 75%-90% of the rated current.
O-Time (S) Dial	Sets the delay time for the output contact in the case of overload. The output contact operates after O-TIME.
D-Time (S) Dial	Because the motor starting current is 3-9 times higher than the normal current, O-TIME is delayed by D-TIME during the motor starting. Set the time after checking the motor starting time because it depends on the motor load.

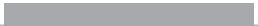
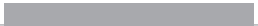
Examples Of Motor Set

	Nominal Current	Rated Current Range(A)	AC220 ~ 240V		AC440 ~ 480V	
			3-Phase Motors Rated Kw(Hp)	Motor Load Current(A)	3-Phase Motor Rated Kw(Hp)	Motor Load Current(A)
<i>i</i> OCR-S	05	0.5 ~ 6	0.18 ~ 0.75 (1/4 ~ 1)	4.8	0.12 ~ 0.55 (~ 0.75)	1.6
	30	3 ~ 30	0.37 ~ 5.5 (0.5 ~ 7.5)	26	1.1 ~ 11 (1.5 ~ 15)	24
<i>i</i> OCR-P	10	1 ~ 12	0.2 ~ 1.5 (1/4 ~ 2)	9.6	0.4 ~ 3 (0.6 ~ 4)	8
	20	5 ~ 25	0.75 ~ 3.7 (1 ~ 5)	17.4	2.2 ~ 7.5 (3 ~ 10)	17
	40	8 ~ 40	2.2 ~ 7.5 (3 ~ 10)	34	4 ~ 15 (5.5 ~ 20)	32.5

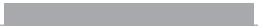
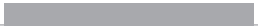
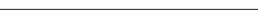
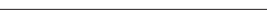
Note : It varies depending on the state of the motor.

Operating Check

< *i*OCR-S >

Condition		LED Signal			
		LED Green(Power)		LED Red(Over Load)	
Supply Voltage	Lights			Flashing	
Operating	Flashing			Lights Out	
Stable Operation	Lights			Lights Out	
Overload	Lights			Flashing	
Operating / Tripping	Overcurrent	Lights		Lights	

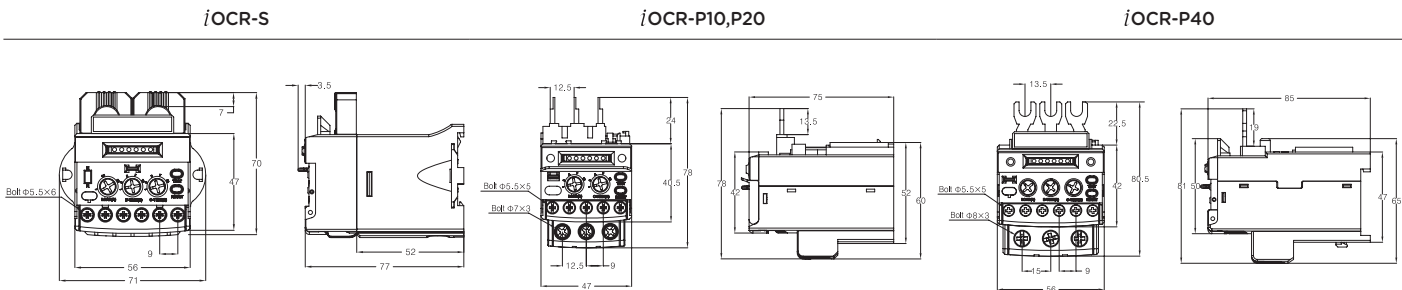
< *i*OCR-P >

Condition		LED Signal			
		LED Green(Power)		LED Red(Over Load)	
Supply Voltage	Lights			Flashing	
Operating	Flashing			Lights Out	
Stable Operation	Lights			Lights Out	
Overload	Lights			Flashing	
Operating / Tripping	Overcurrent	Lights		Lights	
	Stall	Lights Out		Flashing	
	T1	Lights Out		1Cycle 1Count Flickering	
	Phase T2	Lights Out		1Cycle 2Count Flickering	
	T3	Lights Out		1Cycle 3Count Flickering	

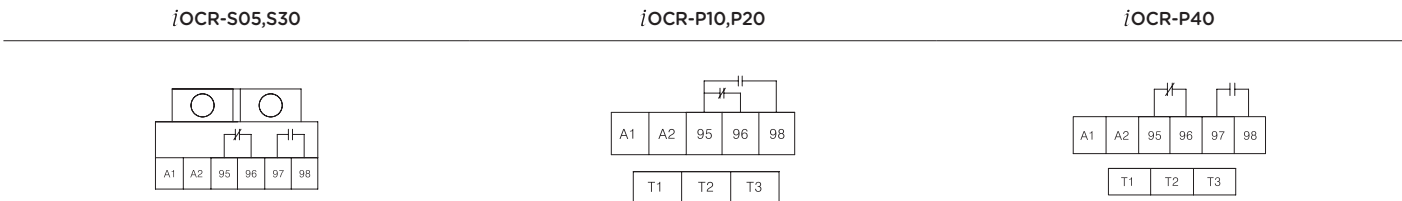
Over Current Relay

iOCR Series

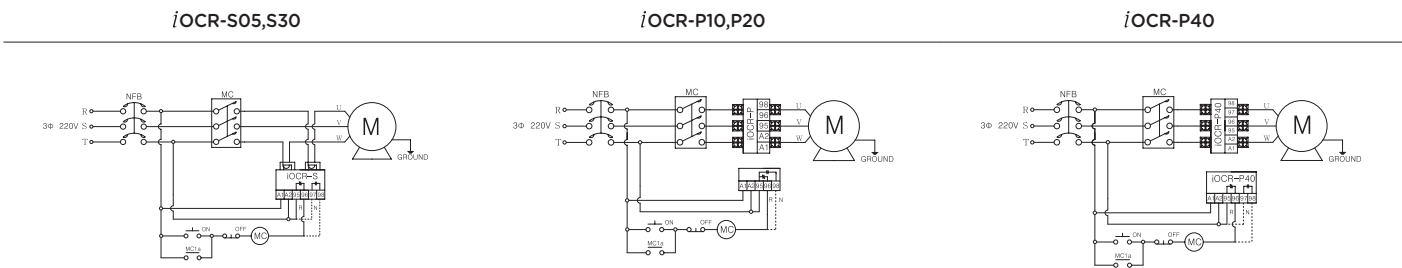
Dimension



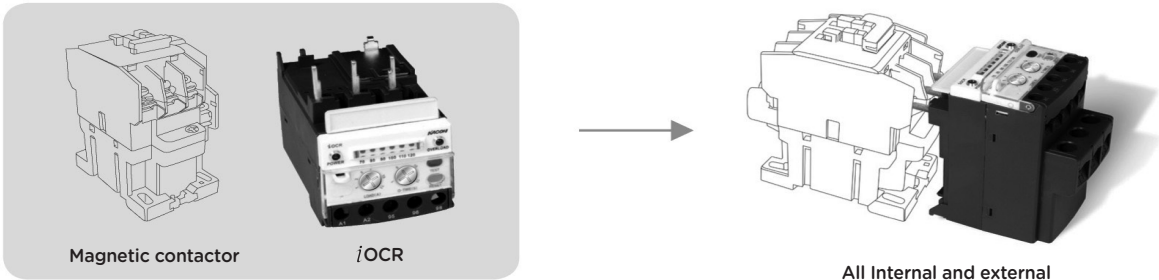
Terminal Arrangement



Circuit Configuration



Direct Connection To Magnetic Contactor



Magnetic Contactor

KMC Series



Part Number Description

KMC - ① ②

① Description	25S : 25A	30S : 30A	40S : 40A	50S : 50A
② Supply Voltage	110VAC	220VAC		

General Specification

Rating Model	Standard (AC Grade3)				Inching (AC Grade4)				Operating current	Life Cycle (X10K)			Closed & Breaking Current		* 1,200 times/hour
	100 ~ 110V	200 ~ 220V	380 ~ 440V	500 ~ 550V	100 ~ 110V	200 ~ 220V	380 ~ 440V	500 ~ 550V		AC Grade 3 *	AC Grade 4 **	Mechanical ***	Closed Current	Breaking Current	
KMC-25S	25A	25A	21A	17A	20A	20A	14A	12A	35A	25	1.5	250	150	25	** 600 times/hour
KMC-30S	30A	30A	23A	21A	22A	22A	20A	14A	40A	25	1.5	250	180	30	*** 1,200 times/hour
KMC-40S	40A	40A	32A	26A	25A	25A	24A	17A	50A	25	1.5	250	240	40	
KMC-50S	50A	50A	48A	38A	35A	35A	32A	24A	60A	25	1.5	250	300	50	

*, **, ***) Although the device can operate within a range of 85 % - 110 % of the rated operating voltage, use the rated voltage for continuous operation.

☞ Specifications and materials can change without prior notice.

Coil Ratings

Coil Voltage	Operating Voltage Range	Coil Resistance(Ω) (±10%)	Coil Current(mA)	Power(W) Consumption	Pick up Voltage(V) PV	Drop out Voltage(V) RV	Operate Timing
220VAC	208 - 240VAC 50/60Hz	975	39	2.7	176	66	on : 45ms off : 15ms
110VAC	100 - 120VAC 50/60Hz	264	85.8	2.7	80	30	

General Ratings

Ambient Temperature	-25°C ~ +55°C (with no icing or condensing)
Storage Temperature	-30°C ~ +65°C (with no icing or condensing)
Ambient Humidity	45 ~ 85% RH (no condensing)

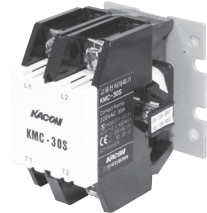
Mechanical Ratings

Model	Input				Output			
	Terminal Dimensions	Wiring(mm ²)	Crimp Terminals(mm ²)	Torque (kgf·cm)	Terminal Dimensions	Wiring(mm ²)	Clamp Terminals(mm ²)	Torque (kgf·cm)
KMC-25S	M5×12	5.5 ~ 8	5.5-5 ~ 8-5	26(±20%)	M3.5	1.25 ~ 2	1.25-3.5 ~ 2-3.5	12(±20%)
KMC-30S								
KMC-40S								
KMC-50S		14 ~ 22	14-5 ~ 22-5					

Magnetic Contactor

KMC Series

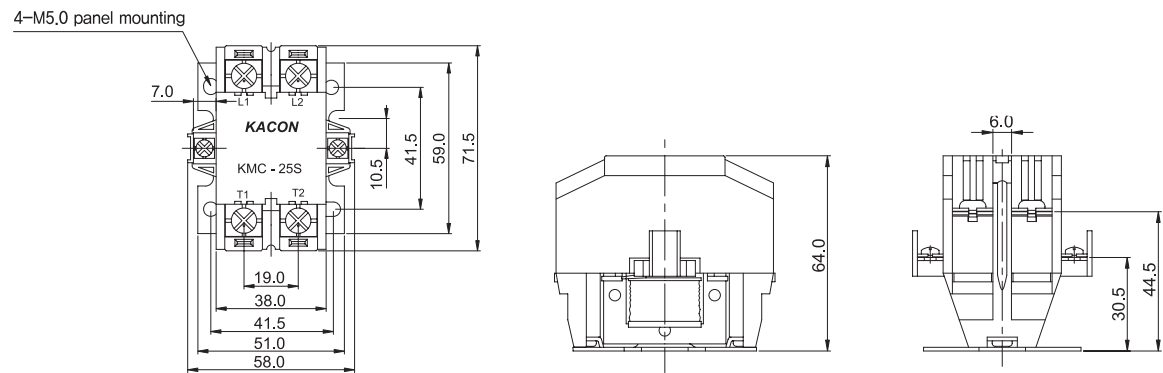
Product Selection



Contact Rating - Standard(AC grade3)				Rated Voltage	Part Number
100 ~ 110V	200 ~ 220V	380 ~ 440V	500 ~ 550V		
25A	25A	21A	17A	110VAC	KMC-25S 110VAC
				220VAC	KMC-25S 220VAC
30A	30A	23A	21A	110VAC	KMC-30S 110VAC
				220VAC	KMC-30S 220VAC
40A	40A	32A	26A	110VAC	KMC-40S 110VAC
				220VAC	KMC-40S 220VAC
50A	50A	48A	38A	110VAC	KMC-50S 110VAC
				220VAC	KMC-50S 220VAC

Dimension

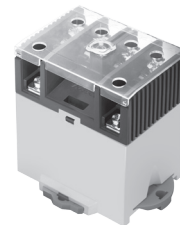
(mm)



※ KMC-25S, KMC-30S, KMC-40S, KMC-50S : same dimensions

Heavy Duty Relay

K750 Series



Part Number Description

K750 - 2A **1**

1 Coil Voltage 12VDC 24VDC 110VAC 220VAC

General Specification

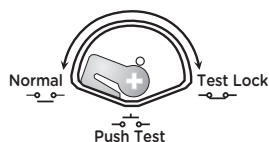
Contact Ratings	Contact Form	2N/C + 2N/O		
	Contact Material	Tri-Composite Silver Alloy		
	Maximum Contact (Resistance load)	100mΩ		
	Rated Current (Resistance Load)	30A 30VDC	40A 250 VAC	
	Maximum Switching Current	40A		
	Minimum Switching Current *	100mA 5VDC		
Coil Ratings	Coil Voltage	12VDC, 24VDC	100/110 VAC 50/60 Hz	220/240 VAC 50/60 Hz
	Coil Consumption	DC coil 1.9W approx. AC coil 1.8 ~ 27VA approx		
	Minimum Pick-up Voltage	80% of Nominal Voltage		
	Maximum Drop-out Voltage	10% of Nominal Voltage DC 30% of Nominal Voltage AC		
	General Ratings	Operating Time	Maximum Pick-up	30 ms
Minimum Drop-out			30 ms	
Insulation Resistance		Max. 100mΩ		
Dielectric Strength		Between Contact Points	2000Vrms for 1 minute	
		Between Contact Points and Coil	4000Vrms for 1 minute	
Life Cycle		Mechanical Min. 1,000,000 Electrical Min. 100,000		
		Vibration Resistance	Malfunction 10 ~ 55Hz dual amp. : 1.0mm Destruction 10 ~ 55Hz dual amp. : 1.5mm	
Shock Resistance		Malfunctional Approx. 10G Destruction Approx. 100G		
Ambient Temperature		-40°C ~ 60°C (with no icing or condensing)		
Ambient Humidity		10 ~ 80%RH (no condensing)		

☞ Please refer to the attention section.

☞ Specifications and materials can be changed without prior notice for the enhancement of the quality.

* The minimum Switching current is indicated as a standard value. The actual minimum Switching rate is variable factor according to the make and break frequency, environmental condition and anticipated credibility level. Therefore, it is recommended that tests be done to test actual load value before the production process.

Test Button



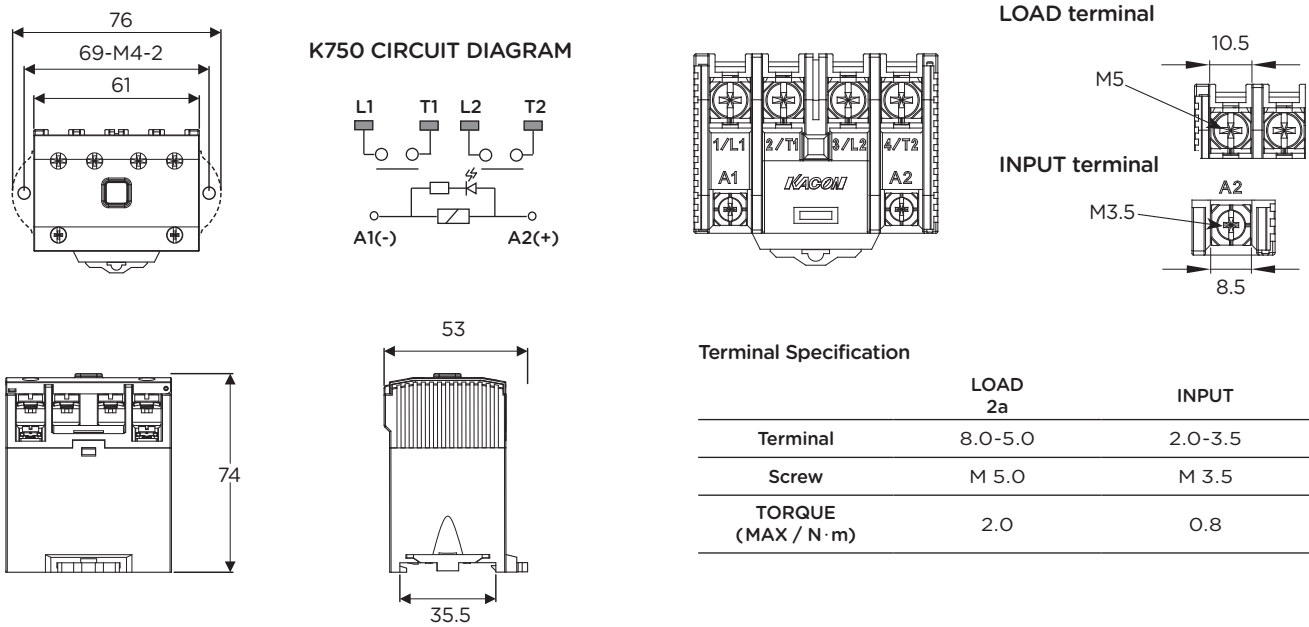
- Push Test : Momentary
- Test Lock : Contact ON
- Normal : Contact OFF

Heavy Duty Relay

K750 Series

Dimension

(mm)



Heavy Duty Relay

K730 Series



Part Number Description

K730 - **1** **2** **3**

1 Contact Arrangement	1 : 1N/O + 1N/C	2 : 2N/O + 2N/C		
2 Mounting & Terminal	TB : Upper (screw) mounting / Bolt		TR : Din-rail mounting / Bolt	
	QB : Upper (screw) mounting / Quick-connect (#350)		QR : Din-rail mounting / Quick-connect (#250)	
3 Coil Voltage	12VDC	24VDC	100/110VDC	100/120VAC 220/240VAC

General Specification

Contact Ratings	Contact Form		1N/O + 1N/C	2N/O + 2N/C			
	Contact Material		Ag alloy (24K gold plate)				
	Maximum Contact Resistance		100mΩ				
	Rated Current (Resistance Load)		30A 30VDC	25A 30VDC			
			30A 277VAC	25A 277VAC			
	Maximum Switching Current		30A	25A			
	Maximum Rated Voltage		DC 900W / 8,310VAC	DC 750W / 5,500VAC			
	Minimum Switching Current *		100mA 5VDC				
Coil Ratings	Coil Voltage		12VDC	24VDC	100/110VDC	100/120VAC 50/60 Hz	220/240VAC 50/60 Hz
	Coil Consumption	DC	1.9W Approx.				
		AC	1.7 - 1.9VA (6VAC - 48VAC)				
			1.9 - 2.7VA (100/120VAC)				
			1.8 - 2.6VA (200/240VAC)				
	Minimum Pick-up Datas		80% of Nominal				
General Ratings	Operating Time		10% of Nominal Voltage DC				
			30% of Nominal Voltage AC				
	Maximum Pick-up	30ms					
		Minimum Drop-out	30ms				
	Insulation Resistance		100MΩ at 500VDC				
	Dielectric Strength		Between Contact Points (2a Type) : 2,000Vrms for 1 minute.				
			Between Contact Points and Coil : 4,000Vrms for 1 minute.				
	Life Cycle		Mechanical : Min. 1,000,000				
			Electrical : Min. 100,000				
	Vibration Resistant		10 ~ 55Hz (width of vibration 1.5mm)				
	Ambient Temperature		-10°C ~ +60°C (with no icing or condensing)				
	Ambient Humidity		35% ~ 80%RH (no condensing)				
Weight		TB : 90g / QB : 120g					
Tightening Torque		1.2N·m (12.24kgf·cm)					

☞ Please refer to the attention section.

☞ Specifications and materials can be changed without prior notice for the enhancement of the quality.

* The minimum switching current is indicated as a standard value. The actual minimum switching rate is variable factor according to the make and break frequency, environmental condition and anticipated credibility level. Therefore, it is recommended that tests be done to test actual load value before the production process.

Heavy Duty Relay

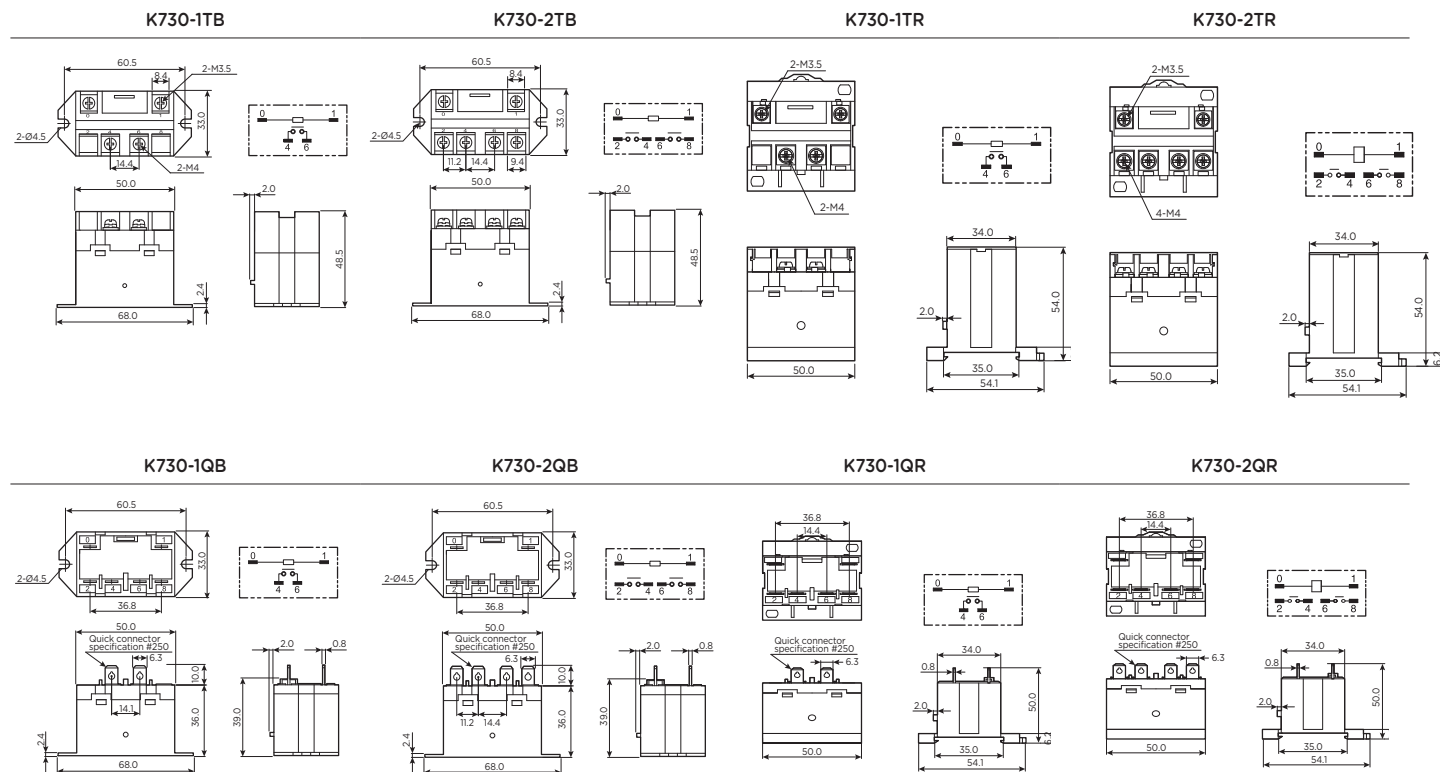
K730 Series

Product Selection

Contact	Type	Rated Voltage	Part Number	Contact	Type	Operational Voltage	Part Number
	1N/O -Screw Terminal -Bracket	220VAC	K730-1TB 220VAC		2N/O -Screw Terminal -Bracket	220VAC	K730-2TB 220VAC
		110VAC	K730-1TB 110VAC			110VAC	K730-2TB 110VAC
		24VDC	K730-1TB 24VDC			24VDC	K730-2TB 24VDC
		12VDC	K730-1TB 12VDC			12VDC	K730-2TB 12VDC
	1N/O -Screw Terminal -Din-rail	220VAC	K730-1TR 220VAC		2N/O -Screw Terminal -Din-rail	220VAC	K730-2TR 220VAC
		110VAC	K730-1TR 110VAC			110VAC	K730-2TR 110VAC
		24VDC	K730-1TR 24VDC			24VDC	K730-2TR 24VDC
		12VDC	K730-1TR 12VDC			12VDC	K730-2TR 12VDC
	1N/O -Quick Connector -Bracket	220VAC	K730-1QB 220VAC		2N/O -Quick Connector -Bracket	220VAC	K730-2QB 220VAC
		110VAC	K730-1QB 110VAC			110VAC	K730-2QB 110VAC
		24VDC	K730-1QB 24VDC			24VDC	K730-2QB 24VDC
		12VDC	K730-1QB 12VDC			12VDC	K730-2QB 12VDC
	1N/O -Quick Connector -Din-rail	220VAC	K730-1QR 220VAC		2N/O -Quick Connector -Din-rail	220VAC	K730-2QR 220VAC
		110VAC	K730-1QR 110VAC			110VAC	K730-2QR 110VAC
		24VDC	K730-1QR 24VDC			24VDC	K730-2QR 24VDC
		12VDC	K730-1QR 12VDC			12VDC	K730-2QR 12VDC

Dimension

(mm)



Heavy Duty Relay

HR723 Series



Part Number Description

HR723

- ① ②

① Contact Arrangement	1C : 1N/O + 1N/C	2A : 2N/O	2C : 2N/O + 2N/C
② Coil Voltage	24VDC	110VAC	220VAC

General Specification

Contact Ratings	Contact Form		1N/O + 1N/C	2N/O	2N/O + 2N/C	
	Contact Material		Ag alloy			
	Maximum Contact Resistance		50mΩ			
	Rated Current (Resistance Load)		30A 24VDC			
			30A 220VAC			
	Maximum Switching Current		30A			
	Maximum Rated Voltage		110VDC / 250VAC			
Minimum Switching Current *			100mA 5VDC			
Coil Ratings	Coil Voltage		12VDC	24VDC	110VAC 50/60 Hz	220VAC 50/60 Hz
	Coil Consumption	DC	Approx. 2.8W			
		AC	9.6VA			
	Minimum Pick-up Voltage			80% of Nominal Voltage		
	Maximum Drop Out Voltage			10% of Nominal Voltage DC		
30% of Nominal Voltage AC						
General Ratings	Operating Time	Maximum Pick-up	30ms			
		Minimum Drop-out	30ms			
	Insulation Resistance		100MΩ at 500VDC			
	Dielectric Strength		Between Contact Points: 2,000Vrms for 1 minute			
			Between Contact Points and Coil : 2,500Vrms for 1 minute			
	Life Cycle		Mechanical : Min. 5,000,000			
			Electrical : Min. 100,000			
	Vibration Resistant		10 ~ 55Hz (width of vibration 3.3mm)			
	Ambient Temperature		-10°C ~ +60°C (with no icing or condensing)			
	Ambient Humidity		5% ~ 80%RH (no condensing)			
	Weight		2A : Approx. 250g, 2C : Approx. 300g, 1C : Approx. 200g			
	Tightening Torque		1.2N·m (12.24kgf·cm)			

¹³⁾ Please refer to the attention section.

¹⁴⁾ Specifications and materials can be changed without prior notice for the enhancement of the quality.

* The minimum switching current is indicated as a standard value. The actual minimum switching rate is variable factor according to the make and break frequency, environmental condition and anticipated credibility level. Therefore, it is recommended that tests be done to test actual load value before the production process.

Heavy Duty Relay

HR723 Series

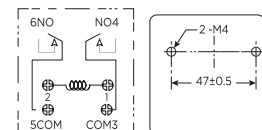
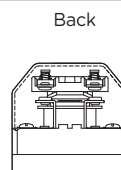
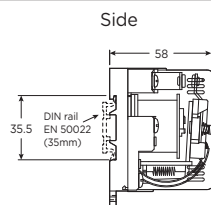
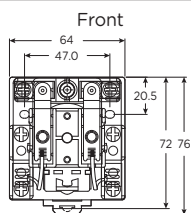
Product Selection

	Contact Form	Rated Voltage	Part Number
	2N/O	220VAC	HR723-2A 220VAC
		110VAC	HR723-2A 110VAC
		24VDC	HR723-2A 24VDC
	1N/O + 1N/C	220VAC	HR723-1C 220VAC
		110VAC	HR723-1C 110VAC
		24VDC	HR723-1C 24VDC
	2N/O + 2N/C	220VAC	HR723-2C 220VAC
		110VAC	HR723-2C 110VAC
		24VDC	HR723-2C 24VDC

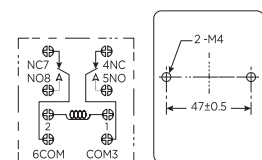
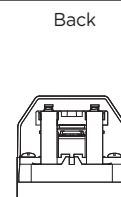
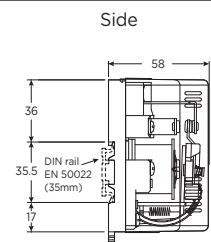
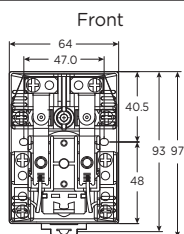
Dimension

(mm)

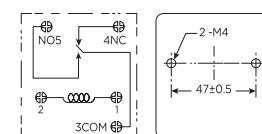
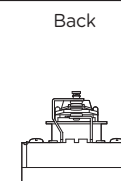
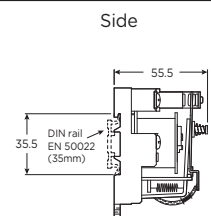
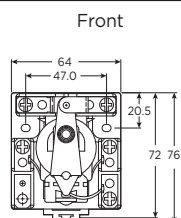
HR723-2A



HR723-2C



HR723-1C



Rotary Switch Disconnect

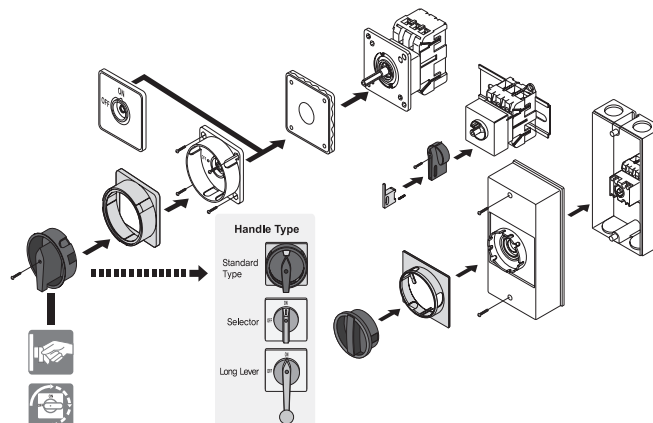
MLD, MLDX Series



MLD



MLDX



Control & Protection

Part Number Description

MLD - ① ② ③ (Base Mounted Load Switches)

① Rated Current	020 : 20A	032 : 32A	040 : 40A
	063 : 63A	080 : 80A	100 : 100A
② Mounting Type	P : Pannel Type	D : Din Rail & Surface	ES : Extension Shaft
③ Handle Type	E : Emergency (Basic)	S : Selector (only P, ES type)	K : Long Lever (only P, ES type)

MLDX - ① ② (Enclosed Disconnect Load Switches)

① Rated Current	020 : 20A	032 : 32A	040 : 40A
	063 : 63A	080 : 80A	100 : 100A
② Handle Type	D : Flush		

General Specification

Model		MLD - 020	MLD - 032	MLD - 040	MLD - 063	MLD - 080	MLD - 100
Division							
Rated Insulation Voltage (Ui)	V	660	660	660	660	1000	1000
Maximum Switching Current (I th)	A	20	32	40	63	80	100
Rated Current (Ie) AC-2 AC-3	A	15	22	30	43	57	70
	A	11	15	22	36	43	57
Rated Voltage (Ue)	V	240 440	240 440	240 440	240 440	240 440	240 440
Contact Capacity AC-2 AC-3	kW	3.7 5.5	5.5 11	7.5 15	9 22	15 30	22 37
	kW	2.7 3.7	4 7.5	5.5 11	8 18.5	9 22	15 30
Motor Load	V	240 440	240 440	240 440	240 440	240 440	240 440
	HP	2 3	5 10	7.5 15	10 20	20 40	25 50
Icw/s	A	180	264	360	516	684	840
Wire	mm ²	1.25 ~ 5.5	2 ~ 14	2 ~ 14	2 ~ 38	2 ~ 38	2 ~ 60
Tightening Torque	N·m	0.8(8.16kgf·cm)		1.2(12.24kgf·cm)		2.5(25.49kgf·cm)	

* Workable temperature : -25 ~ 70°C (With no icing)

Rotary Switch Disconnecter

MLD, MLDX Series

Product Selection

Operating Type	Rated Current	Mounting Type	Handle	Part Number
Main load disconnecter - MLD Series 	20A	Pannel Type	Emergency	MLD-020PE
			Selector	MLD-020PS
			Long Lever	MLD-020PK
		Din Rail & Surface	Emergency	MLD-020DE
		Extension Shaft	Emergency	MLD-020ESE
			Selector	MLD-020ESS
			Long Lever	MLD-020ESK
	32A	Pannel Type	Emergency	MLD-032PE
			Selector	MLD-032PS
			Long Lever	MLD-032PK
		Din Rail & Surface	Selector	MLD-032DE
		Extension Shaft	Emergency	MLD-032ESE
			Selector	MLD-032ESS
			Long Lever	MLD-032ESK
	40A	Pannel Type	Emergency	MLD-040PE
			Selector	MLD-040PS
			Long Lever	MLD-040PK
		Extension Shaft	Emergency	MLD-040ESE
			Selector	MLD-040ESS
			Long Lever	MLD-040ESK
	63A	Pannel Type	Emergency	MLD-063PE
			Selector	MLD-063PS
			Long Lever	MLD-063PK
		Din Rail & Surface	Selector	MLD-063DE
		Extension Shaft	Emergency	MLD-063ESE
			Selector	MLD-063ESS
			Long Lever	MLD-063ESK
	80A	Pannel Type	Emergency	MLD-080PE
			Selector	MLD-080PS
			Long Lever	MLD-080PK
		Extension Shaft	Emergency	MLD-080ESE
			Selector	MLD-080ESS
			Long Lever	MLD-080ESK
	100A	Pannel Type	Emergency	MLD-100PE
			Selector	MLD-100PS
			Long Lever	MLD-100PK
		Extension Shaft	Emergency	MLD-100ESE
			Selector	MLD-100ESS
			Long Lever	MLD-100ESK
Main load disconnecter Box type - MLDX Series 	20A	-	Flush	MLDX-020D
	32A	-	Flush	MLDX-032D
	40A	-	Flush	MLDX-040D
	63A	-	Flush	MLDX-063D
	80A	-	Flush	MLDX-080D

Enclosed Power Switch

KDS Series



Part Number Description

KDS - 1 2			
① Position	1 : 2 Position (on - on)	2 : 2 Position (on - off)	3 : 3 Position (on - off - on)
② Lamp operation	P : Standby on	L : Load on	
Cover color : smoke			

General Specification

Contact Resistance	Max. 50MΩ
Dielectric Strength	1000VAC 1 minute
Insulation Resistance	100MΩ 500VDC
Ambient Temperature	-25 ~ 75°C (with no icing or condensing)
Ambient Humidity	50 ~ 95% RH (no condensing)
Tightening Torque	1.2 N.m (12.25 Kgf.cm)

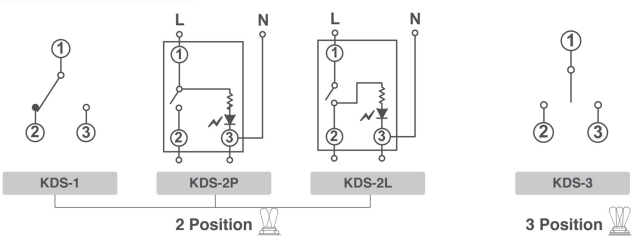
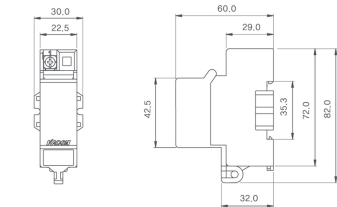
Product Selection

	Part Number	Position	LED
	KDS-1	on - on	
	KDS-2P	2 position	power on/LED on
	KDS-2L		load on/LED on
	KDS-3	3 position	on - off - on

Dimension

(mm)

Diagram



Accessory

KDS-N1	KDS-N2	KDS-N3	KDS-N4	KDS-N5	KDS-N6	KDS-N7	KDS-N8
켜짐 꺼짐	閉 開	ON OFF	AUTO MANU	START STOP	IN OUT	I O	RUN STOP

More reliable interface between
human and machines.

**Machines and engineers
sharing senses.**