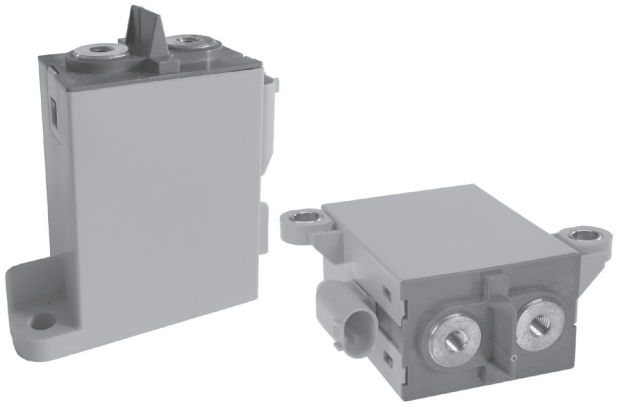
EVC 175 Main Contactor

- **Limiting continuous current 175A at +85°C**
- **Suitable for voltage levels up to 500VDC**
- **High peak current carrying capability up to 5000A[1)]**
- **IEC 60664 (2007) compliant**

Typical applications

DC high voltage and high current applications, e.g. main contactors for larger hybrid electric vehicles (HEV), plug-in hybrids (PHEV) and full electric vehicles (BEV), battery charging systems.



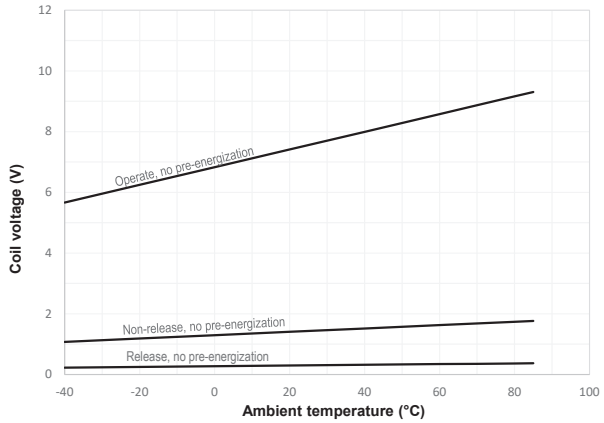
EVC_175_compo

Contact Data	
Contact arrangement	1 form X (SPST NO DM)
Rated voltage	450VDC
Maximum switching voltage	500VDC, dep. on load characteristics[1)]
Limiting continuous current	
+85°C, load cable 25mm²	160A
+85°C, load cable 30mm² (rated)	175A
+85°C, load cable 35mm²	190A
+85°C, load cable 40mm²	210A
+85°C, load cable 50mm²	235A
Limiting short time current	load cable 35mm²
85°C	500A 0.5min 1500A 2s 5000A 20ms[1)]
Limiting make/break current	load cable 35mm²
Forward current direction	0.05mH ON: 210A at 24VDC / OFF: 10A at 24VDC -40°C up to +80°C 100000 times[2)]
Reverse current direction	ON / OFF 33A at 437VDC, 0.05mH 23°C 25 times[2)]
Limiting break current	load cable 35mm²
Forward current direction	500A at 450VDC, 0.05mH 23°C 10 times[2)] 1500A at 450VDC, 0.05mH 23°C 1 time[2)]
Voltage drop (initial) at 100A	max. 40mV after 60s
Voltage drop (over lifetime) at 175A	typ. 35mV[3)]
Operate time[4)]	20ms
Release time[4)]	8ms
Mechanical endurance	>2x10⁵ ops.[2)]

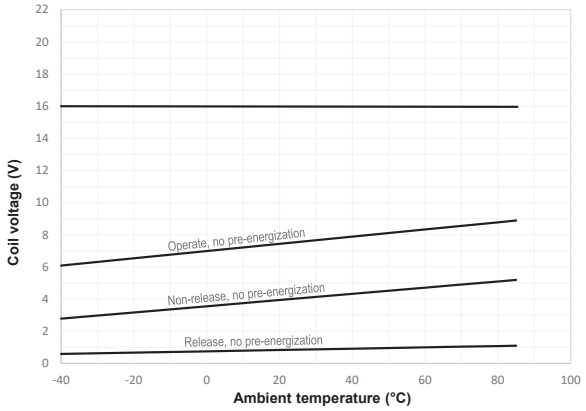
1) Please contact TE Connectivity for details.
2) Preliminary data - not validated yet
3) Max. 600mV with current >1A
4) Measured at standard conditions (23°C/12V without supression elements)

EVC 175 Main Contactor (Continued)

Coil operating range (coil 0001)



Coil operating range (coil 0002)



Insulation Data

Initial dielectric strength	
between open contacts	2800VDC/3mA[13]
between contact and coil	2800VDC/3mA[13]
Insulation resistance after 1500A abuse test[2]	
between open contacts	≥2MΩ[14]
between contact and coil	≥100MΩ[14]
Clearance/creepage	
IEC 60664-1 (2007)	over voltage cat. I[15] pollution degree 3
Altitude max.	5500m

Other Data

Ambient temperature	-40°C to +85°C
Degree of protection	
IEC 61810 (2015-02)	RT I
Vibration resistance (functional)[16]	
ISO 16750-3 (2007)	30.8m/s2
wide-band random (profile IV)	No change of switching state >10µs
Shock resistance (functional)[16]	
ISO 16750-3 (2007)	ON: 6ms, min. 50g[17] / 10 times
half sine	OFF: 6ms, min. 20g / 10 times
	No change of switching state >10µs.
Terminal type	connector (coil) and screw (load)
Weight	approx. 295g (10.4oz)
Packaging unit	36 pcs.

Note:
Temperature monitoring of load terminals recommended.
Avoid impact of strong external magnetic fields near the contactor.

Coil Data[5] (Coil 0001)

Un-economized: single coil version for external economization[6,7]

Coil code	Rated voltage [VDC]	Must Operate voltage [VDC]	Non-release voltage [VDC]	Coil resistance [Ω] ±10%
0001	12	7.5	1.6	5.0

Recommended parameters for external economization with PWM[8,9]

Min. frequency	Controlled current PWM		Controlled voltage equivalent	
	Max. current	Min. current	Max. voltage	Min. voltage
[kHz]	[A RMS]	[A RMS]	[V RMS]	[V RMS]
20	0.77	0.4	5.9	3.0

Coil Data[5] (Coil 0002)

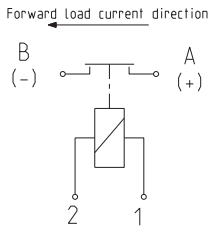
Economized: dual coil version with internal switch[7][10]

Coil code	Rated voltage [VDC]	Must Operate voltage[11] [VDC]	Nominal inrush current [ADC]	Non-release voltage [VDC]	Max. voltage [VDC]	Coil resistance [Ω] ±10%
0002	12	7.5	4.0	4.0	16.0	3/33[12]

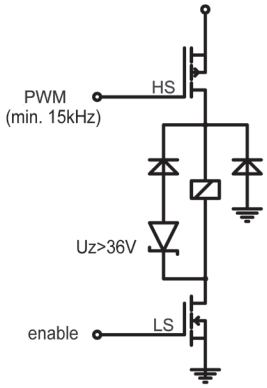
5) All values valid for 23°C ambient temperature with no pre-energization if not noted otherwise. Refer to diagram for values at other temperatures.
6) Requires external coil economization that must start 100-300ms after coil activation. Avoid repetitive switching. Minimum clamp voltage 36V (see circuit recommendation).
7) Valid for 0g
8) To ensure the specified number of switching cycles apply a minimum pull-in current of 2.4A for at least 100ms. Values include the specfied shock and vibration resistance. Valid over ambient temperature range from -40°C to +85°C.
9) Valid for 50g
10) Max. duty cycle 0.5Hz
11) To ensure the specified number of switching cycles apply a minimum coil voltage of 12V for at least 100ms. Values include the specfied shock and vibration resistance. Valid over ambient temperature range from -40°C to +85°C.
12) 3Ω coil is switched off internally max. 130ms after pull-in. Demagnetization voltage is clamped at approx. 40V. No external coil suppression necessary. External coil suppression could reduce switching capability. Please contact TE Connectivity for details
13) ISO/DIS 6469-3:2011 (page 12-13).
14) EN 61810-1:2004 table 8, functional and basic insulation.
15) Meets rated impulse voltage 2500V
16) Preliminary data for bottom mount version. Data not validated yet.
17) Higher values can be achieved with increased holding current applied.

EVC 175 Main Contactor (Continued)

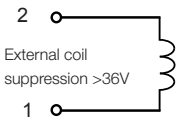
Terminal Assignment



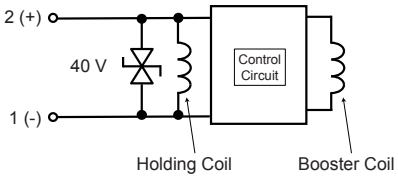
Circuit recommendation for coil 0001
Always use low-side switch “Enable” for switch-off.



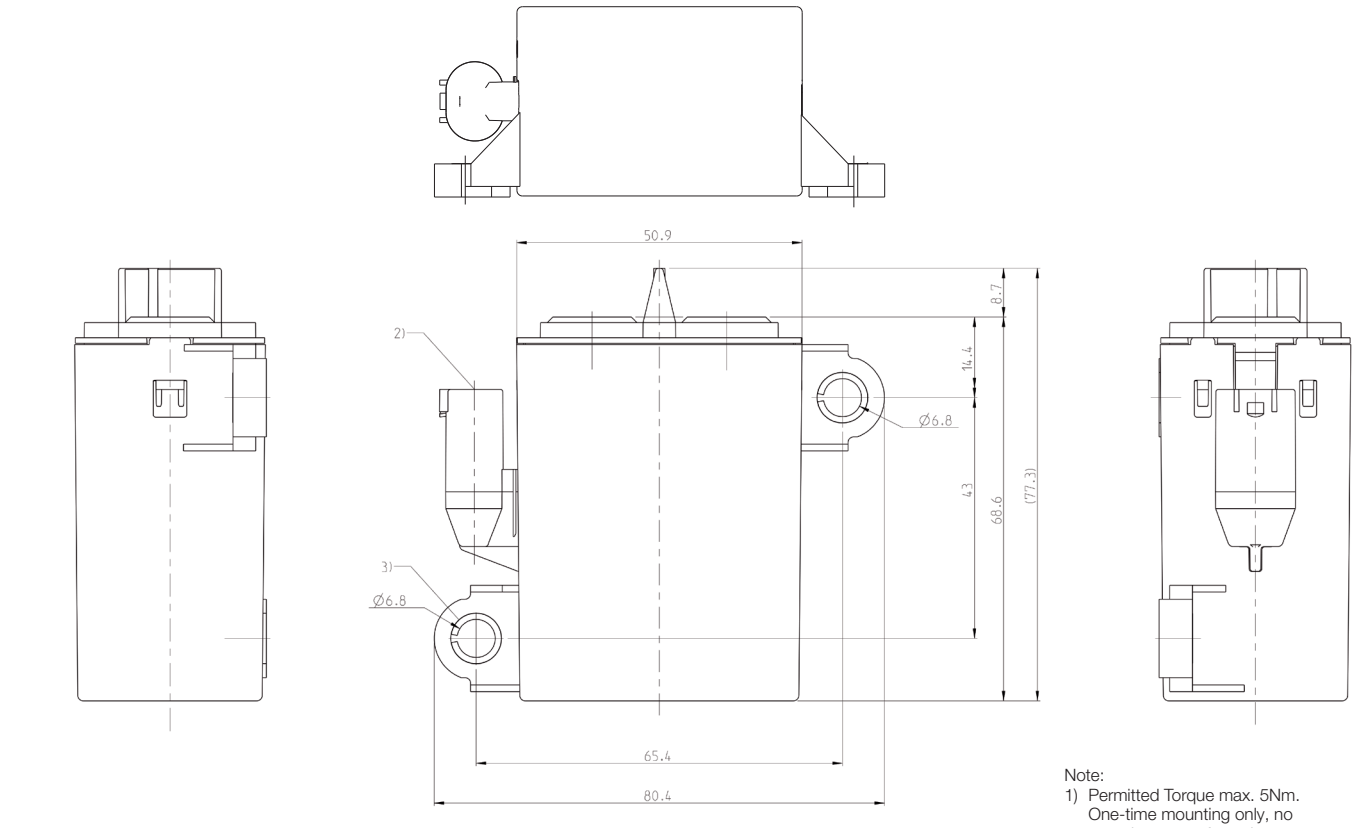
Un-economized coil
Coil 0001

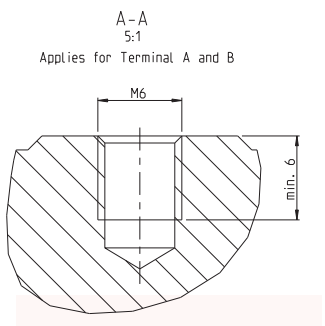


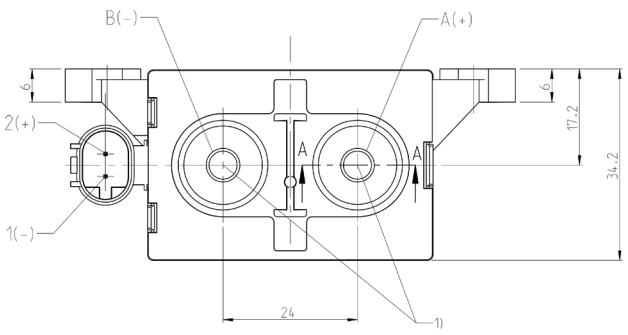
Economized coil internal circuit
Coil 0002



Dimensions
EVC 175 Main Contactor Side Mount Version





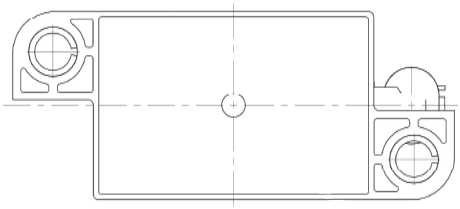


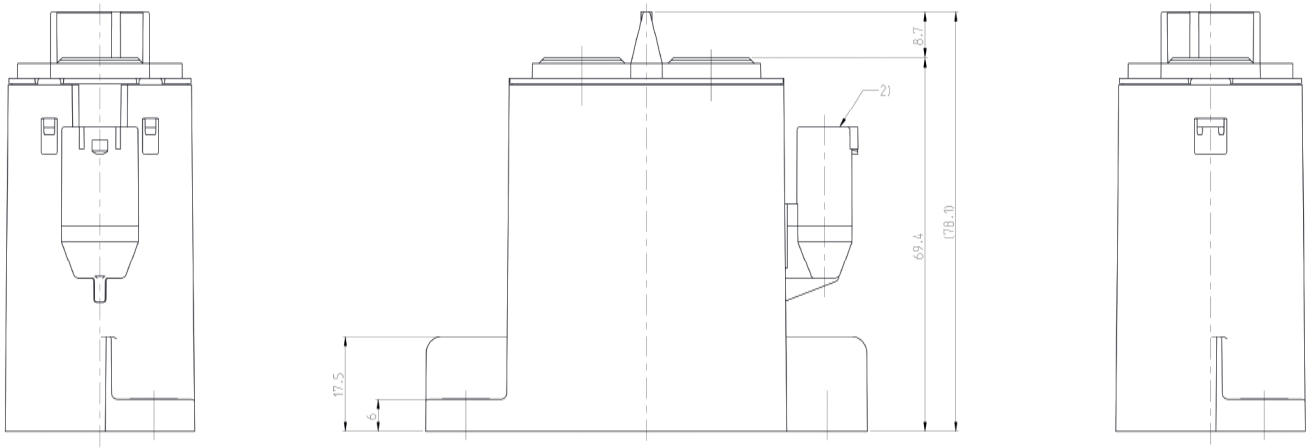
Note:
1) Permitted Torque max. 5Nm. One-time mounting only, no recurring screw fastening permitted.
2) Socket Housing
TE Interface 2 Pos. MQS Code A. appropriate for Socket Housing 2 Pos. MQS.
TE part number 1-967644-1.
3) Mount load connections first. Consult TE Connectivity for detailed mounting instructions.

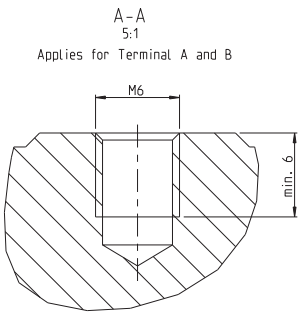
Tolerances ISO8015 / ISO2768-cL.

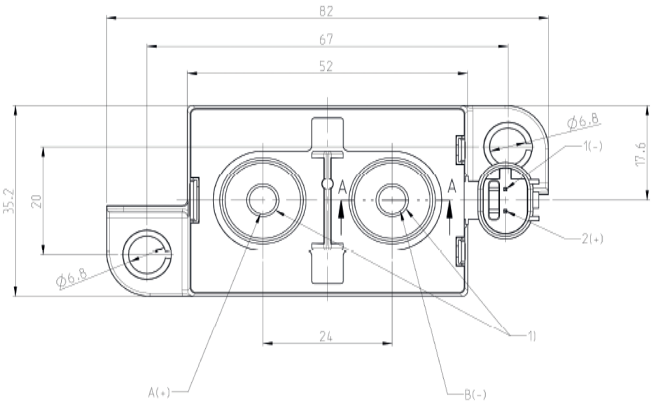
EVC 175 Main Contactor (Continued)

Dimensions
EVC 175 Main Contactor Bottom Mount Version









Note:
1) Permitted Torque max. 5Nm. One-time mounting only, no recurring screw fastening permitted.
2) Socket Housing
TE Interface 2 Pos. MQS Code A. appropriate for Socket Housing 2 Pos. MQS.
TE part number 1-967644-1.
3) Mount load connections first. Consult TE Connectivity for detailed mounting instructions.

Tolerances ISO8015 / ISO2768-cL.

EVC 175 Main Contactor (Continued)

Product code structure Typical product code **V23717** **-A** **0002** **-A** **2** **0** **0**

Type
V23717 EVC 175 Main Contactor

Relay version
A Side mount fixation **B** Bottom mount fixation

Coil version
0001 Un-economized, single coil (12V) **0002** Economized, dual coil (12V)

Load voltage
A 450VDC

Contact material
2 Silver alloy

Status monitoring
0 None

Coil connector version
0 MQS sealed

Production in Europe (only)

Product code	Relay version	Coil suppr.	Circuit	Part number
V23717-A0001-A200	Side mount fixation	External >36V	External economizer	6-1904123-6
V23717-A0002-A200		Internal	Internal economizer	2-1904070-1
V23717-B0001-A200	Bottom mount fixation	External >36V	External economizer	5-1904144-3
V23717-B0002-A200		Internal	Internal economizer	8-1904133-1

Consult TE Connectivity for sample availability.

Production in Asia (only)

Product code	Relay version	Coil suppr.	Circuit	Part number
V23717-A0001-A200	Side mount fixation	External >36V	External economizer	2312311-2
V23717-A0002-A200		Internal	Internal economizer	2312311-1
V23717-B0001-A200	Bottom mount fixation	External >36V	External economizer	2312311-4
V23717-B0002-A200		Internal	Internal economizer	2312311-3

Consult TE Connectivity for sample availability.