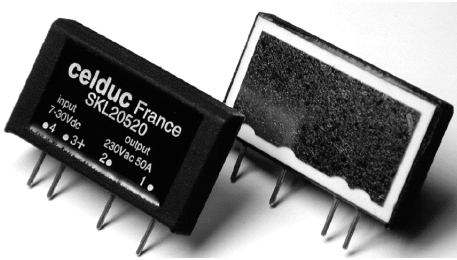
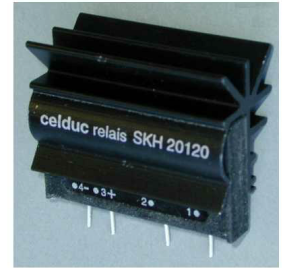


New concept for SSRs.



SKL



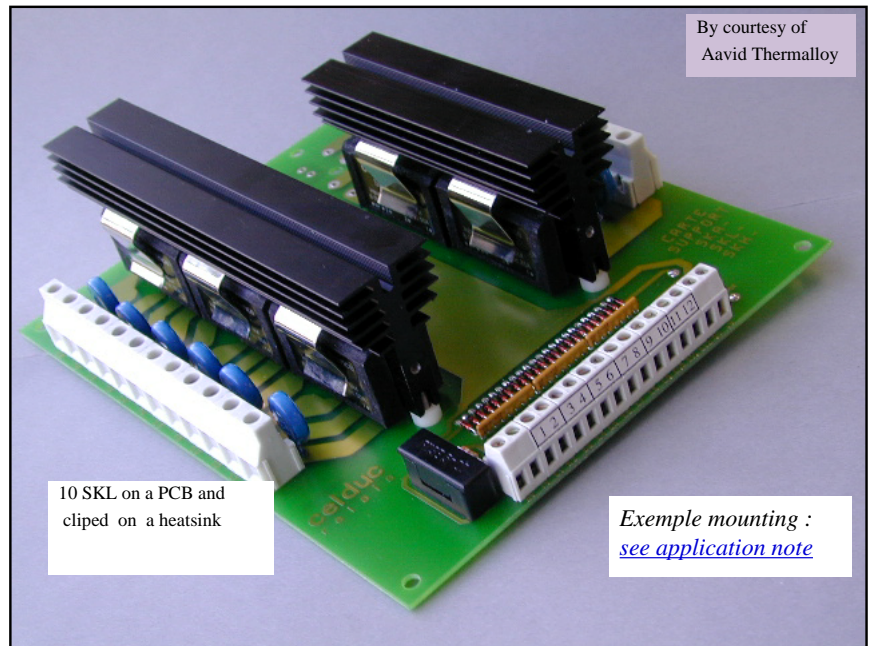
SKH

The SKA standard range for printed circuit board is extended with products in hybrid technology (Direct Copper Bonding (*)) with :

--> 230VAC and 400VAC SKA models built with 50A back to back thyristors which can drive a 6A permanent current and sustain very high surge current : 600A/20ms and $I_2t > 1800A^2s$.

--> SKL range for mounting on heatsink with 16, 25, 50 and 75A power element size . With these SSRs you can drive loads with high inrush current. The nominal current is limited by the size of the heatsink and the printed circuit board (generally 25/30A). (For example : you can drive a load with a nominal current of 25/30A according to the printed circuit board and the heat-sink , but with an inrush current $\geq 75A$ during few seconds)

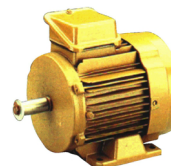
--> SKH range with a small heatsink clipped on the SKL products . SKH can drive a 10A permanent current, extended to 25A with forced air cooling.



This range is particularly designed for heater , incandescent lamps and motor control . These SSRs can sustain very high surge currents (up to 1000A/10ms and 5000A²s) , therefore they can easily be protected against short-circuit of the load and can drive loads with high inrush currents. Many applications like motor switching (pump controls , motor reversing , SSRs integration inside the motor connections box , ...) , transformers , food equipment (coffee machines , pizza ovens , ... , lamps (infrared lamps , traffic lights , lightning , ...) , medical equipments ,

As all **celduc** SSRs, this range is built with high immunity components in compliance with european standards, with very low zero cross voltage,.....

(*) The first advantage of DCB technology (Direct Copper bonding) is the thermal performances , but the main advantage is the increasing of the lifetime expectancy , mainly on loads with high inrush currents.



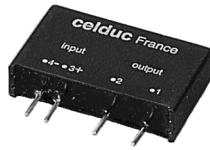
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r e l a i s

L=43,2mm

l =10,2mm

h=25,4mm



standard range

(with or without LED)

L=43,2mm

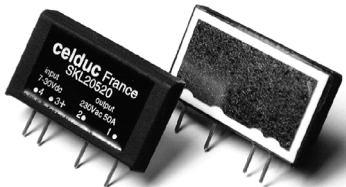
l =10,2mm

h=25,4mm



new SKA : hybrid technology

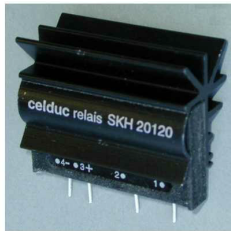
L=43,2mm l =6,3mm h=25,4mm



new SKL

with external heatsink

L=43,2mm l =21mm h=35,7mm

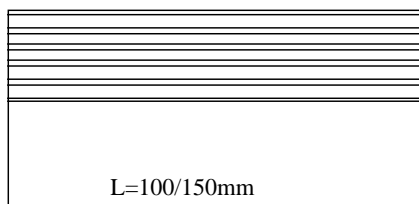
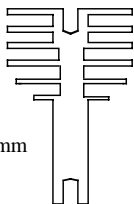


new SKH

with integrated heatsink

l=30mm

h=51mm



L=100/150mm

* The Max Clip System of Aavid Thermalloy, Patented Worldwide (patent N°9805561)

ISO 9001
N° 1993/1106a

REFERENCE	Output voltage	Output current	I2t (A2s)	Control	Type	R input	protection
SKA10420	12-275VAC	4A	72A2s	2,5-10VDC	Z.Cross	330Ω	VDR
SKA20420	12-275VAC	4A	72A2s	4-30VDC	Z.Cross	1000Ω	VDR
SKA20421	12-275VAC	4A	72A2s	4-30VDC	random	1000Ω	VDR
SKA10440	12-460VAC	4A	72A2s	2,5-10VDC	Z.Cross	330Ω	VDR
SKA20440	12-460VAC	4A	72A2s	5-30VDC	Z.Cross	1000Ω	VDR
SKA20460	24-600VAC	4A	72A2s	5-30VDC	Z.Cross	1000Ω	-
SKA20461	24-600VAC	4A	72A2s	4-30VDC	random	1000Ω	-
SKB10420	12-280VAC	4A	72A2s	2,5-10VDC	Z.Cross	330Ω	-
SKB20420	12-280VAC	4A	72A2s	4-30VDC	Z.Cross	1000Ω	-
SKD10306	2-60VDC	3A	-	3-30VDC	-	1000Ω	-
SKD10120	2-200VDC	1A	-	3-30VDC	-	1000Ω	-

Other models : with LED : see [SKA](#) and [SKB](#) data-sheets 3-30VDC control : [SK541100](#)

REFERENCE	Output voltage	Output current	I2t (A2s)	Control	Type	R input	Protection
SKA10620	12-280VAC	6A	1800A2S	4-14VDC	Z.Cross	440Ω	-
SKA20620	12-280VAC	6A	1800A2S	8-32VDC	Z.Cross	1640Ω	-
SKA10640	24-600VAC	6A	1800A2S	4-14VDC	Z.Cross	440Ω	-
SKA20640	24-600VAC	6A	1800A2S	8-32VDC	Z.Cross	1640Ω	-

SKA 6A with I2t as SKL range: on request

REFERENCE	Output voltage	Current with WF032000 heatsink	Thyristors size	I2t (A2s)	Control	Type	R input
SKL10120	12-280VAC	15A @ 40°C	16A	128A2s	4-14VDC	Z.Cross	440Ω
SKL20120	12-280VAC	15A @ 40°C	16A	128A2s	8-32VDC	Z.Cross	1640Ω
SKL10220	12-280VAC	20A @ 25°C	25A	312A2s	4-14VDC	Z.Cross	440Ω
SKL20220	12-280VAC	20A @ 25°C	25A	312A2s	8-32VDC	Z.Cross	1640Ω
SKL10240	24-600VAC	20A @ 35°C	25A	450A2s	4-14VDC	Z.Cross	440Ω
SKL20240	24-600VAC	20A @ 35°C	25A	450A2s	8-32VDC	Z.Cross	1640Ω
SKL10520	12-280VAC	27A @ 25°C	50A	1800A2S	4-14VDC	Z.Cross	440Ω
SKL20520	12-280VAC	27A @ 25°C	50A	1800A2S	8-32VDC	Z.Cross	1640Ω
SKL10540	24-600VAC	27A @ 25°C	50A	1800A2S	4-14VDC	Z.Cross	440Ω
SKL20540	24-600VAC	27A @ 25°C	50A	1800A2S	8-32VDC	Z.Cross	1640Ω
SKL10740	24-600VAC	30A @ 20°C	75A	5000A2S	4-14VDC	Z.Cross	440Ω
SKL20740	24-600VAC	30A @ 20°C	75A	5000A2S	8-32VDC	Z.Cross	1640Ω

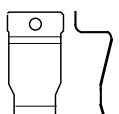
All models available in Random control

REFERENCE	Output voltage	Output current	output current with fan	I2t (A2s)	Control	Type	R input
SKH10120	12-280VAC	10A @20°C	16A	128	4-14VDC	Z.Cross	440Ω
SKH20120	12-280VAC	10A @20°C	16A	128	8-32VDC	Z.Cross	1640Ω
SKH10240	24-600VAC	10A @25°C	25A	450	4-14VDC	Z.Cross	440Ω
SKH20240	24-600VAC	10A @25°C	25A	450	8-32VDC	Z.Cross	1640Ω

The SKH is built with SKL + a clipped heatsink . So all the SKL range can become SKH

SKL ACCESSOIRES

Dissipateurs thermiques (Max Clip System (*) : S507 /Aavid Thermalloy):

[WF042000](#) : L=100mm ≈ 3,6-4 K/W (sans ventilation)[WF032000](#) : L=150mm ≈ 2,6-3 K/W (sans ventilation)Clips for WF03/04 :
[1L941000](#)Clip max 23
Aavid Thermalloyclips with screw : [1L942000](#)**celduc**
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Mains Applications :



Standard SK range

The standard SKA/SKB/SKD range is mainly adapted for driving small loads like contactors , electromagnets , lamps,.....

REF	resistive loads	lamps	inductive loads (contactors,...)
SKAxx4xx	4A 230VAC	2,5A 230VAC	2,5A 230VAC
	4A 400VAC	2,5A 400VAC	2,5A 400VAC
	4A 600VAC	2,5A 600VAC	
SKBxx4xx	4A 230VAC	2,5A 230VAC	
	4A 400VAC	2,5A 400VAC	
SKDxxxxx	3A 60VDC	2A 60VDC	2A 60VDC
	1A 200VDC	0,7A 200VDC	0,7A 200VDC



Electromagnets , lamps, contactors,.....



New SKA in hybrid technology

This SKA range with high I_{tsm} and I^2t is designed to drive loads with :

--> a protection by Miniature Circuit Breakers : Typical example : heating control on small molding machines.

--> high inrush current on loads like lamps or motors (ON/OFF or reversing applications)

REF	resistive loads (AC-51)	Lamps (AC-55)	Inductive loads (AC-53)
SKAxx6xx	6A 230VAC	6A 230VAC	6A 230VAC
	6A 400VAC	6A 400VAC	6A 400VAC

$I_d = 1,4xI_n$



heater

$I_d = 10xI_n$



infrared lamps or lighting lamps



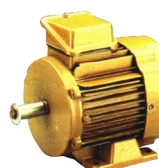
SKH with integrated heatsink

The SKH range with integrated heatsink can drive loads up to 10A:

REF	resistive loads (AC-51)	Lamps (AC-55)	Inductive loads (AC-53)
SKHxx1xx	10A 230VAC	3A 230VAC	3A 230VAC
SKHxx2xx	10A 400VAC	5A 400VAC	5A 400VAC

$I_d = 8xI_n$

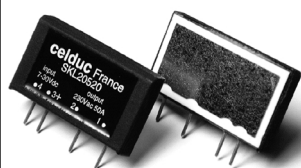
$I_d = 100xI_n$



Motor



Transformer



SKL for external heatsink

The large range of SKL is designed to be installed with an external heatsink allows to reduce the sizes and the price of the equipment, everywhere , there are many SSRs and electronic control . The limit is given by the heatsink and the printed circuit board (generally 25/30A).

The incomparable characteristics of I_{tsm} and I^2t in this small size allows to sustain very high surge current on loads like lamps , motors or transformers.

The short circuit protection on the load can easily be made by Miniature Circuit Breakers.

All the range can be delivered with random control with a turn on time $< 50\mu s$. These SSRs are adapted to phase angle control on different loads like lamps ,..... and to drive some loads like transformers.

REF	resistive loads (AC-51)	Lamps (AC-55)	Inductive loads (AC-53)
SKLxx1xx	16A 230VAC	5A 230VAC	3A 230VAC
SKLxx2xx	25A 230VAC	8A 230VAC	5A 230VAC
	25A 400VAC	8A 400VAC	5A 400VAC
SKLxx5xx	30A 230VAC	16A 230VAC	12A 230VAC
	30A 400VAC	16A 400VAC	12A 400VAC
SKLxx7xx	30A 230VAC	25A 230VAC	16A 230VAC
	30A 400VAC	25A 400VAC	16A 400VAC

SKL protected by MCB



NB : All the range can be delivered on a Rail DIN adapter socket . See XK range.



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Selector guide by application.

The new SKL/SKH SSRs are designed for mounting on a printed circuit board. They are specified in :

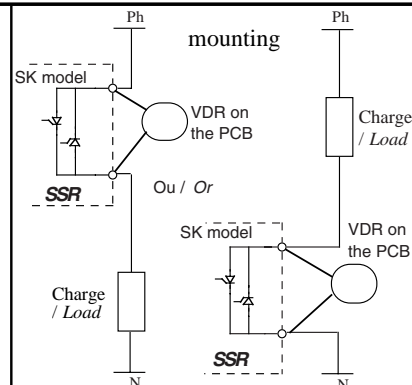
* Thermal current (I_e or I_{th}) depending on the heatsink size.

* I_{tsm} : Maximum surge current into the SSR.

For each reference see curves on the data-sheets.

Use a varistor accross the SSR's output.

In the note below , some exemples are given for different types of loads.



heating load



AC-51

When the load is cold , the starting current can increase at a maximum of $1,4 \times I_n$.
In a normal case , with fuses protection (see application note : SSRs protection) , choose the SSR in compliance with the nominal current and the starting current.
Generally a SKL on printed circuit board is limited at about 25A due to the PCB and the connectors.

In case of a protection by MCB , you must use I2t SSRs : 1800 or 5000A2s

.Exemples : 2000W/230VAC : $I_n = 8,7A \rightarrow 16A$ SSR is acceptable : SKH20120
: 6KW with 3 resistors on 3x400VAC line / protection by MCB
 $\rightarrow 9A/\text{phase} \Rightarrow 3 \text{ SKL20540} + 2,6K/W + \text{MCB } 16A \text{ Z curve}$

infrared lamp



AC-55

Incandescent lamps (infrared ,....) : AC-55b have generally inrush currents up to 8 or 10 times the nominal current . You can use the curve $I_{tsm} = f(t)$, and take a good margin to have a correct lifetime expectancy.

Exemple : lamp 1500W/230VAC : $I_n = 6,5A \rightarrow \text{SKL20520} : 50A$ rating.

Electric discharge lamp : AC-55a have also high inrush current , but in addition , there are overvoltage at the turn OFF . ---> Use 400VAC SSRs for 230VAC loads and add a varistor to protect the SSR.

motor



AC-53

Squirrel cage motors : AC-53 have generally inrush currents up to 5 or 8 times the nominal current . Standards give $8 \times I_n$ during 1,6s .

--> Adapt the SSR to the motor nominal current x 8

Exemple : Three phase motor : 2,2KW /400VAC

$I_{AC-53} = I_n = 5A \rightarrow I_d = 40A$

Use 3 SKL20540 (one by phase) and 3 VDRs (420V size 14)

transformer



AC-56b

See application note on transformer control.

Depending on the transformer type , the inrush current can reach $100 \times I_n$.

It is better to use random SSRs.

Check the inrush current into the transformer . A good method is to measure the primary resistor, because when the transformer is saturated , the current is near U/r .

With 75A SKL (repetitive $I_{tsm} : 500A/20ms$) , it is possible to drive transformers with very high inrush currents.

others loads

In all cases, you must respect the maximum current at turn-ON , the thermal caracteristics when running and the maximum overvoltage at turn-OFF.

SSRs with 1600Vpeak can be delivered for specific applications like PFC , UPS,.....



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