

Distributed by:



Contactor

High voltage contactor for DC

Series/Type:	HVC500*-series
Ordering code:	T. B. D.
Date:	2016-04-29
Version:	01

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Contactor
T. B. D.
High voltage contactor for DC
HVC500*-series
Preliminary data
Product description

The HVC-series are specially designed to meet the requirements of high voltage DC switching applications. The optimized hermetically sealed design exhibits excellent reliability performance against harsh environments. HVC-series can be used in a wide range of applications where fast and reliable switching operations are required.

Features

- Robust design with exceptional electrical & mechanical reliability
- Gas filled & hermetically sealed
- Stable performance over lifetime
- No EMI, no inrush-current phase at start-up
- RoHS-compatible

Applications

- Battery charge/discharge system
- Renewable energy storage system
- DC high voltage/high current applications
- DC fast charging stations

Mechanical specifications

Height × width × depth	83 × 78 × 46	mm
Weight	~ 520	g
Contact material Contact arrangement Internal contact gap	Cu alloy 1A 3.0 (2 × 1.5)	mm
Connection cable cross section ^{a)}	> 200	mm ²
Coil and auxiliary contact ^{b)} wires - length - cross section - material	300 0.5 Cu	mm mm ²
Auxiliary contact ^{b)} - voltage - current - resistance	min. 5 50 ---	max. 150 1000 150
Vibration in xyz-axis - shock, 11 ms ½ sine, peak - vibration, sine 100 ... 2000 Hz, peak - wideband random vibration, 10 ... 2000 Hz ^{c)}	20 20 5	g g g _{eff.}
Operation and storage ^{d)} - temperature - humidity - air pressure	-40 ... +90 5 ... 85 47 ... 106	°C % kPa
Climatic category (IEC 60068-1)	40/090/21	
Label, black positive	T.B.D.	

Notes

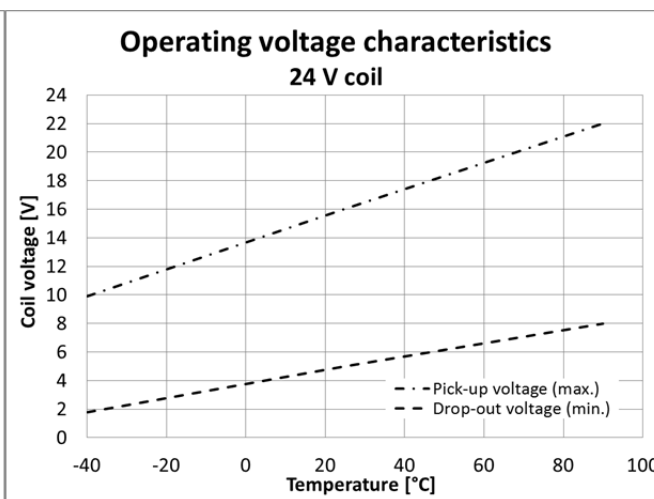
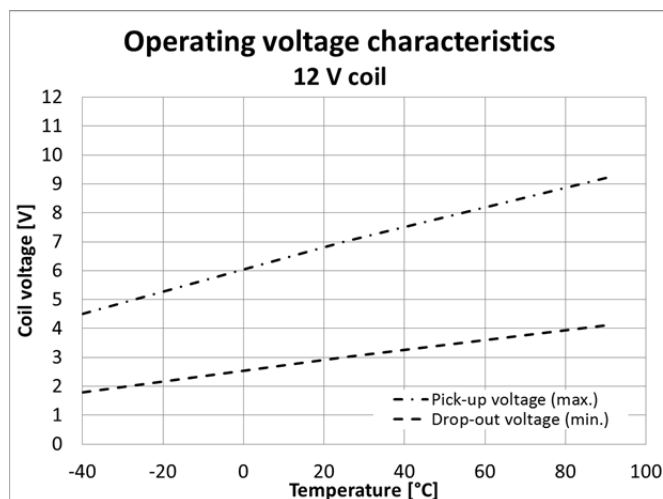
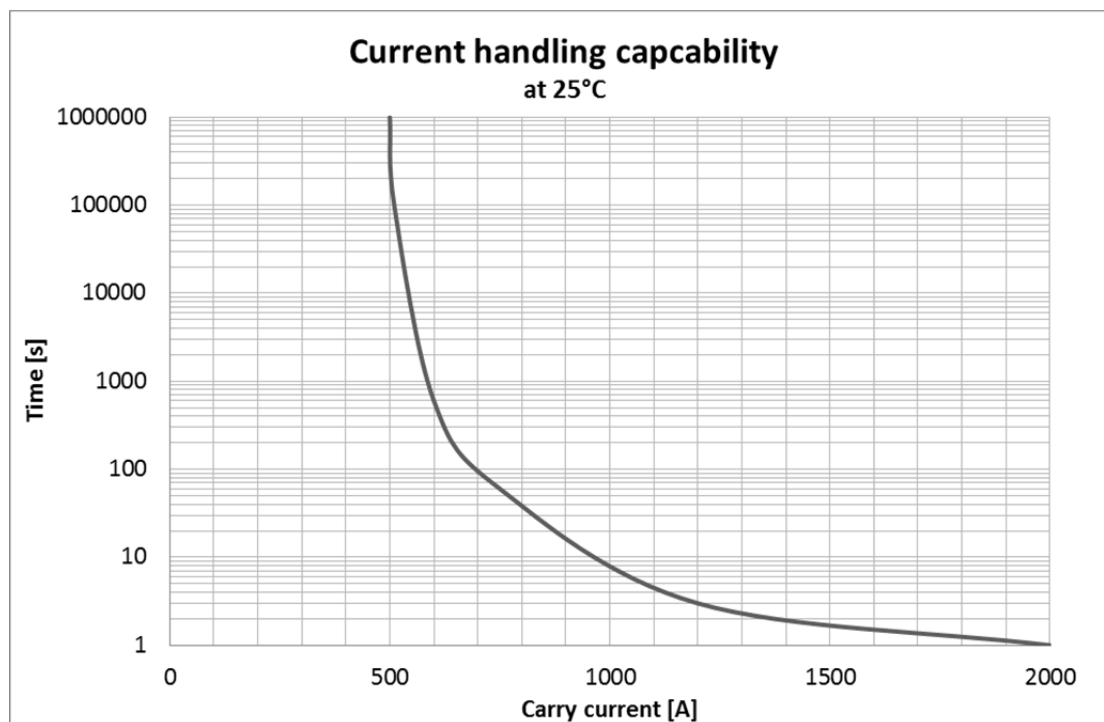
- ^{a)} Recommended. The actual diameter must be matched to actual nominal current and operation temperature.
^{b)} Optional feature, refer page 7 for order information.
^{c)} Acc. to IEC 60068-2-64
^{d)} Freezing or condensing must be avoided

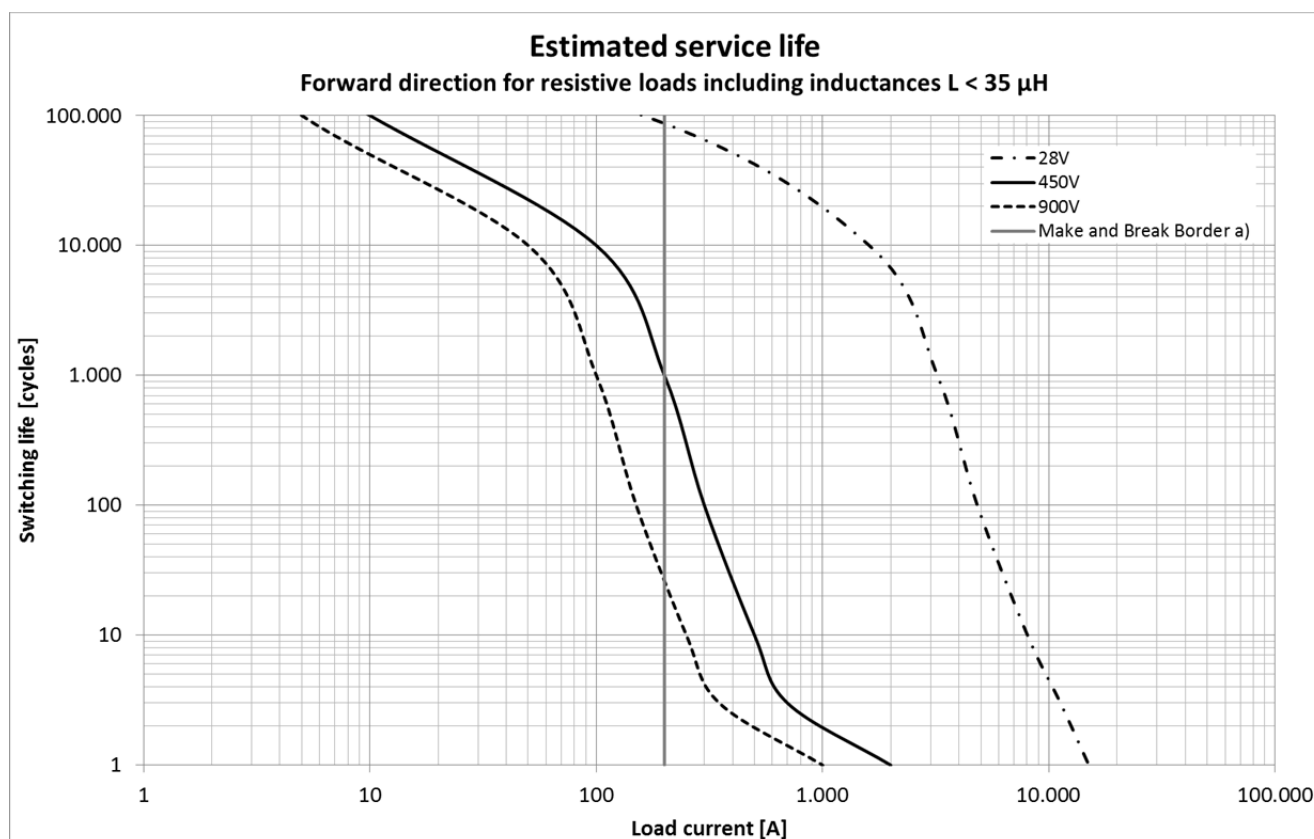
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Electrical specifications ¹⁾

Contact				
Rated operating voltage		24 ... 900		V _{DC}
Nominal current		500		A
Temporary overcurrent	(10 min)	600		A
Temporary overcurrent	(1 min)	750		A
Minimum make and break current		1		A
Contact resistance typical	(> 100 A)	< 0.4		mΩ
Nominal cut-off current	(10 operations) ²⁾	500		A
Maximum cut-off current	(1 operation) ^{2) 3)}	2000		A
Coil ^{4) 5)}		12 V-type	24 V-type	
Rated voltage		12	24	V _{DC}
Operating voltage range		7 ... 18	16 ... 29	V _{DC}
Pick-up voltage (max.)		7	16	V _{DC}
Drop-out voltage (min.)		3	5	V _{DC}
Power consumption		< 6	< 6	W
Minimum holding current		160	160	mA
Electrical characteristics				
Operating time				
make		< 40		ms
break		< 20		ms
Insulation resistance at 500 V (initial)				
contact to contact / contact to coil		> 10		GΩ
Dielectric strength ⁶⁾				
contact to contact / contact to coil		> 3800		V _{DC}
Service life ²⁾				
Mechanical		1 000 000		operations
Make & break at 10 A		100 000		operations
Make & break at 30 A		50 000		operations
Make & break at 100 A		10 000		operations
Make & break at 200 A		100		operations
Break only at 500 A		10		operations
Break only at 2000 A ³⁾		1		operation

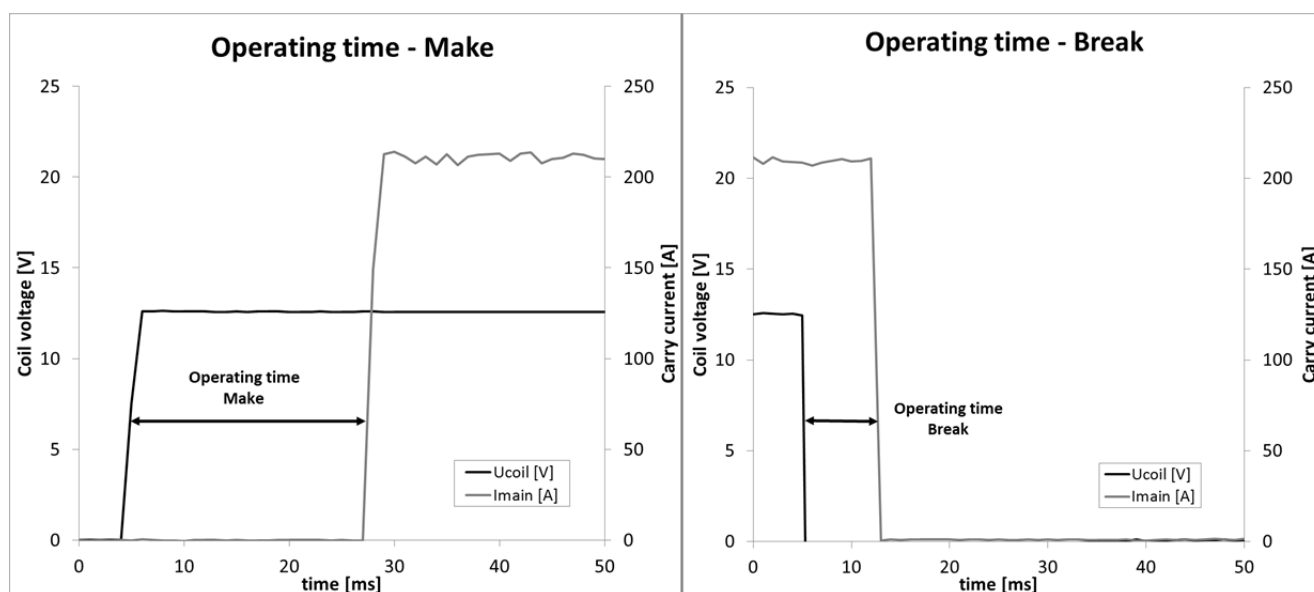
Notes:

- ¹⁾ Specified according to JIS C 5442 (temperature 15°C to 35°C, humidity 25% to 85% RH)
- ²⁾ Tested at 450 V for resistive loads including inductance L < 35 μH.
End of life is reached when dielectric strength is < 50 MΩ @ 500 V.
- ³⁾ No fire, no explosion, dielectric strength and insulation resistance may not meet data sheet
- ⁴⁾ For 25°C ambient temperature
- ⁵⁾ Selectable feature, refer page 7 for order information.
- ⁶⁾ Detection limit 10 mA

Preliminary data
Engineering data


Preliminary data


a) Below border make and break operation is permitted. Above break only is permitted.



Contactor

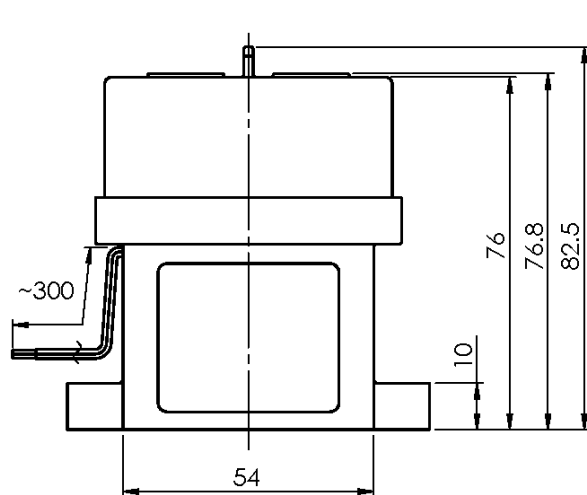
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High voltage contactor for DC

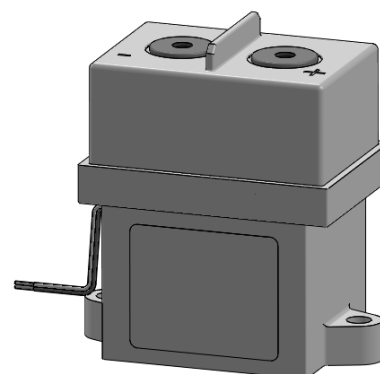
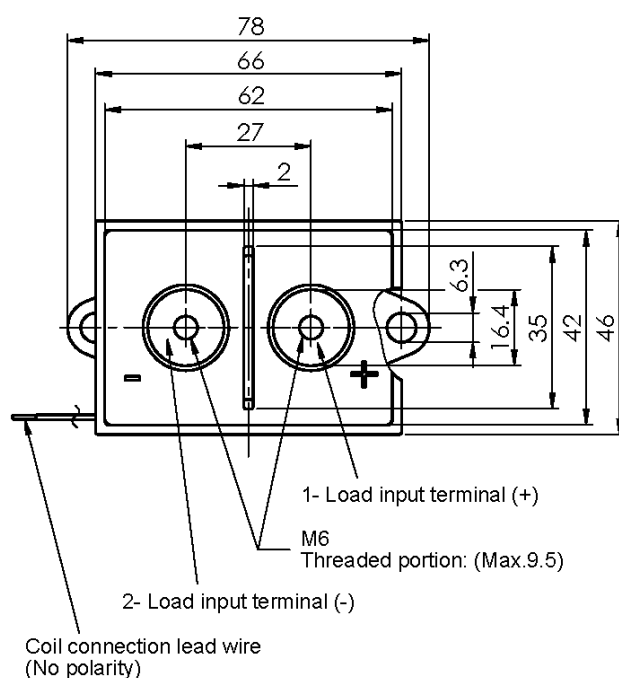
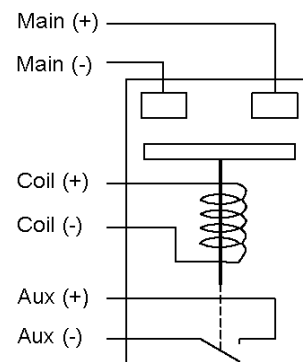
HVC500*-series

Preliminary data

Dimensional drawing for housing in mm



Schematic



Note:

Tightening torque of main contacts:
6 ... 8 Nm for M6 screw

Connection name	Marking
Main positive terminal	" + "
Main negative terminal	" - "
Coil positive wire	red
Coil negative wire	black
Auxiliary contact positive wire	blue
Auxiliary contact negative wire	white
Notes: Auxiliary contacts "green" and "white" are normally open. When the contacts are short, the part is stuck.	

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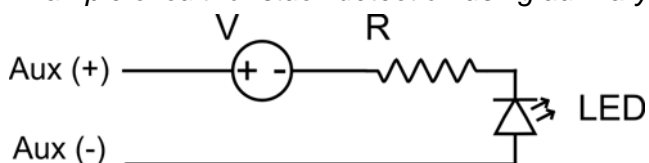
Preliminary data

Type overview

Type names	Ordering codes	Options
HVC500A-12	B88269X....C011 (1 pc.) B88269X....C101 (10 pcs.)	12 V coil
HVC500A-24	B88269X....C011 (1 pc.) B88269X....C101 (10 pcs.)	24 V coil
HVC500A-12S	B88269X....C011 (1 pc.) B88269X....C101 (10 pcs.)	12 V coil with stuck detection
HVC500A-24S	B88269X....C011 (1 pc.) B88269X....C101 (10 pcs.)	24 V coil with stuck detection

Stuck detection

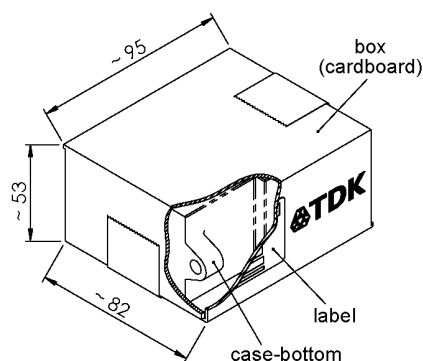
Example circuit for stuck detection using auxiliary contacts



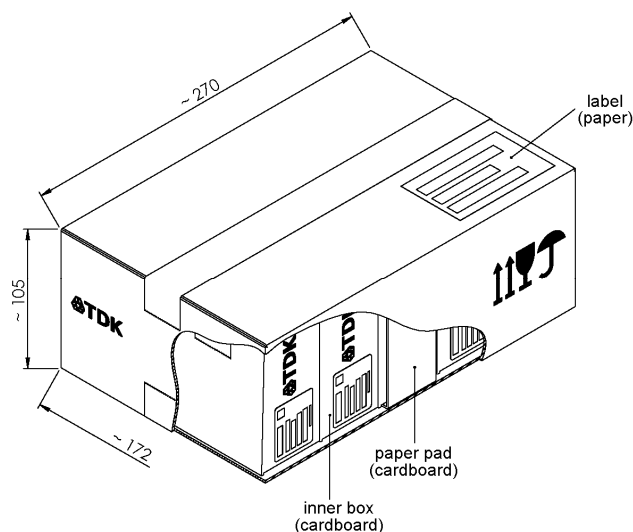
In case the contactor is stuck, the Aux (+) & Aux (-) wires will be short, hence the circuit is closed and the LED will be on.

Packing advices

1 pc. in cardboard box (C011)



10 pcs. in cardboard box (C101)



Preliminary data
Cautions and warnings

- Contactors have a polarity. Please ensure the connection is made in the right way otherwise the lifecycles specified in this document are no longer valid.
- Contactors radiate magnetic and electromagnetic fields. Please ensure that other components mounted in close proximity are not affected.
- The lifecycle of the contactor can be influenced by strong magnetic fields. Please ensure that magnetic field sources in close proximity are avoided.
- The contactor shall be mounted in that way, that the contact face side is perpendicular to the direction of the main shock-axis. If this can be avoided, the contactor shall be mounted upright standing.
- The coil contacts need to be protected from overvoltage occurring during switch-off. Preferable a varistor has to be installed in parallel. It has to be considered that the overvoltage protection device which is used in parallel to the coil has an influence to the break time. It is recommended to use EPCOS S10K30 varistor for 12 V and EPCOS S10K40 for 24 V.
- The leads to the contactor have to be securely tightened to the terminals (check torque force limits in datasheet). Otherwise current stress may lead to the formation of sparks and heating.
- The contactor shall not be operated without any load. Otherwise the contact resistance may increase.
- Contactor may become hot in case of longer periods of over-current stress (danger of burning).
- Contactors may be used only within their specified values. In case of overload, the component may be destroyed.
- Contactors must be handled with care and must not be dropped.
- Damaged contactors must not be re-used.

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