

Dimensions	7	-
Technical characteristics	7	-



Page 7-2

MINIATURE, SINGLE-PHASE

- · Operating current up to 25A
- Operating voltage up to 280VAC
- Faston terminals
- Zero crossing switching
- cURus and VDE certified
- IP00 protection
- Screw fixing.



Page 7-3

COMPLETE WITH HEATSINK, SINGLE-PHASE · Ready to use

- · Operating current up to 60A
- Operating voltage up to 600VAC
- Zero crossing switching
- cULus certified
- IP20 protection
- Status indicator LED
- Screw or on 35mm DIN rail.



Page 7-2

HOCKEY PUCK, SINGLE-PHASE

- Operating current up to 130A
- · Operating voltage up to 600VAC
- Screw terminals
- · Zero crossing switching
- cURus, CSA and VDE certified
- · IP20 protection
- Status indicator LED.



COMPLETE WITH HEATSINK, 3-PHASE, (2 CONTROLLED)

- · Ready to use
- Operating current up to 60A
- · Operating voltage up to 600VAC
- Zero crossing switching
- cULus certified
- IP20 protection
- Status indicator LED
- 35mm DIN rail.



Page 7-2

HOCKEY PUCK, TWO-PHASE

- Operating current up to 50A
- · Operating voltage up to 600VAC
- Screw terminals
- Zero crossing switching
- cURus, CSA and VDE certified
- IP20 protection
- Status indicator LED.



COMPLETE WITH HEATSINK, 3-PHASE (3 CONTROLLED)

- · Ready to use
- Operating current up to 48A
- Operating voltage up to 600VAC
- Zero crossing switching
- cULus certified
- IP20 protection
- Status indicator LED
- Screw or on 35mm DIN rail.



7 Solid state relays

Miniature and hockey puck

Order code

Miniature, Faston terminals.

Hockey puck, screw terminals

HS1B2NT025D024 12...280

HS1B2NT025E230

HS1B5NV040D024

HS1B5NV040E230

HS1B6NT040D024

HS1B6NT040E230

HS1B6NN050D024

HS1B5NV060D024

HS1B5NV060E230

HS1B6NT060D024

HS1B6NT060E230

HS1B6NT090D024 24...600

HS1B6NT090E230 24...600

H\$1B5NV130D024 24...510

H\$1B5NV130E230 24...510

I oad

operating

voltage

12...280

24...510

24...510

24...600

24...600

24...600

24...510

24...510

24...600

24...600

[VAC]

Faston: load 6.3x0.8mm - control 4.8x0.8mm

H\$1A2NN025D024 | 12...280 | 25



INDEX

Miniature and hockey puck, single-phase



HS1A2NN025D024



HS1B....

Hockey puck,

two-phase

new



Order code	LoadIe AC-51operatingat ≤40°Cvoltage●		Control voltage	Type of load	Qty per pkg				
	[VAC]	[A]	[V]		no.				
Hockey puck, Faston terminals.									
HS2B2NN025D024	12280	25	332VDC	Resistive	1				
Hockey puck, screw	terminals.								
HS2B6NN050D024 24600 50 ❷ 1030VDC Resistive 1									
HS2B6NN051D024	24600	50 G	1030VDC		1				
		_							

le AC-51 Control voltage

[V]

4...30VDC

3...32VDC

3.5...32VDC

3.5...32VDC

3.5...32VDC

3.5...32VDC

3.5...32VDC

3.5...32VDC

3.5...32VDC

18...280VAC/DC

20...265VAC/DC

18...280VAC/DC

20...265VAC/DC

18...280VAC/DC

18...280VAC/DC

20...265VAC/DC

at ≤40°C

a

[A]

25

25

40

40

40

40

50

60

60

60

60

90

90

130

130

valid with correct heatsink

I²t 2800A2s. 8 I²t 7200A2s.

HS2B...

General characteristics

Qty

per

pkg

n°

4

1

1

1

1

1

1

1

1

1

1

1

1

1

1

Туре

of load

Resistive

Resistive

Resistive or

inductive

Resistive

Resistive or

inductive

Resistive

Resistive or

inductive

Solid state relays (SSRs) can offer significant advantages in electrical control. SSRs have no moving parts, resulting in a very high electrical life and silent operation. SSRs also have fast switching speed and can sustain a very high switching frequency. SSRs are also resistant to vibration and shocks. Furthermore, they do not generate electric arc during the operation. Their primary use is for controlling resistive loads, such as heating elements, but can also operate small motors and other types of inductive loads. The HS... series can control loads up to 130A. Overall, SSRs offer a solid, efficient and durable solution for precise and reliable electrical control.

Operational characteristics

- Control current:
- HS1A...: <29mA
- HS1B...: <13mA
- HS2B...: <24mA
- Switching mode: zero crossing
- _ Output protection: varistor, TVS or none (V or T or N as 7th digit in the code)
- Status indicator: LED on front (except HS1A...).

Certifications and compliance

Certifications obtained: see table below. Compliant with standards: IEC/EN/BS 60947-4-3, IEC/EN/BS 60947-4-2, IEC/EN/BS 62314, IEC/EN/BS 6335-1.

	cURus	CSA	VDE
HS1A2NN025D024	•	_	•
HS1B2NT025D024	•		•
HS1B2NT025E230	•	_	•
HS1B5NV040D024	•	•	•
HS1B5NV040E230	•	•	•
HS1B6NT040D024		•	•
HS1B6NT040E230	•	_	•
HS1B6NN050D024	•	•	•
HS1B5NV060D024	•	•	•
HS1B5NV060E230	•	•	•
HS1B6NT060D024	•		•
HS1B6NT060E230	•	_	•
HS1B6NT090D024	•	•	•
HS1B6NT090E230	•	_	•
HS1B5NV130D024	•	•	•
HS1B5NV130E230	•		
HS2B2NN025D024	•		
HS2B6NN050D024	•	•	•
HS2B6NN051D024	•	•	•

Accessories page 7-4

7-2

INDEX



Complete with heatsink, single-phase



HS1C...

	Order code	Load operating voltage	le AC-51 at ≤40°C	Control voltage	Type of load	Qty per pkg
		[VAC]	[A]	[V]		n°
	Complete with heatsi	nk, ready to	use, screv	v terminals.		
	HS1C2HV020D024	12275	20	332VDC	Resistive or	1
	HS1C6HV020D024	48600	20	432VDC	inductive	1
	HS1C6HV020A230	48600	20	90280VAC		1
	HS1C2HV025D024	12275	25	25 332VDC		1
	HS1C6HV025D024	48600	25	432VDC	-	1
7	HS1C6HV025A230	48600	25	90280VAC		1
	HS1C2HV030D024	12275	30	332VDC		1
	HS1C6HV030D024	4 48600 30 4		432VDC		1
	HS1C6HV030A230	48600	30	90280VAC	1	1
	HS1C6HV040D024	48600	40	432VDC		1
	HS1C6HV040A230	48600	40	90280VAC		1
	HS1C6HV060D024	48600	60	432VDC		1
	HS1C6HV060A230	48600	60	90280VAC		1

le AC-51 Control voltage

[V]

4...32VDC

90...280VAC

90...280VAC

90...280VAC

4...32VDC

4...32VDC

General characteristics

Solid state relays (SSRs) can offer significant advantages in electrical control. SSRs have no moving parts, resulting in a very high electrical life and silent operation. SSRs also have fast switching speed and can sustain a very high switching frequency. SSRs are also resistant to vibration and shocks. Furthermore, they do not generate electric arc during the operation. Their primary use is for controlling resistive loads, such as heating elements, but can also operate small motors and other types of inductive loads. HS1 ... H ... series can control loads up to 60A. Overall, SSRs offer a solid, efficient, and durable solution for precise and reliable.

HS1... versions have heatsink factory mounted. They are ready to use and fast mounting on DIN rail.

Operational characteristics

Control	current:
• HQ1	$D \cdot 210 m \Lambda$

- HS1...A...: <22mA
- HS2...D...: <21mA
- HS2...A...: <50mA
- HS3...D...: <27mA

Qty

per

n°

1

1

1

1

1

1

pkg

Туре

of load

Resistive or

inductive

- HS3...A...: <50mA
- Input-output insulation: 5kV
- Switching mode: zero crossing
- Output protection: varistor _
- Status indicator: LED on front.

Certifications and compliance

Certifications obtained: cULus. Compliant with standards: IEC/EN/BS 62314; IEC/EN/BS 61000-6-2; IEC/EN/BS 61000-6-3.

Complete with heatsink, three-phase (2 controlled)

new

Order code

Load

voltage

Complete with heatsink, ready to use, screw terminals.

48...600

48...600

[VAC]

HS2C6HV015D024 48...600

HS2C6HV030A230 48...600

HS2C6HV060D024 48...600

HS2C6HV060A230 48...600

HS2C6HV015A230

HS2C6HV030D024

operating at ≤40°C

[A]

15

15

30

30

60

60



HS ₂ .	

Complete with	l
three-nhase	
(3 controlled)	



Order code	Load operating voltage	le AC-51 at ≤40°C	Type of load	Qty per pkg	
	[VAC]	[A]	[V]		n°
Complete with heatsi	nk, ready to	use, screv	v terminals.		
HS3C6HV020D024	48600	20	432VDC	Resistive or	1
HS3C6HV020A230	48600	20 25	90280VAC	inductive	1
HS3C6HV025D024	48600		432VDC		1
HS3C6HV025A230	48600	25	90280VAC		1
HS3C6HV040D024	48600	40	432VDC		1
HS3C6HV040A230	48600	40	90280VAC		1
Complete with heatsi	nk, ready to	use, screv	v terminals, high I	² t.	
HS3D5HV024E230	24520	24	24255VACDC	Resistive or	4
HS3D5HV048E230	24520	48	24255VACDC	1	

HS3C...



HS3D...



new

INDEX

Accessories



HSBXH1



HSBXP...







HSCXM...

Order code	Characteristics	Qty per pkg	Wt							
Heatsinks for HS1E	and HS2B solid state relays.									
HSBXH1	Heatsink 2.2K/W for one HS1B or HS2B solid state relay									
HSBXH2	Heatsink 1.2K/W for one or two HS1B or HS2B solid state relay	2	0.600							
HSBXH3	Heatsink 0.9K/W for one or two HS1B or HS2B solid state relay	1	1.400							
HSBXH4D024	Heatsink 0.3K/W for one HS1B or HS2B solid state relay; complete with fan 24VDC	1	1.720							
HSBXH5A230	1	1.720								
Thermal pads for H	S1B and HS2B solid state relays.									
HSBXP0050	Adhesive thermal pad – 50 pcs	1	0.050							
HSBXP0100	Adhesive thermal pad – 100 pcs	1	0.100							
HSBXP1000	Adhesive thermal pad – 1000 pcs	1	1.200							
Fixing element for	HS1B solid state relays.									
HSBX80	DIN rail adapter. 6K/W dissipation	1	0.080							
Current monitoring	modules for HS1C solid state relays.									
HSCXM1	Load current monitoring. Supply 24VDC	1	0.090							
HSCXM2	Load current monitoring with Modbus- RTU over RS485 comunication. Supply 24VDC	1	0.090							
HSCXM3	Temperature controller and load current monitoring with Modbus-RTU over RS485 comunication. Supply 24VDC	1	0.090							

General characteristics

HEATSINKS FOR HS1B... AND HS2B... SOLID STATE RELAYS

The heatsinks <u>HSBXH1</u>, <u>HSBXH2</u> and <u>HSBXH3</u> can be fixed by screw or on DIN rail. <u>HSBXH4D024</u> and <u>HSBXH5A230</u> are for mounting on

DIN rail only.

All the heatsinks contains the screws to fix the solid state relay.

THERMAL PADS FOR HS1B... AND HS2B... SOLID STATE RELAYS

The thermal pad mounting on the solid state relays is recommended to ensure effective heat dissipation, to prevent overheating and to enhance the overall reliability and performance.

CURRENT MONITORING MODULES FOR HS1C... SOLID STATE RELAYS

The accessory snaps onto the front of the HS1C... solid state relay.

The current monitor modules have a button to set the rated current of the load. In case the current is +10% or -10% of the set threshold, an alarm will be generated.

This alarm, for the version with comunication, will be also trasmitted via Modbus.

Three LED on the front indicate the working status. Current measuring range: 2A...40A.



7 Solid state relays







7-5



INDEX

7 Solid state relays Technical characteristics



ТҮРЕ		HS1A2NN 025D024	HS1B2NT 025D024	HS1B2NT 025E230	HS1B5NV 040D024	HS1B5NV 040E230	HS1B6NT 040D024	HS1B6NT 040E230	HS1B6NN 050D024	HS1B5NV 060D024	
MODEL						Single-phase					
INPUT CHARACTERISTICS								i			
Control voltage		430VDC	332VDC	18280VAC/DC	3.532VDC	20265VAC/DC	3.532VDC	18280VAC/DC	3.532VDC	3.532VDC	
Operating voltage limitspick-up	V	4	3	18	3.5	95	3.5	18	3.5	3.5	
drop-out	V	1	1	8	2	5	2	8	2	2	
Input current at minmax voltage	mA	329	1013	4.56	1013	510	1013	4.56	1013	1013	
OPERATING TIMES											1
switching -on						Half cycle max	(
switching -off						Half cycle max	(
OUTPUT CHARACTERISTICS	1				-	-	-	-			1
Switching mode			(1	Zero	o crossing swite	hing	1		r	
Rated operating voltage	VAC	12280	12280	12280	24510	24510	24600	24600	24600	24510	
Blocking voltage	V	600	600	600	1200	1200	1200	1200	1200	1200	
Operational frequency (minmax)	Hz				1	4565	1	1			
Rated operating current AC-51 (resistive load) at 40°C ❸	A	25	25	25	40	40	40	40	50	60	
Rated operating current AC-51 (resistive load) at 55°C 🛛	A	22	20	20	35	35	35	35	42	52	
Heatsink for use at 40°C and 55°C at rated current AC-51	K/W	≤1.2	≤2.2	≤2.2	≤0.9	≤0.9	≤0.9	≤0.9	≤0.9	≤0.55	
Rated operating current AC-53 (motor load) at 40°C	А	7	-	-	7	7	-	-	-	12	
Min. operational current	Α	0.005	0.005 0.05								
Input - Output isolation	V	4000				40	00				
Input - Output to metal base	V	2500				40	00				
Output protection type		-	T	VS	VI	DR	ד	VS	-	VDR	
l²t	A ² s	340	6	00		12	50		1680	2800	
TERMINAL CHARACTERISTICS											
Control terminals	Туре	Faston 4.8x0.8				Scre	w M4				
Tool	Туре	-				PZ	Z 2				
Tightening torque	Nm	-				1.2	2				
	lb.in	-				10.6.	17.7				
Conductor section connectable (control terminals) with 1 or 2 wires minmax AWG stranded	n°	1614 (Faston lug)				18	14				
Elexible w/o lug	mm ²					0.75	25				
Flexible c/w insulated spade lug	mm ²	0.756 (Faston lug)				0.75	2.5				
Load terminals	Туре	Faston 6.3x0.8				Scre	w M5				
Tool	Туре	-				PZ	Z 2				
Tightening torque	Nm	-				2.	3				
Load terminals (minmax)	lb.in	-	- 20.4								
Conductor section connectable (load terminals) with 1 or 2 wires minmax		1610	10								
AWG stranded	n°	(Faston lug)	(Faston lug) 1610 1610								
Flexible w/o lug	mm ²			0		1.5	6	0.0			
Flexible c/w insulated lug	mm ²	0.756 (Faston lug)	1.5	ob			1.5.	b O			
AMBIENT CONDITIONS											1
Uperating temperature	U°C				-40.	+90				-55+90	
Storage temperature	Ű				-40	.+100				-55+125	
operating position allowable			Any								

Screw

Fixing

Wires up to 50mm² can be connected with specific spade lugs or ring lugs. Lug width max 12.6mm.
 Wires up to AWG0 can be connected with specific spade lugs or ring lugs. Lug width max 12.6mm.

Ratings valid with proper heatsink.
110A max with 0.3K/W heatsink.

7 Solid state relays Technical characteristics



INDEX

HS1B5NV 060E230	HS1B6NT 060D024	HS1B6NT 060E230	HS1B6NT 090D024	HS1B6NT 090E230	HS1B5NV 130D024	HS1B5NV 130E230	HS2B2NN 025D024	HS2B6NN 050D024	HS2B6NN 051D024
	l		Single-phase					Two-phase	
20265VAC/DC	3.532VDC	18280VAC/DC	3.532VDC	18280VAC/DC	3.532VDC	20265VAC/DC	332VDC	1030VDC	1030VDC
20VAC-18VDC	3.5	18	3.5	18	3.5	20VAC-18VDC	3	10	10
5	2	8	2	8	2	5	2	2	2
5 10	10 13	45.6	10 13	45.6	10 13	5 10	10 13	6 24	6 24
010	1010	1.00	1010	1.00	1010	010	1010	0	0
				Half our					
				Zara araasir					
04 540	04,000	04,000	0.4 000	Zero crossii		04 540	10,000	04.000	04.000
24510	24600	24600	24600	24600	24510	24510	12280	24600	24600
1200	1200	1200	1200	1200	1200	1200	600	1200	1200
	1	1		45	65	1			1
60	60	60	90	90	130	130	25	50	50
 									<u> </u>
52	52	52	80	80	105	105	21	37	50
≤0.55	≤0.55	≤0.55	≤0.3	≤0.3	≤0.3	≤0.3	≤0.3	≤0.3❹	≤0.3❹
						00			
12	-	-	-	-	32	32	-	-	-
					05				
				0.1	00				
			1000	40	00				
	1		4000				2500	40	00
VDR		T\	/S		V	'DR	-	-	-
	2800		72	200	22	2000	340	2800	7200
									-
			Screw M4				Faston 4.8x0.8	Sci	rew
			PZ 2				-	Blade	3.5mm
			1.22				-	0.5	Nm
			10.617.7				-	4	.5
							1614		
			1814				(Faston lug)	28.	12
			0.752.5				-	0.75	2.5
			0.752.5				0.756	0.75	2.5
			0				(Faston lug)		
			Screw M5				Faston 6.3x0.8	Screv	w M5
			D7 0						7.0
			PZ 2				-	Pz	2.2
			23				-	2.	3
			20.4				-	20).4
							16 10 (Eastern		
			16 10 0					16	10 0
 			15.6					1 5	6
			1.50				0.75 6 (Easter	1.J 1 =	60
			1.30 U				0.750 (Fasion	1.5.	
							iugj		
			FF .00				40.00		.00
 			-00+90				-40+90	-55	+90
 			-55+125				-40+100	-55	+125
 				A	ıy				
				Scr	ew				

Lovato

7



7 Solid state relays Technical characteristics

TYPE		HS1C2HV 020D024	HS1C6HV 020D024	HS1C6HV 020A230	HS1C2HV 025D024	HS1C6HV 025D024	HS1C6HV 025A230	HS1C2HV 030D024	HS1C6HV 030D024	HS1C6HV 030A230	HS1C6HV 040D024	HS1C6HV 040A230	
MODEL							Single-phase	1					
INPUT CHARACTERISTICS													
Control Voltage		3-32VDC	4-32VDC	90-280VAC	3-32VDC	4-32VDC	90-280VAC	3-32VDC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	
Operating voltage pick-up	V	3	4	45	3	4	45	3	4	45	4	45	
limits drop-out	V	2	2	20	2	2	20	2	2	20	2	20	
Input current at minmax voltage	mA	412	12 812 522 412 812 522 412 812 522 812 522										
OPERATING TIMES													
switching -on						ŀ	Half cycle ma	x					
switching -off						ŀ	Half cycle ma	х					
OUTPUT CHARACTERISTICS													
Switching mode						Zero	crossing swit	ching					
Rated operating voltage	VAC	12275VAC	486	00VAC	12275VAC	486	00VAC	12275VAC		486	00VAC		
Blocking Voltage	V	600	12	200	600	12	200	600		12	00		
Operational frequency (minmax)	Hz						4565				1		
AC-51 rated operating current (resistive load) at 40°C	A		20			25			30		4	0	
AC-51 rated operating current (resistive load) at 55°C	A		17			22			25		3	32	
AC-53 rated operating current (motor load) at 40°C	A						-						
Min. operational current	Α						0.165						
Input - Output isolation	V						5000						
Input - Output to metal base	V						5000				-		
Output protection type							VDR						
l²t	A ² s		792					13	50				
TERMINAL CHARACTERISTICS													
Control terminals	Туре						Screw						
Tool	Туре					Blade	screwdriver 3	3.5mm					
Tightening torque	Nm						0.5Nm						
	lb.in						4.5						l
Conductor section connectable (control terminals) minmax													
AWG stranded	n°						2812						
Flexible w/o lug	mm ²						0.752.5						
Flexible c/w insulated spade lug	mm²						0.752.5						
Load terminals	Туре						Screw						
Tool	Туре						PH2						
Tightening torque Load terminals (MinMax)	Nm Ib.in						1.5 13.3						
Conductor section connectable (load terminals) with 1 or 2 wires minmax AWG stranded	n°						1810						
Flexible w/o lug	mm ²						16						
Flexible c/w insulated lug	mm ²						116						
AMBIENT CONDITIONS													
Operating temperature	°C						-40+80°C						
Storage temperature	°C						-40+130°C						
Operating position allowable						0	n vertical pla	ne					
Fixing						Screw	or on 35mm	DIN rail					

electric

Wires up to 50mm² can be connected with specific spade lugs or ring lugs. Lug width max 12.6mm.
 Wires up to AWG0 can be connected with specific spade lugs or ring lugs. Lug width max 12.6mm.



7 Solid state relays Technical characteristics

HS1C6HV 060D024	HS1C6HV 060A230	HS2C6HV 015D024	HS2C6HV 015A230	HS2C6HV 030D024	HS2C6HV 030A230	HS2C6HV 060D024	HS2C6HV 060A230	HS3C6HV 020D024	HS3C6HV 020A230	HS3C6HV 025D024	HS3C6HV 025A230	HS3C6HV 040D024	HS3C6HV 040A230	HS3D5HV 024E230	HS3D5HV 048E230
Single	-phase		Tł	ree-phase	(2 controlle	d)				TI	hree-phase	(3 controlle	ed)		
	1						1		1						
4-32VDC	90-280VAC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	4-32VDC	90-280VAC	24255 VAC/DC	24255 VAC/DC
4	45	4	90	4	90	4	90	4	90	4	90	4	90	24	24
2	20	2	20	2	20	2	20	2	20	2	20	2	20	2	2
812	522	1321	2350	1321	2350	1321	2350	1727	2350	1727	2350	1727	2350	4.56	4.56
							Half cy	cle max							
							Half cy	cle max							
							Zero crossir	ng switching							
	48600VAC											24520VAC			
	1200												1600		
 60	60	15	15	20	20	60	45.	00	20	25	25	40	40	24	/0
00	00	(UL 12)	(UL 12)	30	30	(UL 50)	(UL 50)	20	20	20	20	40	40	24	40
40	40	12 (UL 10)	12 (UL 10)	25	25	48 (UL 40)	48 (UL 40)	1/	1/	20	20	32	32	18	38
-	-	7	7	13.5	13.5	15	15	12.5	12.5	13.5	13.5	15	15	12	32
0.165	0.165 0.166 0.16 0.16 0.16 0.16 0.16 0.16 0.1													0.05	
	5000													4000	
	5000												4000		
40	VDR										VDR				
10	500						14	104						2000	22000
						Sc	rew							Screy	₩ M4
	Blade screwdriver 3.5mm											PZ 2			
						0.5	iNm							1.22	
						4	.5							10.617.7	
														18.	14
						28.	12								
0.752.5													0.752.5		
0.752.5														0.752.5	
 Screw														Screw M5	
1 5 PH2													PZ2		
						19	33	-						2.	
														20	
						18.	10							6*	00
						1.	6							1.56	
						1	.16							1.5.	60
						_ 40	180°0							40	100
						-40	+00 0 +130°C							-40	+125
						On verti	cal plane							Anv	
1					S	Screw or on 3	35mm DIN ra	ul						Sci	ew

7

