

Mini K HV Precharge Relays

Suitable for voltage levels up to 450VDC

- Precharge currents up to 20A
- Limiting break currents up to 20A
- Available with PCB and plug-in terminals

Typical applications

DC high voltage precharge applications in hybrid, full battery electric vehicles and fuel-cell cars.

Contact Data

Contact Data	
Contact arrangement	1 form X (NO DM)
Rated voltage	400VDC
Max. switching voltage ¹⁾ / power	450VDC / 9kW
Limiting switching current ²⁾	
normal operation	20A on/0A off: min. 10 ⁵ ops.
fault break operation ³⁾	20A on/20A off: min. 10 ops. ³⁾⁴⁾
Initial contact voltage drop at 10A	typ. 150mV, max. 300 mV
Operate time at nominal voltage	typ. 2.5ms
Release time ⁵⁾	typ. 1ms
Mechanical endurance	>10 ⁶ ops.
1) Consult TE Connectivity for insulation co	mpatibility with bighor voltages

Consult TE Connectivity for insulation compatibility with higher voltages.

2) Load circuit: L/R <14µs.

3) After 10 fault break operations relay must be replaced.

4) Test conditions: on-time 100ms, off-time 10s.

5) Valid for recommended 250Ω suppression resistor (PCB version).

Note: A low resistive suppression device in parallel to the relay coil increases the release time and reduces the lifetime due to increased erosion and / or higher risk of contact tack weldina.

Coil Data

Nominal voltage	12V
Min./Max. energization duration	max. 2s ⁶⁾
Max. coil temperature	155°C

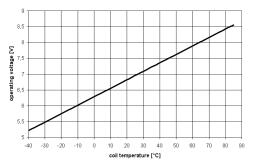
6) Max. continuous activation time is limited and depends on operating conditions. Please contact TE Connectivity for details.

Coil versions

Coil	Rated	Operate	Release	Coil	Rated coil
code	voltage	voltage	voltage	resistance	power
	VDC	VDC ⁷⁾	VDC ⁷⁾	Ω±10%	W
001	12	6.9	1.2	50	2.9
$002^{8)}$	12	6.9	1.2	41.6	3.5

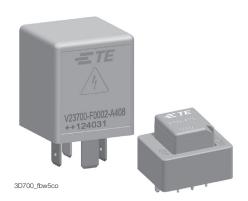
7) All values are given for coil without pre-energization, at ambient temperature +23°C. 8) Coil suppression resistor already included in the relay. No additional suppression component allowed.

Coil operating range



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Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section.



Insulation Data¹⁾

Initial dielectric strength	
between open contacts	2800 VDC/1mA
between contact and coil	2800 VDC/1mA
Insulation resistance after 10 fault	t break ops. (20A)
between open contacts	>200MΩ
between contact and coil	>200MΩ
Max. altitude	4000m
Clearance / creepage	
acc. IEC60664-1 (2007) for	over voltage category I, pollution degree 2

Other Date

Other Data					
EU RoHS/ELV compliance	compliant				
Flammability of plastic material	acc. UL94-HB				
Ambient temperature range	-40°C to +85°C				
Climatic cycling with condensation					
EN ISO 6988	6 cycles, storage 8/16h				
Temperature cycling (shock)					
	10 cycles, -40/+85°C (5°C per min)				
Damp heat constant					
	56 days, upper air temperature 40°C				
Degree of protection PCB version					
IEC 61810	RT III – immersion cleanable				
Corrosive gas					
IEC 60068-2-42	10 days				
IEC 60068-2-43	10 days				
Wide-band noise					
IEC 60068-2-64	10 to 1000Hz, 30.8 m/s ^{2 9)}				
Shock resistance (functional)					
IEC 60068-2-27 (half sine)	11ms, 20g ⁹⁾				
Terminal type	PCB and plug-in/QC				
Weight					
PCB version:	approx. 17g (0.6oz)				
Plug-in version:	approx. 39g (1.4oz)				
Solderability (aging 3: 4h/155°C) PCB					
IEC 60068-2-20, Ta, method 1	hot dip 5s, 215°C				
Resistance to soldering heat PCB vers					
IEC 60068-2-20, Tb, method 1A	hot dip 10s,				
	260°C with thermal screen				
Note: Parameters given in http://relay	<u>/s.te.com/definitions</u> for preheating				
and soldering must be observed.					
Sealing, IEC 60068-2-17 PCB version					
Storage conditions	according IEC 60068 ¹⁰⁾				
9) No change in the switching state $>10\mu s$.					

For general storage and processing recommendations please refer to our Application Notes and especially to Storage in the Definitions or at http://relays.te.com/appnotes/

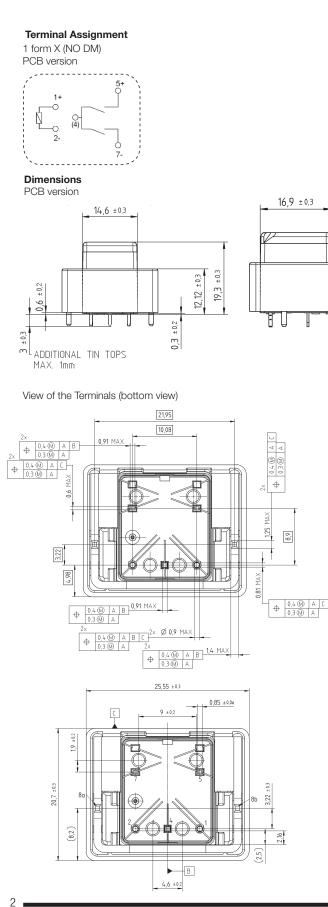
Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change.

1



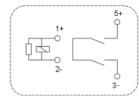
Mini K HV Precharge Relays (Continued)



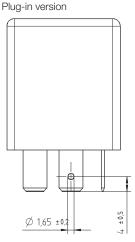
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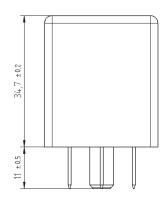
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Terminal Assignment 1 form X (NO DM) with resistor Plug-in version

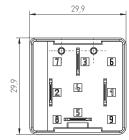


Dimensions

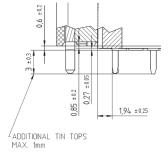




View of the Terminals (bottom view)



Detail PCB version: minimum clearance requirements (see note below)



Notes regarding PCB-layout and terminal assignment:

- Pin 4 must not be electrically connected, no solder eye at that pin is allowed, only a drill-hole without via Potential assignment of pins:
 pins 1; 2: low voltage (LV)
- pins 5; 7; 4(*): high voltage (HV)
- pin 8a: 8b: no potential but internally connected (*) pin 4 is on HV potential in ON-state of relay only.

Notes regarding clearance and creepage distances:

The required clearance and creepage distances between HV and LV potential must be ensured. Layout of the PCB has to ensure min. clearance and creepage distances of conducting relay parts and relay terminal 1 and conducting relay parts and terminal 2 respectively. Refer to detail drawing. Minimum distance to neighboring ferruginous parts: 3mm.

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Mini K HV Precharge Relays (Continued)

Produ	ict co	de structure	Typical pro	duct code	V23700	-C	0	001	-A	40	8
Туре											
туре	V2370	0 Mini K HV									
	12010										
Termin	nal and	enclosure									
	С	PCB	F	Plug-in							
Desig											
	0	Standard									
Coil											
0011	001	without parallel resistor	002	with paralle	el resistor						
Conta	ct type										
	Α	Standard									
Conta	ct mate	erial									
	40	Silver based									
Conta	ct arra	ngement									
	8	1 form X (NO DM)									

Product code	Terminal/Encl.	Design	Coil	Contact type	Contact mat.	Arrangement	Part number
V23700-C0001-A408	PCB, sealed	Standard	without parallel resistor	Standard	Silver based	1 form X (NO DM)	2-1904058-5
V23700-F0002-A408	Plug-in, QC		with parallel resistor				2-1904058-7

3