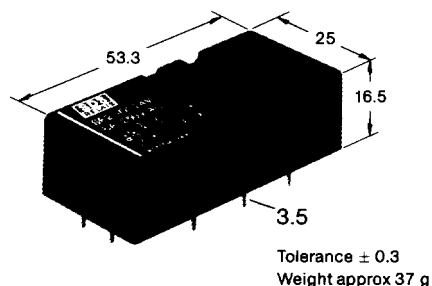


NAIS

POLARISED, MONOSTABLE SAFETY RELAY WITH FORCED OPERATION CONTACTS COMPLYING WITH ZH1/457

SF2-RELAYS



- Creepage distances and airgaps:
Contact/Contact C = 4.7 mm, A = 4.3 mm
Contact/Coil C = 4.6 mm, A = 4.4 mm
- As per VDE 0110
Contamination level 3/250 V
Overvoltage category III/300 V
- Degree of protection IP67 (washable)
- TÜV test, no. 945/EL181/93
SEV approval, no. 92.1 10714.05
SUVA no. 5454

625 875
↓
887

Characteristics

Contact configuration (a = Normally open, b = Normally closed)		2a2b
Volumetric resistance (at 6 Vdc, 1 A new condition)	mΩ	- / < 30
Max. make-/rated-/break current	A	20/10/6
Max. switched voltage	V	440
Max. switched load (resistive load, 1))	W (VA)	150 (1500 2))
Min. switched voltage/switching current	V/mA	10/10
Pick-up/nominal power consumption at 20°C	mW	280/500
Pick-up/drop-out voltage in % of nominal voltage at 20°C		75/10
Pick-up/drop-out/bounce time (approx. values at U _{rated})	ms	17/7/2
Max. switching frequency	Hz	10
Operational life mechanical	Sw.ops	10 ⁷
Permissible ambient temperature at rated power consumption	°C	-40/+70
Upper temperature limit	°C	105
Thermal resistance (max. packing density)	K/W	see Thermal Loading capability
Test voltage open contact/contact-contact/coil	V _{rms}	2500
Insulation resistance at 500 Vdc (new condition)	Ω	10 ⁹
Shock resistance (11 ms), Vibration resistance ³⁾	g, g/Hz	30, 10/10-55
Degree of protection		IP67/IP30 ²⁾

- 1) at 10⁵ switching operations, ambient temperature +70°C
2) with breather hole; 3) Contact interruption < 10 μs

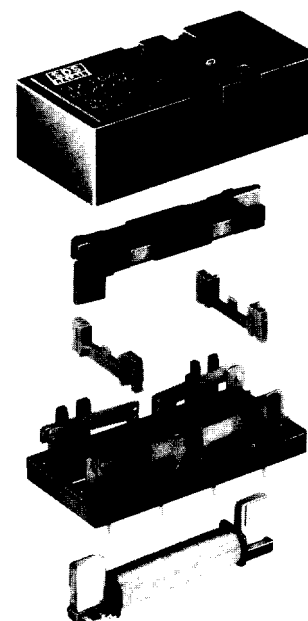
Electrical operational life

Switched voltage	Switched current	Switched load	Load type	Switching freq.	No. of sw.ops. 4)
250 VAC	8.00 A	2000 VA	cos φ = 1	0.2 Hz	30.000
220 VAC	6.82 A	1500 VA	cos φ = 1	0.2 Hz	100.000
220 VAC	5.11 A	1125 VA	cos φ = 0.6	0.2 Hz	100.000
220 VAC	4.43 A	975 VA	cos φ = 0.35	0.2 Hz	100.000
220 VAC	2.27 A	500 VA	cos φ = 1	0.2 Hz	300.000
220 VAC	1.70 A	375 VA	cos φ = 0.6	0.2 Hz	300.000
220 VAC	1.45 A	320 VA	cos φ = 0.35	0.2 Hz	300.000
30 VDC	2.00 A	60 W	resistive	0.5 Hz	2 Mio.
60 VDC	0.05 A	3 W	L/R = 28 ms	0.5 Hz	2 Mio.
10 VDC	0.01 A	0.1 W	resistive	0.5 Hz	2 Mio.

4) at ambient temperature of +70 °C

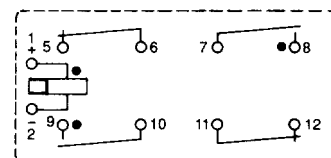
Ordering Information / Coil data

Part-number	Coil nominal voltage (V)	Pick-up voltage (V)	Drop-out voltage (V)	Coil resistance (Ω) ± 10%, 20°C	Coil inductance (mH)
SF2- 5 V	5	3.75	0.5	50	48
SF2-12 V	12	9	1.2	288	240
SF2-24 V	24	18	2.4	1152	1000
SF2-48 V	48	36	4.8	4608	3300
SF2-60 V	60	45	6.0	7200	6100

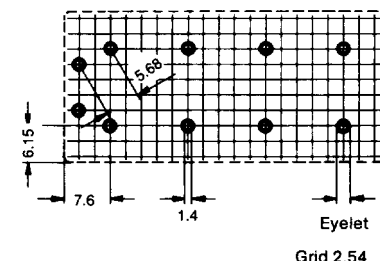


Connection diagram and pcb bore hole data

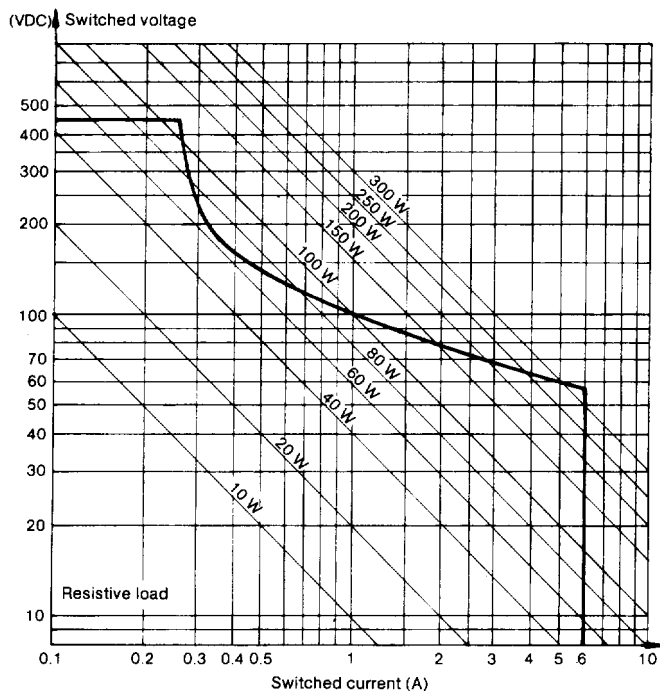
Bottom view



The contacts are shown in the de-energised condition. Changeover takes place when the coil is energised with the polarity shown.

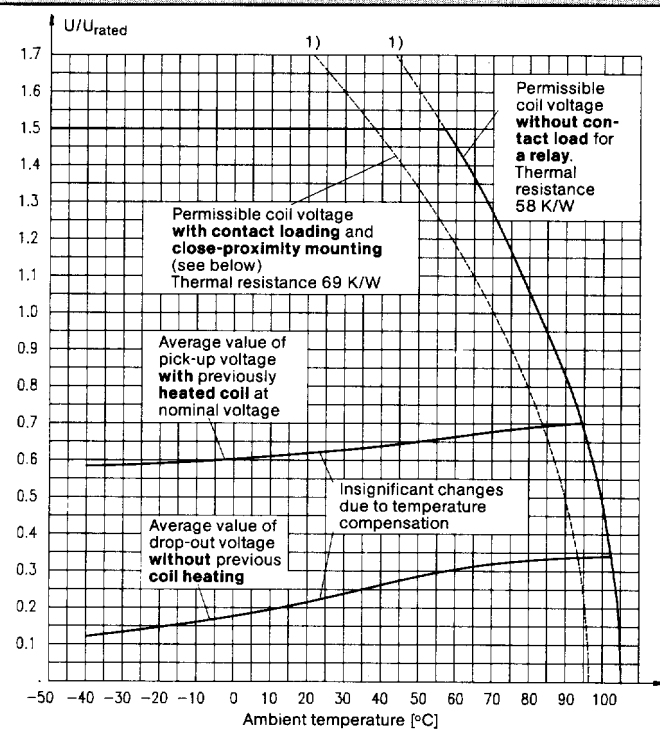


Load Limit Curves



Loads in the range under the curve can be switched safely. The arc will extinguish before the opposite contact makes (important if NO (a) and NC (b) contacts are connected to dissimilar voltages).

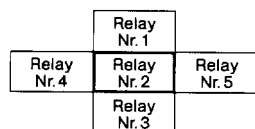
Continuous Thermal Loading Capability of the Coil



1) The curves shown apply to an average value coil resistance

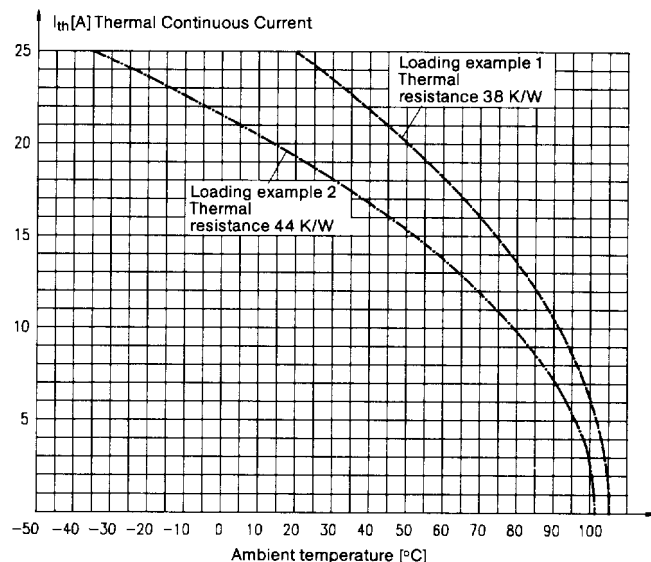
Permissible coil voltages and pick-up and drop-out characteristics at various ambient temperatures and contact loads.

Relay layout for high density packing with load carrying contacts



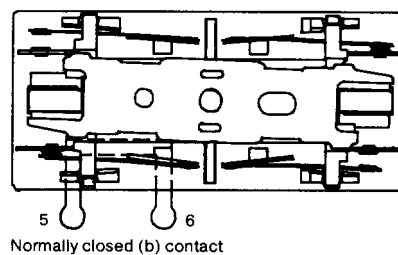
Relay coils 1-5 energised by up to $1.5 U_{rated}$. **All normally open (a) contacts** carrying 10 Amps.

Continuous Contact Thermal Loading Capability



Permissible continuous current for a relay at varying ambient temperatures.

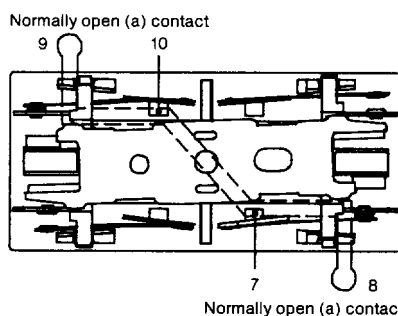
Loading example 1



Coil de-energised:

A normally closed (b) contact carrying current. Contact volumetric resistance $R_d 5-6 = 3.6 \text{ m}\Omega$

Loading example 2



Coil energised at rated voltage.

All Normally open (a) contacts are load carrying. Contact volumetric resistance $R_d = 5 \text{ m}\Omega$

Connection module available according page 317