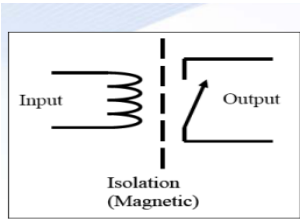
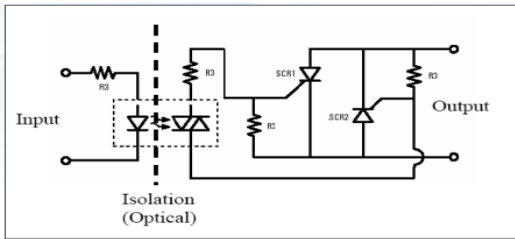


Solid State Relays





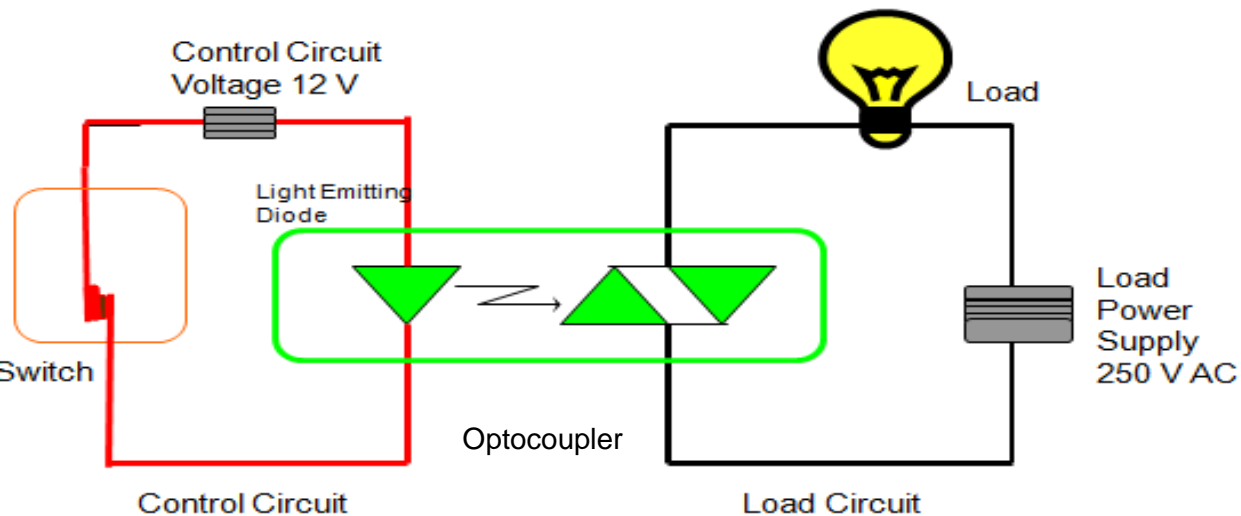
EMR



SSR

Compared to EMR, the Solid State Relay has no moving mechanical parts. It is essentially an electronic device that relies on the electrical and optical properties of semiconductors to achieve its isolation and switching function.

SSR Working principle:



What is Solid State Relay?

Key feature of Solid State Relays

- **Maintenance free**
 - Long life & Reliable option for frequent switching application e.g. packaging machine, injection molding & F&B.
 - Superior lifetime on resistive load, as switching occurs at zero voltage/current.
- **Fast response**
 - High speed & precision control e.g. packaging, textile, injection molding application.
- **Soundless control**
 - Silent, no switching noise e.g. medical equipments.
- **Harsh environment**
 - Resistance to shock or vibration
 - Dust, humidity or combustible



Reliable & long life span



Fast & frequency switching



Complete silence while switching



Ideal for Harsh Environments

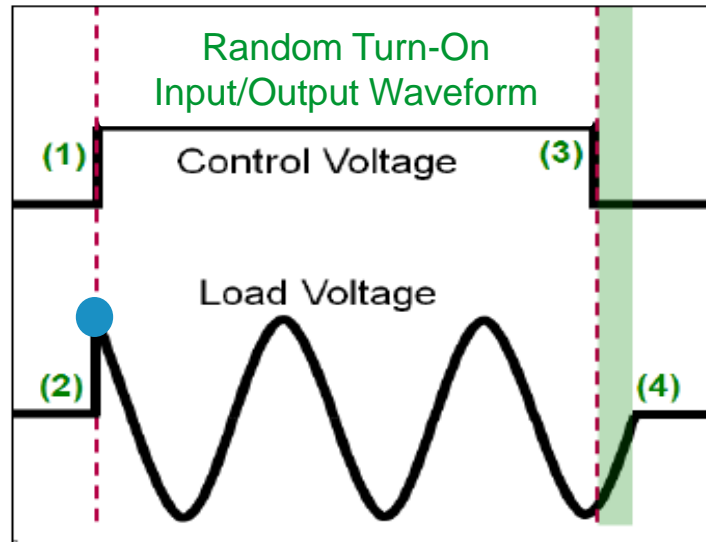
Choice between SSR or EMR

- > Accurate and fast: SSR+
- > Cost of ownership: SSR+
especially when frequent and fast switching needed.
- > Silent operation: SSR+
- > Wide **control input** voltage: SSR+
- > Immunity to harsh environment: SSR+
- > Thermal consideration: SSR-

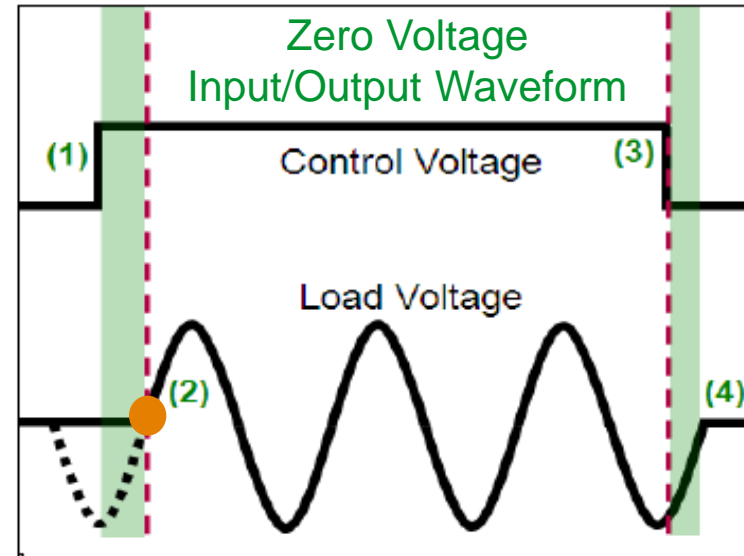
- > Multiple contacts: EMR +
- > Purchasing price: EMR+
- > Wide **load output** voltage: EMR+
- > Contact degradation: EMR-

SSR Switching Type

Random switching



Zero Voltage switching



- 1) Control voltage applied to the input of SSR
- 2) Load voltage turn on: Instantaneously for **RANDOM** switching
Next zero voltage for **ZERO VOLTAGE** switching
- 3) Control voltage removed from input of SSR
- 4) Stops conducting load current

Superior lifetime switching resistive load @ zero voltage/current, not seeing high inrush current which create high mechanical stress

Summary of Solid state technology

Made of semi-conductor, no mechanical mechanism

- Semi-conductor
- No mechanical contact, contact bounce,
- No arc or intermittent contact issue
- No mechanical switching noise
- Switching resistive loads at zero voltage/current

LONG LIFE SPAN

FAST RESPONSE

RELIABLE SWITCHING

SILENT

ZERO VOLTAGE



Zelio SSR

Offer & selection

SSR Selection

1) Range type – SSL/SSM/SSP

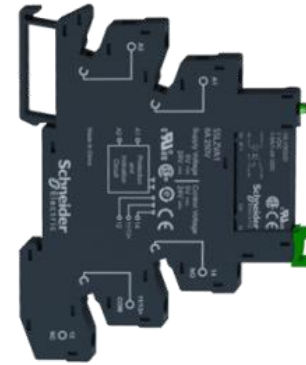
- Application type, mounting & size

2) Load voltage & current, switching type

- AC / DC, zero voltage / random

3) Control voltage

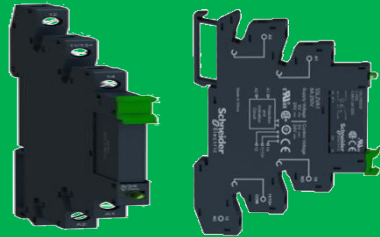
- AC / DC



Complete Zelio SSR Offer

~ SSL/SSM/SSP

SLim
interface SSR



SSL

Interfacing



Modular
Din Rail SSR



SSM

Control & Switching

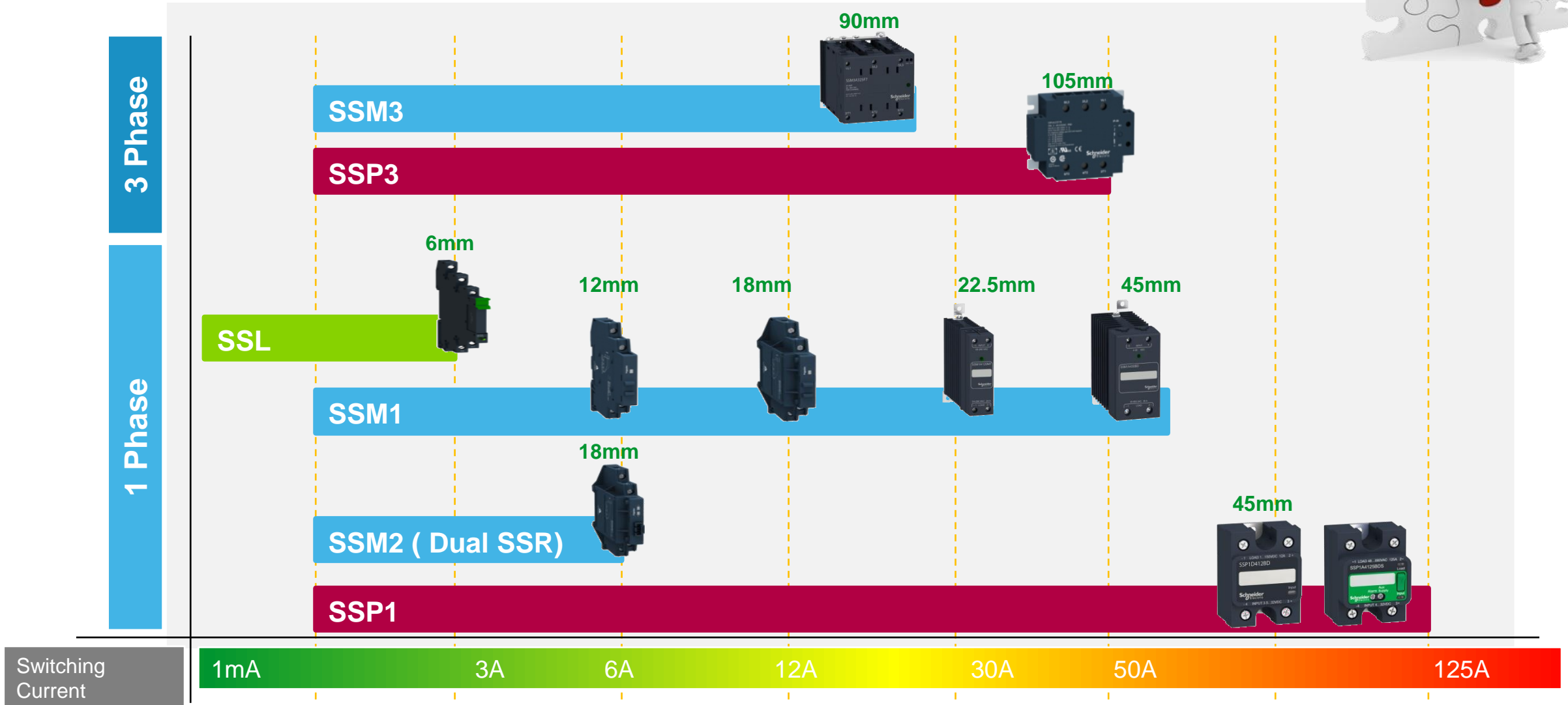
Panel Mount
SSR



SSP

Control & Switching

2015 Complete SSR offer



Zelio SSR Nomenclature

SSP1A450BDT

Product range

SSL : Slim interface
SSM: Modular DIN rail
SSP: Panel Mount

Contact configuration

1 :1 Phase SSR (1NO)
2: Dual 1 Phase SSR (2NO)
3: 3 Phase SSR (3NO)

Load voltage range

A1: 24...300Vac
A4: 48...660Vac
D4: 3...150Vdc

Additional feature

T: with thermal pad
-: no thermal pad
S: smart diagnostic feature with thermal pad

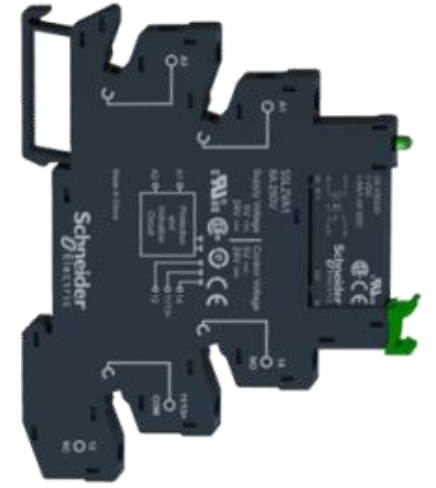
Control input voltage

BD: 4-32Vdc
M7: 90-280Vac

Load current (rated)

50: 50 Ampere
125: 125 Ampere

Product Nomenclature - Example EMR vs SSR (RSL vs SSL)



>RSL 1 AB4 BD

Control Voltage: 24Vdc

Contact material for
different **Loads**

No of contact e.g. 1 : 1C/O

Product range
Slim electromechanical relay

SSL 1 A1 2 BD

Control Voltage: 4-32Vdc

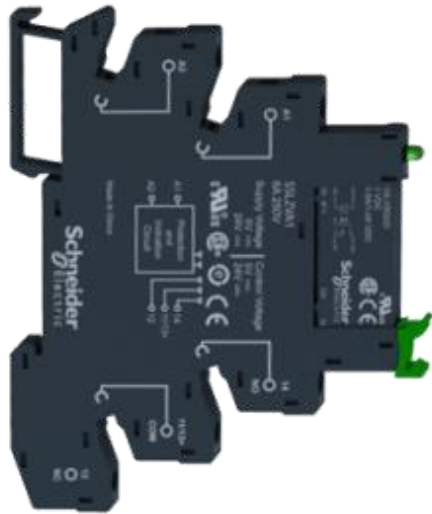
Load voltage & current:
A1: AC 24-280Vac
2: 2 Amperes

No of contact e.g. 1 : 1N/O

Product range
Slim solid state relay

Zelio SSL – Slim interface SSR

> Interfacing application – Solid State Slim



Only **6.2 mm**

In width



SSL Relay

> Slim 6 mm in width

> Load voltage & current

- 24 V DC @ 3.5 A
- 48 VDC @ 100mA
- 230 V AC @ 2 A

> Control voltages : (12..24, 48..60, 110, 230 V AC/DC)

SSLZ Socket

> Easy locking & removal of the relay

> Choice between Screw Connector and Spring Clamp (need 'Tool' to install the cable and also need "Tool' to take out the cable)

> To mount on 35mm DIN Rail

> Integrated Protection against reverse polarity & surges

> LED indicator : (Control Status)

> Control voltages : (12..24, 48..60, 110, 230 V AC/DC)



Zelio SSL – Slim interface SSR

1



2



SSL1 slim interface solid state relays (DC switching)

Type	SSL1 relays (6 mm)		Screw connector sockets	Spring terminal sockets	
Contact	1 NO		-	-	
Switching type	DC switching		-	-	
Load current	0.1 A	3.5 A	-	-	
Load voltage	1...48 V DC	1...24 V DC	-	-	
Complete product	3...12 V DC	SSL1D101JD	SSL1D03JD	SSLZVA1	SSLZRA1
	24 V DC	SSL1D101BD	SSL1D03BD	SSLZVA1	SSLZRA1
	60 V DC	SSL1D101ND	SSL1D03ND	SSLZVA2	SSLZRA2

SSL1 slim interface solid state relays

Type	SSL1 relays (6 mm)	SSL1 relays (6 mm)	Screw connector sockets	Spring terminal sockets	
Contact	1 NO	1 NO	-	-	
Switching type	Random switching	Zero voltage switching	-	-	
Load current	2 A	2 A	-	-	
Load voltage	24...280 V AC	24...280 V AC	-	-	
Complete product	3...12 V DC	SSL1A12JDR	SSL1A12JD	SSLZVA1	SSLZRA1
	24 V DC	SSL1A12BDR	SSL1A12BD	SSLZVA1	SSLZRA1
	60 V DC	SSL1A12NDR	SSL1A12ND	SSLZVA2	SSLZRA2
	110 V AC/DC	SSL1A12NDR	SSL1A12ND	SSLZVA3	SSLZRA3
	230 V AC/DC	SSL1A12NDR	SSL1A12ND	SSLZVA4	SSLZRA4

Zelio SSM – Modular DIN Rail SSR

> Control & Switching application

- 1 Phase & 3 Phase solution
- Ready to use DIN rail mount solution
- Compact modular size with integrated heatsink
 - 12mm - 6A
 - 18mm - 12A
 - 22.5mm - 20 & 30A
 - 45mm - 45 & 55A
- Load voltage:
 - Up to 100 V DC, 660 V AC
- Control voltage
 - 4-32V DC, 90-280V AC

Zelio SSM - Full range modular DIN rail offer to meets all kinds of switching application requirement.

15% Cost productivity from



SSRD → SSM1



12mm



18mm



22.5mm



45mm



90mm

1 Phase SSR

3 Phase SSR



Zelio SSM – Modular DIN rail SSR



SSM modular DIN rail solid state relays (DC switching)

Contact	1 NO				
Switching type	DC switching				
Load current	6 A		12 A		
Load voltage	1...60 V DC	1...100 V DC	1...60 V DC	1...100 V DC	
Frontal width	12 mm		18 mm		
Complete product	4..32 V DC	SSM1D26BD	SSM1D36BD	SSM1D212BD	SSM1D312BD

SSM modular DIN rail solid state relays s (random switching)

Contact	1 NO				2 NO		
Switching type	Random switching						
Load current	6 A		12 A		6 A		
Load voltage	24...280 V AC	48...600 V AC	24...280 V AC	48...600 V AC	24...280 V AC	48...600 V AC	
Frontal width	12 mm		18 mm		18 mm		
Complete product	4..32 V DC	SSM1A16BDR	SSM1A36BDR	SSM1A112BDR	SSM1A312BDR	SSM2A16BDR	SSM2A36BDR
	18..36 V AC	SSM1A16B7R	-	SSM1A112B7R	SSM1A312B7R	-	-
	90..140 V AC	SSM1A16F7R	-	SSM1A112F7R	SSM1A312F7R	-	-
	200..265 V AC	SSM1A16P7R	-	SSM1A112P7R	SSM1A312P7R	-	-

SSM modular DIN rail solid state relays (zero voltage switching)

Contact	1 NO				2 NO		
Switching type	Zero voltage switching						
Load current	6 A		12 A		6 A		
Load voltage	24...280 V AC	48...600 V AC	24...280 V AC	48...600 V AC	24...280 V AC	48...600 V AC	
Frontal width	12 mm		18 mm		18 mm		
Complete product	4..32 V DC	SSM1A16BD	SSM1A36BD	SSM1A112BD	SSM1A312BD	SSM2A16BD	SSM2A36BD
	90..140 V AC	SSM1A16F7	-	SSM1A112F7	SSM1A312F7	-	-
	200..265 V AC	SSM1A16P7	-	SSM1A112P7	SSM1A312P7	-	-

Zelio SSP – Panel Mount SSR

> Control & Switching application

- 1 & 3 Phase Panel mount solution
 - 1 Phase up to **125A**
 - 3 Phase up to **50A**
- Wide range of SSRH* Heat sinks, 0.2 – 2.5°C/W
- SSRA* copper lug enable wiring size up to AWG0.
- Load voltage:
 - Up to 150 V DC, 660 V AC
- Control voltage
 - 4-32V DC, 90 – 280 V AC

15% Cost productivity from  SSRP → SSP1



Zelio SSP - Full range panel mount products solution to meets all kinds of switching application.



Zelio SSP – Panel Mount SSR

SSP1 1-phase panel mount solid state relays (DC switching)

Contact	1 NO		
Switching type	DC switching		
Load current (1)	12 A	25 A	40 A
Load voltage	3...150 V DC		
Complete product	3...12 V DC SSP1D412BDT	SSP1D425BDT	SSP1D440BDT



SSP1 1-phase panel mount solid state relays (zero voltage switching)

Contact	1 NO							
Switching type	Zero voltage switching							
Load current (1)	10 A	25 A	50 A	50 A	75 A	75 A	90 A	125 A
Load voltage	24...300 V AC	24...300 V AC	24...300 V AC	48...660 V AC	24...300 V AC	48...660 V AC	48...660 V AC	48...660 V AC
Complete product	4...32 V DC SSP1A110BDT	SSP1A125BDT	SSP1A150BDT	SSP1A450BDT	SSP1A175BDT	SSP1A475BDT	SSP1A490BDT	SSP1A4125BDT
	90...280 V DC SSP1A110M7T	SSP1A125M7T	SSP1A150M7T	SSP1A450M7T	SSP1A175M7T	SSP1A475M7T	SSP1A490M7T	SSP1A4125M7T

What's new?

SSP1 versus SSRP

Enhanced feature **better performance**

Innovative screw terminal

Easy wirings with all kinds of termination e.g. cable ends, fork lug and ring lug

Safer, fool-proof IP20 protection

Integrated enclosure

Easy identification/markings

Indication area for schematic markings

Wider offer range

Operating voltage up to 660Vac, 125 Amps

Better thermal performance

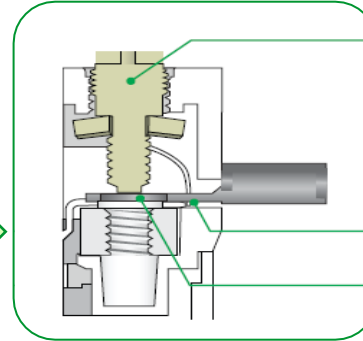
Lower On-state voltage drop, better R_c thermal rating & wider operating temperature

Environmental friendly

Green design with Epoxy free

Consistent SE offer

SE Brand recognition, better experience



Innovative screw



SSP1

VS



SSRP

Simplified offer **for solution**

Easy product selection

Simplified product nomenclature

Simple installation interface

Product with embedded thermal pad

Easier thermal consideration

Direct heatsink selection from derating curves

Short circuit protection

Coordination table with circuit breaker & fuse.

Inductive loads

Motor controller rating

New telescopic screw terminal

Innovative Telescopic screw Simple, Safe & Robustness design



SIMPLE:

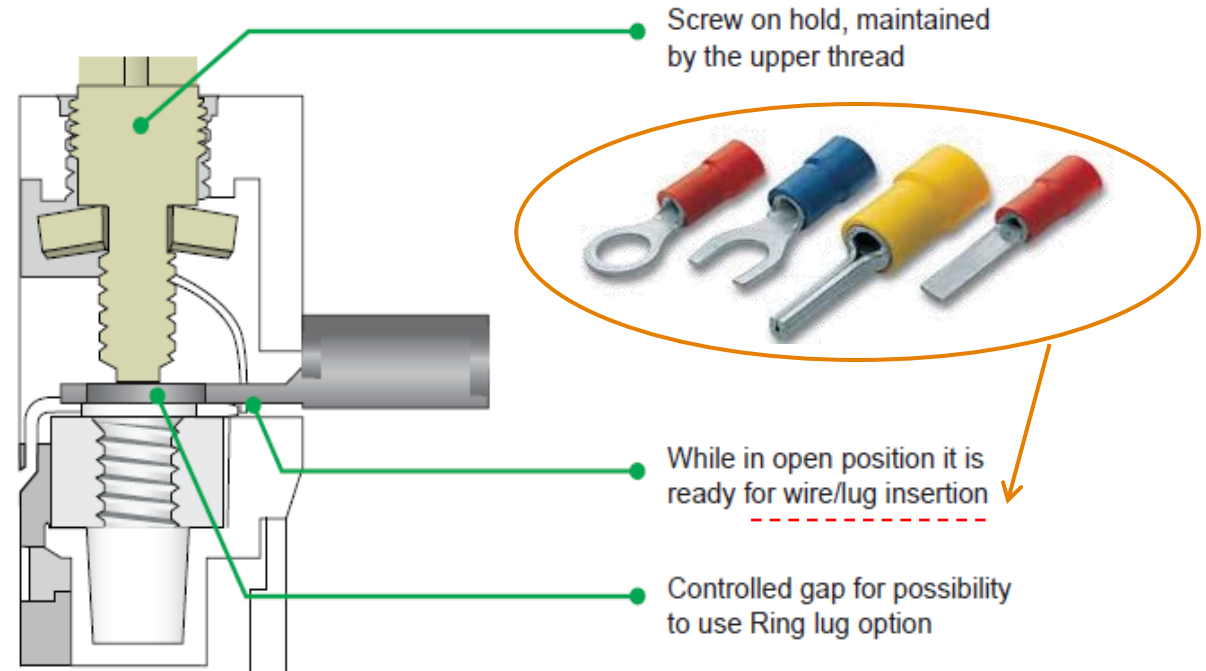
New terminal design allow easy wirings with all kinds of wires with cable ends, fork-lug and **ring-lug** termination.

SAFE:

Fool proof design with IP20 protection, as telescopic terminals are built in with integrated enclosure.

ROBUSTNESS:

Effectiveness to prevent screw jammed due to misalignment. As screws are pre-aligned on upper threads of integrated enclosure prior screw tightening.



SMART DIAGNOSTIC SSR - Zelio SSP1.S



Smart Diagnostic feature allows:

- **Immediate response to abnormalities:** Embedded visual indication and output to monitor proper operation of SSR.
- **Easy to test & commissioning:** Debugging test button

Normal Operation

Visual indication:
Load LED - **Orange**

Output to monitor proper
operation of SSR



Abnormality on control input –
open/short-circuited



Load LED
- **RED**

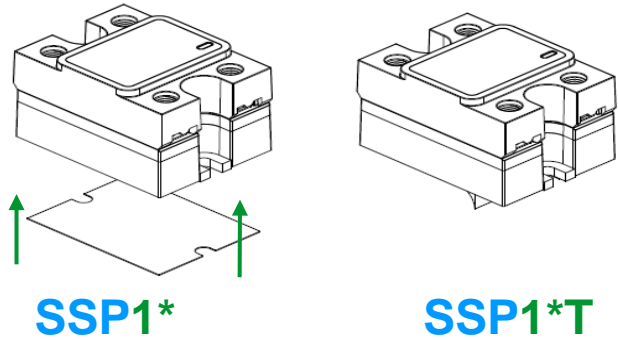
Abnormality on load output –
open/short-circuited



Load LED
- **RED flashing**

Recommendation of Product Selection

1) Product Selection: Solid state relay – SSP



No of Phase → Output Voltage → Load current → Input Voltage → Additional feature

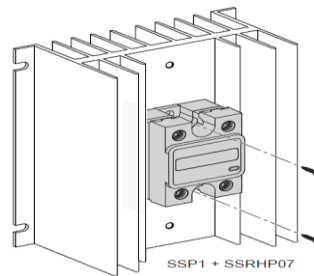
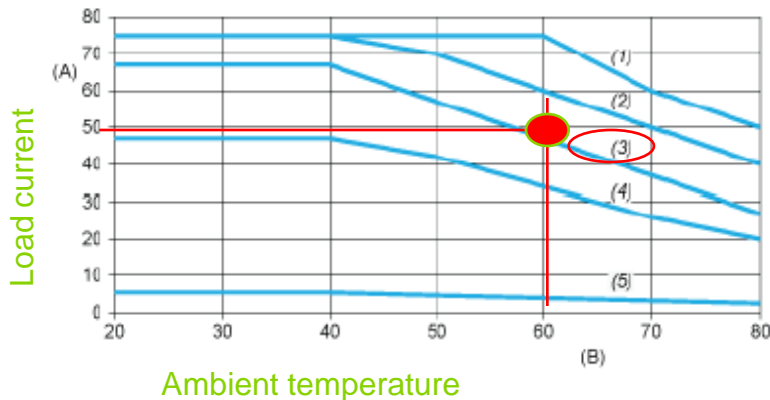
e.g. **SSP1A475BDT** → Panel mount, 1Phase, OP:48-660Vac, 75A, IP: 4-32VDC, with thermal pad.

Product Nomenclature

Output Voltage (OP)		Input Voltage (IP)	
A1: 24 - 300 VAC		BD: 4 -32VDC	
A2: 48 - 530VAC		P7: 180 – 260VAC	
A4: 48 - 660VAC		M7: 90 – 280 VAC	
D4: 3 – 150VDC			

SSP	No of Phase	Load current	Additional feature
1	1: 1Phase 3: 3Phase	10: 10 Amps 25: 25 Amps 50: 50 Amps 75: 75 Amps 90: 90 Amps 125: 125 Amps 12: 12 Amps (DC only) 25: 25 Amps (DC only) 40: 40 Amps (DC only)	-: Without thermal pad T: With Thermal pad S: Smart Diagnostic feature with thermal pad

2) Direct Heat sink (SSRH*) selection → 60°C, 50A, Choose (3) - SSRHP07.



- (1) For Heatsink SSRHP02
- (2) For Heatsink SSRHP05
- (3) For Heatsink SSRHP07
- (4) For Heatsink SSRHD10
- (5) No Heatsink

3) Terminal lug (SSRA*) accessories for big cable size.



Up to AWG 0 (53.5mm²)
wire size

SSRAL1: up to AWG 0 (53.5mm²)
SSRAL2: up to AWG 6 (13.3mm²)

SSRA*

**Heating
Control**



**Motion
Control**



**Lighting
Control**



SSR applications

Zelio Solid State Relays

Segment Targets:

- Plastic & Rubber, Textile segment, Packaging, F&B.

Application Targets:

- To 'Start' with Heating control applications customers
- To 'Explore' Motion control applications customers
- To be 'Opportunistic' with Lighting control applications

Heating

- Plastic injection molding
- Furnaces/Oven
- Drying
- Home heating
- Packaging machine e.g. FFS
- Textile (Synthetic fibre)

Heating
Control



Motor Starting

- Pumps
- Solar tracker
- Compressors
- Conveyors
- Fans

Motion
Control



Lighting

- Public lighting
- Cinema
- Theatre lamps
- Airport runway lamps
- Road lighting

Lighting
Control

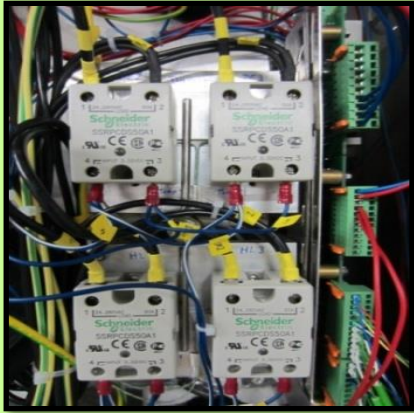


Control

- PLC interface
- Heating element control
- Solenoid valve
- Contactor coils
- Opto-coupling of sensors

Some Examples of Application

F&B: Ovens



References

- SSP1*(SSRD)
- SSM1*

Product Function

- Switch ON & OFF Load

Details of Application

- The Solid state relays are integral part of the Baking ovens.
- SSR are selected due to its 'fast switching' time & frequency capabilities

Customer Benefits

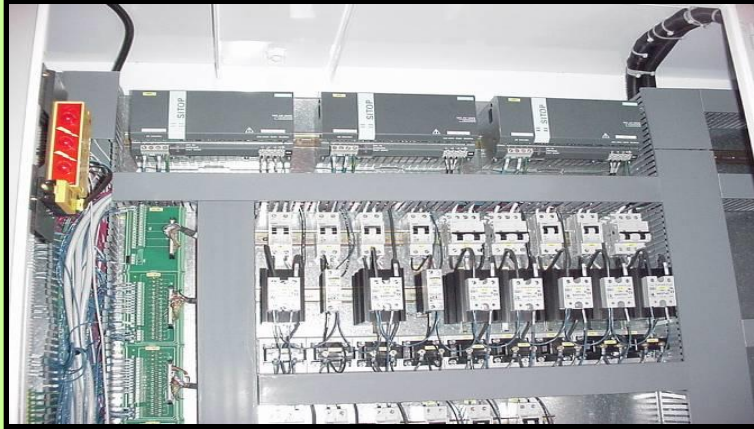
- Long life with SSR
- Fast Switching

Target customers profile :- Oven manufacturers

- Target vertical - Food & Beverage
- Offer synergy -Temperature controllers

Some Examples of Application

Plastic Extrusion Machine



References

- SSP1*

Product Function

- Switch ON & OFF Load

Details of Application

- Heating element control application for SSR.
- Being high current fast switching application
- The plastic extrusion process is time driven process.
- SSRs controlling the load elements

Customer Benefits

- Long life with fast & frequent switching

Target customers profile :- OEM and mfg of plastics extrusion Machine

- Target vertical : Plastics

Some Examples of Application



Inside Dryers



References

- SSP1*
- SSP3A250BD

Product Function

- Switch ON & OFF Load

Details of Application

- Heating element control application for SSR.
- Being high power switching application (100A) - SSR's are the best choice
- SSRs controlling the load elements

Customer Benefits

- Long life with fast & frequent switching

Target customers profile :- Mfg for Printing and Drying Equipments

- Target vertical : Textile , Wood , Tobacco

Some Examples of Application

Buildings → Temperature Control



References

- SSM1A12BD

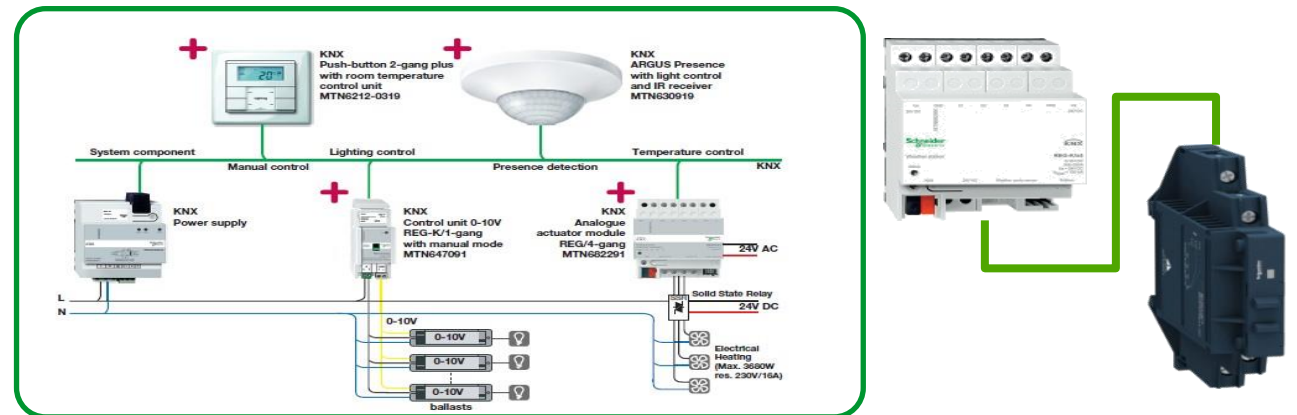
Product Function

- Switch ON & OFF low current , low power load

Details of Application

- The SSR are coupled between KNX Controller and heaters.
- SSR are preferred due to its 'silent' switching capabilities and also long life and fast switching.

- Target vertical :- Buildings
- Offer synergy – Temperature controllers , Timers



Some Examples of Application

Solar → Thermosolar Tracker



References

- SSP3A250BD

Product Function

- AC Motor / DC Valves

Details of Application

- The solar trackers are following sun direction.
- High switching frequency [1 step in 20 sec]
- Normally for the movement AC Motors or DC valves are used.

Customer Benefits

- Long life with SSR
- Fast Switching

Target customers profile :- Solar Panel Builders , Solar Projects

- Target vertical :- Solar
- Offer synergy – Control Relays , PLC

Some Examples of Application

Pumping → Dose Pumps



References

- SSM1*

Product Function

- AC Motor / DC Valves

Details of Application

- Solid-state relays used as they are silent, offers greater life expectancy.
- SSM are compact in size (only 18mm) saves valuable space.

Customer Benefits

- Long life with SSR
- Fast Switching












- Target vertical :- Pumping

- Offer synergy – Pump Control Relays



SSR market competition

SSP1 cross reference mapping

 							
							
Refs	IP	OP	A	Refs	Refs	Refs	Refs
SSP1D412BDT	3.5-32Vdc	3-150Vdc	12A	G3NA-D210B DC5-24	NA	NA	D1D12
SSP1D425BDT	3.5-32Vdc	3-150Vdc	25A	NA	NA	SCM030200	D1D40
SSP1D440BDT	3.5-32Vdc	3-150Vdc	40A	NA	NA	SCM030200	D1D40
SSP1A110BDT	3-32Vdc	24-300Vac	10A	G3NA-210B DC5-24	NA	NA	A2410G
SSP1A125BDT	3-32Vdc	24-300Vac	25A	G3NA-220B DC5-24	RM1A23D25	SO842074	A2425G
SSP1A150BDT	3-32Vdc	24-300Vac	50A	G3NA-240B DC5-24	RM1A23D50	SO845070	A2450G
SSP1A450BDT	4-32Vdc	48-660Vac	50A	G3NA-440B DC5-24	RM1A60D50	SO865070	A4850G
SSP1A175BDT	3-32Vdc	24-300Vac	75A	G3NA-275B DC5-25	RM1A23D75	SO848070	A2475G
SSP1A475BDT	4-32Vdc	48-660Vac	75A	G3NA-475B DC5-25	RM1A60D75	SO867070	A4875G
SSP1A490BDT	4-32Vdc	48-660Vac	90A	G3NA-490B DC5-25	NA	SO868070	HA6090G
SSP1A4125BDT	4-32Vdc	48-660Vac	125A	NA	RM1A60D100	SO869070	HA60125G
SSP1A110M7T	90-280Vac	24-300Vac	10A	G3NA-210B AC	NA	NA	CSW 2410GS
SSP1A125M7T	90-280Vac	24-300Vac	25A	G3NA-220B AC	RM1A23A25	SO842974	CSW 2425GS
SSP1A150M7T	90-280Vac	24-300Vac	50A	G3NA-240B AC	RM1A23A50	SO845970	CSW 2450GS
SSP1A450M7T	90-280Vac	48-660Vac	50A	G3NA-440B AC	RM1A60A50	SO865970	H12D850G
SSP1A175M7T	90-280Vac	24-300Vac	75A	G3NA-275B AC	RM1A23A75	NA	CSW 2475GS
SSP1A475M7T	90-280Vac	48-660Vac	75A	G3NA-475B AC	RM1A60A75	SO869770	H12D875G
SSP1A490M7T	90-280Vac	48-660Vac	90A	G3NA-490B AC	NA	SO868970	H12WD890G
SSP1A4125M7T	90-280Vac	48-660Vac	125A	NA	RM1A60A100	SO869970	H12WD8125G

Please get ready to growth with our Zelio
Solid State Relays.

Thank you!

Zelio SSL●SSM●SSP