

# Hybrid X<sub>s</sub>-EV Series

## HYBRID PROTECTION

### HYBRID DC POWER RELAY



The new X<sub>s</sub>-EV product series is one of the latest developments in Mersen Hybrid DC Power Relays.

X<sub>s</sub>-EV have been engineered to provide high DC switching performances versus conventional mechanical power relays. This series addresses DC-applications like, but not limited to, Electrical Energy Storage, EV/HEV, DC Smart-grid, PV installations.

X<sub>s</sub>-EV provide maximum flexibility in equipment design and ultimate DC operation performance. This Power Relay is a Hybrid technology with the capability of switching both high voltage and high current, designed specially for electrical vehicle applications.

All information provided in this datasheet relates to prototypes still under development. Most features can be modified to adjust to customers' needs (incl. current/voltage ratings and timings). Some characteristics will require additional testing to confirm preliminary estimation (incl. cycling and extreme environment operation).

## TECHNICAL DATA OVERVIEW

Voltage Range DC	500 ... 1200 VDC
Breaking capacity	Up to 2,000 A @ 1,200VDC
Product Size	162 x 66 x 95 mm
Current	300A (nominal)
Device current polarity	Bidirectional
L/R max.	≤ 5ms (for higher rates please contact Mersen)

## FEATURES & BENEFITS

- DC specific design
- Bidirectional
- Arc-less
- Reduced footprint & mass
- Low conduction losses
- Repeatable current make/break capability for resistive & inductive loads at full rated voltage and current
- Enhanced cycling performances
- Built-in turn ON fault detection
- Built-in charging circuit (optional)
- Easily tunable L/R rating (optional)
- Galvanic insulation

## APPLICATIONS

- DC Power Relay for demanding EV applications
- EES
- DC grid protection, PV applications

## STANDARDS

- IATF - ISO/TS 16949 Quality management system

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## PRODUCT RANGE



XsEV90B300-B2000

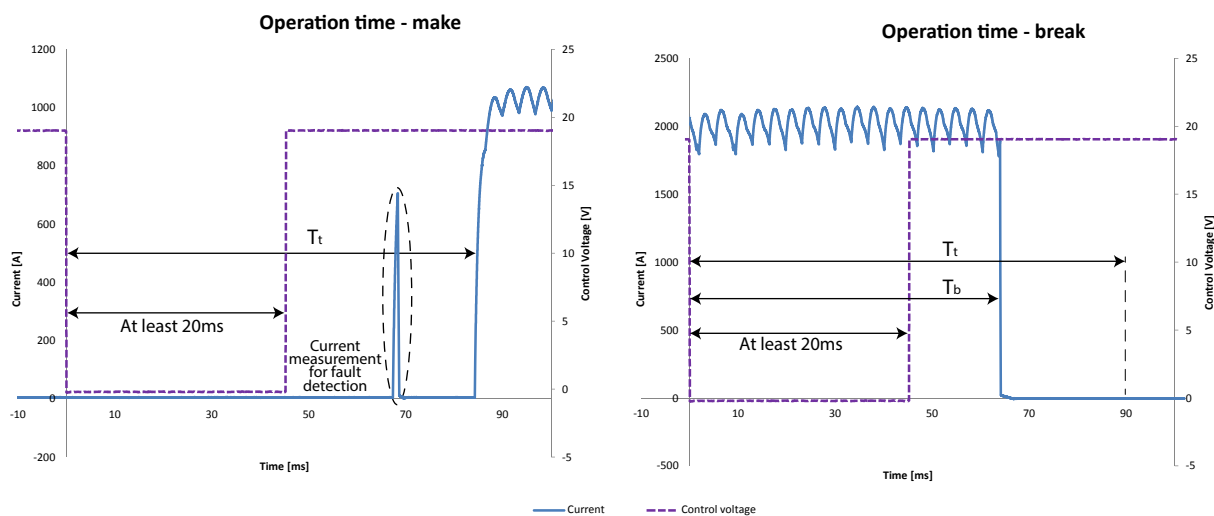
### Xs-EV

Catalog number	Rated voltage DC (IEC)	Rated current I <sub>n</sub>	Rated breaking capacity DC	Charging circuit	Weight	Package
XsEV90B300-B2000	900 V	300 A	2000 A	No	0.8 kg	1
XsEV90B300-B1500	900 V	300 A	1500 A	No	0.8 kg	1
XsEV120B300-B1500	1200 V	300 A	1500 A	No	0.8 kg	available 2017-03
XsEV120B300-B2000	1200 V	300 A	2000 A	No	0.8 kg	available 2017-03
XsEV120C300-B2000	1200 V	300 A	2000 A	Yes	-	in development

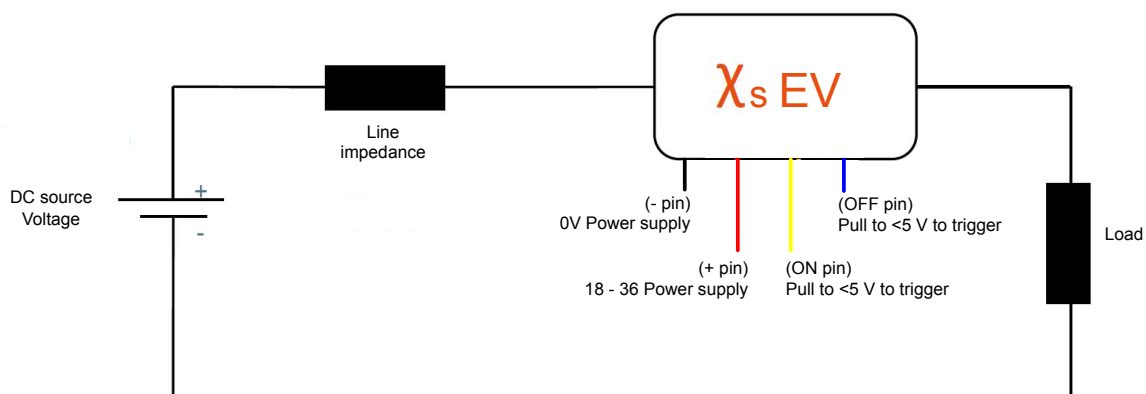
## TECHNICAL DATA

	Xs-EV
Operating temperature	-40°C to 85°C
Wiring cross sections	> 95mm <sup>2</sup>
Body Material	PA 12 (colored black)
Breaking capacity	Circuit break time: Typ. 70 ms (see typical switching behaviour)
Max. ON/OFF switching current	Max. ON = 1000A Max. OFF = 500A/1000A/1500A/2000A
Lifetime	> 100.000 cycles (mechanical)
Insulation	Resistance > 100MΩ (initially)
Dielectric strength	3000VDC
Internal contact gap	3mm (2 x 1.5mm)
Contact voltage drop	150mV (initially) 175mV (after typical life)
Operating time	Make: Typ. 90 ms Break: Typ. 90 ms
Power supply voltage (+/-)	18 - 36VDC
Input control voltage (On/Off)	Low level: 0 - 5VDC High level: 8 - 36VDC
Switching & holding current	Switching: Typ. 10A Holding: Typ. 0.1A
Tightening torque (recommended)	Power terminals: M8 (15Nm) Base plate: M5 (4Nm)
Vibration resistance	> 6 g (50...2000 Hz) ISO 16750-3 (pending)
Pollution degree	PD 1 (prototype only)
Altitude	Max. 2000m
Number of cycles vs current and L/R	> 20 cycles @ 2000A, 500VDC, L/R = 0.5ms > 2000 cycles @ 300A, 500VDC, L/R = 5ms
Transient voltage during clearing current	Typ. 1400VDC @ 500VDC – 2000VDC @ 1000VDC

## TYPICAL SWITCHING BEHAVIOR

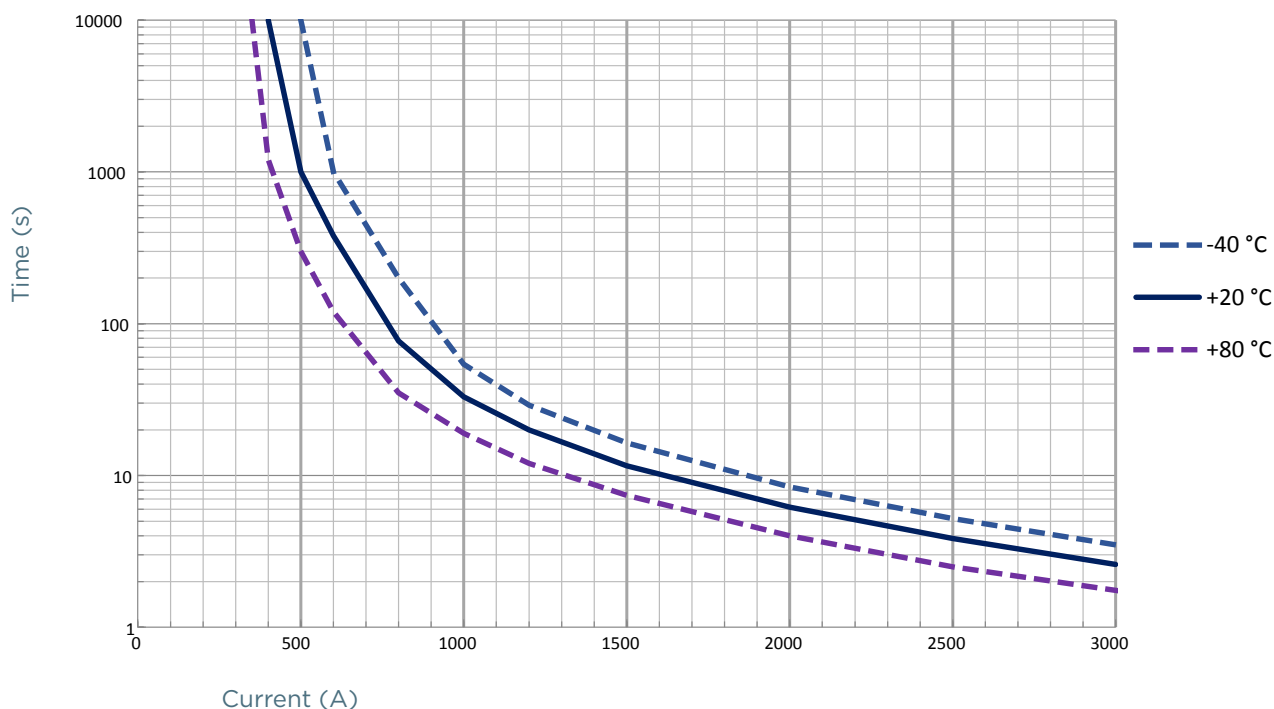


## TYPICAL ELECTRICAL CONNECTION



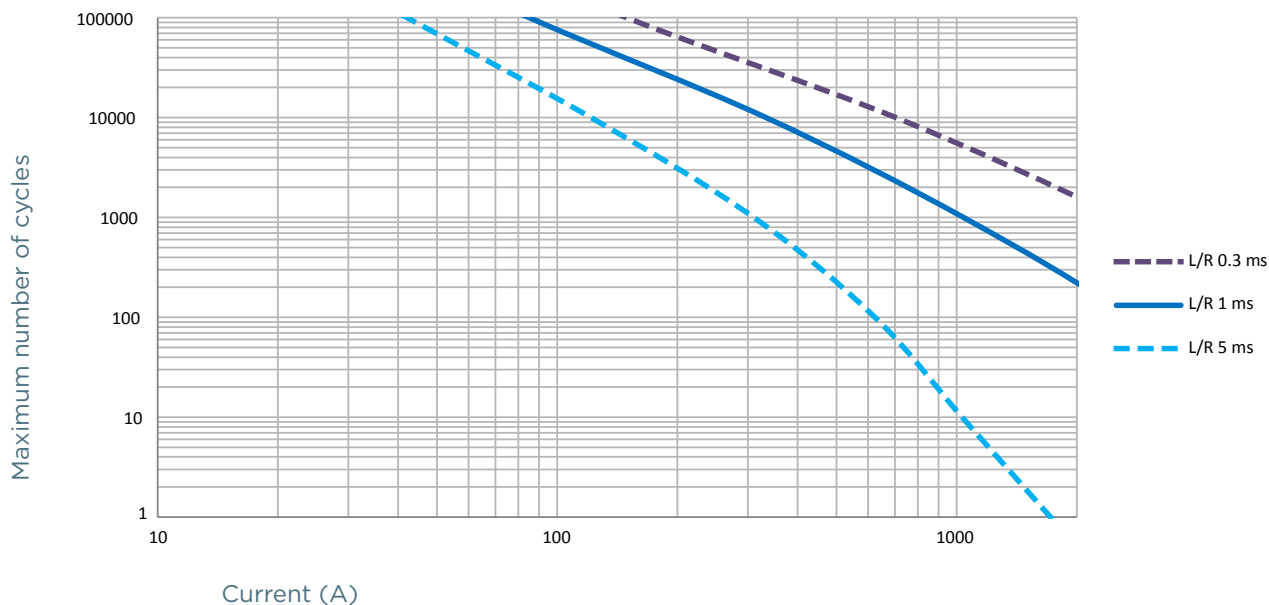
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## CURRENT HANDLING CAPABILITY



## PRELIMINARY CYCLING PERFORMANCES

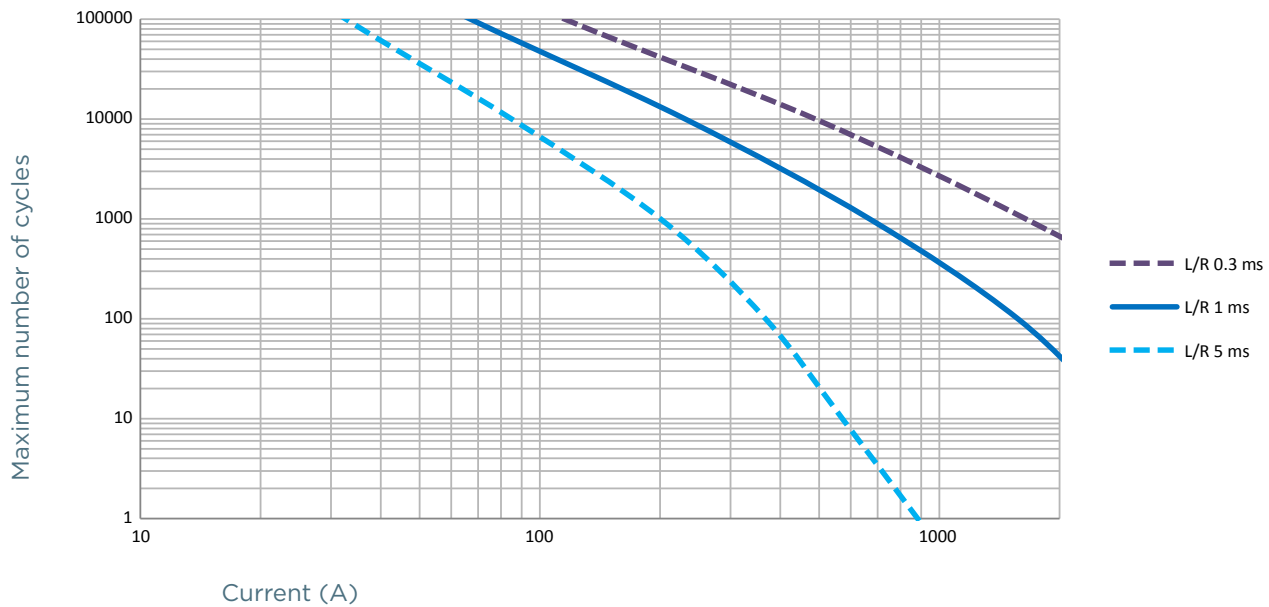
### Number of openings versus current and L/R at 500VDC



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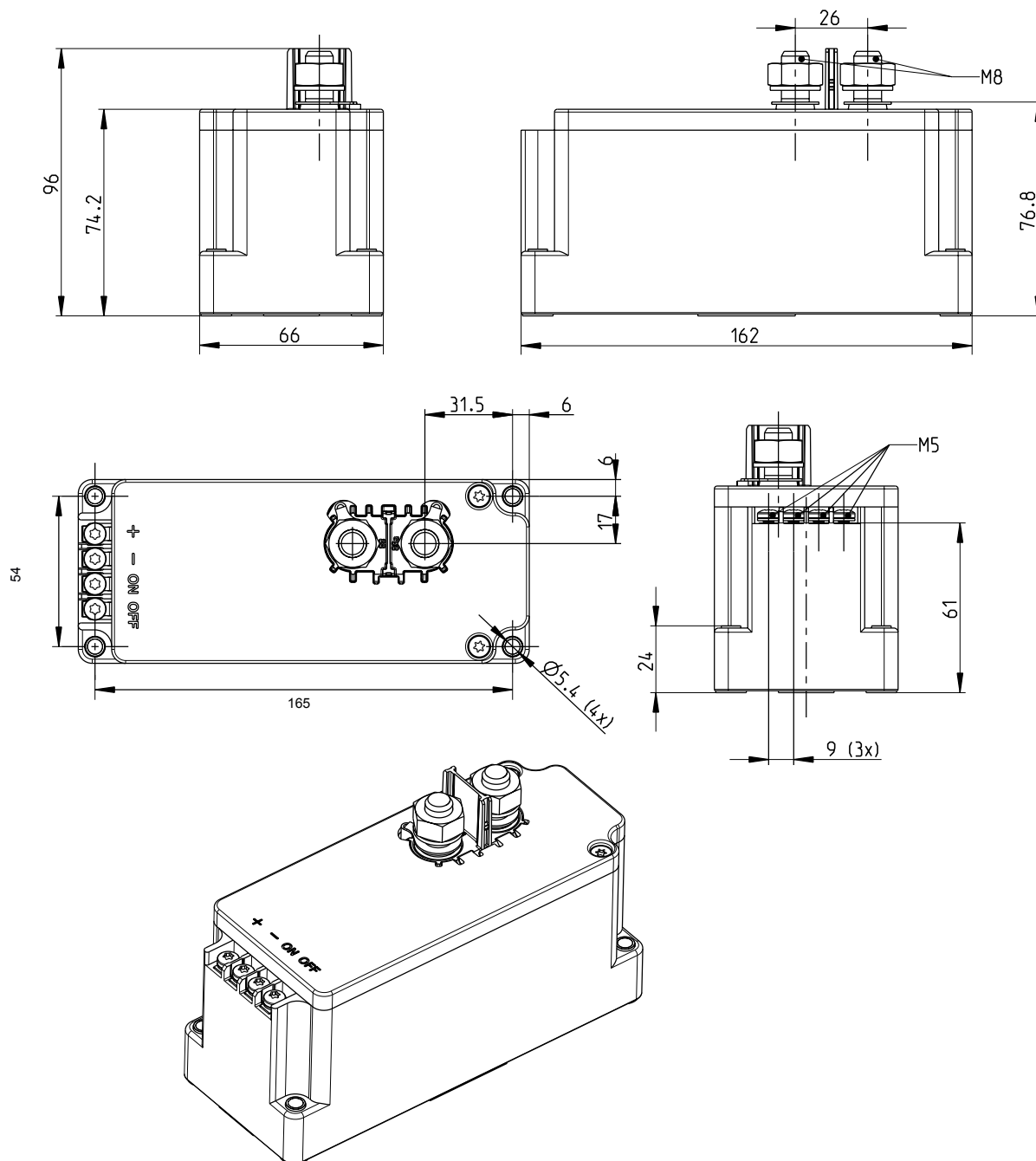
## PRELIMINARY CYCLING PERFORMANCES

### Number of openings versus current and L/R at 1000VDC



# Hybrid Xs-EV Series

## DIMENSIONS



Dimensions in mm

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