Kissling High Voltage Relays and Contactors

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Kissling High Voltage Relays and Contactors

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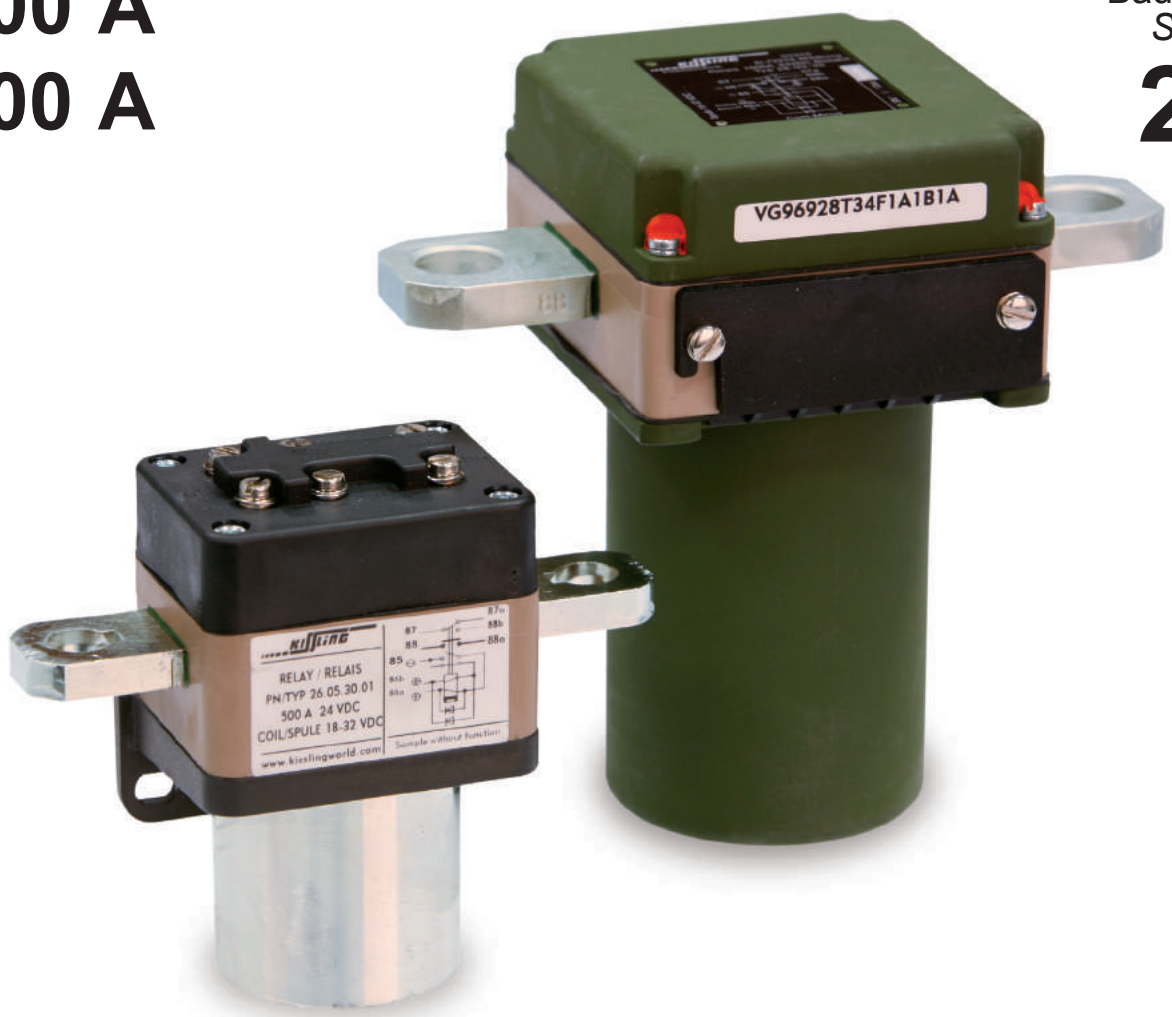
BISTABILES HOCHLEISTUNGSRELAIS
BI-STABLE HIGH POWER RELAYS

Entspricht den Anforderungen nach MIL-R-6106
Meets the requirements of MIL-R-6106

500 A
1000 A

Baureihe
Series
26



Dichtes, bistabiles Hochleistungsrelais der Baureihe 26 für höchste Anforderungen im Militär- und Luftfahrtbereich, sowie für extreme Beanspruchungen im Nutzfahrzeug-, Schienenfahrzeug-, Flurförderfahrzeug-, Baumaschinen- und Stromversorgungsbereich.

Durch die permanentmagnetische Haltung der Schaltzustände werden dieselben hohen Parameter erreicht, wie Sie sie von unseren zweispuligen Leistungsrelais gleicher Baugröße gewohnt sind. Daraus resultiert eine hohe Sicherheit bei Schock und Vibration sowie ein geringer Kontaktspannungsabfall. Die leistungslose magnetische Haltung benötigt keine Halteleistung und somit findet auch keine Spulenerwärmung statt.

Zum Schutz der Spule verfügt das Relais über eine interne Selbstabschaltung, wodurch ein Dauersignal / Dauerimpuls auf die Spule vermieden wird. Die robuste Bauart der bistabilen Hochleistungsrelais erfüllt eine Dichtheit nach IEC 60529 und DIN 40050-9 gemäß IP67 und IP-6K9K (Dampfstrahldichtheit).

Diese Relais sind in den Strombereichen von 500 A und 1000 A erhältlich.

Environmentally sealed bistable High Power Relays for extreme requirements in various applications in the area of defence, aerospace, railway, commercial vehicles, construction machinery, ground support, lift trucks and power generation.

With the special magnetic circuit comparable parameters, which you already know from our dual coil system power relays, in identical ratings are achieved. In particular high shock and vibration characteristics and low contact voltage drop. The permanent magnetic holding of contact state requires no power and therefore no coil heat generation takes place.

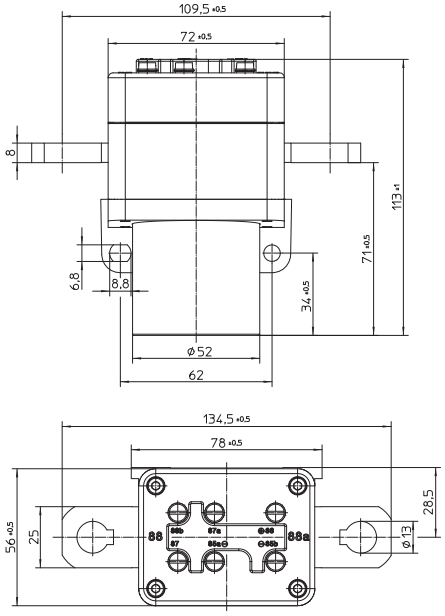
To protect the coil, the relay has an internal shut-off function whereby a continuous signal / pulse will be prevented from the coil. The robust design of our bistable High Power Relays fulfills the environmental sealing requirements according to IEC 60529 and DIN 40050-9 in respect to IP67 and IP6K9K (steam pressure cleaning).

Relays from this series are available in either 500 Amps or 1000 Amps.

Abmessungen | *Dimensions*

500A

Seitenflansch - Schliesser mit Hilfskontakten
Side mounting NO-Contact with auxiliaries



500A

Metrische Ausführung / *Metric version*

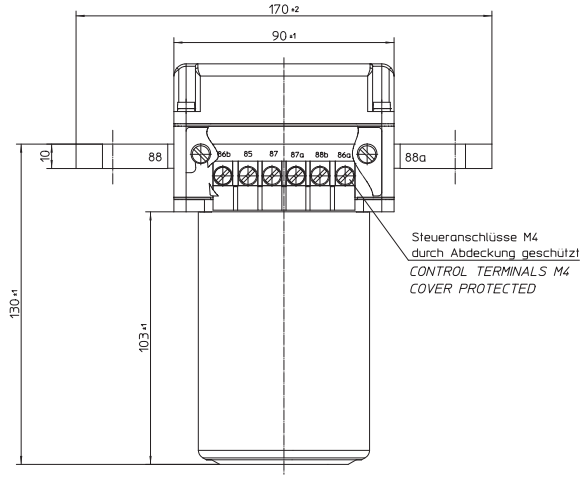
Minusabschaltung mit Verpolschutz / com (-) *with polarity protection*	26.05.30
Minusabschaltung ohne Verpolschutz / com (-) *without polarity protection*	26.05.32

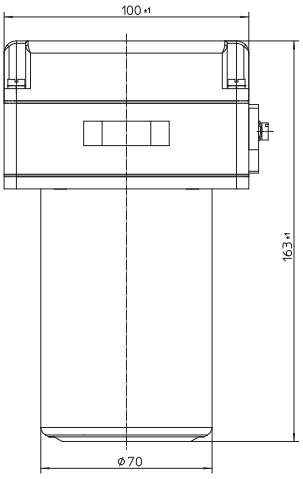
500A

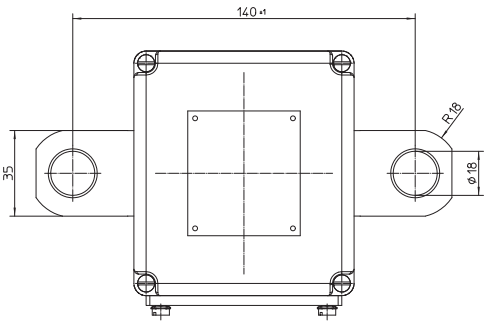
Metrische Ausführung / *Metric version*

Plusabschaltung mit Verpolschutz / com (+) *with polarity protection*	26.05.31
Plusabschaltung ohne Verpolschutz / com (+) *without polarity protection*	26.05.33

1000A







1000A
Metrische Ausführung / *Metric version*

Minusabschaltung mit Verpolschutz / com (-) *with polarity protection*	26.02.30
Minusabschaltung ohne Verpolschutz / com (-) *without polarity protection*	26.02.32

1000A
Metrische Ausführung / *Metric version*

Plusabschaltung mit Verpolschutz / com (+) *with polarity protection*	26.02.31
Plusabschaltung ohne Verpolschutz / com (+) *without polarity protection*	26.02.33

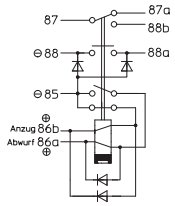
Schaltbilder | *Circuits*

Schliesser mit Verpolschutz

NO-Contact with polarity protection

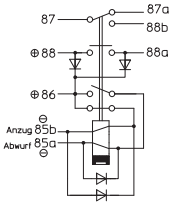
Minusabschaltung mit Verpolschutz / *com (-) with polarity protection*

26.02.30
26.05.30



Plusabschaltung mit Verpolschutz / *com (+) with polarity protection*

26.02.31
26.05.31

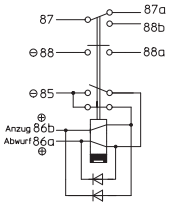


Schliesser ohne Verpolschutz

NO-Contact without polarity protection

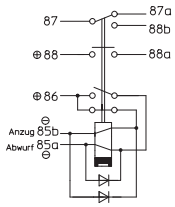
Minusabschaltung ohne Verpolschutz / *com (-) without polarity protection*

26.02.32
26.05.32



Plusabschaltung ohne Verpolschutz / *com (+) without polarity protection*

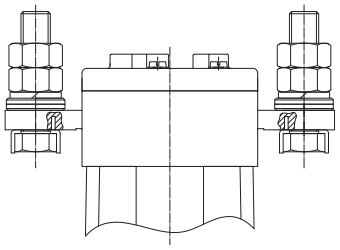
26.02.33
26.05.33



Zubehör | *Accessories*

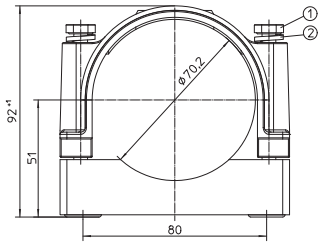
500 A

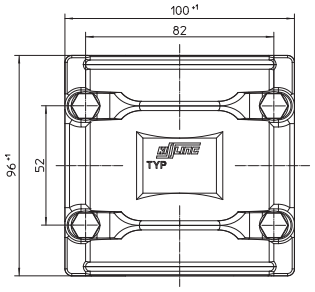
Anschlusssatz-metrisch 26.06.56 oder *or* Anschlusssatz-UNC *Connecting kit-UNC* 26.06.58

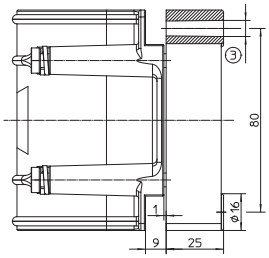


Zubehör | *Accessories*

1000A Montageflansch / *Mounting brackets*







Ausführungen und zusätzliche Abmessungen / *Types and additional dimensions*

Typ *Type*	① 6kt-Schraube *Hexagon head screw*	② Federring *Spring washer*	③ Befestigung *Fastening*	Oberfläche *surface*
Metrischer Standard-Flansch *Metric standard bracket* **26 . 50 . 00**	M6	6 DIN 127	Ø 6.5 / 0.256"	lackiert bronze-grün RAL 6031-F9 *painted bronze-green*
UNC-Flansch / *UNC-Bracket* **26 . 02 . 53**	1/4 "UNC	1/4 "UNC	Ø 6.5 / 0.256"	lackiert bronze-grün RAL 6031-F9 *painted bronze-green*
UNC-Flansch / *UNC-Bracket* **26 . 02 . 54**	1/4 "UNC	1/4 "UNC	Ø 8.2 / 0.323"	lackiert bronze-grün RAL 6031-F9 *painted bronze-green*

Lieferbare Typen | *Available types*

	Typ Bestellschlüssel ***Type*** Ordering Key	**Kontakt** ***Contact***		**Ansteuerung** ***Coil Controlling***		**Seitenflasch** ***Side mounting***	*** Montage flasch** **** Mounting brackets***	**Vierloch Fussflansch** ***4-hole bottom mount.***	**Lösch-kombination** ***Suppression device***	**Verpolschutz** ***Polarity protection***	**Hilfskontakt** ***Auxiliary contact***	**Gewicht** ***Weight***	
		NO	**NC**	**com (-)**	**com (+)**							**Kg**	**Pound**
24/28 V 500 A	26.05.30	x		x		x			x	x	x	1.14	2.5
	26.05.31	x			x	x			x	x	x	1.14	2.5
	26.05.32	x		x		x			x		x	1.14	2.5
	26.05.33	x			x	x			x		x	1.14	2.5
24/28 V 1000 A*	26.02.30	x		x			x		x	x	x	4.10	9.1
	26.02.31	x			x		x		x	x	x	4.10	9.1
	26.02.32	x		x			x		x		x	4.10	9.1
	26.02.33	x			x		x		x		x	4.10	9.1

Weitere Typen und kundenspezifische Sondertypen auf Anfrage
** Den Montageflasch finden Sie unter Zubehör*

Other types and customer specified Special Types upon request
** Mounting Brachets can Be found under accessories*

Technische Daten | *Technical Data*

Allgemeine Daten			***Environmentally Characteristics***
	500 A	**1000 A**	
Umgebungstemperatur	-40°C bis +85°C / -40°F to +185°F	-46°C bis +85°C / -50.8°F to +185°F	*Temperature range*
Max. Arbeitshöhe	15000 m	*50 000 ft*	*Max.Altitude rating*
Schutzart	IEC 60529 & DIN 40050-9, IP67 (0,2bar; 1 min) & IP6K9K		*Protection*
StossbelastungSchärfegrad J (30 g,11 msec Halbsinus) VG 95210, Blatt 28 *MIL-STD-202, Test method 213, Half-sine, 11 msec/ 30 G*		Schärfegrad A (50 g,11 msec) VG 95210, Blatt 28 *MIL-STD-202, Test method 213, Test condition A, 11 msec/ 50 G*	*Shock*
Vibration Schärfegrad C (10 g,10-2000 Hz) VG 95210, Blatt 16 & 19 *MIL-STD-202, Test method 213, Test condition C / 10 G*		Schärfegrad D (20 g,10-2000 Hz) VG 95210, Blatt 19 *MIL-STD-202, Test method 204, Test condition D / 20 G*	*Vibration*
Beschleunigung	15 g	15 G	*Acceleration*
Beständigkeit gegen gebräuchliche Öle, Kraftstoffe, Hydraulikflüssigkeiten, Alkohol, Salzsprühnebel, Feuchtigkeit, Ozon, Sand und Staub, Lösungsmittel, Feuerlöschmittel			*Resistance against most oils, fuels, hydraulic fluids, alcohol, salt spray, humidity, ozone, sand & dust, solvents, fire-extinguishing agents*

Anzugsdrehmomente		***Max. torque***
Gewindegrößen	M4 = 2.0–2.2 Nm	*Thread sizes*

Elektrische Daten		***Electrical Characteristics***
Min. Isolationswiderstand	100 MΩ	*Min. Insulation Resistance*
Isolationswiderstand nach Belastung	50 MΩ	*After live or environmental*
Hochspannungsfestigkeit	1050 VAC / 1 min bei|*at* 50 Hz	*Dielectric withstanding voltage*
Max. Kontaktspannungsabfall	150 mV	*Max. Contact drop, initial*
Kontaktspannungsabfall nach Lebensdauer	175 mV	*Contact drop after life test*

	500 A	**1000 A**	
Dauerstrom	500 A	1000 A	*Continuous current*
Überlast	4000 A, 1 sec / 2000 A, 20 sec	4000 A, 1 sec / 2000 A, 2 min	*Overload*

Lebensdauer und Kontaktbelastung (24/28 VDC)				***Rated contact load (24/28 VDC)***
	500 A		**1000 A**	
Hauptkontakt				***Main Contact***
Ohmsche Last	50 000 Schaltspiele | *cycles* 500 A		10 000 Schaltspiele | *cycles* 1000 A	*Resistive load*
Mech. Lebensdauer	100 000 Schaltspiele | *cycles*		50 000 Schaltspiele | *cycles*	*Mechanical life*
Hilfskontakt				***Auxiliary Contact***
Dauerstrom	2 A		16 A	*Continuous Current*
Schaltstrom	2 A		16 A	*Make & break*

Spulendaten data	**500 A**	**1000 A**	**Coil**
	24 / 28 VDC	**24 / 28 VDC**	
Betriebsspannung	18 - 32 VDC	18-32 VDC	*Voltage range*
Nennspannung	24 VDC	24 VDC	*Nominal voltage*
Anzugsspannung	≥ 13 VDC	≥ 13 VDC	*Pick up voltage max.*
Abwurfspannung	≥ 10 VDC	≥ 8 VDC	*Drop out voltage min.*
Anzugsspulenwiderstand	3.3 Ω ±10%	1.0 Ω ±8%	*Pull in coil resistance*
Anzugsstrom, max.	7.3 A	20 A	*Pull in current approx.*
Abwurfspulenwiderstand	3.23 Ω ±10%	1.3 Ω ±8%	*Drop out coil resistance*
Abwurfstrom, ca.	7.4 A	15 A	*Drop out current approx.*
Anzugsimpulsdauer, ca. (Dauerimpuls max. 1 min)	50 ms	50 ms	*Pick up impulse time approx. (continuous impulse max. 1 min)*
Abwurfimpulsdauer, ca. (Dauerimpuls max. 1 min)	50 ms	50 ms	*Drop out impulse time approx. (continuous impulse max. 1 min)*
Selbstabschaltend - Impulsdauer min. 50 msec			*Automatic cut-off - puls duration min. 50 msec*

Schaltzeiten Schliesser-Relais		***Operating times NO-Contact relay***
	500 A	**1000 A**
Anzugszeitmax.	max. 30 msec	max. 60 msec	*Operation*
Prellzeitmax.	max. 5 msec	max. 5 msec	*Bounce*
Abfallzeitmax.	max. 25 msec	max. 40 msec	*Release*

Anschlussquerschnitt			***Wire section***
500 A	min. 240 mm² / MCM 500	*0.372 sq.inch / MCM 500*	***500 A***
1000 A	min. 2 x 240 mm² / MCM 1000	*0.775 sq.inch / MCM 1000*	***1000 A***
Einbaulage	beliebig	*optional*	***Mounting position***

Für hohe Schaltzyklen empfehlen wir unsere speziell optimierten Relaistypen. | *For high switching cycles we recommend our specially optimised relay types.*

Kissling Elektrotechnik GmbH
Bohnland 16
D-72218 Wildberg

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Telefax: +49 (0) 70 54 / 2 06-3 02

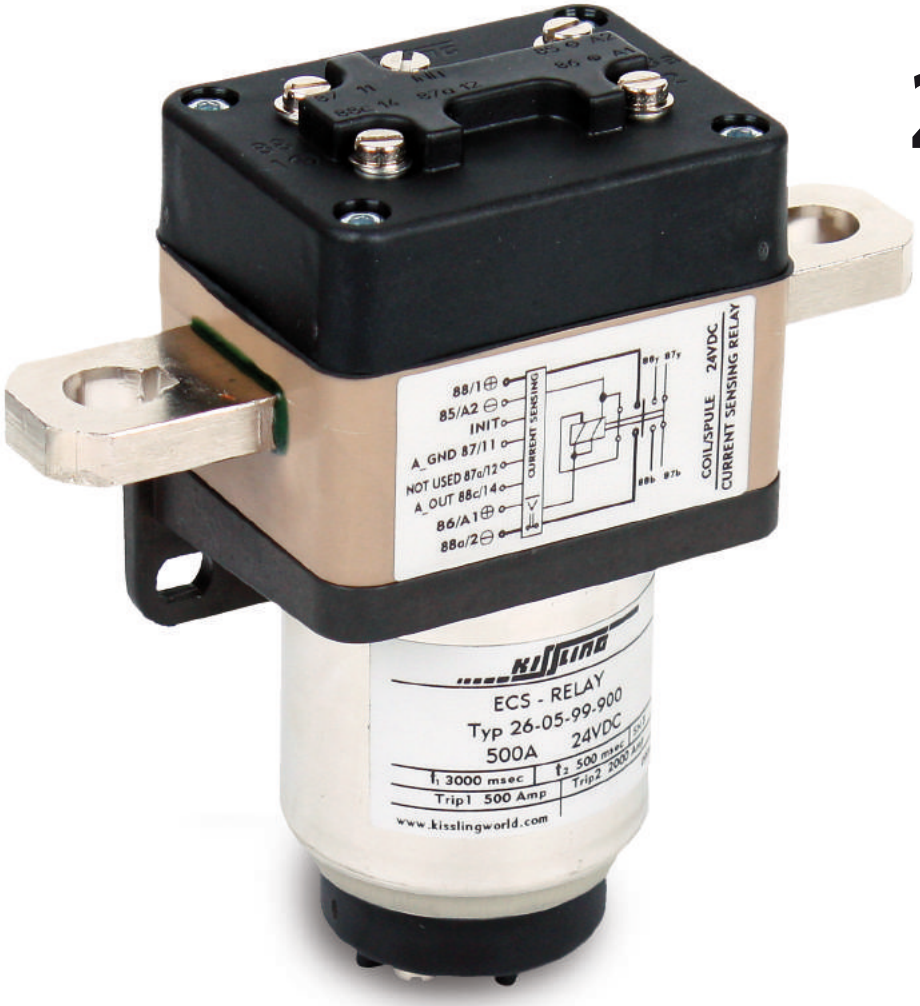
E-mail: info@kissling.de
Internet: www.kissling.de

HOCHLEISTUNGSRELAIS MIT BIDIREKTIONALER STROMSENSORIK

HIGH POWER RELAYS WITH BIDIRECTIONAL ELECTRONIC CURRENT SENSING

Baureihe
Series

26.99



Die Baureihe 26.99 sind Leistungsrelais mit eingebauter Auswerteelektronik für individuelle Bedürfnisse der Stromüberwachung. Ein frei programmierbarer Analogausgang sowie vergrößerte Strommessbereiche und Abschaltzeiten sind weitere nennenswerte Merkmale dieser Baureihe. Die Elektronik ermöglicht:

- Automatisches Abschalten der Relais bei Überstrom im Hauptstromkreis (Lastkreis).
- frei programmierbare Überstromabschaltschwellen bis max. ± 2000A
- Möglichkeit der Nachbildung einer herkömmlichen Schmelzsicherungskennlinie als Auslösecharakteristik zu verwenden.
- Ein- und Ausschalten der Relais über einen Steuereingang.
- optionaler Steuereingang für den Anlasser, für ein messtechnisches „Ausblenden" kurzzeitiger Stromspitzen während des Anlassvorganges
- Unterspannungsabschaltschwelle, sowie Übertemperaturabschaltung realisierbar.
- Ausgabe eines Statussignals zur Anzeige des Betriebszustandes.

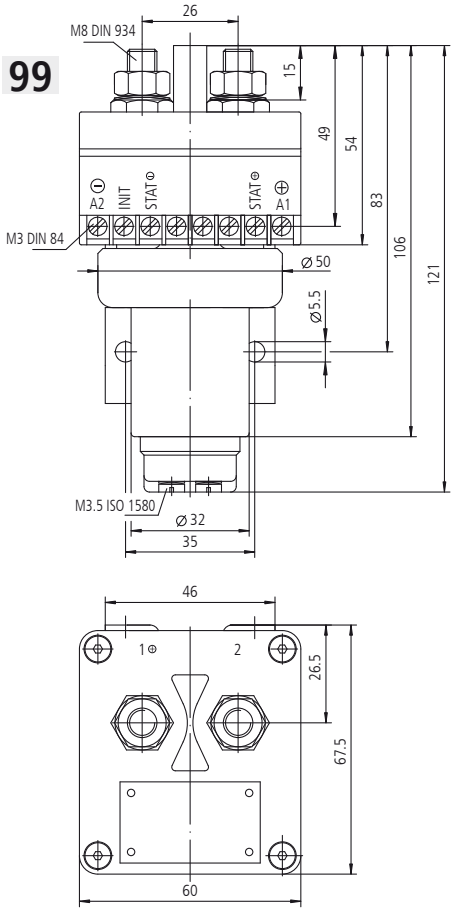
The 26.99 series are power relays with an integrated evaluation system. With this series we can respond to your individual requirements of current monitoring. Benefits of this series allow programmable analog outputs, larger current ranges and shutdowns. The electronics enables:

- *Automatic relay shutdown when over-current is detected in the main circuit (Load circuit).*
- *Free programmable over-current cut off thresholds up. ± 2000 Amps*
- *There is the possibility of using a conventional simulation of melting fuse characteristics.*
- *Relay switching on and off by a control input.*
- *Optional control input for starter for a measuring technology „Hide" transient current spikes during the start procedure*
- *Safety release by low voltage, and over-temperature shutdown feasible.*
- *Output a status signal to indicate the operating status.*

Abmessungen | *Dimensions*

Relais 100 A
Relay 100 A

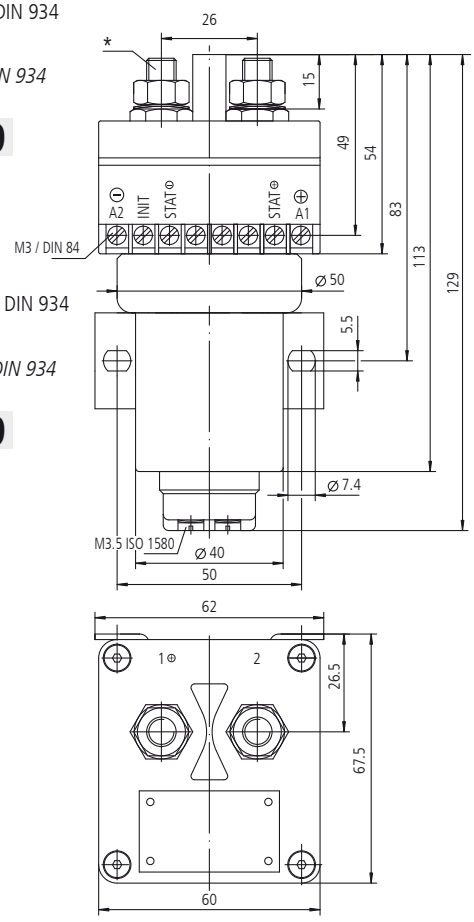
26 . 60 . 99



Relais 200 A
* Hauptanschluss M8 / DIN 934

Relay 200 A
** Main terminal M8 / DIN 934*

26 . 08 . 99



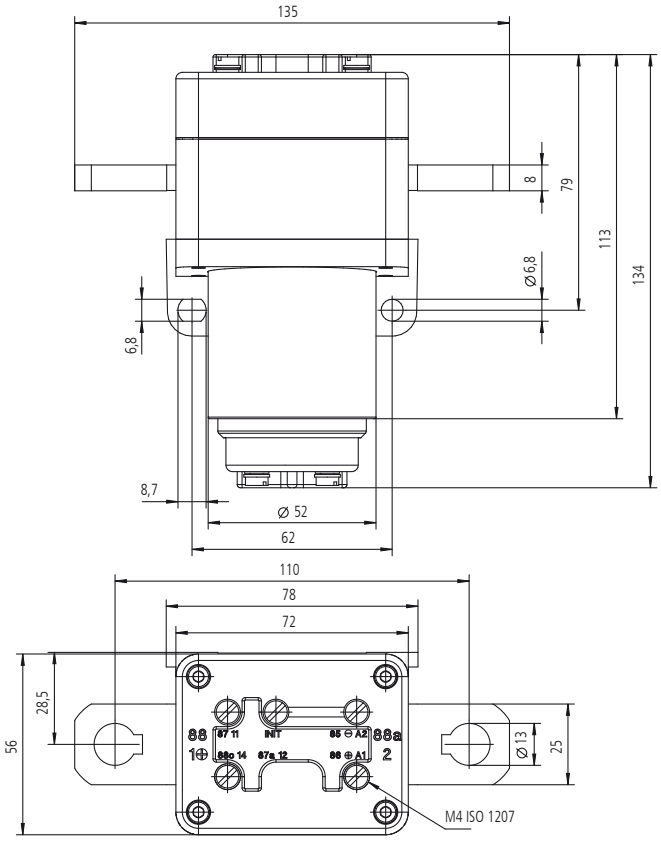
Relais 300 A
* Hauptanschluss M10 / DIN 934

Relay 300 A
** Main terminal M10 / DIN 934*

26 . 56 . 99

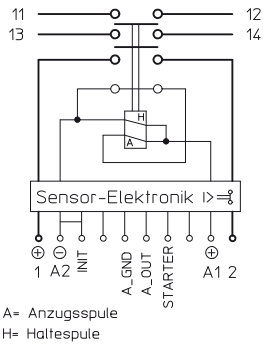
Relais 500 A
Relay 500 A

26 . 05 . 99

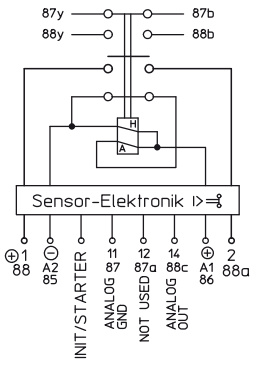


Schaltbilder | *Circuits*

Relais 100 A / 200 A / 300 A
Relay 100 A / 200 A / 300 A



Relais 500 A
Relay 500 A



Funktion | *Operation*

Die Elektronik des Relais misst den Hauptstrom galvanisch getrennt. Beim Überschreiten der von ihnen vorgegebenen Stromschwellen schaltet das Relais ab und bleibt bis zum Zurücksetzen des INIT-Eingangs oder der Versorgungsspannung abgeschaltet. Bei erneutem Einschalten wird das Relais wieder aktiviert.

Der Schaltzustand wird im Wesentlichen vom Zustand des Schalteinganges (INIT) bestimmt. Das besagt, dass das Relais auch bei anliegender Versorgungsspannung erst dann einschaltet, wenn der Spannungswert am INIT ca. 0,5 V **unterschreitet.** Will man das Relais direkt mit dem Einschalten der Versorgungsspannung aktivieren, so kann vor oder mit dem Anlegen der Versorgungsspannung der INIT-Eingang auf das Minus-Potential (A2) der Versorgungsspannung gezogen werden (z.B. über eine Brücke). Die Elektronik schaltet beim Überschreiten einer eingestellten Stromschwelle das Relais ab.

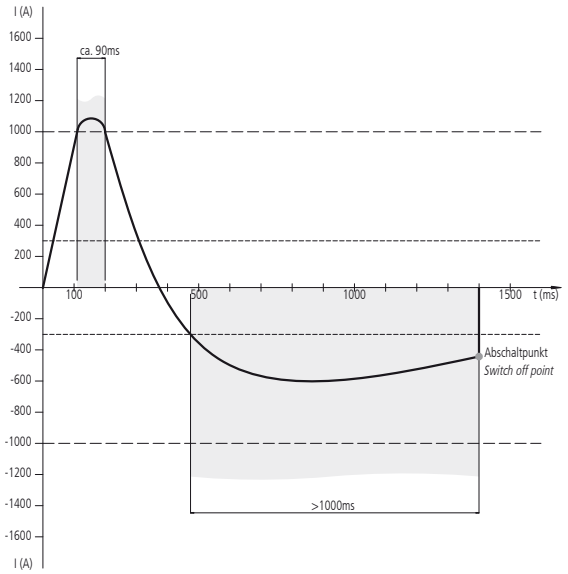
Abschalten bei Unterspannung
Um Funktionsstörungen auszuschließen, wird eine minimale Versorgungsspannung (z.B. 16 VDC) vorgegeben. Darunter kann das Relais nicht eingeschaltet werden. Beim Unterschreiten des Mindestwertes während des Betriebes schaltet das Relais ab und bleibt abgeschaltet, auch wenn die Versorgungsspannung wieder über den Mindestwert ansteigt. Das Relais kann dann nur durch AUS-schalten von INIT und/ oder der Versorgungsspannung und erneutem EIN-schalten aktiviert werden.

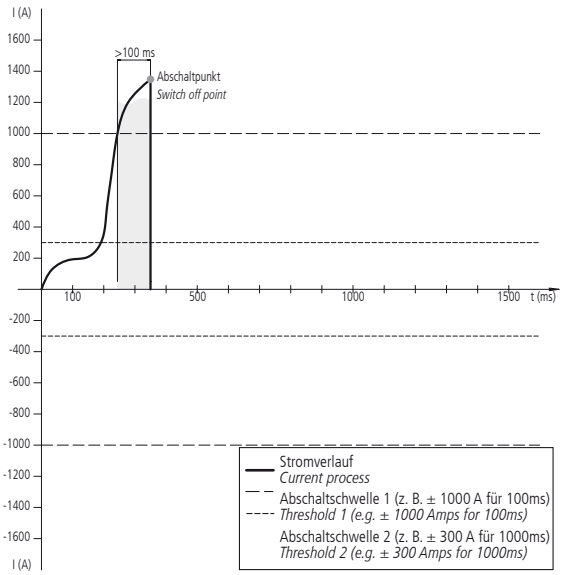
The electronic measures the main current galvanically isolated and switch-OFF the relay whenever the threshold is exceeded. The relay remains switch-OFF until again reset by switching-OFF-ON INIT or switching-ON-OFF the supply voltage.

*The switching status of all relays with electronic sensing is primarily determined by the input signal (INIT). Even if the supply voltage is sufficient, the relay will only switched-ON after the voltage at the INIT-input falls **below** 0,5 VDC. IF the relay must be switched-ON directly by supply voltage, then the INIT signal must be drawn to a minus potential through A2 (e.g. wire bridge). If the standard threshold is exceeded, the electronic switches the relay off.*

Tripping [switching-OFF] during Low Voltage Conditions
To avoid malfunction, a minimum supply voltage (example 16 VDC) has to be present. The relay cannot be switched-ON under this voltage. If the voltage drops below this value, the relay is switched-OFF and remains turned-OFF, even if the voltage rises back above the required minimum. The relay can only be re-set through INIT and/or if the supply voltage is reactivated through a switch-on function.

Funktionsdarstellung und Begriffe:
Operational characteristics and terminology:





Anschlüsse | *Terminals*

A1+/A2–: Spannung bzw. Stromversorgung.
Geschützt gegen kurzzeitige Spannungsspitzen und Verpolung.

INIT: Bei Spannungswerten unter 0,5 VDC wird das Relais Ein geschaltet (aktiv LOW).

STARTER: Bei Spannungswerten > 9 VDC werden die Abschaltschwellen deaktiviert (aktiv HIGH).

STAT+/STAT– : Der galvanisch getrennte Statusausgang kann einen Strom von max. 200 mA schalten. Das Statussignal ist aktiv (niederohmig), wenn ein Überstrom im Hauptkreis oder eine Unterspannung im Versorgungsstromkreis detektiert wurde. Durch ausschalten des Relais (Öffnen des INIT-Eingangs oder Abschalten der Versorgungsspannung) wird das Statussignal zurückgesetzt (hochohmig). Der Statusausgang ist derzeit nur beim 100A; 200A und 300A – Relais realisiert.

A_OUT/A_GND: Analogspannung 0 – 5 VDC

Mechanische Hilfskontakte: Optional möglich.

A1+/A2–: *Current and voltage supply.*
Polarity and peak protected.

INIT: *5 V control input signal. When the voltage drops below 0.5 VDC the relay is switched-ON (active LOW).*

STARTER: *A voltage-value 9 VDC disconnects at cut-off threshold (active HIGH).*

STAT+/STAT–: *The galvanic insulated status output can switch a maximum of 200 mAmp. The status signal is active (Low ohmic resistance) whenever an overload current un the main current or a low voltage in the supply circuit has been detected. When the relay is switched-OFF (opening of INIT input or switching-OFF the supply voltage), the Status signal is reset (HIGH ohmic resistance). Status signal is currently available only for 100 Amps, 200 Amps and 300 Amps Relays.*

A_OUT/A_GND: *Analog voltage 0 – 5 VDC*

Mechanical auxiliary contacts: *Optional possible.*

Technische Daten | *Technical Data*

	Allgemeine Daten | ***Environmentally Characteristics***	
Umgebungstemperatur	–40°C bis +85°C | –40°F to +185°F	*Temperature range*
Schutzart Innenraum	IEC 60529 & DIN 40050-9, IP67 (0.2bar; 1 min) & IP6K9K	*Interior protection*
Schutzart	IP 00 IEC 60529	*Protection*
Beständigkeit gegen gebräuchliche Öle, Kraftstoffe, Hydraulikflüssigkeiten, Alkohol, Feuerlöschmittel		*Resistance against most oils, fuels, hydraulic fluids, alcohol, fire-extinguishing agents*

Technische Daten | *Technical Data*

	Anzugsdrehmomente		***Max. torque***
Gewindegrößen	M3 = 0.5–0.6 Nm | M3.5 = 1.1–1.2 Nm | M4 = 2.0–2.2 Nm | M8 = 12–13 Nm | M10 = 15–20 Nm		*Thread sizes*

	Elektrische Daten		***Electrical Characteristics***
Min. Isolationswiderstand	100 MΩ		*Min. Insulation Resistance*
Isolationswiderstand nach Belastung	50 MΩ		*Insulations Resistance after live*
Hochspannungsfestigkeit	1050 VAC / 1 min bei|*at* 50 Hz		*Dielectric withstanding voltage*
Max. Kontaktspannungsabfall	150 mV		*Max. Contact drop, initial*
Kontaktspannungsabfall nach Lebensdauer	175 mV		*Contact drop after life test*

Dauerstrom	100 A	200 A	300 A	500 A	*Duty rating*
Überlast	1000 A, 1 sec 250 A, 20 sec	2000 A, 1 sec 500 A, 20 sec	3000 A, 1 sec 750 A, 20 sec	5000 A, 1 sec 1250 A, 20 sec	*Overload*

	Lebensdauer und Kontaktbelastung		***Rated contact load***
Ohmsche Last	100 A | 200 A | 300 A | 500 A		*Resistive load*
Schaltspiele	50 000		*Cycles*
Mech. Lebensdauer	100 000 Schaltspiele | *cycles*		*Mechanical life*

	Spulendaten		***Coil data***
Betriebsspannung	18-32 VDC		*Voltage range*
Nennspannung	24 VDC		*Nominal voltage*
Mindestbetriebsspannung	15 VDC		*Min. operational voltage*
Spannungsspitzen	70 VDC, 50 msec		*Spikes*

	100 A	200 A	300 A	500 A	
Einschaltstrom	6 A, 50 msec	4 A, 50 msec	4 A, 50 msec	8 A, 50 msec	*Pull in current*
Betriebsstrom	0.25 A	0.3 A	0.3 A	0.4 A	*Operational current*
Abschaltschwellen	frei wählbar		*arbitrary*		*Thresholds*
Überstromaustastungen	ab 100 msec		*from 100 msec*		*Overcurrent trip preventions*

	Schaltzeiten		***Operating times***
Überstromauslastungen	ab 100 msec		*from 100 msec*	*Inrush trip prevention (t1)*
Anzugszeit einschl Prell und Laufzeit	ca. 100 msec		*approx. 100 msec*	*Operate incl. bounce and runtime*
Abfallzeit einschl. Laufzeit	ca.50 msec		*approx 50 msec*	*Release incl. runtime*

	Hilfskontakt		***Auxiliary Contact***
Schaltstrom	6 A		*Make & break*
Dauerstrom	2 A		*Continuous current*

	Steuereingang (INIT)		***Control INPUT (INIT)***
Steuersignal	< 0.5 V LOW / > 4 V HIGH		*Control signal*

	Steuereingang (STARTER)		***Control INPUT (STARTER)***
Steuersignal	< 5 V LOW / > 9 V HIGH		*Control signal*

	Statusausgang		***Status OUTPUT***
Statussignal	aktiv niederohmig		*active low impedance*	*Status signal*
Ausgangsstrom	max. 200 mA		*Output current*
Restspannung	max. 1 VDC		*Residual voltage*

	Analogausgang		***Analog OUTPUT***
Ausgangssignal	0 – 5 VDC		*Output signal*
Genauigkeit	5 % ± 5 A		*Accuracy*

Anschlussquerschnitt			**Wire section**
100 A	25 mm² / AWG 3	*0.039 sq.inch / AWG 3*	**100 A**
200 A	70 mm² / AWG 00	*0.109 sq.inch / AWG 00*	**200 A**
300 A	95 mm² / AWG 0000	*0.147 sq.inch / AWG 0000*	**300 A**
500 A	240 mm² / MCM 500	*0.372 sq.inch / MCM 500*	**500 A**

Einbaulage	beliebig	*optional*	**Mounting position**
	Kundenspezifische Sonderlösungen auf Anfrage.	Special types upon request.	

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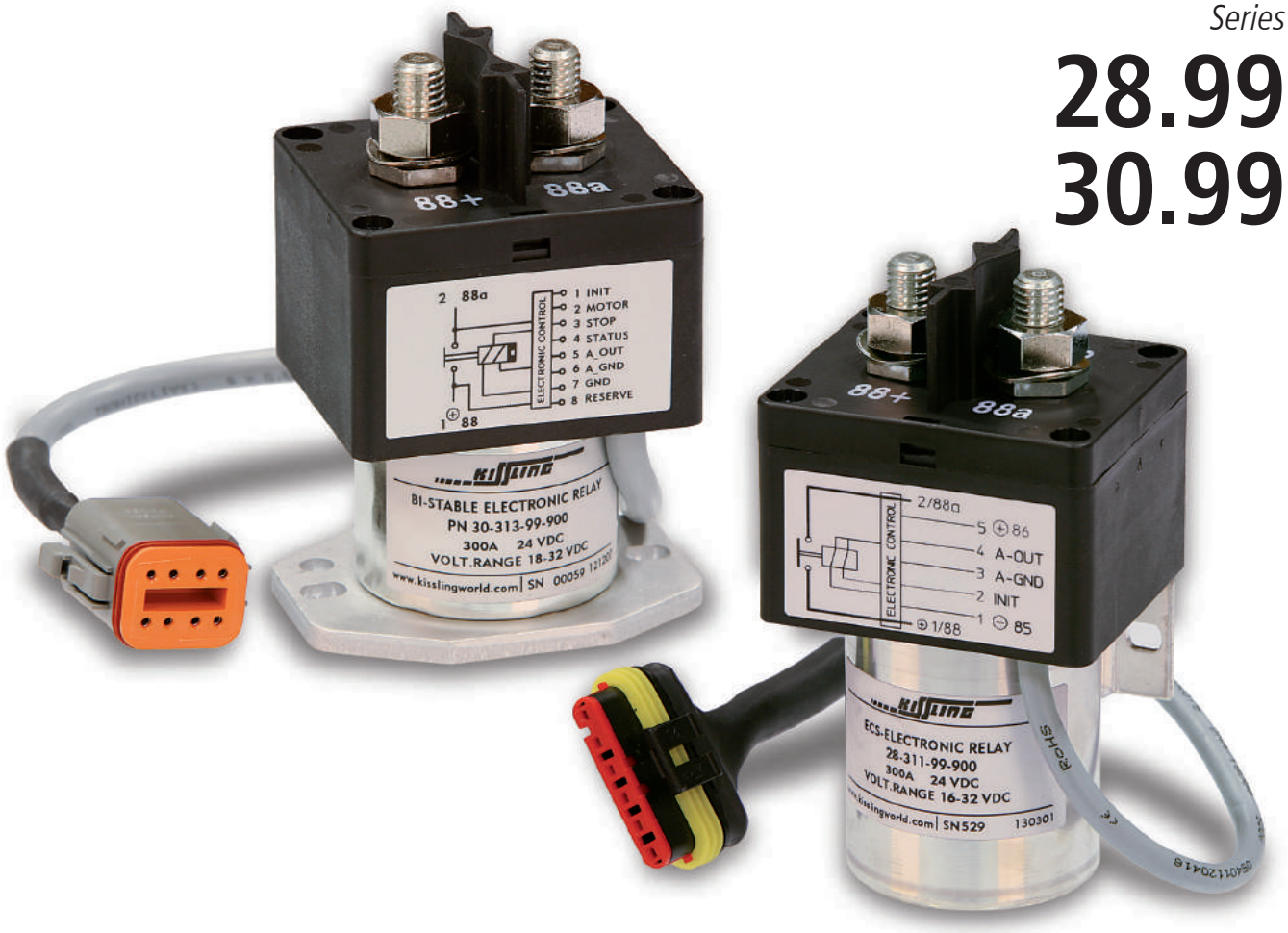
MONO- UND BISTABILE LEISTUNGSRELAIS MIT BIDIREKTIONALER STROMSENSORIK

MONO- AND BI-STABLE POWER RELAYS WITH BIDIRECTIONAL ELECTRONIC CURRENT SENSING

Baureihe
Series

28.99
30.99



Die Baureihe 28.99 und 30.99 sind dichte Leistungsrelais mit mono- und bistabiler Antriebstechnik und eingebauter Auswerteelektronik für individuelle Bedürfnisse der Stromüberwachung.

Grundlage des Typs 28.99 ist ein zweispuliges monostabiles Relais mit separater Anzugs- und Haltewicklung. Daraus resultieren während des Betriebs hohe Kontaktdrücke bei geringem Kontaktspannungsabfall und ein geringer Haltestrom.

Als Basis des Typs 30.99 dient ein bistabiles Relais mit 2 Spulen und dauermagnetischer Haltung, wodurch die Leistungslose magnetische Haltung keine zusätzliche Halteenergie verbraucht. Die Relaisansteuerung, Hauptkontaktüberwachung, Stromsensorik sowie weitere Kontrollfunktionen werden von einer Elektronik übernommen.

Die Zusatzelektronik ermöglicht unter anderem:

- Automatisches Abschalten der Relais bei Überstrom im Hauptstromkreis (Lastkreis)
- Frei programmierbarer Analogausgang
- Frei programmierbare Überstromabschaltschwellen
- Möglichkeit der Nachbildung einer herkömmlichen Schmelzsicherungskennlinie als Auslösecharakteristik
- Ein- und Ausschalten der Relais über einen Steuereingang
- optionaler Steuereingang für den Anlasser, für ein messtechnisches „Ausblenden" kurzzeitiger Stromspitzen während des Anlassvorganges
- Unterspannungsabschaltschwelle sowie Übertemperaturabschaltung realisierbar
- Ausgabe eines Statussignals zur Anzeige des Betriebszustandes
- Signal- und Steuereingänge über Kabel und Steckverbinder
- Kurzschlussfest und integrierter Verpolschutz

The 28.99 and 30.99 series are environmentally sealed power relays with mono- and bi-stable drive technology integrating an evaluation system for the individual requirements of current monitoring.

The basis of the type 28.99 is a dual-coil monostable relay with a separate pickup and holding coil. This system generates a high contact pressure with the benefit of having a low contact voltage drop and a low holding current.

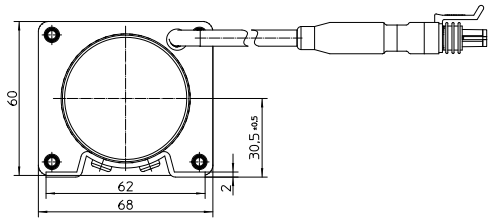
The basis of the type 30.99 is a bistable power relay with a dual coil system and a permanent magnetic holding of the contact state which requires no additional holding energy. The relay control, main-contact monitoring, current sensing and other control-functions are supervised by the integrated electronics.

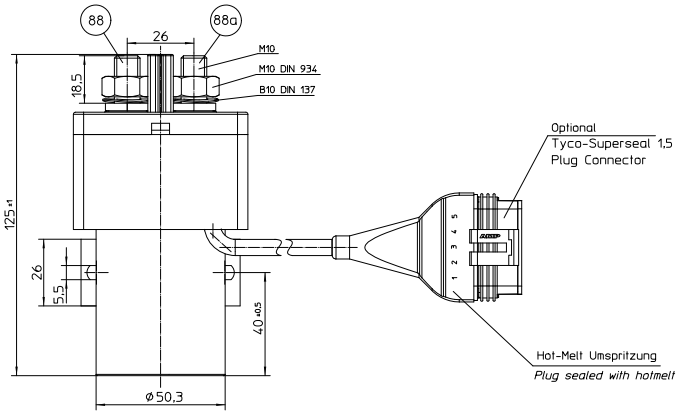
The additional electronics enables:

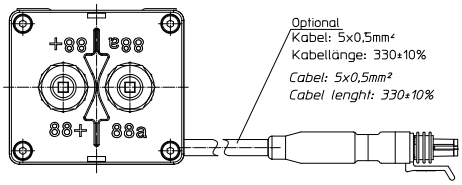
- *Automatic relay shutdown when over-current is detected in the main circuit (Load circuit)*
- *Free programmable analog OUTPUT*
- *Free programmable over-current cut off thresholds*
- *Possibility of using a conventional simulation of melting fuse characteristics*
- *Relay switching on and off by a control input*
- *Optional control input for starter to "hide" transient current spikes during the start procedure*
- *Safety release by low voltage, and over-temperature shutdown feasible*
- *Output of a status signal to indicate the operating status*
- *Signal and control input via cable and connectors*
- *Short-circuit-proof and integrated polarity protection*

Abmessungen | *Dimensions*

28.311.99.900







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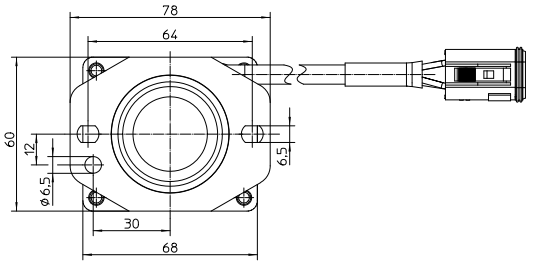
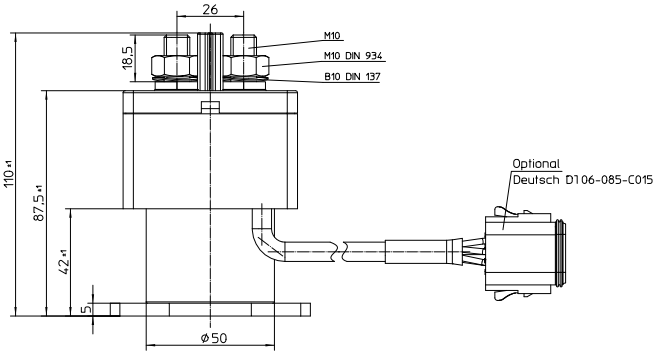
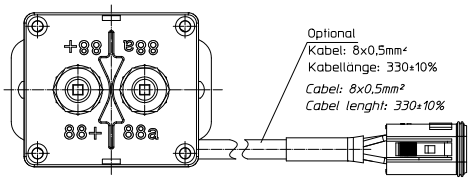
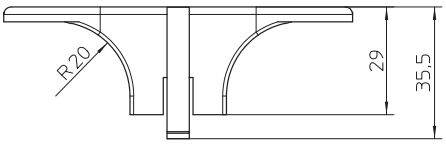


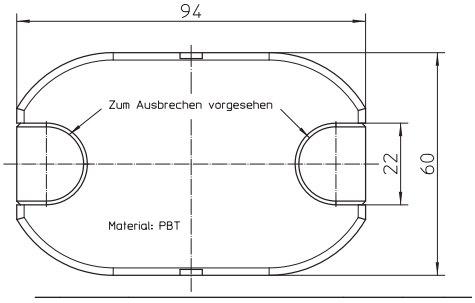




Zubehör | *Accessories*

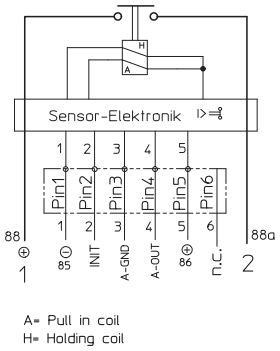
Abdeckung / *Cover*
30-211-93-004





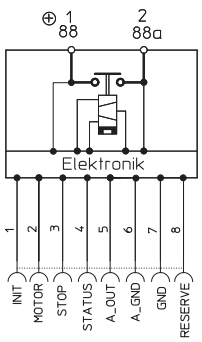
Schaltbilder | *Circuits*

Relais / *Relay*
28.311.99.900



A= Pull in coil
H= Holding coil

Relais / *Relay*
30.313.99.900



Funktion | *Operation*

Die Elektronik des Relais misst den Hauptstrom galvanisch getrennt. Beim Überschreiten der von ihnen vorgegebenen Stromschwellen schaltet das Relais ab und bleibt bis zum Zurücksetzen des INIT-Eingangs oder der Versorgungsspannung abgeschaltet. Bei erneutem Einschalten wird das Relais wieder aktiviert.

Der Schaltzustand wird im Wesentlichen vom Zustand des Schalteinganges (INIT) bestimmt. Das besagt, dass das Relais auch bei anliegender Versorgungsspannung erst dann einschaltet, wenn der Spannungswert am INIT ca. 0,5 V **unterschreitet.** Will man das Relais direkt mit dem Einschalten der Versorgungsspannung aktivieren, so kann vor oder mit dem Anlegen der Versorgungsspannung der INIT-Eingang auf das Minus-Potential (A2) der Versorgungsspannung gezogen werden (z.B. über eine Brücke). Die Elektronik schaltet beim Überschreiten einer eingestellten Stromschwelle das Relais ab.

Abschalten bei Unterspannung
Um Funktionsstörungen auszuschließen, wird eine minimale Versorgungsspannung (z.B. 16 VDC) vorgegeben. Darunter kann das Relais nicht eingeschaltet werden. Beim Unterschreiten des Mindestwertes während des Betriebes schaltet das Relais ab und bleibt abgeschaltet, auch wenn die Versorgungsspannung wieder über den Mindestwert ansteigt. Das Relais kann dann nur durch AUS-schalten von INIT und/ oder der Versorgungsspannung und erneutem EIN-schalten aktiviert werden.

Weitere Funktionen
Zusätzliche Funktionen wie Zeitverzögerung beim Ein- und/oder Ausschalten, verarbeiten von zusätzlichen Bordnetzinformationen, Modifikation der Software auf anwendungsspezifische Belange oder elektronisch geschützte Bypasslösungen können mit dem Anwender abgestimmt werden.

Als weitere Funktionen sind Strom- und/oder Spannungsüberwachung realisierbar. Die Sicherungsfunktion kann bei Stromüberwachung mit übernommen werden. Mit Stromrichtungserkennung ist Laden oder Entladen feststellbar.

The electronic measures the main current galvanically isolated and switch-OFF the relay whenever the threshold is exceeded. The relay remains switch-OFF until again reset by switching-OFF-ON INIT or switching-ON-OFF the supply voltage.

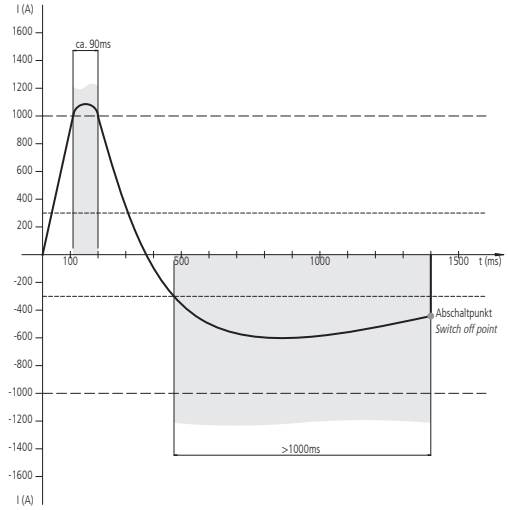
*The switching status of all relays with electronic sensing is primarily determined by the input signal (INIT). Even if the supply voltage is sufficient, the relay will only switched-ON after the voltage at the INIT-input falls **below** 0,5 VDC. IF the relay must be switched-ON directly by supply voltage, then the INIT signal must be drawn to a minus potential through A2 (e.g. wire bridge). If the standard threshold is exceeded, the electronic switches the relay off.*

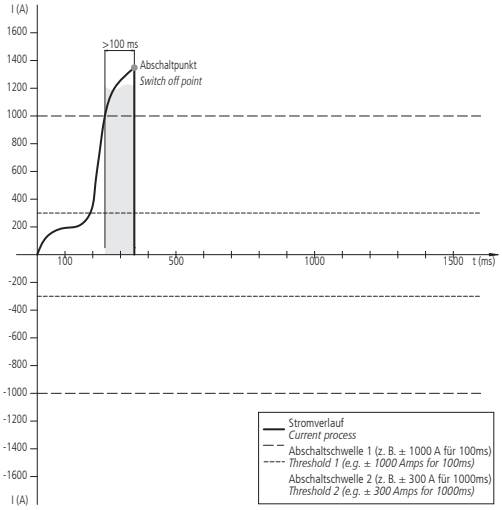
Tripping [switching-OFF] during Low Voltage Conditions
To avoid malfunction, a minimum supply voltage (example 16 VDC) has to be present. The relay cannot be switched-ON under this voltage. If the voltage drops below this value, the relay is switched-OFF and remains turned-OFF, even if the voltage rises back above the required minimum. The relay can only be re-set through INIT and/or if the supply voltage is reactivated through a switch-on function.

Additional Functions
Extra functions i.e. time delay on make and/or break, additional processing of onboard information, electronic protected bypass solutions or software modifications in accordance with user's requirements are possible.

In addition current and/or voltage sensing can be realised. The current sensing can fulfil fuse functions. Current direction sensing monitors the state of charging and discharging.

Funktionsdarstellung und Begriffe:
Operational characteristics and terminology





Technische Daten | *Technical Data*

	Allgemeine Daten | ***Environmentally Characteristics***	
Umgebungstemperatur	–40°C bis +85°C | –40°F to +185°F	*Temperature range*
Lagerungstemperatur	–46°C bis +95°C (+95°C für 2 h) | –51°F to +203°F (+203°F for 2 h)	*Storage temperature*
Schutzart Innenraum	IEC 60529 & DIN 40050-9 / IP67 (0,2 bar; 1 min) & IP6K9K	*Interior protection*
Schutzart Anschlüsse	IP 00 IEC 60529	*Terminal protection*
Schock	6 g / 11 msec	*Shock*
Vibration	4 g / 50 -2000 Hz	*Vibration*
Beständigkeit gegen gebräuchliche Öle, Kraftstoffe, Hydraulikflüssigkeiten, Alkohol, Feuerlöschmittel, Batteriesäure, Salznebel, Schadgase, Reinigungsmittel,Feuchte Wärme, Temperaturwechseln		*Resistance against most oils, fuels, hydraulic fluids, alcohol, fire-extinguishing agents, battery acid, salt spray, injurious gas, cleaning agents, humidity, alternating temperature*
Gewicht	ca. 900 g | *1.8 pounds*	*Weight*

	Anzugsdrehmomente | ***Max. torque***	
Gewindegrößen	M10 = 15–20 Nm	*Thread sizes*

	Elektrische Daten | ***Electrical Characteristics***	
Min. Isolationswiderstand	100 MΩ	*Min. Insulation Resistance*
Isolationswiderstand nach Belastung	50 MΩ	*Insulations Resistance after live*
Hochspannungsfestigkeit	1050 VAC / 1 min bei|*at* 50 Hz	*Dielectric withstanding voltage*
Max. Kontaktspannungsabfall	150 mV	*Max. Contact drop, initial*
Kontaktspannungsabfall nach Lebensdauer	175 mV	*Contact drop after life test*
Dauerstrom	**300A**	*Duty rating*
Überlast	3000 A, 1 sec; 750 A, 20 sec	*Overload*

Technische Daten | *Technical Data*

Lebensdauer und Kontaktbelastung					***Rated contact load***
Hauptkontakt		**28.99**		**30.99**	***Main Contact***
Ohmsche Last	200 000 Schaltspiele	*cycles 300 A*		50 000 Schaltspiele	*cycles 300 A*	*Resistive load*
Mech. Lebensdauer	300 000 Schaltspiele	cycles		100 000 Schaltspiele	*cycles*	*Mechanical life*

Spulendaten		***Coil data***
Betriebsspannung	16-32 VDC	*Voltage range*
Nennspannung	24 VDC	*Nominal voltage*
Mindestbetriebsspannung	16 VDC	*Min. operational voltage*
Überspannung	36 VDC bei/at 40°C, 1 h	*Over voltage*

Relais Daten - 28.99		***Relay Data - 28.99***
Anzugsspulenwiderstand, ca.	5.2 Ω ±10%	*Pull in coil resistance, approx.*
Anzugsstrom, max.	4 A, 20 msec	*Pull in current, max.*
Haltespulenwiderstand, ca.	101 Ω ±10%	*Resistance holding coil, approx.*
Haltestrom, max.	0.3 A	*Holding current, max.*

Relais Daten - 30.99		***Relay Data - 30.99***
Anzugsspulenstrom – Impuls ca.	3.0 A	*Pull in coil, approx.*
Abwurfspulenstrom – Impuls ca.	2.8 A	*Drop out coil, approx.*

Schaltzeiten		***Operating times***
Anzugszeit einschl. Prell- u. Laufzeit	ca. 150 msec	*Operate over supply voltage*
Abfallzeit einschl. Laufzeit - INIT	ca. 100 msec	*Operate over INIT*
Prellzeit	max. 5 msec	*Bounce*

Elektronik Daten	**28.99**	**30.99**	***Electronic Control Characteristics***
Ruhestrom	0 A	< 1 mA	*standby current*

	Steuereingang	**Control INPUT**	
Steuersignal	bis zu 4 Mal - Aktive LOW	up to 4 times - Aktive LOW	*Control signal*
Schaltschwelle	LOW < 0.5 VDC		*Control Threshold*
Funktion	Frei Programmierbar	Free programmable	*Function*

	Steuereingang	**Control INPUT**	
Steuersignal	bis zu 4 Mal - Aktive HIGH	up to 4 times - Aktive HIGH	*Control signal*
Schaltschwelle	LOW < 5 VDC / HIGH > 9 VDC		*Control Threshold*
Funktion	Frei Programmierbar	Free programmable	*Function*

	Schaltausgang	**Switching OUTPUT**
Low-side FET Ausgang	< 500 mA	*Low-side FET Output*
High-side FET Ausgang, bis zu 2 Mal (Bypass)	< 500 mA	*High-side FET Output, up to 2 times (Bypass)*
Kurzschlussfest, integrierter Verpolschutz		*Short circuit protected, integrated polarity protection*

	Analogausgang	**Analog OUTPUT**
Ausgangssignal, frei Programmierbar	0.1– 4.9 VDC z. Bsp. */ for example* *-300 A = 0VDC* *0 A = 2.5 VDC* *+300 A = 5 VDC* *Toleranz / Tolerance ±5%*	*Output signal, free programmable*

Anschlussquerschnitt	min. 95 mm² / AWG 4-0	*0.147 sq.inch / AWG 4-0*	***Wire section***
Einbaulage	beliebig	*optional*	***Mounting position***
	Kundenspezifische Sonderlösungen auf Anfrage.	*Special types upon request.*	

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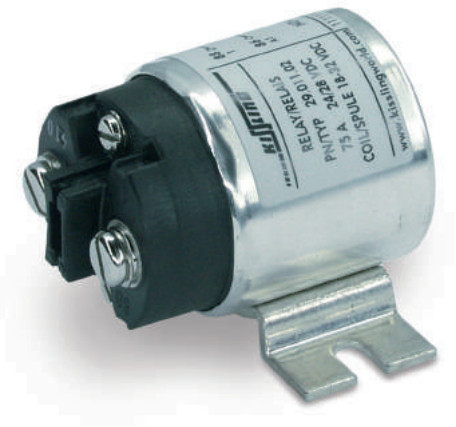


KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 75A - from TE Connectivity (TE)

The economical 29 series single coil relays with 75 amps (A) are developed using our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 40VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

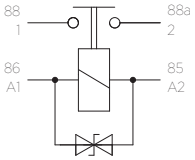
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding-current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

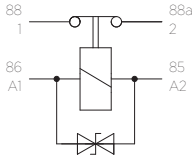
Circuits

NO-Contact



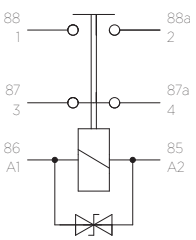
Suppression diode

NC-Contact



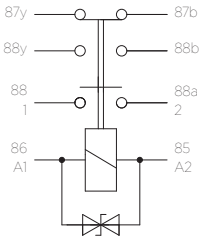
Suppression diode

NO/NC-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M3.5 = 1.1 - 1.2Nm | M4 = 2.0 - 2.2Nm | M5 = 3.2 - 3.5Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	75A
Overload	600A - 1sec / 150A - 20sec

Rated contact	12 / 24 / 28 / 36VDC	48VDC	80VDC
Resistive load	75A	75A	50A
Cycles	200.000	100.000	100.000
Mechanical life	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles

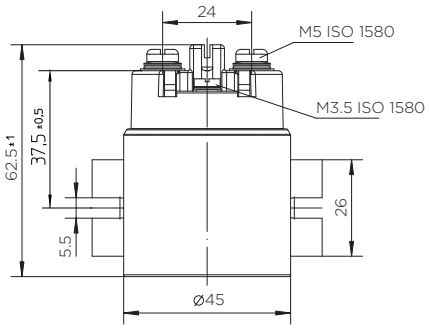
Coil Data	12VDC	24 / 28VDC	48VDC	80VDC
Voltage range	9-16VDC	18-32VDC	36-54VDC	60-80VDC
Nominal voltage	12VDC	28VDC	48VDC	80VDC
Pick up voltage max.	9VDC	18VDC	36VDC	60VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 8VDC	≤ 8VDC
Coil resistance	19Ω ± 10%	76Ω ± 10%	280Ω ± 10%	900Ω ± 10%
Coil current approx.	0.60A	0.30A	0.20A	0.12A
Coil power approx.	8W	10W	8.5W	9.5W

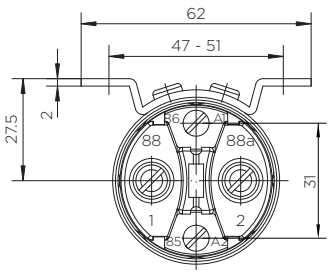
Operating times NO-Contact relay

Operate	max. 35msec
Bounce	max. 5msec
Release	max. 15msec
Wire Section	min. 10mm² / 0.016 sq.inch / AWG 7
Mounting position	optional

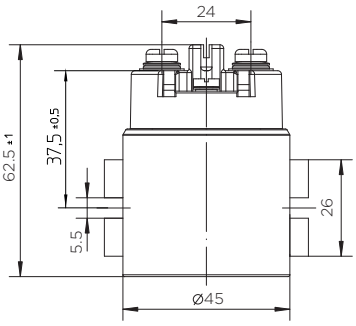
Technical drawings

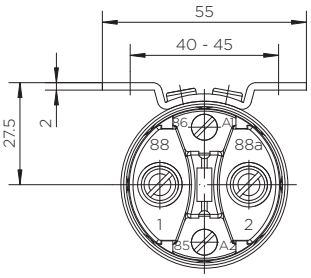
Standard side mounting



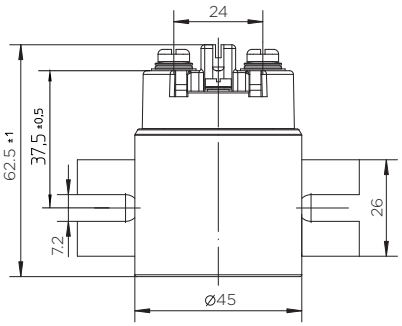


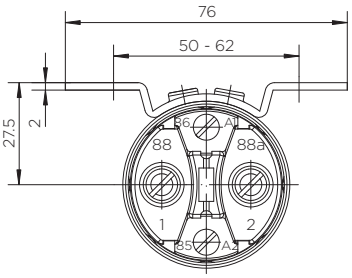
Short form side mounting



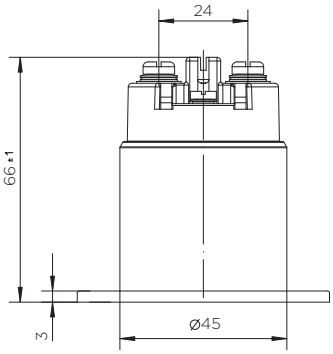


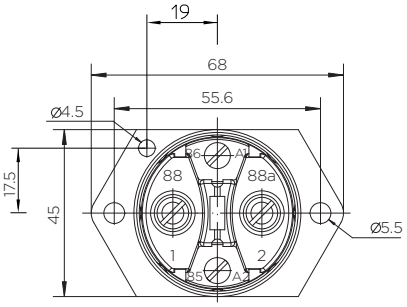
Long form side mounting



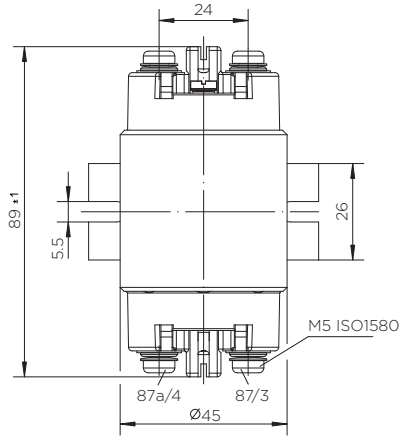


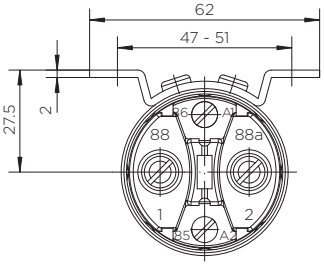
Bottom mounting





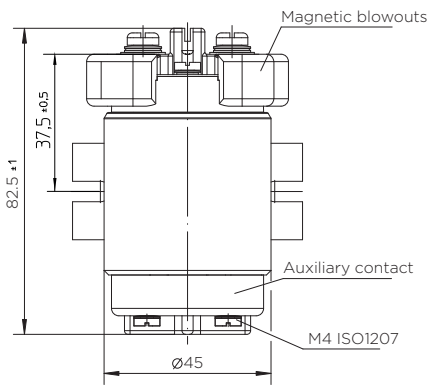
Change-over NO/NC

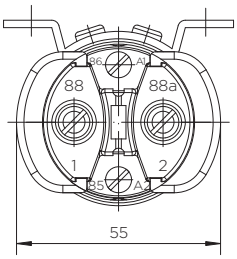




Options:

Auxiliary contacts, magnetic blowouts





Ordering Information

Part Number
example: 29.011.02
29.0__.___

Current

0	Current 75A

Contacts

1	Make Contact NO
2	Change over NO/NC*
3	Break Contact NC

* Only mounting type - 1 "Standard side mounting"

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24 / 28V
3	48V
4	80V

Suppression

0	Without suppression
1	With suppression

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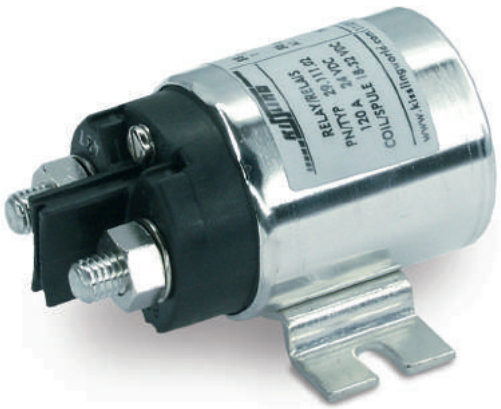


KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 120A - from TE Connectivity (TE)

The economical 29 series single coil relays with 120 amps (A) are developed sing our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 40VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

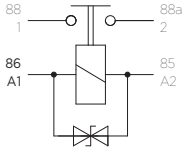
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

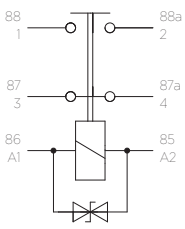
Circuits

NO-Contact



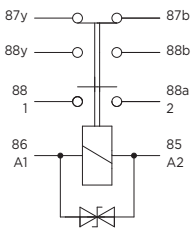
Suppression diode

NO/NC-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M3.5 = 1.1 - 1.2Nm | M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	120A
Overload	1000A - 1sec / 250A - 20sec

Rated contact	12 / 24 / 28 / 36VDC	48VDC	80VDC
Resistive load	120A	120A	80A
Cycles	200.000	100.000	100.000
Mechanical life	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles

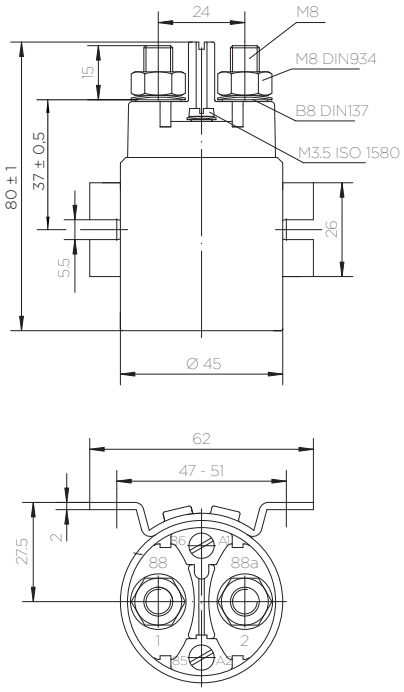
Coil Data	12VDC	24 / 28VDC	36VDC	48VDC
Voltage range	9-16VDC	18-32VDC	27-48VDC	36-54VDC
Nominal voltage	12VDC	28VDC	36VDC	48VDC
Pick up voltage max.	9VDC	18VDC	27VDC	36VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 5VDC	≤ 8VDC
Coil resistance	20Ω ± 10%	80Ω ± 10%	155Ω ± 10%	245Ω ± 10%
Coil current approx.	0.6A	0.35A	0.25A	0.2A
Coil power approx.	7W	10W	10W	9.5W

Operating times NO-Contact relay

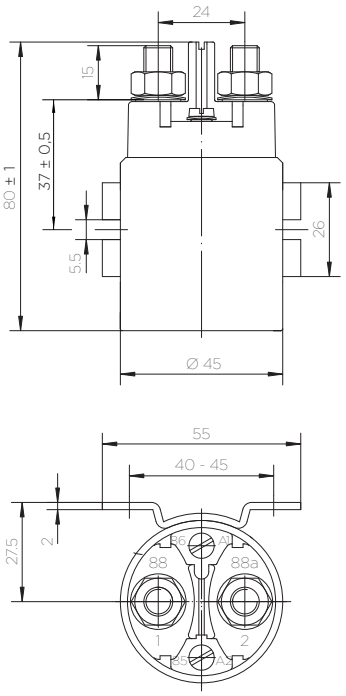
Operate	max. 35msec
Bounce	max. 5msec
Release	max. 15msec
Wire Section	min. 25mm² / 0.039 sq.inch / AWG 3
Mounting position	optional

Technical drawings

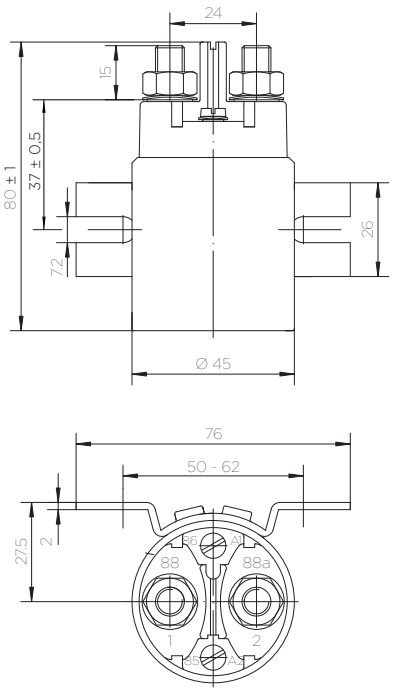
Standard side mounting



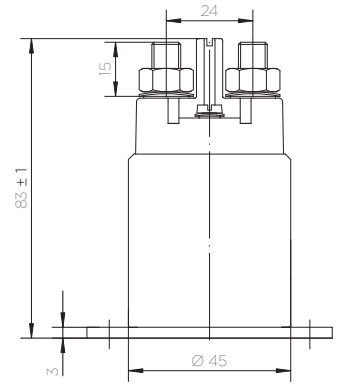
Short form side mounting

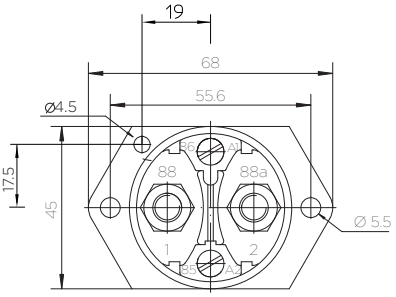


Long form side mounting

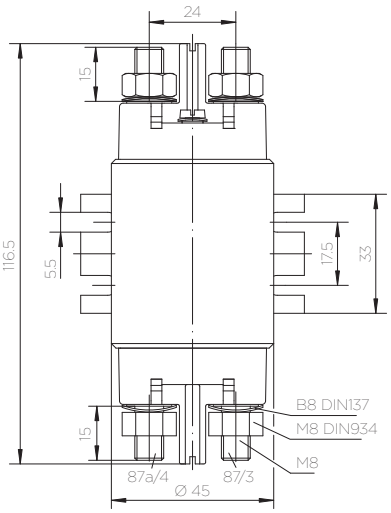


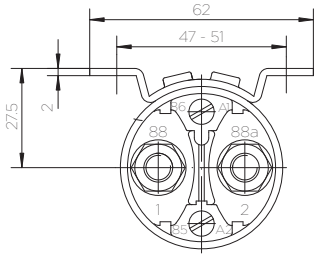
Bottom mounting





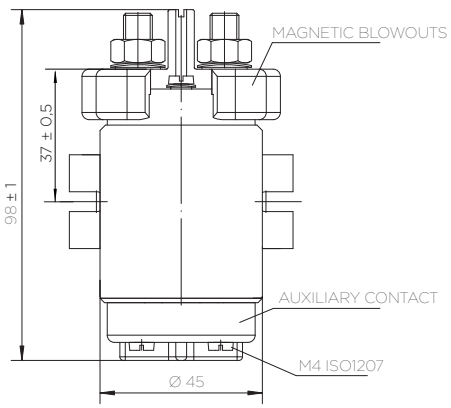
Change-over NO/NC

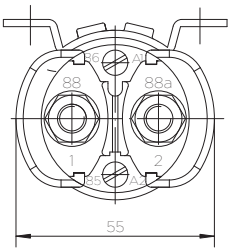




Options:

Auxiliary contacts, magnetic blowouts





Ordering Information

Part Number
example: 29.111.02
29.1__.___

Current

1	Current 120A

Contacts

1	Make Contact NO
2	Change over NO/NC*

* Only mounting type - 1 "Standard side mounting"

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24 / 28V
3	36V
4	48V

Suppression

0	Without suppression
1	With suppression

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KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 200A - from TE Connectivity (TE)

The economical 29 series single coil relays with 200 amps (A) are developed using our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 40VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

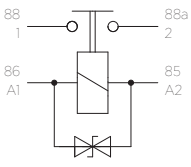
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continu ous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

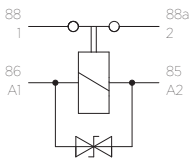
Circuits

NO-Contact



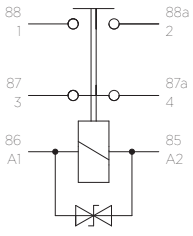
Suppression diode

NC-Contact



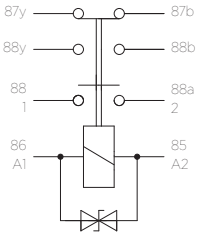
Suppression diode

NO/NC-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	200A
Overload	1600A - 1sec / 400A - 20sec

Rated contact load	12 / 24 / 28VDC	48VDC	60VDC	80VDC
Resistive load	220A	200A	200A	120A
Cycles	200.000	100.000	50.000	10.000
Mechanical life	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles

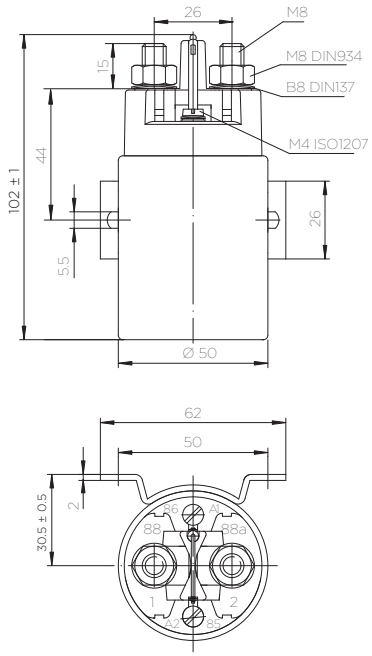
Coil Data	12VDC	24 / 28VDC	48VDC	60VDC	80VDC
Voltage range	9-16VDC	18-32VDC	36-54VDC	45-68VDC	60-90VDC
Nominal voltage	12VDC	28VDC	48VDC	60VDC	80VDC
Pick up voltage max.	9VDC	18VDC	36VDC	45VDC	60VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 8VDC	≤ 10VDC	≤ 20VDC
Coil resistance	15Ω ± 10%	62Ω ± 10%	245Ω ± 10%	370Ω ± 10%	660Ω ± 10%
Coil current approx.	1A	0.40A	0.20A	0.18A	0.12A
Coil power approx.	10W	10W	10W	10W	10W

Operating times NO-Contact relay

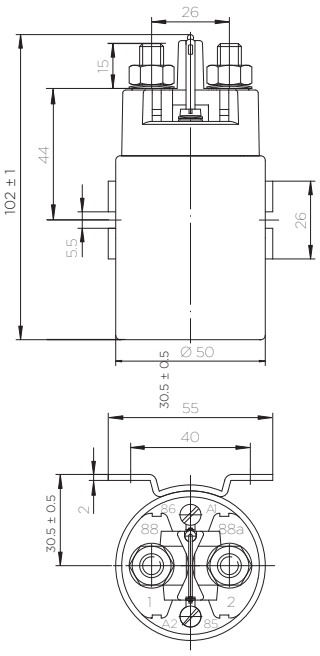
Operate	max. 40msec
Bounce	max. 5msec
Release	max. 20msec
Wire Section	min. 70mm² / 0.039 sq.inch / AWG 2-0
Mounting position	optional

Technical drawings

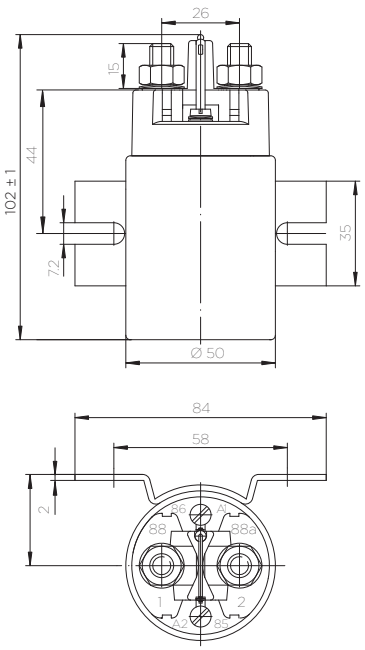
Standard side mounting



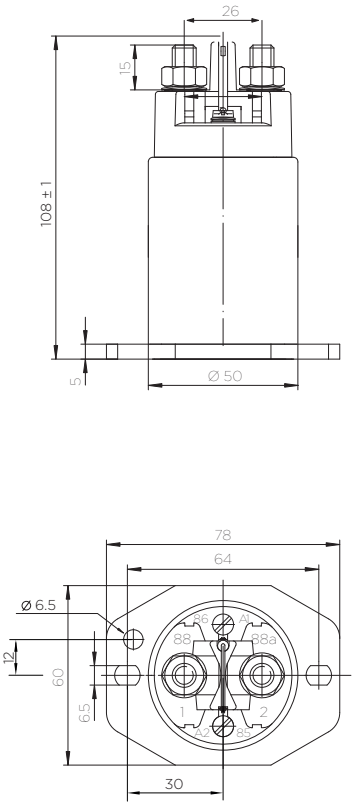
Short form side mounting



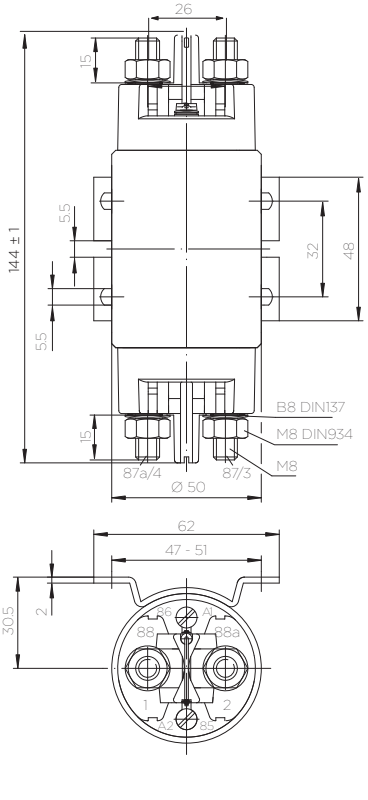
Long form side mounting



Bottom mounting

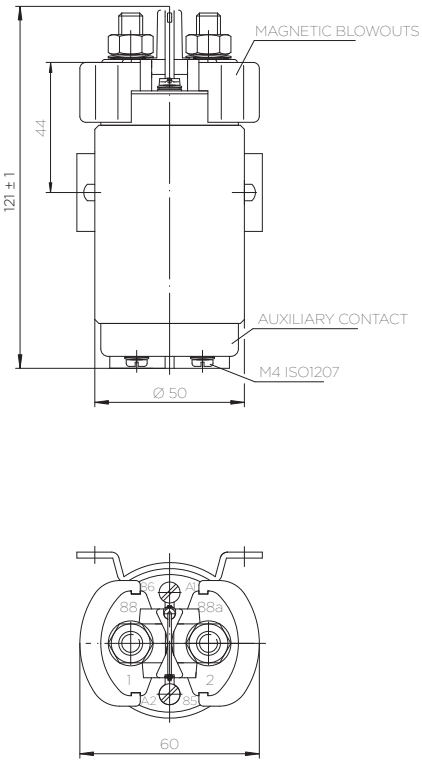


Change-over NO/NC



Options:

Auxiliary contacts, magnetic blowouts



Ordering Information

Part Number
example: 29.211.02
29.2__.___

Current

2	Current 200A

Contacts

1	Make Contact NO
2	Change over NO/NC*
3	Break Contact NC

* Only mounting type - 1 "Standard side mounting"

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24V
3	36V**
4	48V
5	60V
6	72V**
7	80V

**Upon request

Suppression

0	Without suppression
1	With suppression

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K1166699 | Version 08/2020

KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 300A - from TE Connectivity (TE)

The economical 29 series single coil relays with 300 amps (A) are developed using our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 40VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

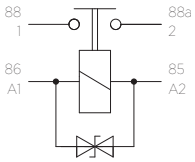
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

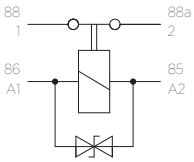
Circuits

NO-Contact



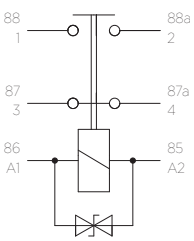
Suppression diode

NC-Contact



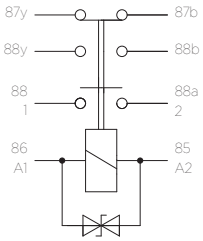
Suppression diode

NO/NC-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec

Rated contact load	12 / 24 / 28VDC	48VDC	60VDC	80VDC
Resistive load	300A	300A	300A	200A
Cycles	200.000	100.000	50.000	100.000
Mechanical life	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles	2.000.000 cycles

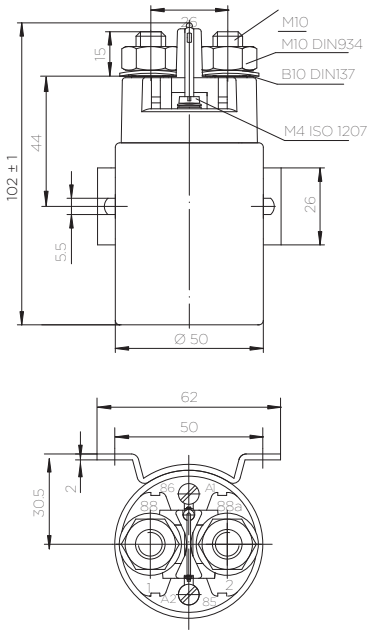
Coil Data	12VDC	24 / 28VDC	48VDC	60VDC	80VDC
Voltage range	9-16VDC	18-32VDC	36-54VDC	45-68VDC	60-90VDC
Nominal voltage	12VDC	28VDC	48VDC	60VDC	80VDC
Pick up voltage max.	9VDC	18VDC	36VDC	45VDC	60VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 8VDC	≤ 10VDC	≤ 20VDC
Coil resistance	15Ω ± 10%	62Ω ± 10%	245Ω ± 10%	370Ω ± 10%	660Ω ± 10%
Coil current approx.	1A	0.40A	0.20A	0.18A	0.12A
Coil power approx.	10W	10W	10W	10W	10W

Operating times NO-Contact relay

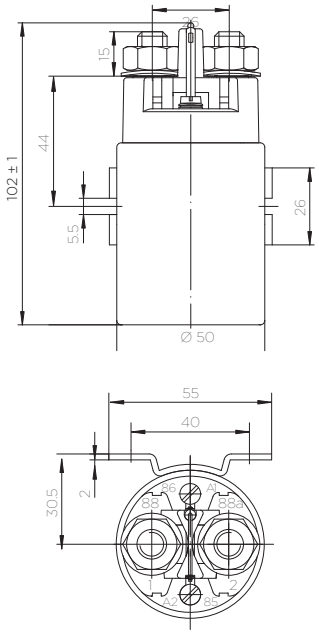
Operate	max. 40msec
Bounce	max. 5msec
Release	max. 20msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0
Mounting position	optional

Technical drawings

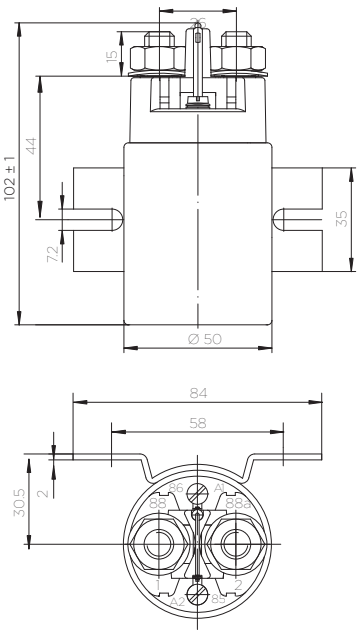
Standard side mounting



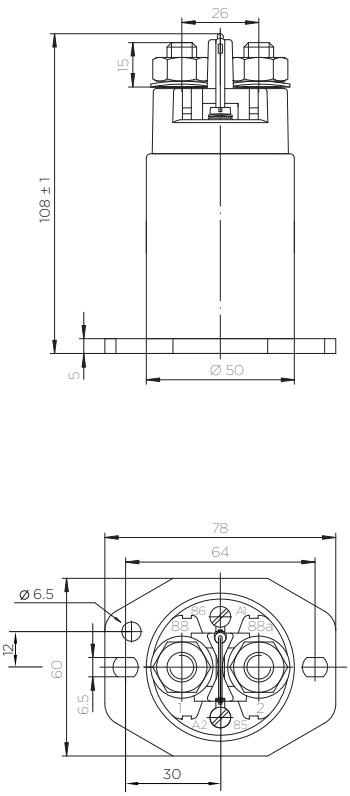
Short form side mounting



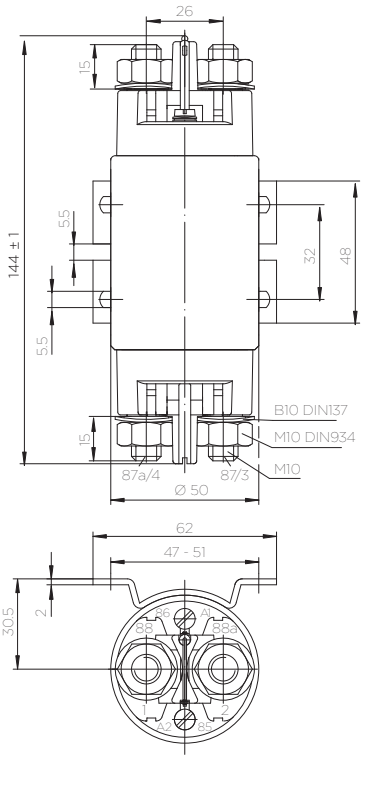
Long form side mounting



Bottom mounting

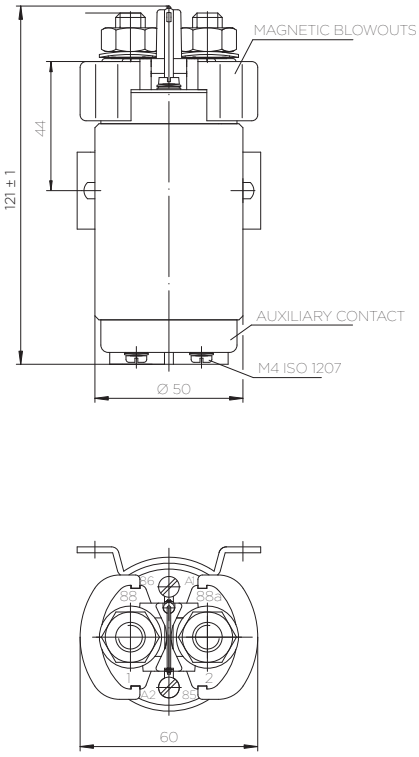


Change-over NO/NC



Options:

Auxiliary contacts, magnetic blowouts



Ordering Information

Part Number
example: 29.311.02
29.3__.___

Current

2	Current 300A

Contacts

1	Make Contact NO
2	Change over NO/NC*
3	Break Contact NC

* Only mounting type - 1 "Standard side mounting"

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24V
3	36V**
4	48V
5	60V
6	72V**
7	80V

**Upon request

Suppression

0	Without suppression
1	With suppression

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KISSLING
DUAC POWER RELAYS

Series 29 / 2 x 300A - from TE Connectivity (TE)

The economical 29 series double pole power relays with 2 x 300A are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This relay features high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing are corrosion resistant.

The design of our double pole power relays provides a sealing rate of IP67 and IP6K9K (steam pressure cleaning) in accordance with IEC 60529 and DIN 40050-9. Relays of this series are available in the continuous current ranges of 2 x 300 Amps.

Features

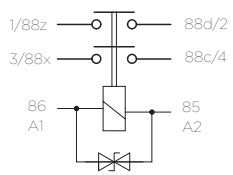
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Efficient coil (12V and 24V) and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

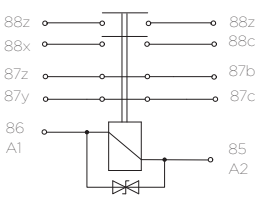
Circuits

NO-Contact



Suppression diode

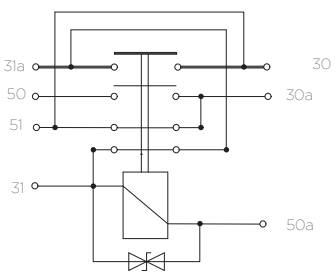
NO/NC-Contact



Suppression diode

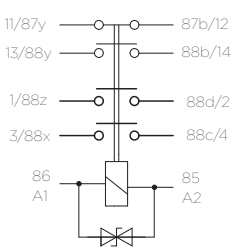
Double pole Change-over

NO/NC parallel series switch for two 12V batteries



Suppression diode

NO-Contact
Auxiliary-contacts



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	2 x 300A
Overload	2 x 2400A - 1sec / 2 x 600A - 20sec

Rated contact load	12 / 24 / 28VDC
Resistive load	300A
Cycles	200.000
Mechanical life	2.000.000 cycles | 1.000.000 cycles (NO/NC)

Coil Data	12VDC*	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pick up voltage max.	9VDC	18VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC
Coil resistance	4.4Ω ± 10%	38Ω ± 10%
Coil current approx.	2.7A	0.8A
Coil power approx.	32W	22W

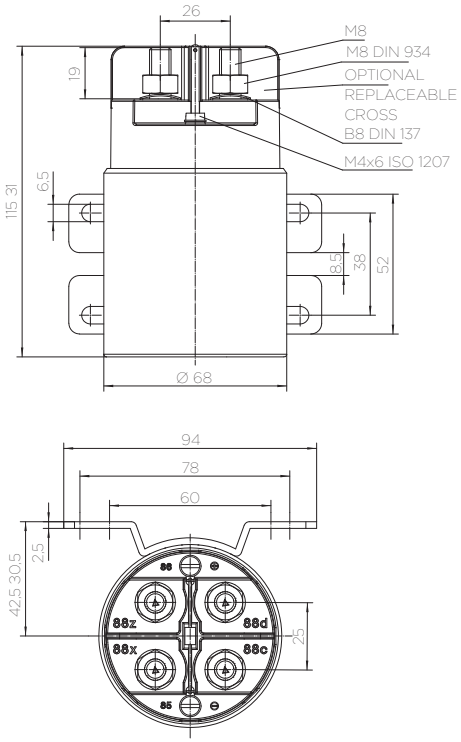
* Change-over – short duration approx. 5 min.

Operating times NO-Contact relay

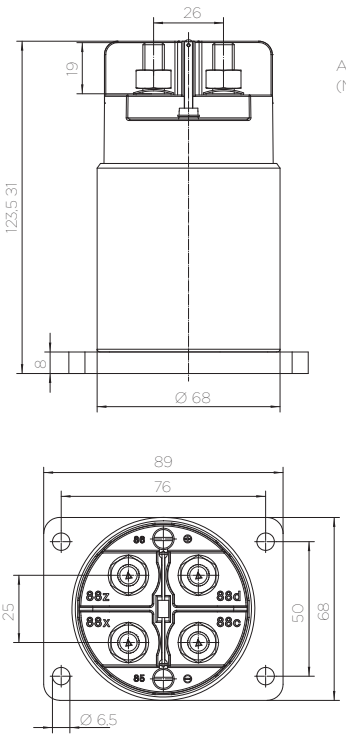
Operate	max. 60msec
Bounce	max. 5msec
Release	max. 30msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0
Mounting position	optional

Technical drawings

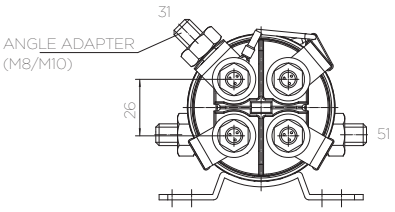
Standard side mounting

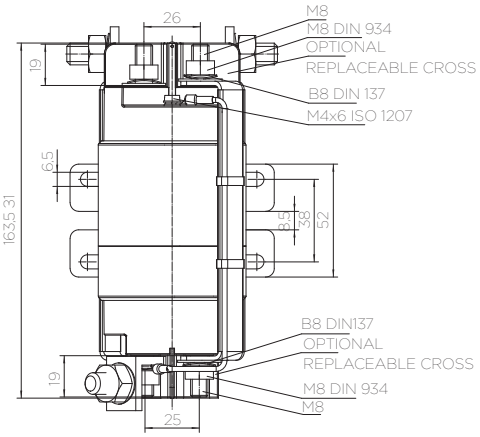


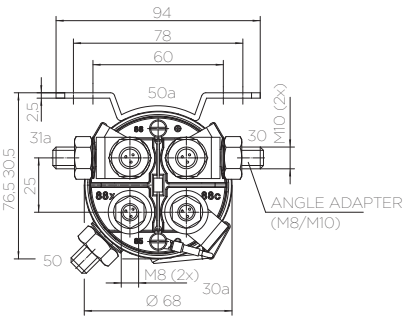
Bottom mounting



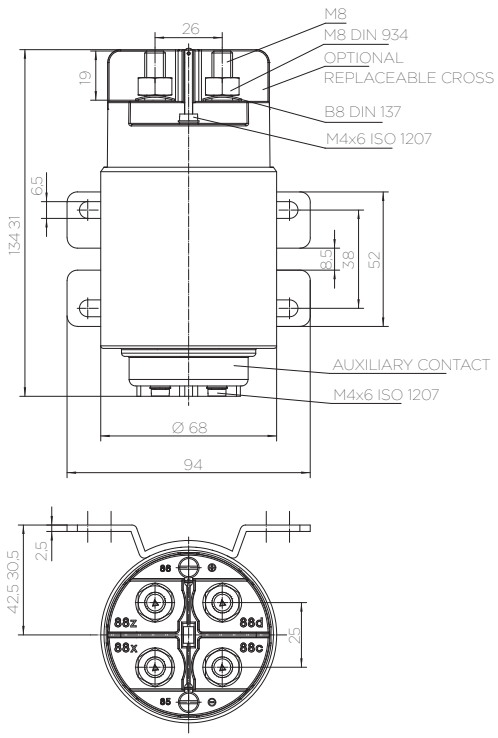
Double pole Change-over NO/NC
as parallel series switch of
two 12V batteries







Option - Auxiliary contact



Ordering Information

Part Number
example: 29.341.02
29.3__.___

Current

3	Current 300A

Contacts

4	Make Contact NO (2x)
5	Change over NO/NC* (2x)

* Only mounting type - 1 "Standard side mounting"

Mounting

1	Standard side mounting
3	Bottom mounting

Options

A	Auxiliary contacts*

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V – short duration
2	24V

Suppression

0	Without suppression
1	With suppression

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K1166701 | Version 08/2020

KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 400A - from TE Connectivity (TE)

The economical 29 series single coil relays with 400 amps (A) are developed using our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 48VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

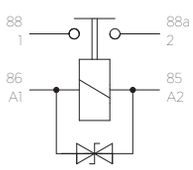
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

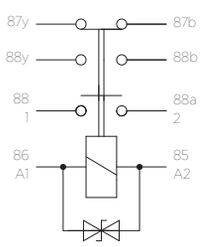
Circuits

NO-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M12 = 18 - 22Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	400A
Overload	3200A - 1sec / 800A - 20sec

Rated contact load	12 / 24 / 28VDC	80VDC
Resistive load	400A	300A
Cycles	100.000	100.000
Mechanical life	2.000.000 cycles	2.000.000 cycles

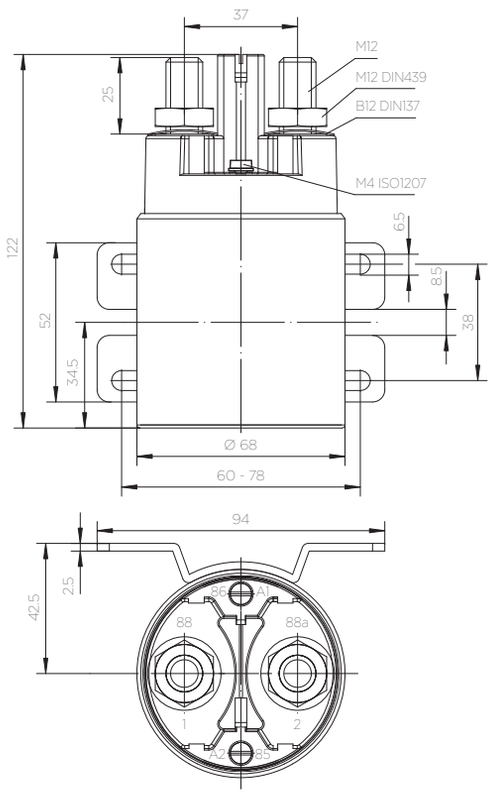
Coil Data	12VDC	24 / 28VDC	80VDC
Voltage range	9-16VDC	18-32VDC	60-90VDC
Nominal voltage	12VDC	28VDC	80VDC
Pick up voltage max.	9VDC	18VDC	60VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 8VDC
Coil resistance	9Ω ± 10%	36Ω ± 10%	350Ω ± 10%
Coil current approx.	1.33A	0.78A	0.23A
Coil power approx.	22W	22W	19W

Operating times NO-Contact relay

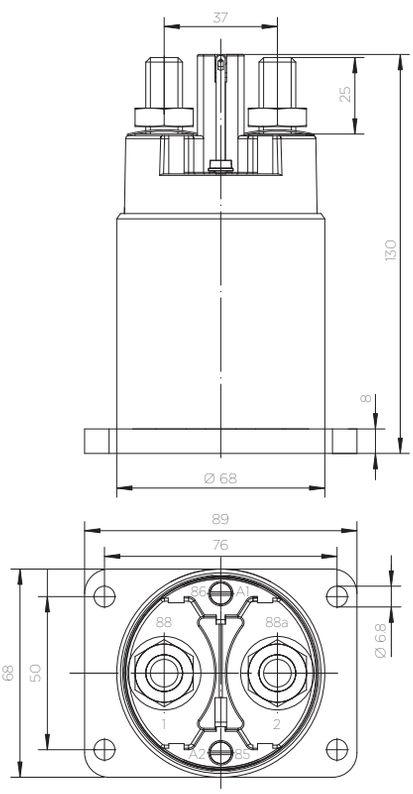
Operate	max. 60msec
Bounce	max. 5msec
Release	max. 30msec
Wire Section	min. 150mm² / 0.233 sq.inch / MCM 300
Mounting position	optional

Technical drawings

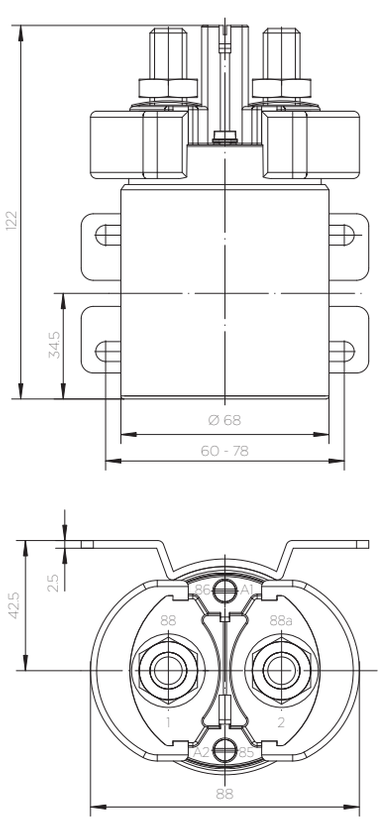
Side mounting



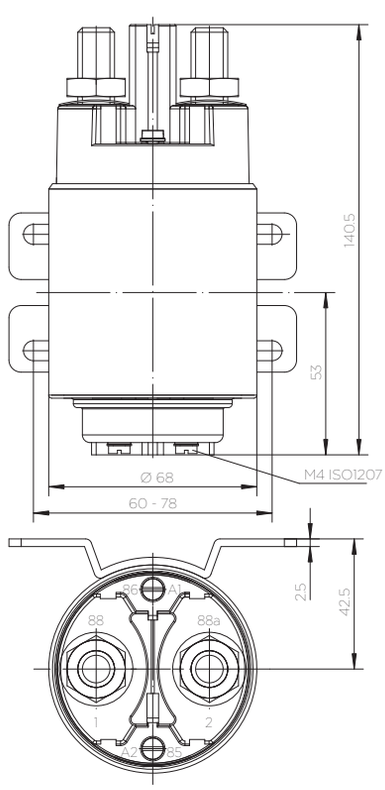
Bottom mounting



Options: Magnetic blowouts



Options: Auxiliary contacts



Ordering Information

Part Number
example: 29.411.02
29.4__.___

Current

4	Current 400A

Contacts

1	Make Contact NO

Mounting

1	Standard side mounting
3	Bottom mounting

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40V)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24V/28V
8	80V

Suppression

0	Without suppression
1	With suppression

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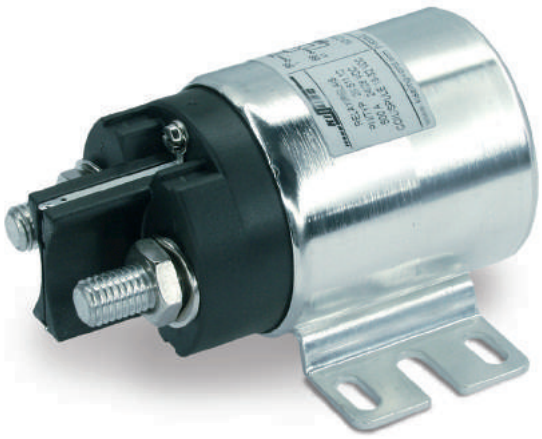


KISSLING
SINGLE POLE POWER RELAYS

Series 29 / 500A - from TE Connectivity (TE)

The economical 29 series single coil relays with 500 amps (A) are developed using our competence and expertise gathered over decades of manufacturing to meet even the most demanding operating requirements.

This single coil system relay features high shock and vibration resistance predominantly from its careful design and an optimized magnetic circuit. The sealing technology used in these relays meets both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe conditions.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion.

By equipping these relays with blow-out magnets, contact voltages are also achievable up to 250VDC. The use of blow-out magnets are also recommended for contact voltages over 40VDC and for inductive load applications to maintain long contact life at all voltages.

Also available are various bracket styles to meet your installation conditions and suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

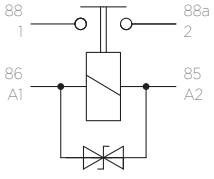
- Sealed housing conforms to IP6K9K
- Robust design
- Minimized coil current
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle
- Efficient coil and magnetic circuit design with switching properties and holding current requirements

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Fork lift applications

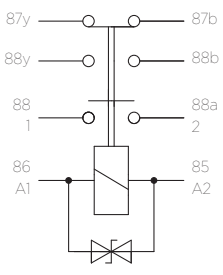
Circuits

NO-Contact



Suppression diode

NO-Contact/Auxiliary-Contact



Suppression diode

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 & DIN 40050-9 - IP67 (0,2bar, 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50-2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M12 = 18 - 22Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	500A
Overload	4000A - 1sec / 1800A - 20sec

Rated contact load	12 / 24 / 28VDC	80VDC
Resistive load	500A	300A
Cycles	100.000	100.000
Mechanical life	2.000.000 cycles	2.000.000 cycles

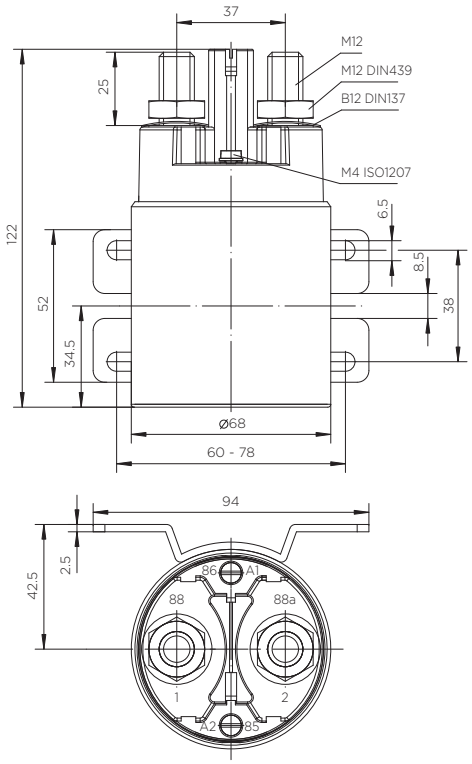
Coil Data	12VDC	24 / 28VDC	36VDC	48VDC	60VDC	80VDC
Voltage range	9-16VDC	18-32VDC	27-48VDC	36-54VDC	45-68VDC	60-90VDC
Nominal voltage	12VDC	28VDC	36VDC	48VDC	60VDC	80VDC
Pick up voltage max.	9VDC	18VDC	27VDC	36VDC	45VDC	60VDC
Drop out voltage min.	≤ 2VDC	≤ 4VDC	≤ 5 VDC	≤ 8VDC	≤ 10VDC	≤ 10VDC
Coil resistance	9Ω ± 10%	36Ω ± 10%	97Ω ±10%	166Ω ± 10%	195Ω ± 10%	350Ω ± 10%
Coil current approx.	1.33A	0.78A	0.40A	0.30A	0.30A	0.23A
Coil power approx.	22W	22W	15W	16W	18W	19W

Operating times NO-Contact relay

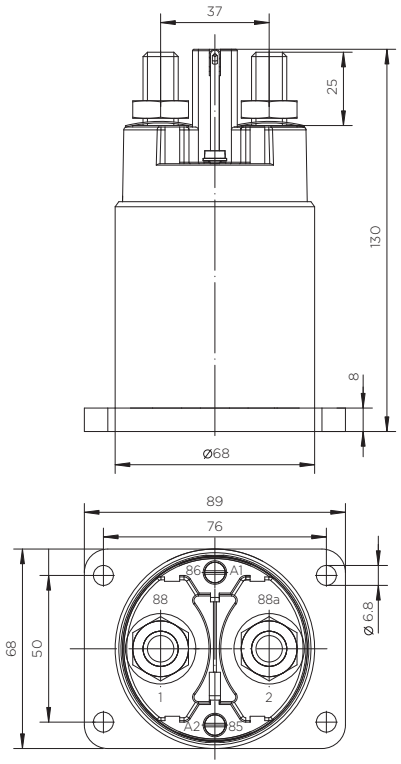
Operate	max. 60msec
Bounce	max. 5msec
Release	max. 30msec
Wire Section	min. 240mm² / 0.372 sq.inch / MCM 500
Mounting position	optional

Technical drawings

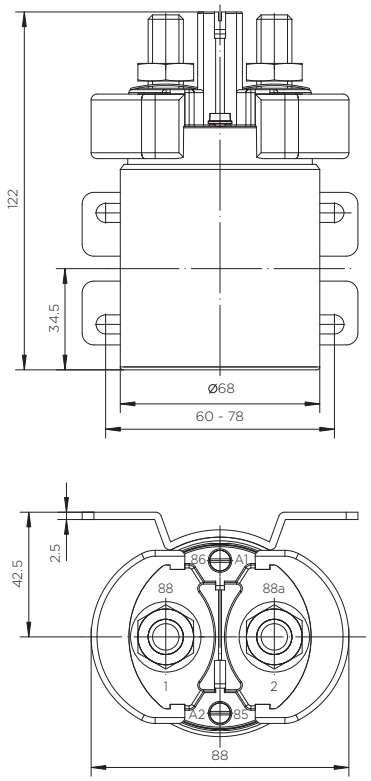
Side mounting



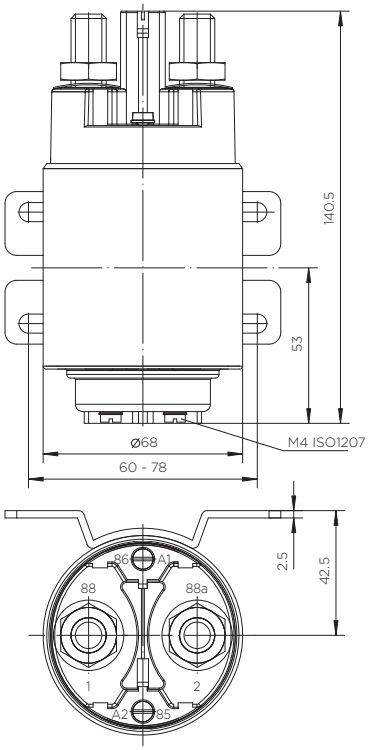
Bottom mounting



Options: Magnetic blowout



Options: Auxiliary contact



Ordering Information

Part Number
example: 29.511.02
29.5__.___

Current

5	Current 500A

Contacts

1	Make Contact NO

Mounting

1	Standard side mounting
3	Bottom mounting

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting and NO/NC relay

Coil voltage

1	12V
2	24 / 28V
3	36V
4	48V
6	60V
8	80V

Suppression

0	Without suppression
1	With suppression

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KISSLING
SINGLE POLE BI-STABLE RELAYS

Series 30 / 120A - from TE Connectivity (TE)

The series 30 bi-stable relay meets even the most difficult operating requirements and is suited for various applications in severe conditions on commercial vehicles, buses, construction & agricultural vehicles, ground support equipment and fork lifts.

These relays are available with a wide variety of configuration options including different contact configurations and coil voltages to have the right product for your needs.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion. Furthermore, our relays are characterized by high shock and vibration characteristics and a low voltage drop.

By equipping the relays with blow-out magnets, contact voltages up to 250VDC are possible. The use of blow-out magnets is recommended for contact voltages over 40VDC and blow-out magnets are also recommended for inductive load applications to maintain long contact life at all voltages.

Features

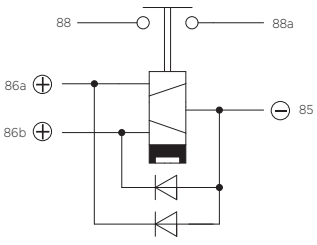
- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

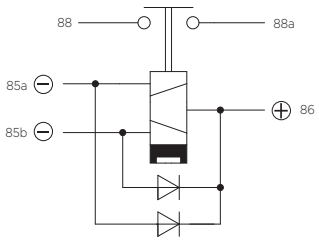
Circuits

NO-Contact
Standard type
common -



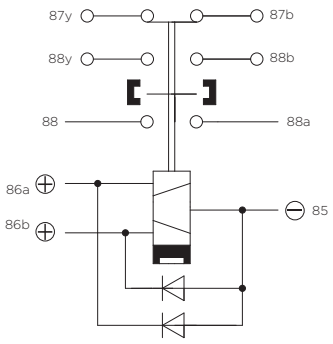
Suppression diode
30-100-50

NO-Contact
Special type reversed polarity
common +



Suppression diode
30-100-59

NO-Contact
Auxiliary contact / Magnetic blowout



Suppression diode
30-100-50

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M3,5 = 1.1 - 1.2Nm | M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	120A
Overload	1000A - 1sec / 250A - 20sec

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 200A
Mechanical life	100.000 cycles

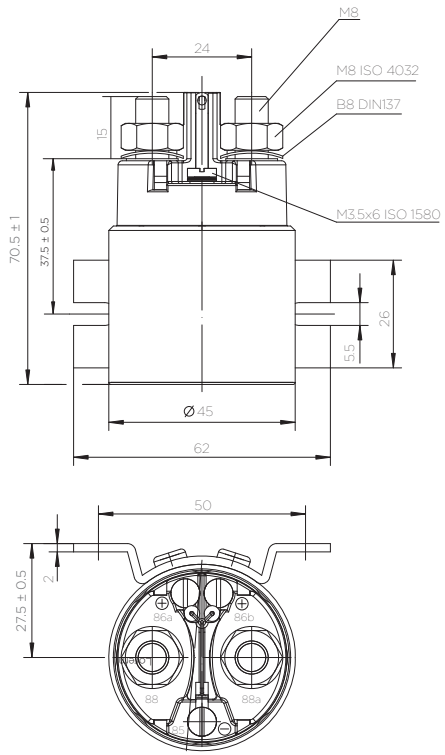
Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pick up voltage	≥ 9VDC	≥ 13VDC
Drop out voltage min.	≥ 7VDC	≥ 10VDC
Pull in coil resistance	2.1Ω ± 20%	9.0Ω ± 20%
Pull in current approx.	5.7A	2.7A
Drop out coil resistance	2.4Ω ± 20%	10Ω ± 20%
Drop out current approx.	4.9A	2.4A
Pick up impulse time approx. (continuous impulse max.1 min)	50ms	50ms
Drop out impulse time approx. (continuous impulse max.1 min)	50ms	50ms

Operating times NO-Contact relay

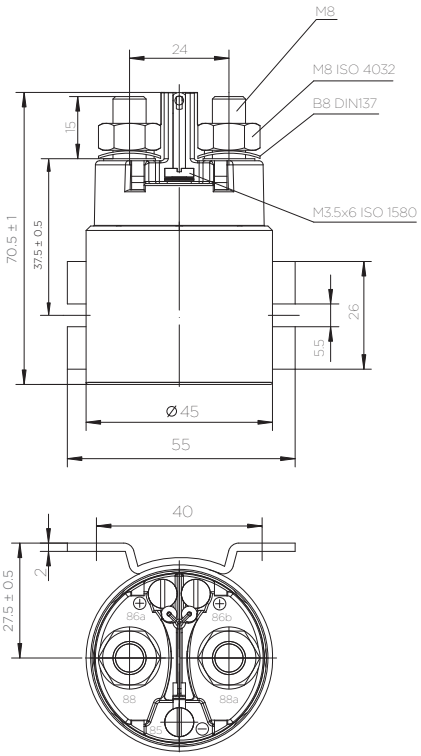
Operate	15msec
Bounce	5msec
Release	10msec
Wire Section	min. 25mm² / 0.039 sq.inch / AWG 3
Mounting position	optional

Technical drawings

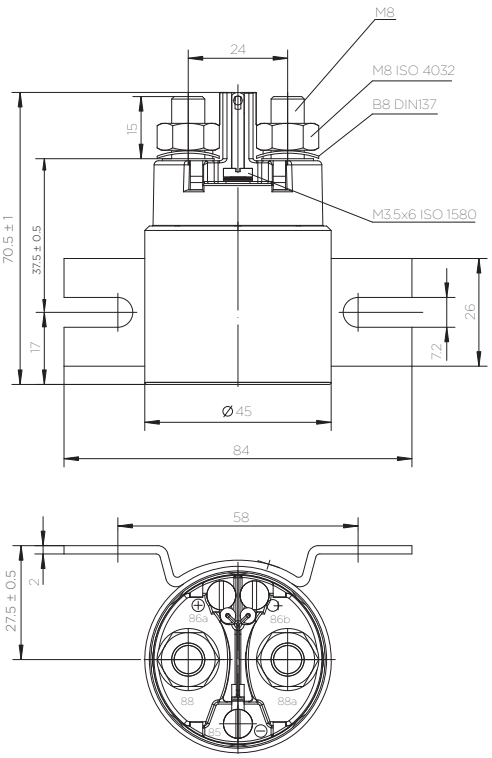
Standard side mounting



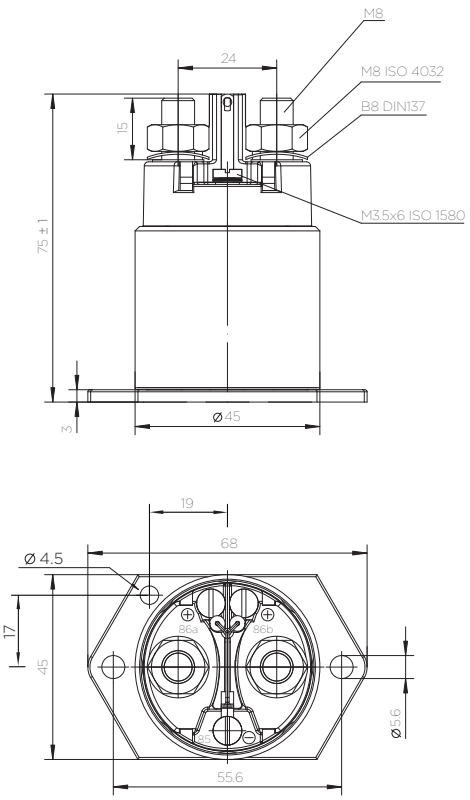
Short form side mounting



Long form side mounting

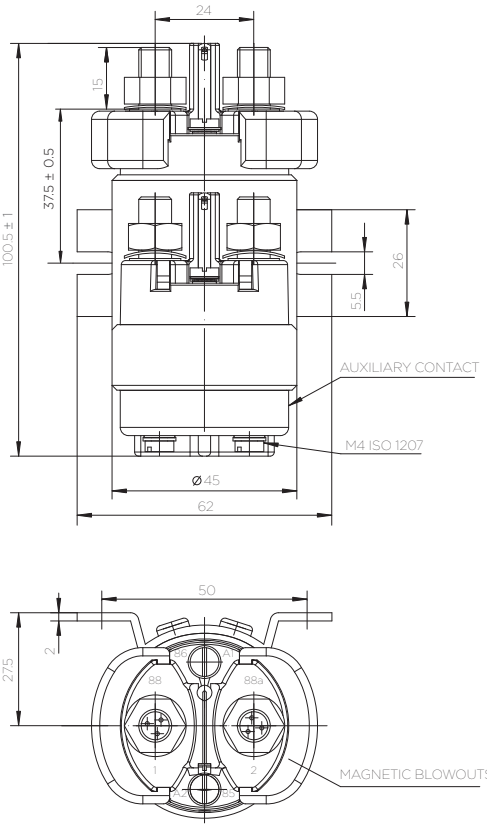


Bottom mounting



Options:

Auxiliary contacts, magnetic blowouts



Ordering Information

Part Number
example: 30.111.02
30.1__.___

Current

1	Current 120A

Contacts

1	Make contact NO

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts* Make and Break = 2A Continuous current = 2AMP
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Coil voltage

1	12V
2	24 / 28V

Suppression

0	Without suppression
1	With suppression

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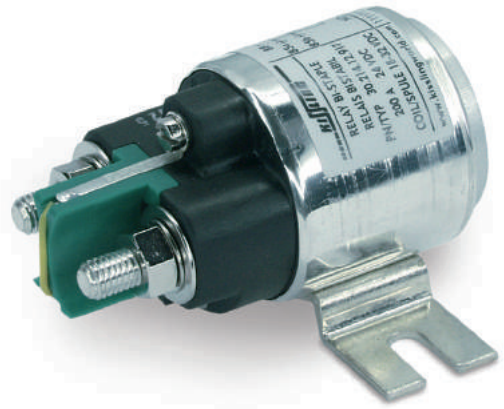


KISSLING
SINGLE POLE BI-STABLE RELAYS

Series 30 / 200A - from TE Connectivity (TE)

The series 30 bi-stable relay meets even the most difficult operating requirements and is suited for various applications in severe conditions on commercial vehicles, buses, construction & agricultural vehicles, ground support equipment and fork lifts.

These relays are available with a wide variety of configuration options including different contact configurations and coil voltages to have the right product for your needs.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion. Furthermore, our relays are characterized by high shock and vibration characteristics and a low voltage drop.

By equipping the relays with blow-out magnets, contact voltages up to 250VDC are possible. The use of blow-out magnets is recommended for contact voltages over 40VDC and blow-out magnets are also recommended for inductive load applications to maintain long contact life at all voltages.

Features

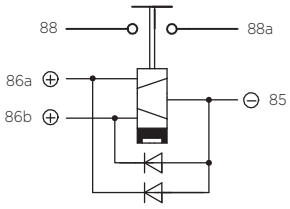
- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

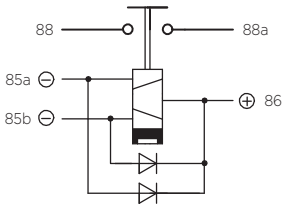
Circuits

NO-Contact
Standard type



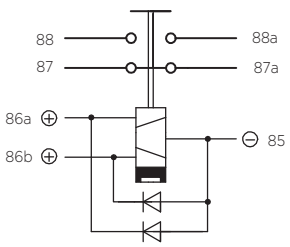
Suppression diode
30-200-50

NO-Contact
Special type
reversed polarity



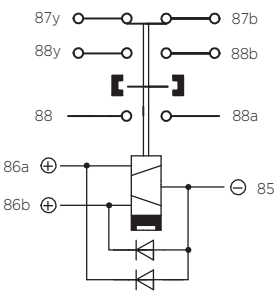
Suppression diode
30-200-59

NO/NC-Contact



Suppression diode
30-200-50

NO-Contact
Auxiliary contact
/ Magnetic blowout



Suppression diode
30-200-50

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	200A
Overload	1600A - 1sec / 400A - 20sec

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 200A
Mechanical life	100.000 cycles

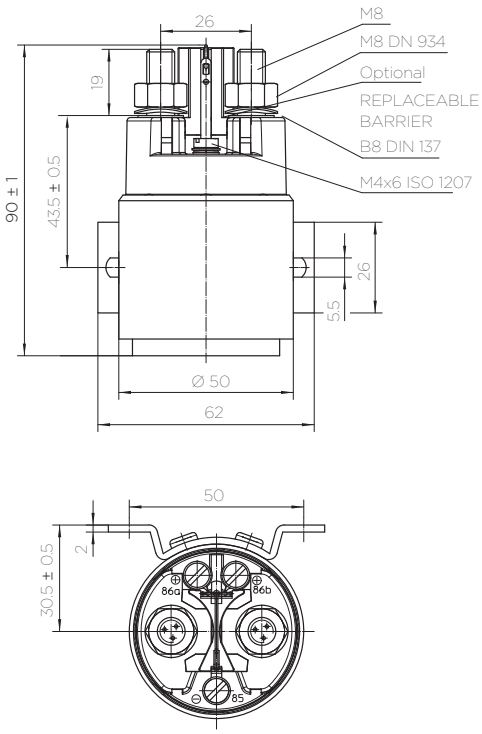
Coil Data	12VDC	24 / 28VDC	24VDC NO/NC	36VDC
Voltage range	9-16VDC	18-32VDC	18-32VDC	27-48VDC
Nominal voltage	12VDC	28VDC	24VDC	36VDC
Pick up voltage	≥ 9VDC	≥ 13VDC	≥ 13VDC	≥ 20VDC
Drop out voltage min.	≥ 7VDC	≥ 10VDC	≥ 10VDC	≥ 15VDC
Pull in coil resistance	1.8Ω ± 20%	7.8Ω ± 20%	4.1Ω ± 20%	18Ω ± 20%
Pull in current approx.	6.6A	3.0A	5.8A	approx. 1.9A
Drop out coil resistance	2.0Ω ± 20%	8.4Ω ± 20%	6.4Ω ± 20%	21.8Ω ± 20%
Drop out current approx.	6.0A	2.8A	3.7A	approx. 1.6A
Pick up impulse time approx.*	50ms	50ms	50ms	50ms
Drop out impulse time approx.*	50ms	50ms	50ms	50ms

* (continuous impulse max.1 min)

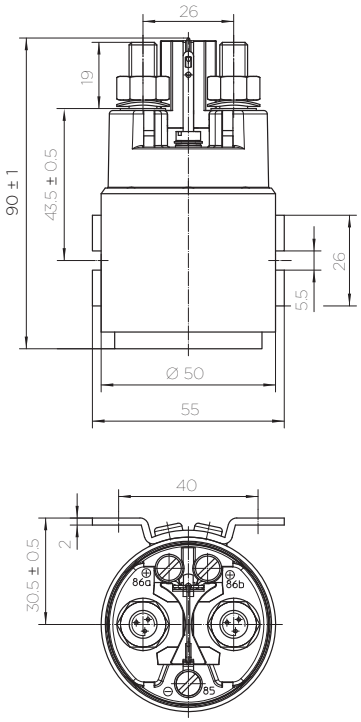
Operating times	NO-Contact	Changeover NO-Contact	Changeover NC-Contact
Operate	max. 15msec	max. 25msec	max. 30msec
Bounce	max. 5msec	max. 5msec	max. 8msec
Release	max. 10msec	max. 20msec	max. 35msec
Wire Section	min. 70mm² / 0.109 sq.inch / AWG 2-0		
Mounting position	optional		

Technical drawings

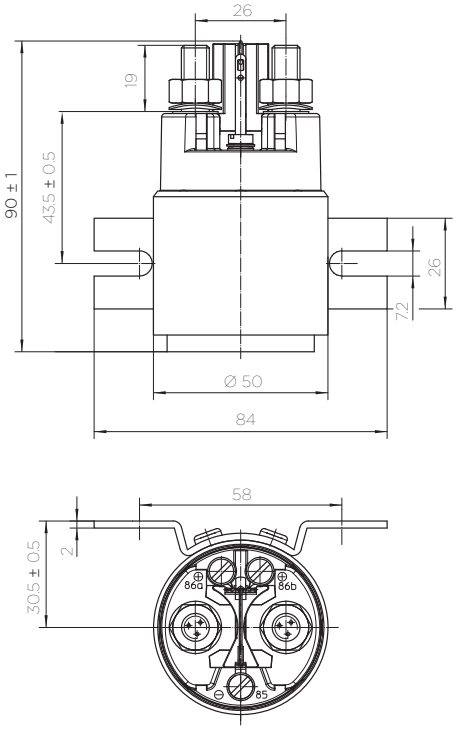
Standard side mounting



Short form side mounting

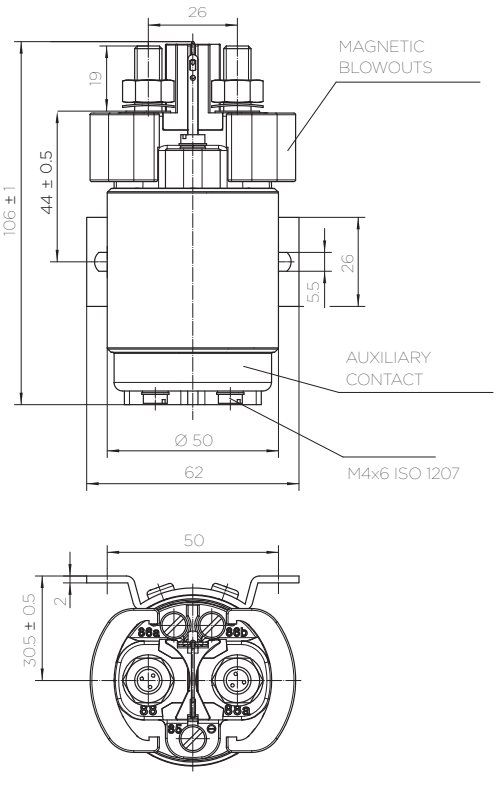


Long form side mounting

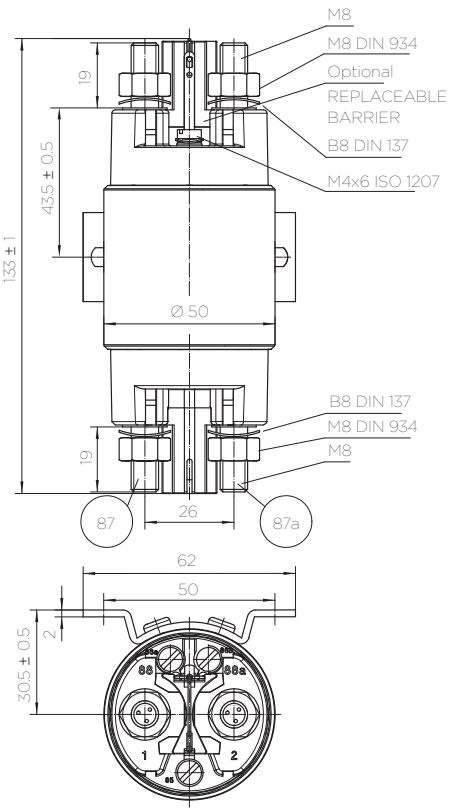


Options:

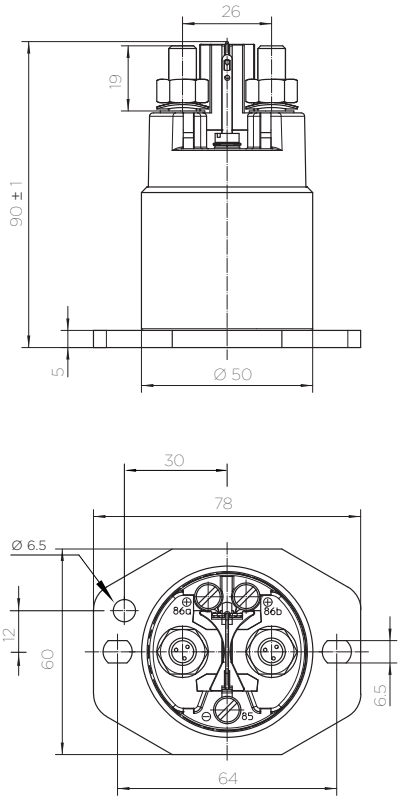
Auxiliary contacts, magnetic blowouts



Change-over NO/NC



Bottom mounting



Ordering Information

Part Number
example: 30.211.02
30.2__.___

Current

2	Current 200A

Contacts

1	Make contact NO
2	Change over NO/NC*

* Only mounting type 1 possible

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts* Make and Break = 2A Continuous current = 2AMP
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Coil voltage

1	12V
2	24 / 28V

Suppression

0	Without suppression
1	With suppression

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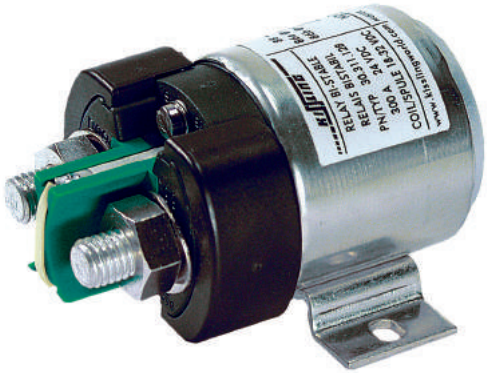

KISSLING
SINGLE POLE BI-STABLE RELAYS

Series 30 / 300A - from TE Connectivity (TE)

The series 30 bi-stable relay meets even the most difficult operating requirements and is suited for various applications in severe conditions on commercial vehicles, buses, construction & agricultural vehicles, ground support equipment and fork lifts.

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Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion. Furthermore, our relays are characterized by high shock and vibration characteristics and a low voltage drop.

By equipping the relays with blow-out magnets, contact voltages up to 250VDC are possible. The use of blow-out magnets is recommended for contact voltages over 40VDC and blow-out magnets are also recommended for inductive load applications to maintain long contact life at all voltages.

Features

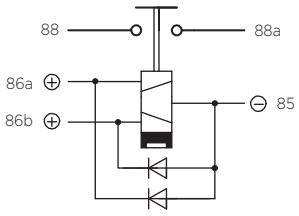
- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

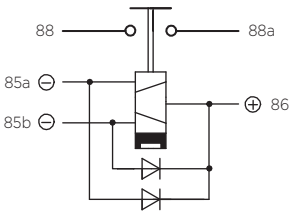
Circuits

NO-Contact
Standard type
common -



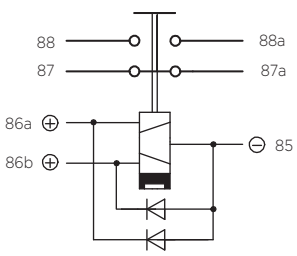
Suppression diode
30-200-50

NO-Contact
Special type reversed polarity
common +



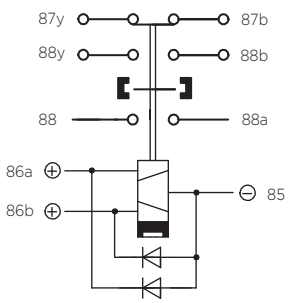
Suppression diode
30-200-59

NO/NC-Contact



Suppression diode
30-200-50

NO-Contact
Auxiliary contact
/ Magnetic blowout



Suppression diode
30-200-50

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 300A
Mechanical life	100.000 cycles

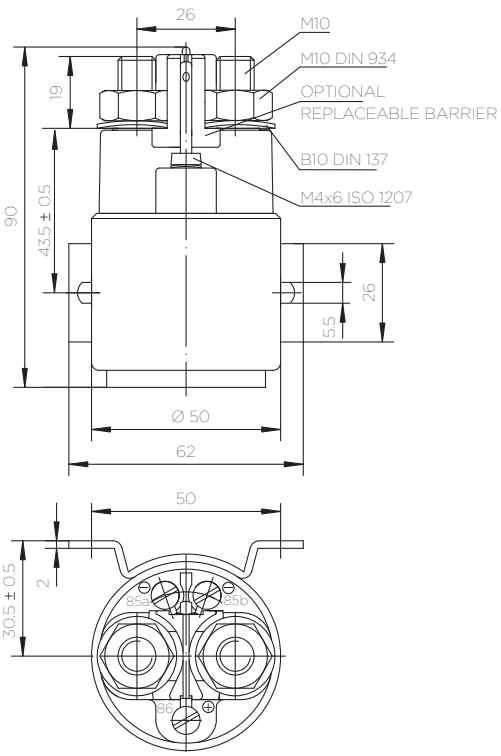
Coil Data	12VDC	24 / 28VDC	24VDC NO/NC	36VDC
Voltage range	9-16VDC	18-32VDC	18-32VDC	27-48VDC
Nominal voltage	12VDC	28VDC	28VDC	36VDC
Pick up voltage	≥ 9VDC	≥ 13VDC	≥ 13VDC	≥ 20VDC
Drop out voltage min.	≥ 7VDC	≥ 10VDC	≥ 10VDC	≥ 15VDC
Pull in coil resistance	1.8Ω ± 20%	7.8Ω ± 20%	4.1Ω ± 20%	18Ω ± 20%
Pull in current approx.	6.6A	3.0A	6.8A	approx. 1.9A
Drop out coil resistance	2.0Ω ± 20%	8.4Ω ± 20%	6.4Ω ± 20%	21.8Ω ± 20%
Drop out current approx.	6.0A	2.8A	4.4A	approx. 1.6A
Pick up impulse time approx.*	50ms	50ms	50ms	50ms
Drop out impulse time approx.*	50ms	50ms	50ms	50ms

* (continuous impulse max.1 min)

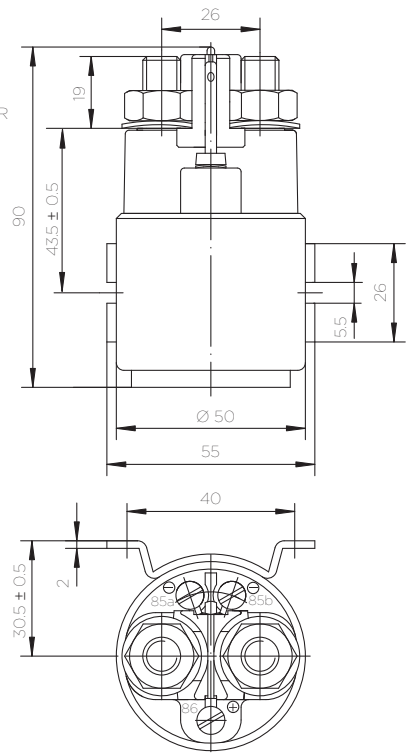
Operating times	NO-Contact	Changeover NO-Contact	Changeover NC-Contact
Operate	max. 15msec	max. 25msec	max. 30msec
Bounce	max. 5msec	max. 5msec	max. 8msec
Release	max. 10msec	max. 20msec	max. 35msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0		
Mounting position	optional		

Technical drawings

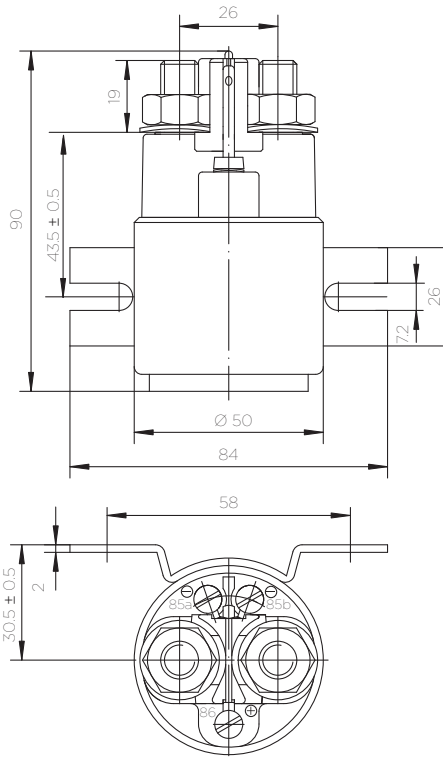
Standard side mounting



Short form side mounting

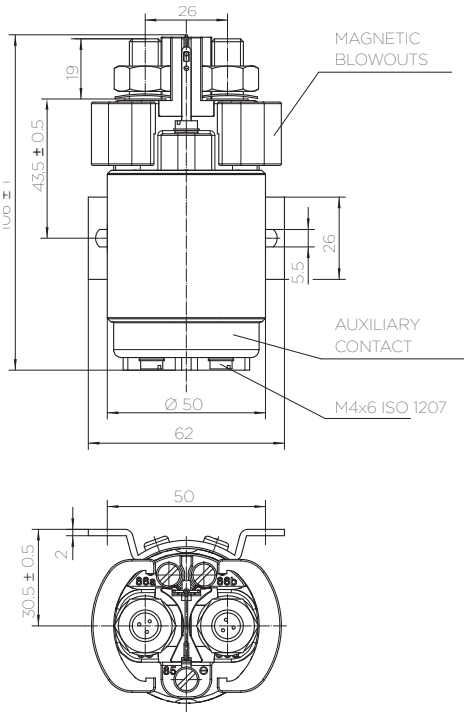


Long form side mounting

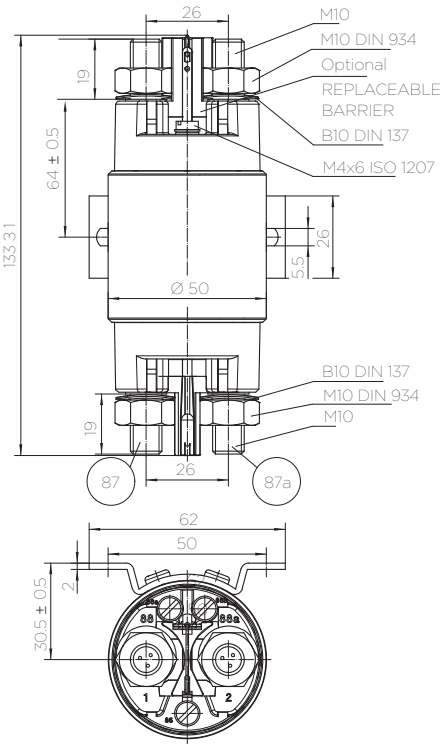


Options:

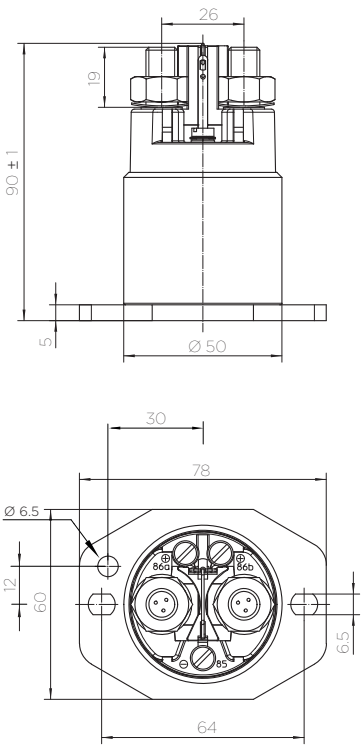
Auxiliary contacts, magnetic blowouts



Change-over NO/NC



Bottom mounting



Ordering Information

Part Number
example: 30.311.02
30.3__.___

Current

2	Current 300A

Contacts

1	Make contact NO
2	Change over NO/NC*

* Only mounting type 1 possible

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Options

A	Auxiliary contacts* Make and Break = 2A Continuous current = 2AMP
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Coil voltage

1	12V
2	24 / 28V

Suppression

0	Without suppression
1	With suppression

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K1166709 | Version 08/2020

KISSLING
DOUBLE POLE BI-STABLE RELAYS

Series 30 / 2 x 300A - from TE Connectivity (TE)

The KISSLING series 30 double pole bistable power relay was developed to extend our relay portfolio of the high-end power relay series.

These relays are available with a wide variety of configuration options including different contact configurations and coil voltages to have the right product for your needs.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion. Furthermore, our relays are characterized by high shock and vibration characteristics and a low voltage drop.

The robust design of our double pole bistable power relays provides a sealing rate of IP67 and IP6K9K (steam pressure cleaning) in accordance with IEC 60529 and DIN 40050-9. Relays from this series are available in the following continuous current ranges: 2 x 300 Amps.

Features

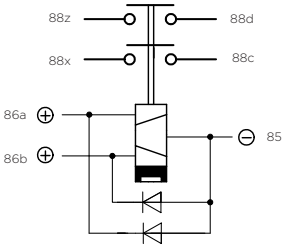
- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

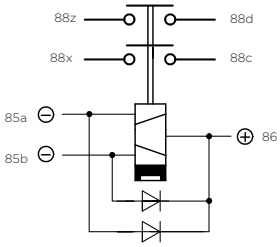
Circuits

NO-Contact
Standard type



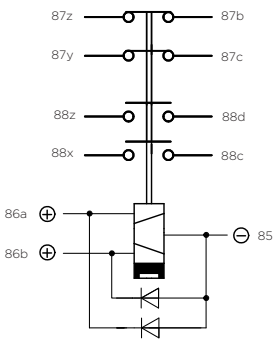
Suppression diode
30-340-50

NO-Contact
Special type reversed polarity



Suppression diode
30-340-59

NO/NC-Contact



Suppression diode
30-340-50

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	2 x 300A
Overload	2 x 2400A - 1sec / 2 x 600A - 20sec

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 300A
Mechanical life	100.000 cycles

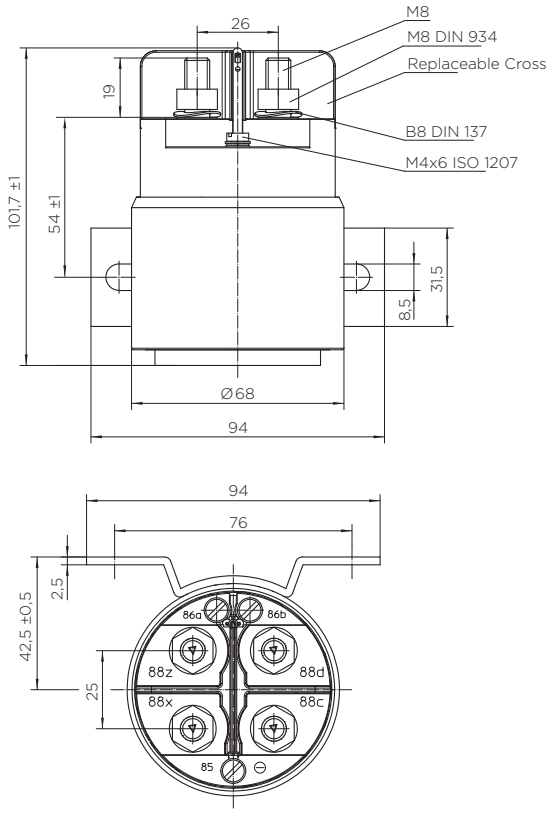
Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	24-28VDC
Pick up voltage	≥ 9VDC	≥ 13VDC
Drop out voltage min.	≥ 7VDC	≥ 10VDC
Pull in coil resistance	0.6Ω ± 20%	2.7Ω ± 20%
Pull in current approx.	20A	10A
Drop out coil resistance	0.85Ω ± 20%	3.8Ω ± 20%
Drop out current approx.	14A	7.3A
Pick up impulse time approx. (continuous impulse max.1 min)	50ms	50ms
Drop out impulse time approx. (continuous impulse max.1 min)	50ms	50ms

Operating times NO-Contact relay

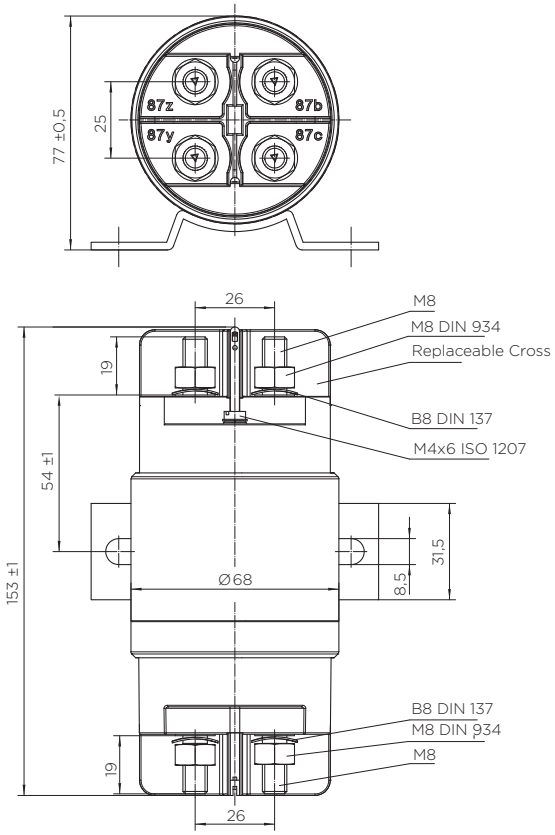
Operate	max. 25msec
Bounce	max. 5msec
Release	max. 10msec
Wire Section	min. 95mm² / 0.147sq.inch / AWG 4-0
Mounting position	optional

Technical drawings

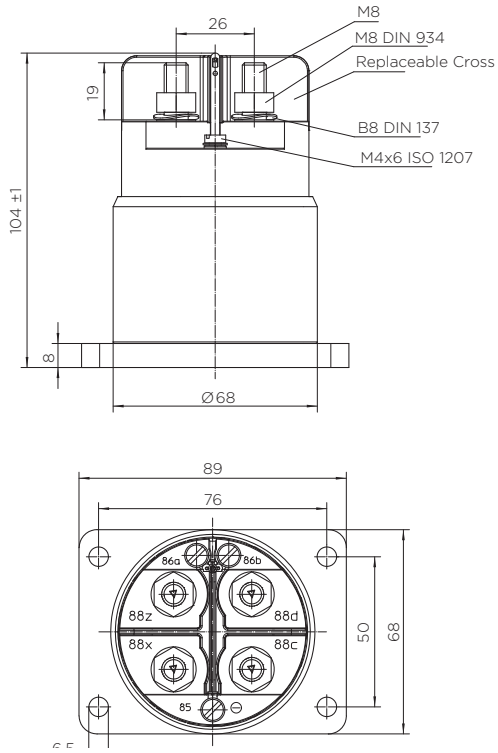
Standard side mounting

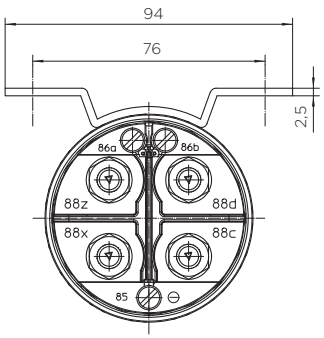


Double Pole Change-over NO/NC



Bottom mounting





Ordering Information

Part Number
example: 30.341.02
30.3__.___

Current

3	Current 300A

Contacts

4	Make contact NO
5	Change over NO/NC*

* Only standard side mounting

Mounting

1	Standard side mounting
3	Bottom mounting

Options

A	Auxiliary contacts*

* Not possible for bottom-mounting relays / special types on request

Coil voltage

1	12V - short duration
2	24/28V

Suppression

0	Without suppression
1	With suppression

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K1166710 | Version 08/2020

KISSLING
SINGLE POLE BI-STABLE RELAYS

Series 30 / 500A - from TE Connectivity (TE)

The series 30 bi-stable relay meets even the most difficult operating requirements and is suited for various applications in severe conditions on commercial vehicles, buses, construction & agricultural vehicles, ground support equipment and fork lifts.

These relays are available with a wide variety of configuration options including different contact configurations and coil voltages to have the right product for your needs.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and the housing are protected against corrosion. Furthermore, our relays are characterized by high shock and vibration characteristics and a low voltage drop.

By equipping the relays with blow-out magnets, contact voltages up to 250VDC are possible. The use of blow-out magnets is recommended for contact voltages over 40VDC and blow-out magnets are also recommended for inductive load applications to maintain long contact life at all voltages.

Features

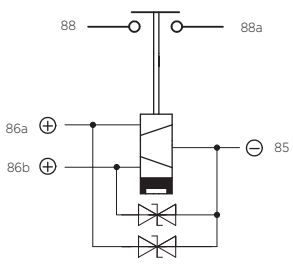
- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- Main contact current rated for continuous current and 100% duty cycle

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

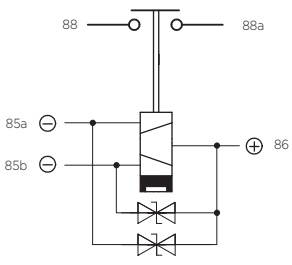
Circuits

NO-Contact
Standard type
common -



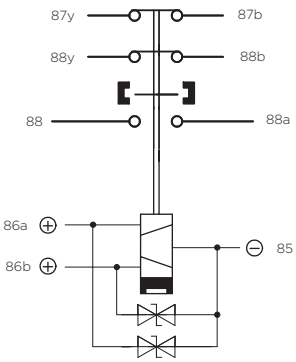
Suppression diode
30-500-50

NO-Contact
Special type reversed polarity
common +



Suppression diode
30-500-50

NO-Contact
Auxiliary contact / Magnetic blowout



Suppression diode
30-500-50

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M12 = 18 - 22Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	500A
Overload	4000A - 1sec / 1800A - 20sec

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 200A
Mechanical life	100.000 cycles

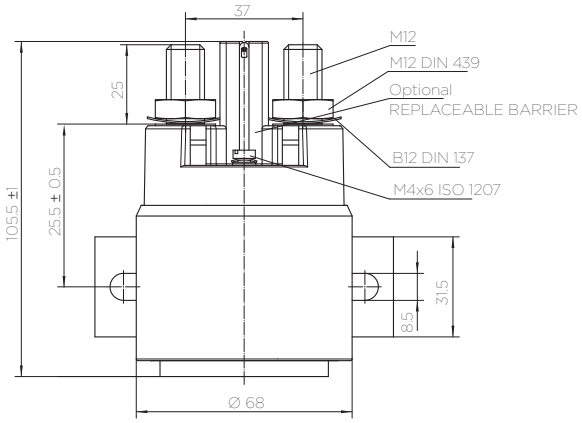
Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pick up voltage	≥ 9VDC	≥ 13VDC
Drop out voltage min.	≥ 7VDC	≥ 10VDC
Pull in coil resistance	0.6Ω ± 20%	2.7Ω ± 20%
Pull in current approx.	20A	10A
Drop out coil resistance	0.85Ω ± 20%	3.8Ω ± 20%
Drop out current approx.	14A	7.3A
Pick up impulse time approx. (continuous impulse max.1 min)	50ms	50ms
Drop out impulse time approx. (continuous impulse max.1 min)	50ms	50ms

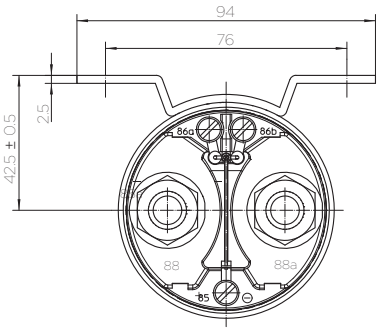
Operating times NO-Contact relay

Operate	max. 25msec
Bounce	max. 5msec
Release	max. 10msec
Wire Section	min. 240mm² / 0.372 sq.inch / MCM500
Mounting position	optional

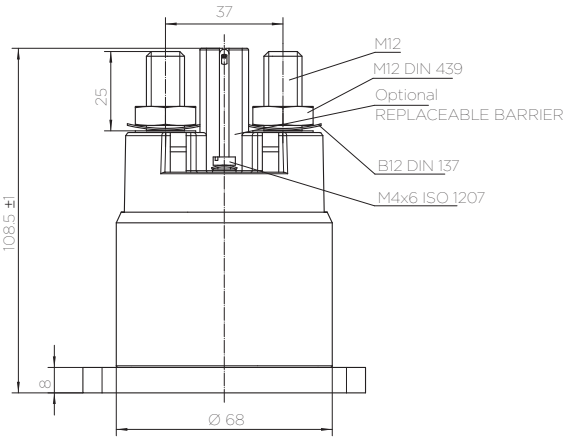
Technical drawings

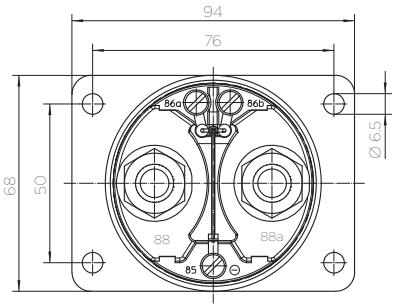
Standard side mounting



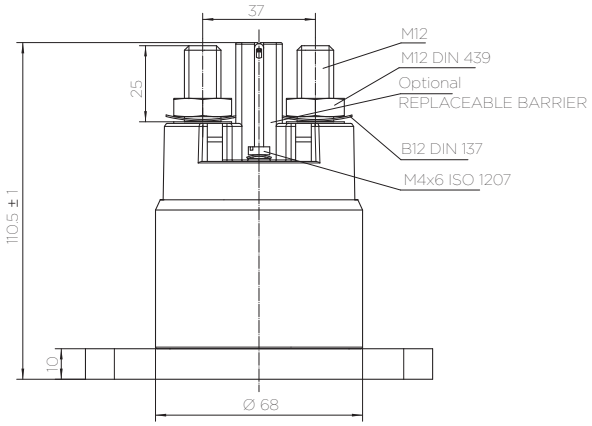


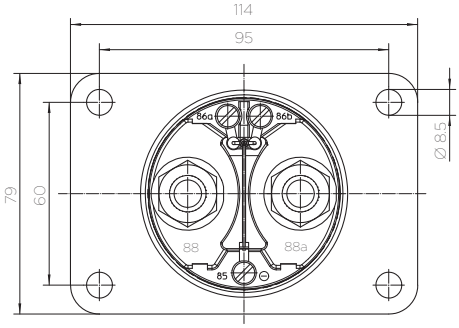
Bottom mounting





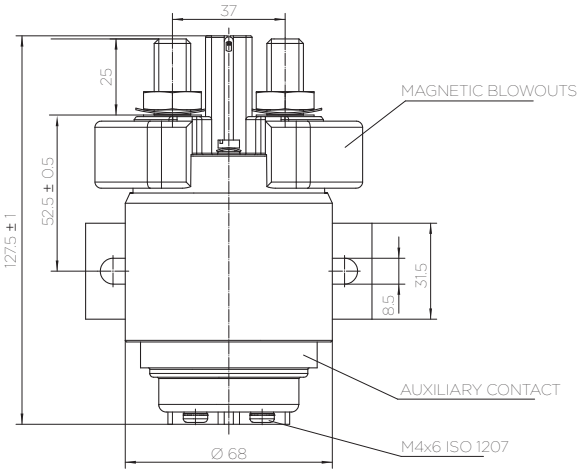
Bottom mounting tall

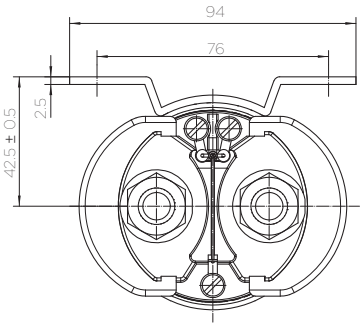




Options:

Auxiliary contacts, magnetic blowouts





Ordering Information

Part Number
example: 30.511.02
30.5__.___

Current

5	Current 500A

Contacts

1	Make contact NO

Mounting

1	Standard side mounting
3	Bottom mounting

Options

A	Auxiliary contacts* Make and Break = 2A Continuous current = 2AMP
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Coil voltage

1	12V
2	24 / 28V

Suppression

0	Without suppression
1	With suppression

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K1166711 | Version 08/2020

KISSLING BI-STABLE RELAYS WITH INTERNAL CONTROL ELECTRONICS

Series 31 / SAFETY - from TE Connectivity (TE)

Our series 31 bi-stable power relay with internal control electronics is based on the Series 30 industrial relay and has all of the same quality mechanical and electrical switching characteristics - but also features additional electronic functions.

This relay is particularly well suited for battery management and power distribution applications on commercial vehicles, buses, construction & agricultural vehicles, ground support equipment and lift trucks.

The robust design of our bi-stable relays provides a sealing rate of IP67 and IP6K9K (steam pressure cleaning) in accordance with IEC 60529 and DIN 40050-9. The series 31 includes power relays in nominal voltages of 12 & 24 V and nominal continuous amperages of 300 Amps. Contact voltages up to 250VDC with magentical blowout (>40VDC).

Features

- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

Elektronic Safety-Control

The technical principle of this relay is a reliability proven two coil device with a Pull In and Drop Out coil with a powerless permanent magnetic holding.

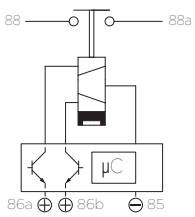
An impulse into the respective coil switches the relay into an “On” or “Off” position. The electronic function protects against incorrect actuation which therefore prevents overheating or damage to any component parts.

The minimum pick up impulse time is approximately 250ms and continuous signals will not cause any damage.

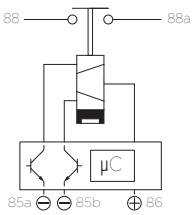
The electronic board integrates under voltage function that eliminates critical mechanic actuation, a suppression diodes, short circuit and polarity protection.

Circuits

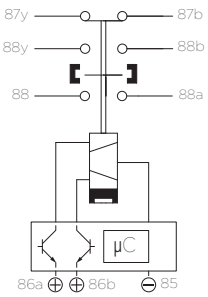
NO-Contact (S)
Standard type



NO-Contact (S-P)
Special type



NO-Contact
Auxiliary contact /
Magnetic blowout



Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec
Quiescent current	approx. 2mA

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 300A
Mechanical life	100.000 cycles

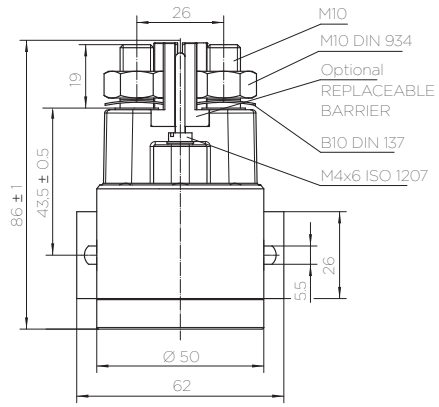
Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pick up voltage	9VDC	18VDC
Pull in current	5.7A, 50ms	3.3A, 50ms
Drop out current	6.0A, 50ms	3.5A, 50ms

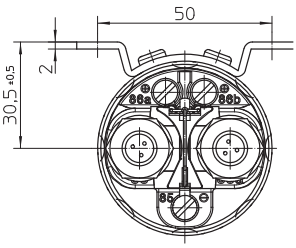
Operating times

Pick up incl. bounce and running time µC	approx. 250msec
Drop out incl. running time µC	approx. 250msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0
Mounting position	optional

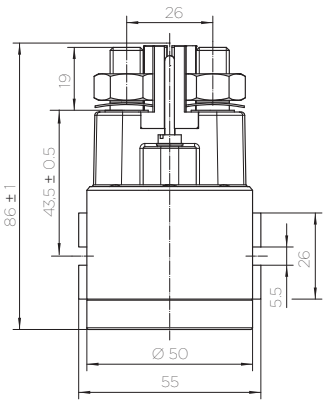
Technical drawings

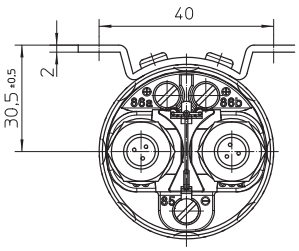
Standard side mounting



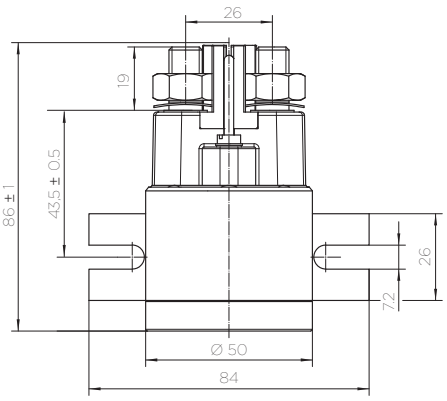


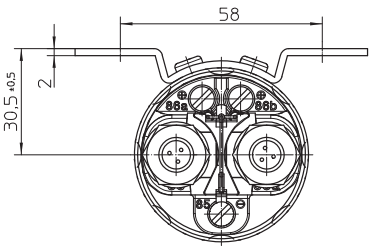
Short form side mounting





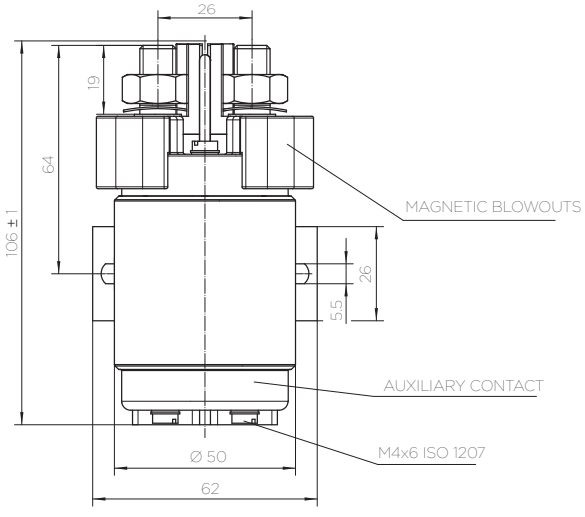
Long form side mounting

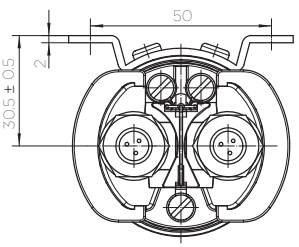




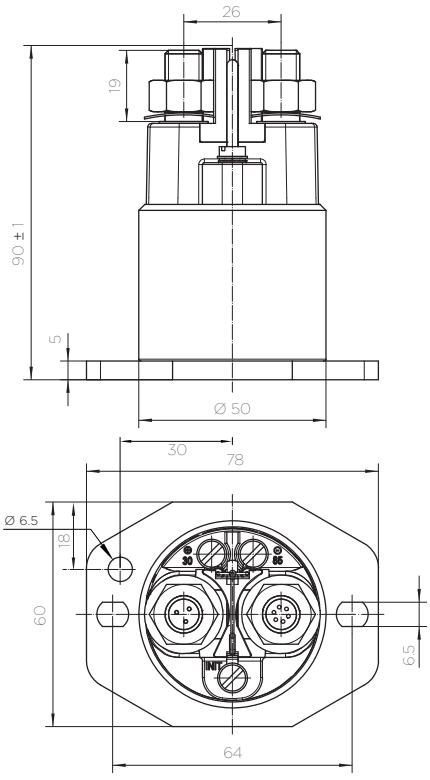
Options:

Auxiliary contacts, magnetic blowouts





Bottom mounting



Ordering Information

Part Number
example: 31.311.12.S
31.3__.1_.S._

Current

3	Current 300A

Contacts

1	Make contact NO

Mounting

1	Standard side mounting
2	Short form side
3	Bottom mounting
4	Long form side

Suppression

1	Suppression (integrated)

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Switching function SAFETY

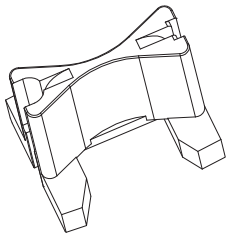
S	Standard type com-
S-P	Special type com+

Coil voltage

1	12V
2	24 / 28V

Accessories

Replaceable barrier
29-200-55



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K1166721 | Version 08/2020

KISSLING BI-STABLE RELAYS WITH INTERNAL CONTROL ELECTRONICS

Series 31 / INIT - from TE Connectivity (TE)

Our series 31 bi-stable power relay with internal control electronics is based on the Series 30 industrial relay and has all of the same quality mechanical and electrical switching characteristics - but also features additional electronic functions.

This relay is particularly well suited for battery management and power distribution applications on commercial vehicles, buses, construction & agricultural vehicles, aircraft, ground support equipment and lift trucks.

Our robust design of our bi-stable relays provides a sealing rate of IP67 and IP6K9K (steam pressure cleaning) in accordance with IEC 60529 and DIN 40050-9. The series 31 includes power relays in nominal voltages of 12 & 24 V and nominal continuous amperages of 300 Amps. Contact voltages up to 250VDC with magentical blowout (>40VDC).

Features

- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

Electronic INIT-Control

The basic principle of the relay is a reliability proven two coil device with a “Pull In” and “Drop Out” coil with a powerless permanent magnetic holding.

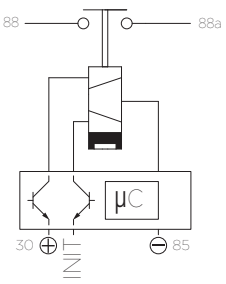
At the clamp 30(+) and 85(–) applied the permanent-supply. The selection ensured powerless from INIT-imput.

A HIGH-level activate the relay, a LOW-level disconnect it. If the monostable activation keep use, the INIT- activation is an advantage.

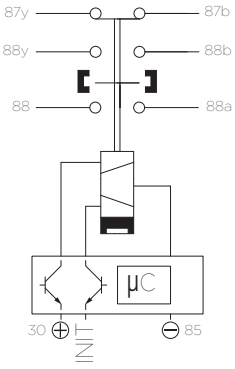
The electronics are short-circuit protected and feature safety coil selection, reverse polarity protection and coil cancellation. The integrated undervoltage protector secures the relay against undefined operating conditions.

Circuits

NO-Contact
Standard type



NO-Contact
Auxiliary contact /
Magnetic blowout



Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec
Quiescent current	approx. 2mA

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 300A
Mechanical life	100.000 cycles

Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pull in current	5.7A, 50ms	2.9A, 50ms
Drop out current	6.0A, 50ms	3.0A, 50ms

Control input INIT

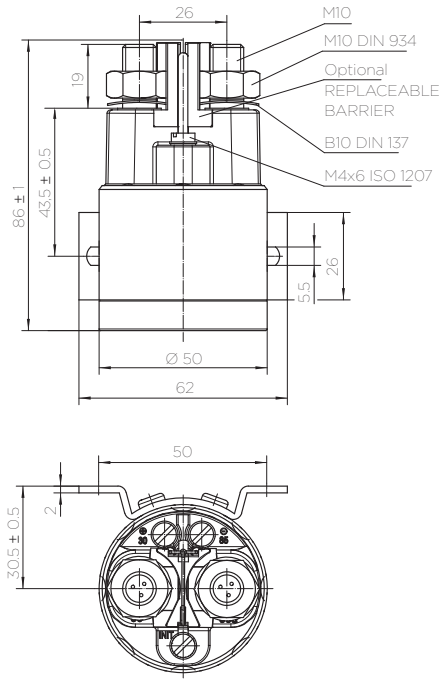
Control signal	active high
Drop out current	LOW < 0,5VDC / HIGH > 5VDC | LOW < 5VDC / HIGH > 9VDC

Operating times

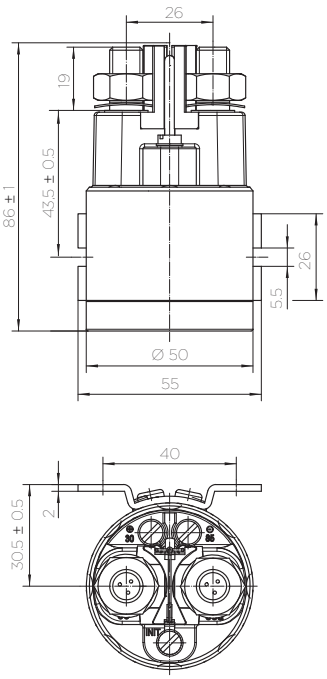
Pick up incl. bounce and running time µC	approx. 150msec
Drop out incl. running time µC	approx. 150msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0
Mounting position	optional

Technical drawings

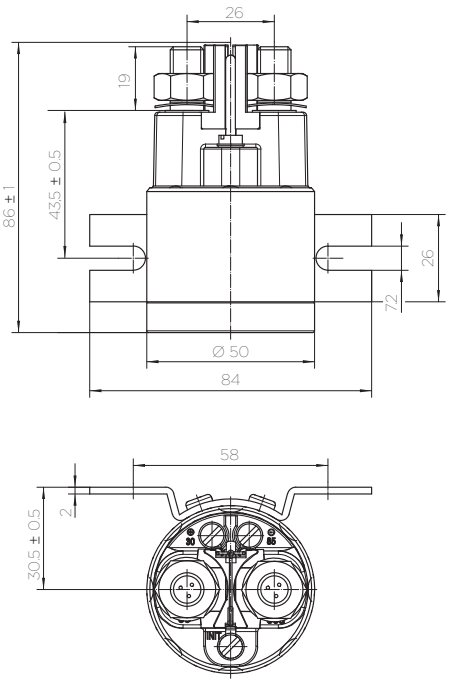
Standard side mounting



Short form side mounting

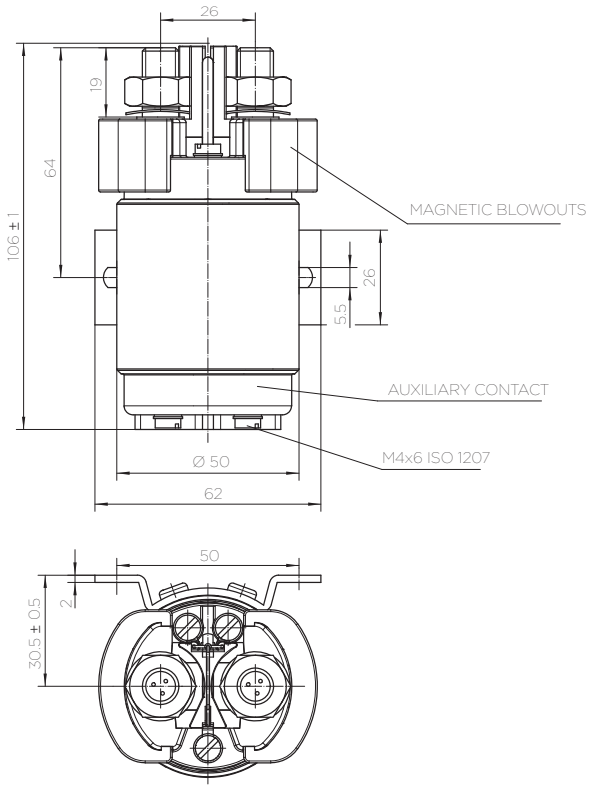


Long form side mounting

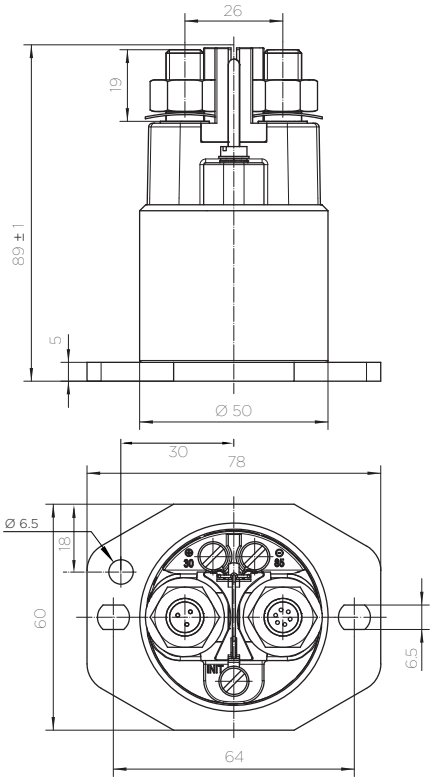


Options:

Auxiliary contacts, magnetic blowouts



Bottom mounting



Ordering Information

Part Number
example: 31.311.12.I
31.3__.1_.I._

Current

3	Current 300A

Contacts

1	Make contact NO

Mounting

1	Standard side mounting
2	Short form side
3	Bottom Mounting
4	Long form side

Suppression

1	Suppression (integrated)

Options

A	Auxiliary contacts*
B	Magnetic blowout (required over 40VDC)

* Not possible for bottom mounting

Switching function INIT

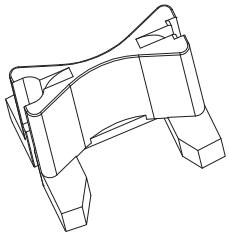
I	INIT

Coil voltage

1	12V
2	24 / 28V

Accessories

Replaceable barrier
29-200-55



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K1166719 | Version 08/2020

KISSLING BI-STABLE RELAYS WITH INTERNAL CONTROL ELECTRONICS

Series 31 / ENERGY - from TE Connectivity (TE)

Our series 31 bi-stable power relay with internal control electronics is based on the Series 30 industrial relay and has all the same quality mechanical and electrical switching characteristics - but also features additional electronic functions.

This relay is particularly well suited for battery management and power distribution applications on commercial vehicles, buses, construction & agricultural vehicles, aircraft, ground support equipment and lift trucks.

Our robust design of our bi-stable relays provide a sealing rate of IP67 and IP6K9K (steam pressure cleaning) in accordance with IEC 60529 and DIN 40050-9. The series 31 includes power relays in nominal voltages of 12 & 24 V and nominal continuous amperages of 300 Amps. Contact voltages up to 250VDC with magentical blowout (>40 VDC).

Features

- Sealed housing conforms to IP6K9K
- Robust design
- Variety of configuration options
- 6G shock and 4G vibration resistant
- “Energy” function for automatic shutoff in case of loss of power improves safety levels and reaction times in critical situations.

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

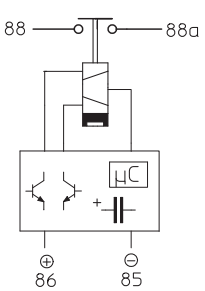
Electronic energy storage-control

The relay has only two control connections which make it possible to replace a standard monostable relay with a bi-stable relay providing the advantage of powerless holding.

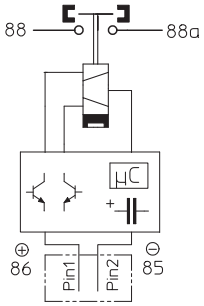
The internal capacitor is charged during the switch-on process. When the power supply is removed, the capacitor discharges the power into the drop out coil, which therefore switches off the relay. The characteristics of a standard bi-stable relay requires resupply of energy to drop out the coil. The electronics are short-circuit protected and feature safety coil selection, reverse polarity protection and coil cancellation.

Circuits

NO-Contact
Standard type



NO-Contact
Plugin connection /
Magnetic blowout



Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IEC 60529 / DIN 40050-9 / IP67 (0,2bar; 1min) and IP6K9K
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M4 = 2.0 - 2.2Nm | M10 = 15 - 20Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec
Quiescent current	approx. 2mA

Rated contact load	12 and 24 / 28VDC
Resistive load	50.000 cycles 300A
Mechanical life	100.000 cycles

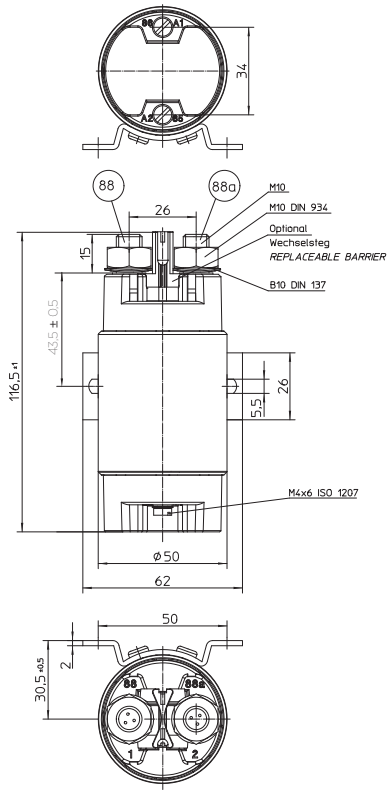
Coil Data	12VDC	24 / 28VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	28VDC
Pick up coil resistance	2.1Ω ± 20%	7.8Ω ± 20%
Drop out coil resisance	2.6Ω ± 20%	8.4Ω ± 20%

Operating times

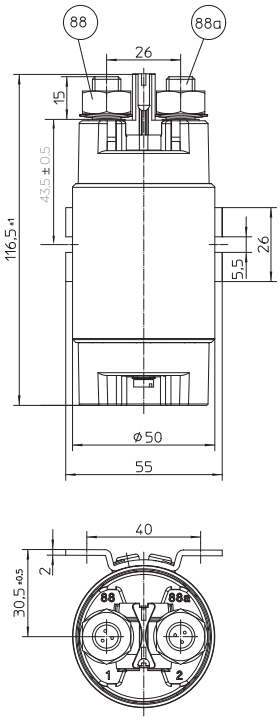
Min. pick up time	approx. 500msec
Bounce time	max. 5msec
Min. drop time	approx. 100msec
Wire Section	min. 95mm² / 0.147 sq.inch / AWG 4-0
Mounting position	optional

Technical drawings

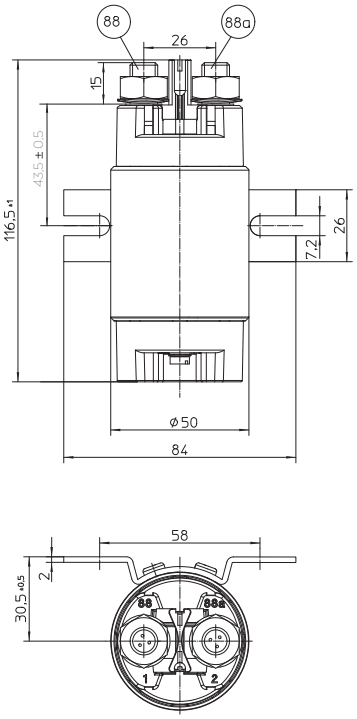
Standard side mounting



Short form side mounting

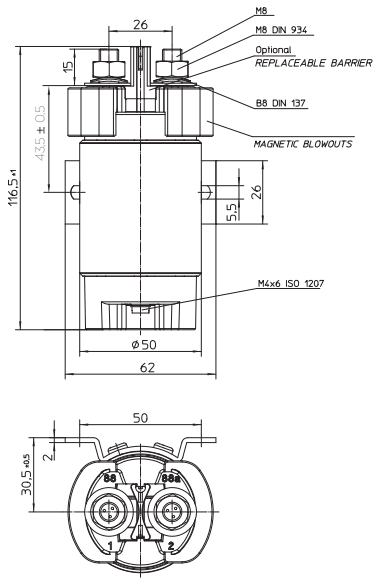


Long form side mounting



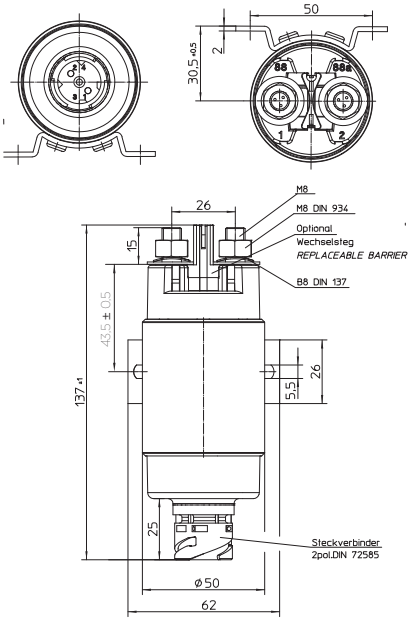
Options:

Magnetic blowouts



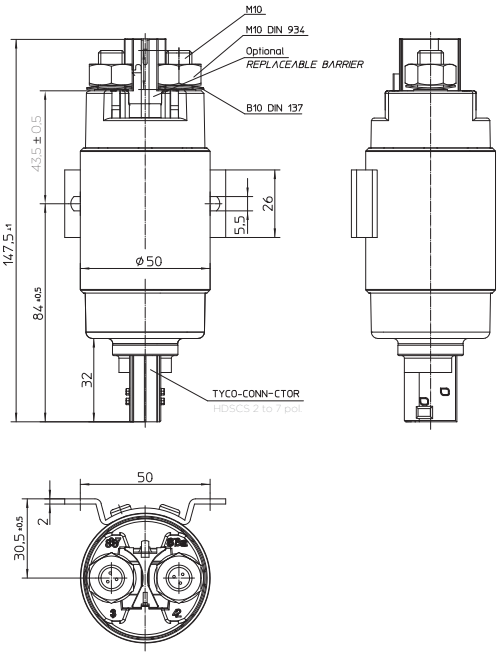
Options -9XX:

Bayonet connector DIN 72585



Options -9XX:

HDSCS connector



Ordering Information

Part Number
example: 31.311.12.E
31.3__.1_.E._

Current

3	Current 300A

Contacts

1	Make contact NO

Mounting

1	Standard side mounting
2	Short form side
4	Long form side

Suppression

1	Suppression (integrated)

Options

B	Magnetic blowout (required over 40VDC)
9xx	DIN Bayonet Connector
9xx	HDSCS Connector

* Not possible for bottom mounting

Switching function INIT

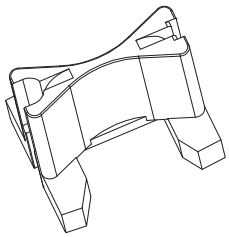
E	ENERGY

Coil voltage

1	12V
2	24 / 28V

Accessories

Replaceable barrier
29-200-55



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K1166718 | Version 08/2020

KISSLING
HIGH VOLTAGE CONTACTOR

Series 60 - from TE Connectivity (TE)

Power Switching in KISSLING Quality

The ongoing electrification in the automotive and special vehicle industry leads to new requirements for manufacturers of electric components. To achieve power levels similar to modern combustion engines in an electric vehicle, high voltage drive systems are unavoidable. Unfortunately, high voltages also cause switching arc problems when separating electric loads – which, if not handled properly can destroy switching contacts and shorten the switch life or even cause safety critical failures.

Features

- Without gas filling
- Overload up to 500 Amp
- Integrated PWM electronic controlling
- Contact voltage ≤ 800 VDC
- EMC E1 approval

Applications

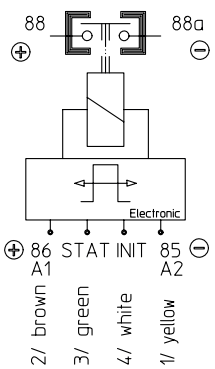
- Electric vehicles
- Industrial vehicles
- Military vehicles

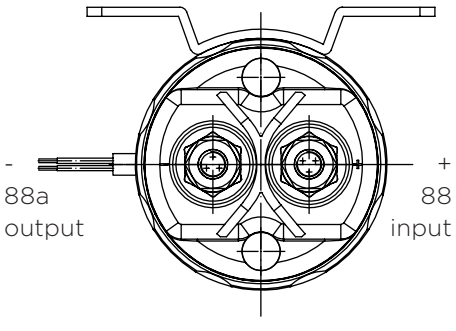
Maximum Safety

The high voltage contactor is optimized to meet the needs of the electric vehicle market and TE Connectivity - under its KISSLING brand offers relays and manual switches based on a non-gas-filled ceramic contact chamber. By avoiding the use of special gases in the contact chamber, we also avoid the risk of gas leaks, which would jeopardize the safe operational functionality of the switch. The biggest challenge for manufacturers is to minimize the burn time of the switching arc.

TE Connectivity has met this challenge with unique combination of blow out magnet positioning and ceramic chamber geometry coupled with a highly dynamic and efficient propulsion system, this combination of innovative design characteristics ensures a first-class product lifecycle.

Circuits





* for bidirektional application please contact engineering

INIT (control input)

Function relay ON/OFF (active high)

Control signal

- LOW < 5VDC
- HIGH > 9VDC

Debouncing approx. 25ms

STATUS (High-Side-Output)

Switches main power from 86 (bypass)

- HIGH = Contactor ON
- LOW = Contactor OFF

Max. 2A

Ordering Information

Description	Part Number
Series 60 /// 9-16 VDC	60-311-11
Series 60 /// 18-32 VDC	60-311-12

Specification

Technical Data

Temperature range	-40°C to +85°C
Shock	6g / 11msec
Vibration	4g / 50 - 2000Hz
Thread sizes / Torque	M8 = 12 - 13Nm

Electrical Characteristics

Min. Insulation resistance	100MΩ
After live or environment	50MΩ
Dielectric withstanding voltage	2250V / 1min
Max. contact drop, initial	150mV
Max. voltage range	≤ 800VDC
Contact drop after life test	175mV
Continuous current	300A
Carrying overload	3500A, 2sec / 700A, 30sec

Rated contact load (resistive load 300) Make & Break						Break only	Extreme overload
Voltage range up to	24VDC	250VDC	400VDC	500VDC	600VDC	up to 750VDC	500A @ 600VDC = 2x
Endurance	200.000	20.000	10.000	5.000	1.000	10	400A @ 750VDC = 1x

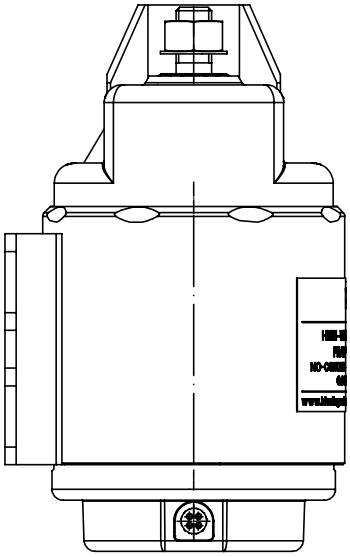
Mechanical endurance	2.000.000 switching cycles

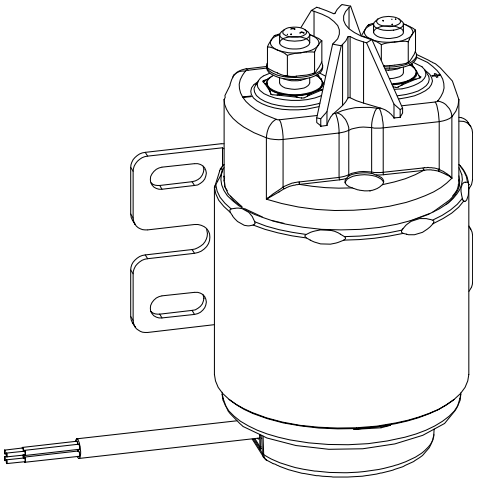
Coil data and Operating Characteristics	12V	24V
Voltage range	9 - 16VDC	18 - 32VDC
Nominal voltage	24VDC	
Pick up voltage max.	9VDC	
Drop out voltage min.	≤ 2VDC	
Coil current approx.	2A	
Coil power approx.	6W	
Quiescent current	approx. 1.5mA	

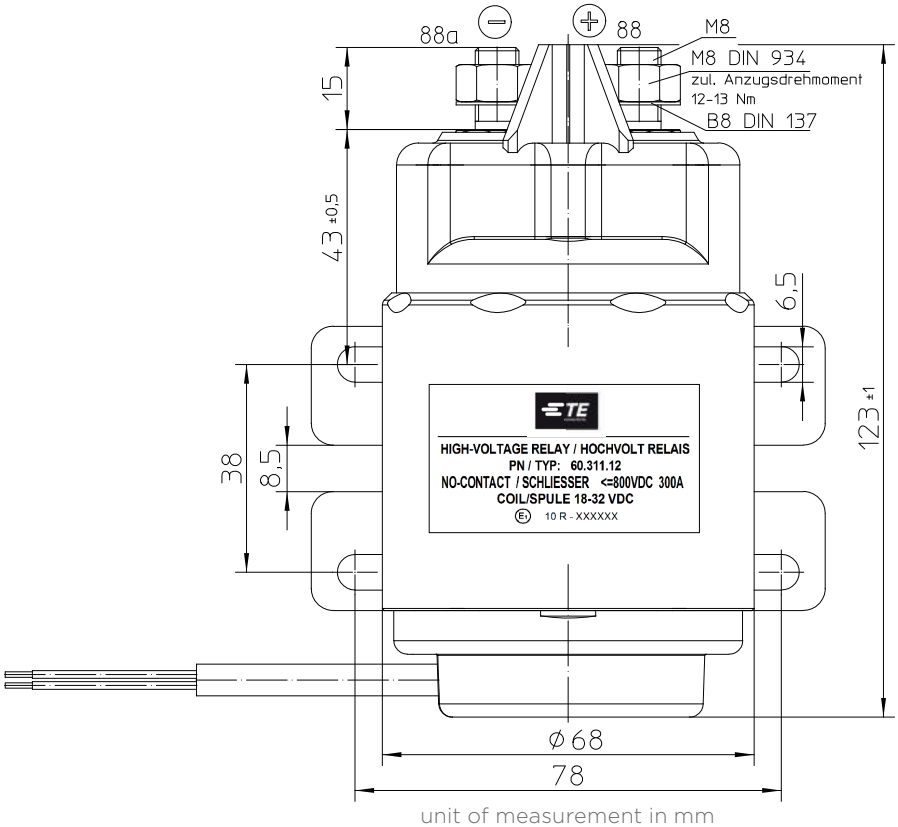
Operating times NO-Contact relay

Operate	max. 75msec
Bounce	max. 5msec
Release	max. 50msec
Wire section	min. 95mm² / 0.147 sq.inch / AWG 4-0

Technical drawings







unit of measurement in mm

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K1166723 | Version 08/2020

KISSLING
CUBE RELAY WITH TIME DELAY

Series 85 - from TE Connectivity (TE)

The KISSLING cube relay with time delay switching offers a wide range of different applications due to the integrated microcontroller.

The special feature is the realizable time delay in the pick-up and drop-out behavior of the relay. These time delays can be programmed from 100 milliseconds up to 24 hours, depending on customer requirements. The control of the relays can also be frequency controlled if required. The cube relays of this series are available in 12VDC or 24VDC as changeover contacts with circuit protection.

This relay is protected against quantities of dust that could interfere with normal operation of the product, as well as against splashing water from any angle in accordance to IP54.

Applications in temperature ranges from -40°C up to +85°C are no problem for the relay, which has a mechanical life of up to 10 million cycles.

Features

- Time delay programmable from 100ms to 24 hours
- Activation of the relays can also be frequency controlled
- Main contact current rated for 10A continuous current and 100% duty cycle
- Rated for minimum 100,000 switching cycles under full load

Applications

- Commercial vehicles
- Bus
- Truck
- Ground support equipment
- Construction and agricultural vehicles
- Military equipment

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IP54 (IEC 60529)
Interference immunity: Delay-on-make / Frequency	according to DIN40839
EMC	according to DIN ISO 11452-5 (focus 1), EN 61000-4-4 (focus 3)
CE-certification	according to EN 55011 and EN 50082-2
Weight	approx. 35g

General Electrical Characteristics

Rest current	max. 2mA @ 24VDC
Over load	
Contact NO	20A, 1min
Contact NC	15A, 1min
Pulse width (INIT)	min. 100ms ± 5%
Time delay	from 100ms ± 5%
Accuracy of time delay	at 25°C ±2% / at -40°C to +85°C ± 10%

Coil data	**12 VDC**	**24 VDC**
Voltage range	9-15VDC	18-30VDC
Holding current	12 VDC	24VDC
Contact operate	≥ 9VDC	≥ 18VDC
Contact bounce	1VDC to 5.5VDC	2VDC to 10VDC
Contact release	max. 10msec	

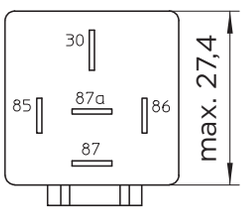
Current consumption	**12 VDC**
Active	9-15VDC
Passive	12 VDC

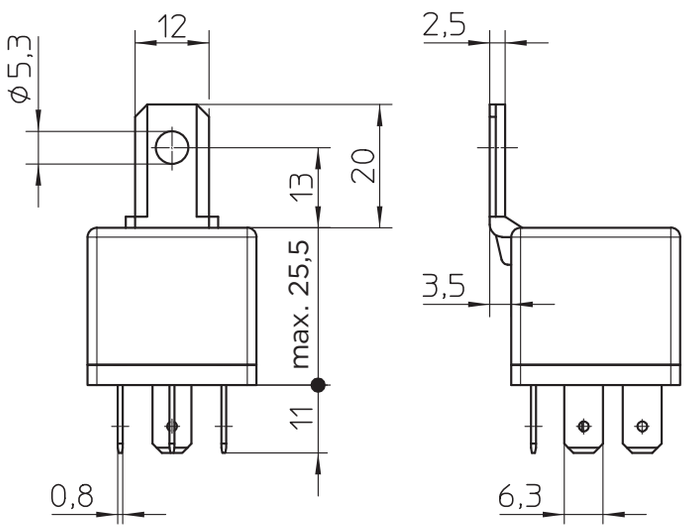
Version related data	**12V / 10A**	**24V / 10A**	**24V / 10A with Poti**	**24V / 30A**	**24V / 50A**
continuous current Change Over	10A	10A	10A	30A	50A
Time delay	3s ± 5%	30s ± 5%	Poti ± 5%	15s ± 5%	3s ± 5%
Mechanical life max.	10 mio cycles	10 mio cycles	10 mio cycles	10 mio cycles	1 mio cycles
Electrical life max.	100.000 cycles				

Technical drawings

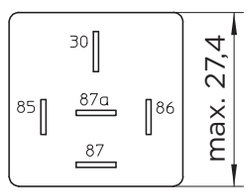
Delay-on-make / Delay-on-break

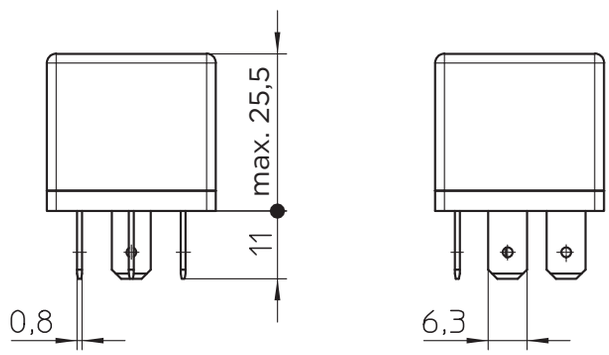
With bracket



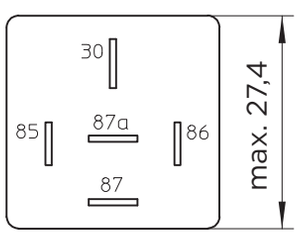


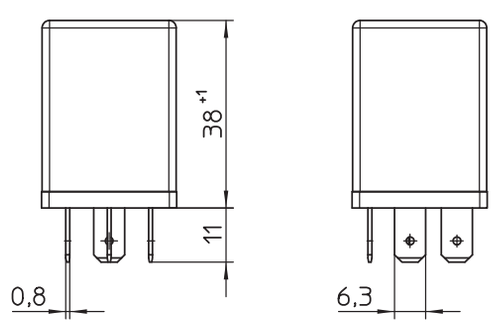
Without bracket





Frequency





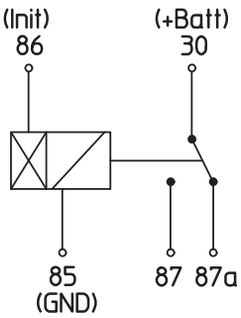
Ordering Information

Please contact your TE contact person or field engineer for more information on the different variants and available products,

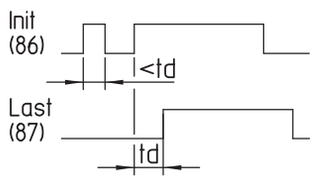
Click here to contact our **TE Customer Service**

Technical drawings

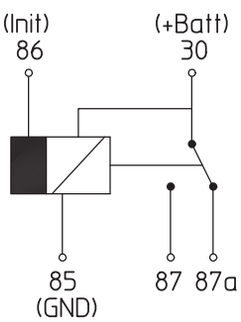
Delay-on-make



Switching characteristic

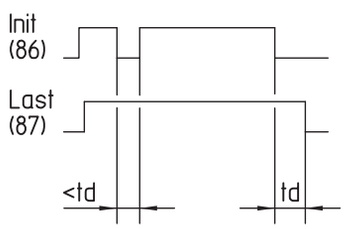


Delay-on-break

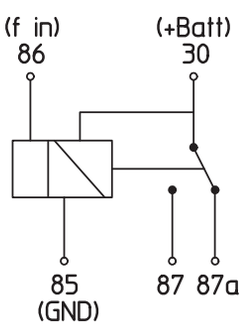


Attention:
Control and load circuit are not galvanically isolated.

Switching characteristic

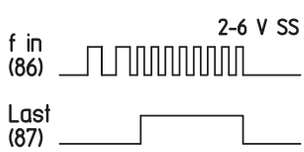


Frequency



Attention:
Control and load circuit are not galvanically isolated.

Switching characteristic



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K1166704 | Version 06/2021

KISSLING
ADR BATTERY MASTER SWITCH

Series 87 - from TE Connectivity (TE)

For trucks, which are to be used for transportation of hazardous materials as defined by European legislation ADR 2003 section 9.2.2.3, an Emergency disconnector between the battery and the electrical system is required.

In case of an emergency the battery master switch can for example be set from within the cab or the exterior of the vehicle.

The main components of the ADR battery master switch are the proven 200A or 300A bistable KISSLING relays, which are connected into the main power circuit directly behind the battery and an electronic control, which controls the ON / OFF function in respect to the required function based on law.

The ADR battery master switch closes, if the Emergency switches and the ignition switch are closed. Interrupting the ignition switch, the main contact will open after an adjustable customer specific delay.

Dependent on the situation of further input signals – i.e. air conditioning system, refrigerator or parking light the interruption can be controlled or delayed. Additional outputs will disconnect the generator before load peaks are generated. If one of the emergency switches is activated, the battery will be separated from the electrical system immediately.

Further function

- Monitoring of relay condition. Possible error messages.
- Timer functions are available by changing the software,for example different delay times according Euro 4 or Euro 5.
- Minimum charge monitoring for battery protection is possible.

Licence

- Applicable in Zone 1 and Zone 2 per ADR 2003
- Design examination TÜV Süd TÜ.EGG. 086-04 ADR 2003 9.2.2.3
- Electronic: T = –40°C to +85°C ExIIG EEx m ib IIC T6 / T4

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IP6K9K (DIN40050-9 and IEC 529.2)
Shock	ISO/DIS 16750-3: 4.2.2.2 Class A
Vibration	ISO/DIS 16750-3: 4.1.3.2.3 Test 7
Resistance to solvents	ISO/DIS 16750-5Z
Housing material	PBT
Terminals material	CuZn / Brass
Wire section	min 95mm² / AWG 000

Electrical Characteristics

Voltage range	18-32VDC
Nominal voltage	24VDC
Min. Insulation Resistance	100MΩ
After llve or environmental	50MΩ
Dielectric withstanding voltage	500VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2400A - 1sec / 600A - 20sec

Rated contact load

Resistive load	50.000 cycles - 300A
Mechanical Life	100.000 cycles

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K1166692 | Version 09/2020

KISSLING AUTOMATIC BATTERY CUT-OFF RELAY

Series 88 - from TE Connectivity (TE)

The intelligent KISSLING Battery Cut-off Relay has been developed to switch the vehicle-on-board network as an independent control unit on and off. The integrated electronics monitor the vehicle's onboard network and in addition, it controls the relay and specific functions.

The integrated electronics, processing the analog control inputs individually and convert them into the control commands required. The integrated coil economizer always reduces the holding current to an optimum current ratio. The main contacts are continuously monitored to quickly detect switching operations or faults, as well as prevent faulty operating conditions.

The control unit receives various information through the control inputs as well as the voltage levels of the two main contacts. These signals are provided digitally by LIN, CAN or J1939.

Features

- Sealed housing conforms to IP6K9K
- switch vehicle on board network
- Variety of different signal
- 6g shock and 4g vibration resistant

Applications

- Commercial vehicles
- Bus
- Lift truck
- Ground support equipment
- Construction and agricultural vehicles

Specification

Technical Data

Temperature range	-40°C to +85°C
Protection	IP6K9K (DIN40050-9 and IEC 529.2)
Shock	6g - 11msec
Vibration	4g (50-2000Hz)
Wire section	200A - min 70mm² - AWG 2-0 / 300A - min 95mm² - AWG 4-0
Mounting position	optional
Weight	0,63kg

General Electrical Characteristics

Voltage range	9-32VDC
Nominal voltage	12 / 24VDC
Min. Insulation Resistance	100MΩ
After llve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min
Max. Contact drop, initial	150mV
Contact drop after life test	175mV

Coil data - monostable

Pull in coil	1,6A for 100ms
Holding current	100mA
Contact operate	200msec
Contact bounce	max. 5msec
Contact release	max. 10msec

Coil data - bistable	12VDC	24VDC
Voltage range	9-16VDC	16-32VDC
Nominal voltage	12VDC	24VDC
Min. operational voltage	9VDC	16VDC
Over voltage	18VDC - 1h	36VDC - 1h
Pull in coil approx.	6,6A	3,0A
Drop out coil approx.	6.0A	2,8A
Operate	max. 15msec	
Bounce	max. 5msec	
Release	max. 10msec	
Quiescent current	< 300µA	

Rated contact load	200A	300A
Resistive load	50.000 cycles - 200A	50.000 cycles - 300A
Mechanical Life	100.000 cycles	100.000 cycles
Continuous current	200A	300A
Overload	1600 A - 1 sec / 400 A - 20 sec	2400 A - 1 sec / 600 A - 20 sec

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K1166698 | Version 08/2020

KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 50A - from TE Connectivity (TE)

The KISSLING 26 series dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant for high climatic conditions and withstands a variety of different oils and fluids.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC, NO/NC), coil voltages (12V, 24/28V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

- Sealed housing conforms to IP67 / IP6K9K
- Monostable high performance relay
- Mechanical life tested for 1 million mechanical cycles
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military

Specification

Technical Data

Temperature range	-55°C to +85°C
Max. Altitude rating	50.000 ft
Protection	IP6K9K / IP67
Shock	10G - 6msec / 500G - 0,5msec
Vibration	Types 26.70... & 26.73 = 1,5G (10-400Hz) / 1G (400-2000Hz) Types 26.71... & 26.72 = 10G (10-500Hz)
Acceleration	15G
Thread sizes / Torque	M3 = 3.2 - 3.5Nm | M5 = 0.5 - 0.6Nm
Wire section	min 6mm² / AWG 9
Mounting option	optional

Electrical Characteristics

Min. Insulation Resistance	100MΩ
After llve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	50A
Overload	10A - 1sec / 100A - 20sec
Rupture current	500A
Types 26.70.08/09 Overload	400A - 0,5sec / 200A - 1sec / 100A - 20sec

Rated contact load (12 & 24 / 28VDC)

Resistive load	100.000 cycles - 50A
Mecahnical Life (iaw MIL-R-6106)	200.000 cycles - 12A
Endurance	1.000.000 cycles - 12A
Types 26.70.08/09 Overload	50.000 cycles 400A on / 50A off

Coil Data

Coil Data	Types 26.70 / 71 / 73		Types 26.72	
	12VDC	24 / 28 VDC	12VDC	24 / 28 VDC
Voltage range	10-16VDC	18-32VDC	10-16VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC	12VDC	24/28VDC
Pick up voltage max.	10VDC	18VDC	10VDC	18VDC
Drop out voltage	≤ 3VDC	≤ 6VDC	≤ 3VDC	≤ 6VDC
Coil resistance	26Ω ± 10%	110Ω ± 10%	21Ω ± 10%	88Ω ± 10%
Coil current max.	0,6A	0,25 / 0,30A	0,7A	0,3 / 0,4A

Operating times	NO Contact | Changeover
Operate	max. 30msec
Bounce	max. 8msec
Release with suppression	max. 120msec | max. 80msec
Release without suppression	max. 15msec

Operating times	NC Contact | Changeover
Break time	max. 25msec
Bounce	max. 8msec
Make time with suppression	max. 100msec | max. 80msec
Make time without suppression	max. 25msec | max. 20msec

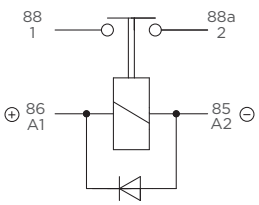
Available Types

	Type Ordering key	Contact NO	 NC	Side mounting	4-hole side mounting	90° Version	Long form bottom mount.	Short form bottom mount.	Stud mount.	Suppression	Weight kg / pound
12V	26.70.24	x		x						x	0.33 / 0.73
	26.70.25*	x		x							0.33 / 0.73
	26.71.21	x						x		x	0.34 / 0.75
	26.71.22	x						x			0.34 / 0.75
	26.71.24	x			x					x	0.34 / 0.75
	26.71.25	x			x						0.34 / 0.75
	26.72.21	x	x		x					x	0.40 / 0.88
	26.72.22	x	x		x						0.40 / 0.88
	26.72.23	x	x		x	x				x	0.40 / 0.88
	26.72.24	x	x		x	x					0.40 / 0.88
24V / 28V	26.70.01	x					x			x	0.35 / 0.77
	26.70.02	x					x				0.35 / 0.77
	26.70.04	x		x						x	0.33 / 0.73
	26.70.05*	x		x							0.33 / 0.73
	26.70.06	x							x	x	0.33 / 0.73
	26.70.07	x							x		0.33 / 0.73
	26.70.08	x							x	x	0.33 / 0.73
	26.70.09	x							x		0.33 / 0.73
	26.71.01	x						x		x	0.34 / 0.75
	26.71.02	x						x			0.34 / 0.75
	26.71.04	x			x					x	0.34 / 0.75
	26.71.05	x			x						0.34 / 0.75
	26.72.01	x	x		x					x	0.40 / 0.88
	26.72.02	x	x		x						0.40 / 0.88
	26.72.03	x	x		x	x				x	0.40 / 0.88
	26.72.04	x	x		x	x					0.40 / 0.88
	26.73.04		x	x						x	0.33 / 0.73
	26.73.05*		x	x							0.33 / 0.73

Other types and customer specified types upon request / also available with current sensing / * Standard version

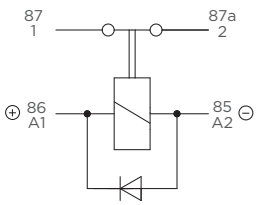
Circuits

NO-Contact



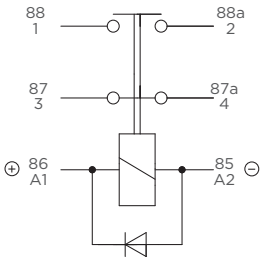
Suppression diode

NC-Contact



Suppression diode

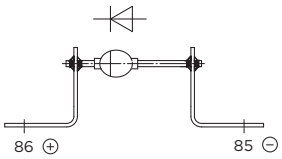
NO/NC-Contact



Suppression diode

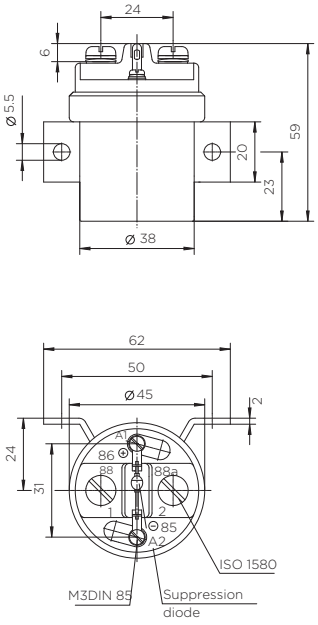
Suppression dioide

26.70.50

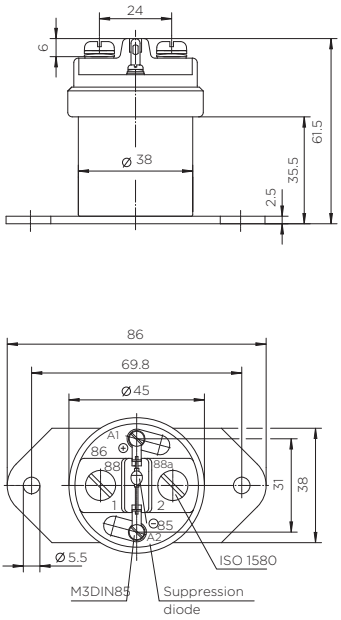


Technical drawings

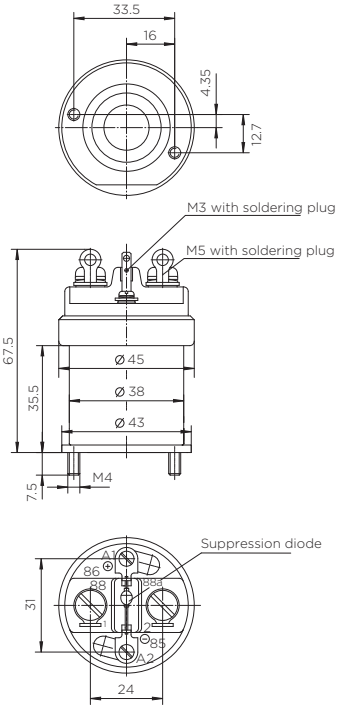
Side mounting
Types 26.70... & 26.73...



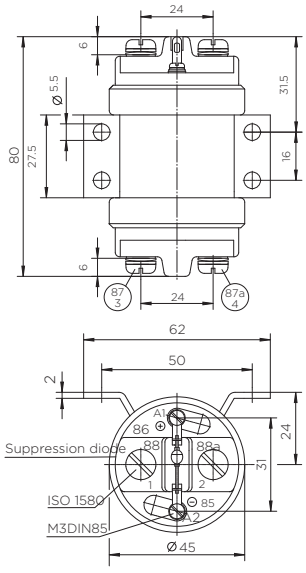
Long bottom mounting
Types 26.70... & 26.73...



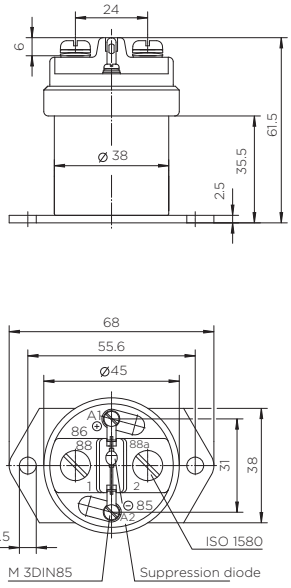
Stud mounting
Types 26.70.06/07/08/09



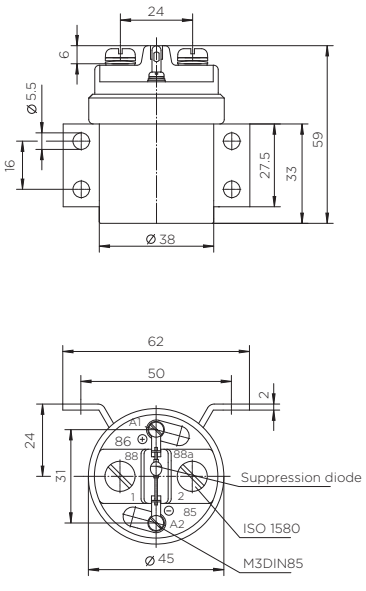
Change over NO/NC
Types 26.72...



Short form bottom mounting
Types 26.71...



4-hole side mounting
Types 26.71...



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K1166683 | Version 12/2020

KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 100A - from TE Connectivity (TE)

The KISSLING 26 Series dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP6K9K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant for high climatic conditions and withstands a variety of different oils and fluids.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC) coil voltages (12V, 24/28V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coils and optional auxiliary contacts.

Features

- Sealed housing conforms to IP6K9K
- Dual-Coil monostable high performance relay with optional auxiliary contact
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military

Specification

Technical Data

Temperature range	-55°C to +74°C
Max. Altitude rating	50.000 ft
Protection	IEC 60529 & DIN 40050-9, IP67 (0,2 bar; 1min) & IP6K9K
Shock	30G - 11msec | VG 95210, MIL-STD-202, Test method 213, Half-sine, 11 msec / 50 G
Vibration	10G | VG 95210, MIL-STD-202, Test method 213, Test condition C / 10 G
Acceleration	15G
Thread sizes	M3.5 = 1.1–1.2Nm | M4 = 2.0–2.2Nm | M8 = 12–13Nm | M10 = 15–20Nm
Wire section	min. 25mm2 / 0.039 sq.inch / AWG 3
Mounting position	optional

Electrical Characteristics

Min. Insulation Resistance	100MΩ
After IIve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	100A
Overload	1000A - 1sec / 500A - 20sec
Rupture current	1000A
Auxiliary contacts	Continuous current 2A / Make and Brake 6A

Rated contact load (12 & 24 / 28VDC)

Resistive load	50.000 cycles - 100A
Mechanical Life	100.000 cycles - 25A

Coil Data

	12VDC	24 / 28 VDC
Voltage range	10-15VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC
Pick up voltage max.	10VDC	18VDC
Drop out voltage	≤ 4VDC	≤ 6VDC
Pull in coil resistance	1,4Ω ± 20%	3,6Ω ± 20%
Pull in current max.	10A - 20msec	6/8A - 20msec
Coil resistance	40Ω ± 10%	145Ω ± 10%
Coil current max.	0,35A	0,20 / 0,25A

Operating times	NO Contact
Operate	max. 25msec
Bounce	max. 5msec
Release with suppression	max. 80msec
Release without suppression	max. 15msec

Operating times	NC Contact
Break time	max. 10msec
Make time with suppression	max. 60msec
Make time without suppression	max. 40msec

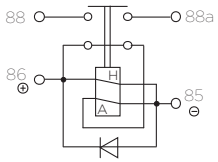
Available Types

	Type Ordering key	Contact NO	Contact NC	UNC threads	Reversed polarity	Side mounting	Side mount. with inserts	Suppression	Polarity protection	Auxiliary contact	Weight kg / pound
12V	26.60.21*	x				x					0.44 / 0.97
	26.60.25	x				x		x			0.44 / 0.97
	26.60.275	x				x		x		x	0.46 / 1.01
24V / 28V	26.60.01*	x				x					0.44 / 0.97
	26.60.04	x				x		x	x		0.45 / 0.99
	26.60.05	x				x		x			0.44 / 0.97
	26.60.15	x			x	x		x			0.44 / 0.97
	26.60.17	x			x		x	x			0.44 / 0.97
	26.60.75	x				x		x		x	0.46 / 1.01
	26.63.01		x			x		x	x		0.45 / 0.99
	26.63.02		x			x		x			0.44 / 0.97
	26.63.03*		x			x					0.44 / 0.97
	26.64.01		x	x		x		x	x		0.45 / 0.99
	26.64.02		x	x		x		x			0.44 / 0.97
	26.64.03		x	x		x					0.44 / 0.97

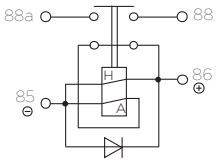
Other types and customer specified types upon request / also available with current sensing / * Standard version

Circuits

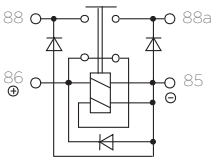
NO-Contact



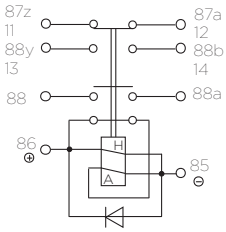
NO-Contact
Reversed polarity



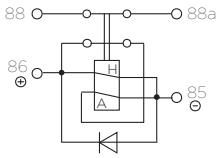
NO-Contact
with polarity protection



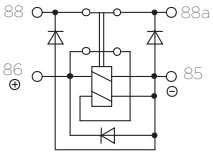
NO-Contact
with auxiliary contact



NC-Contact



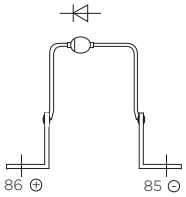
NC-Contact
with polarity protection



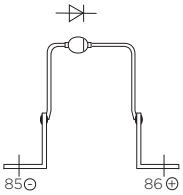
Accessories

Suppression diode

26.08.50

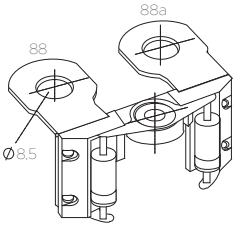


26.05.50.900
reverse polarity



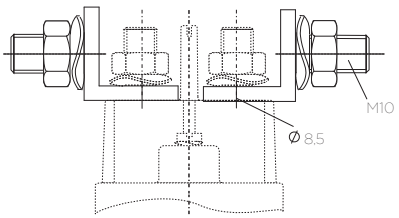
Polarity protection

26.08.51



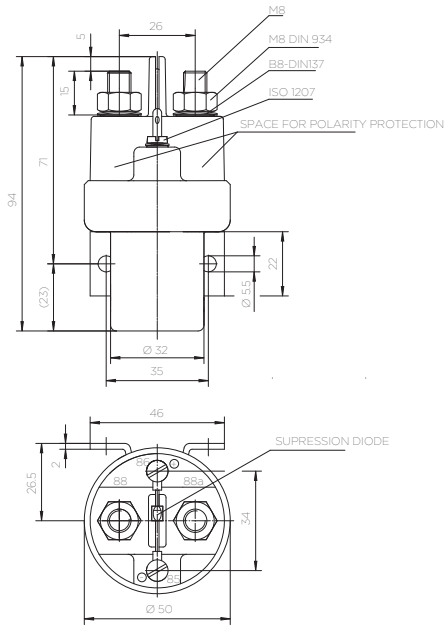
Angler adapter

26.08.52

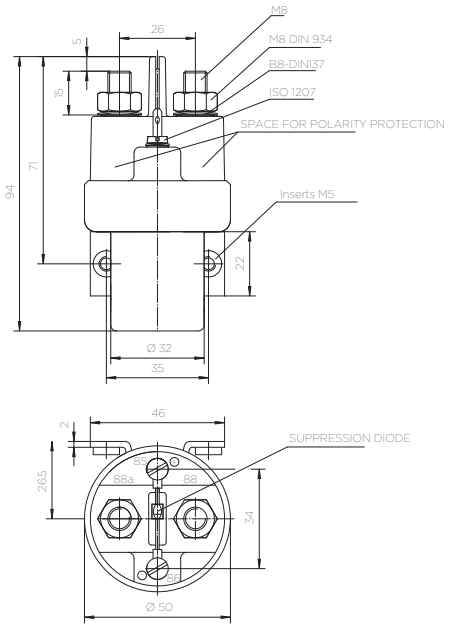


Technical drawings

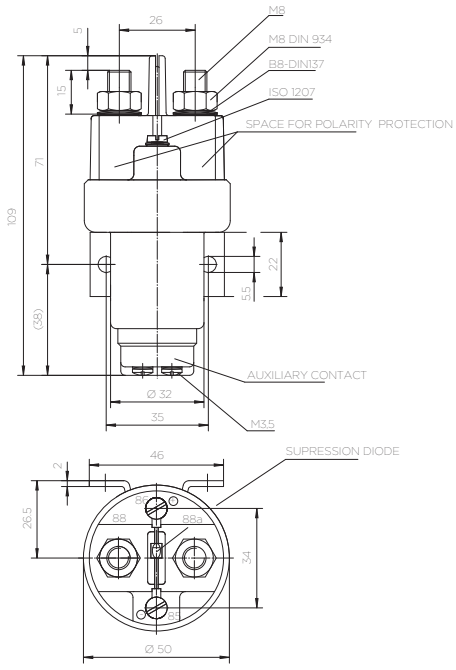
Side mounting



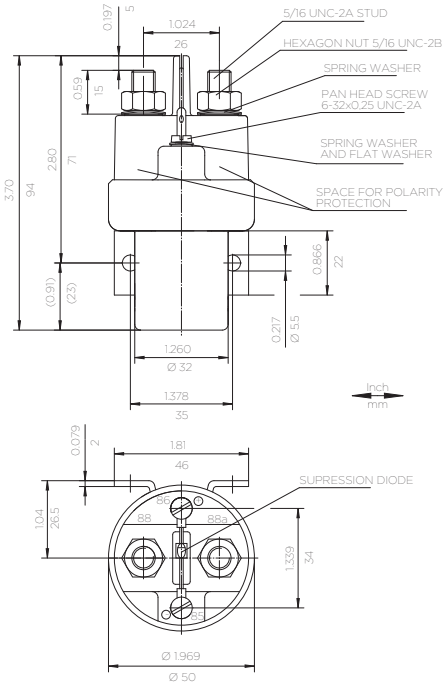
Side mounting with inserts



Side mounting - Auxiliary contact



Side mounting - UNC Threads



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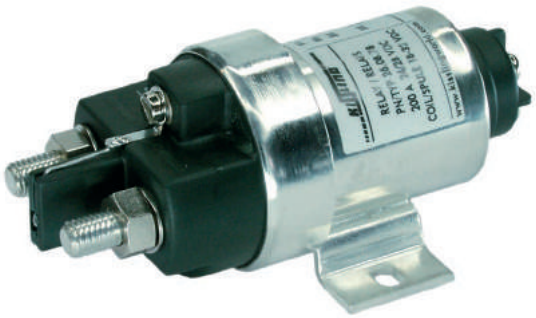


KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 200A - from TE Connectivity (TE)

KISSLING 26 series dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP69K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC), coil voltages (12 V, 24/28 V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coils and optional auxiliary contacts.

Features

- Sealed housing conforms to IP6K9K
- Dual-Coil monostable high performance relay with optional auxiliary contact
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military

Specification

Technical Data

Temperature range	-55°C to +130°C
Max. Altitude rating	50.000 ft
Protection	IEC 60529 & DIN 40050-9, IP67 (0,2 bar; 1min) & IP6K9K
Shock	30G - 11msec | VG 95210, MIL-STD-202, Test method 213, Half-sine, 11 msec / 30 G
Vibration	10G | VG 95210, MIL-STD-202, Test method 213, Test condition C / 10 G
Acceleration	15G
Thread sizes	M3.5 = 1.1–1.2Nm | M4 = 2.0–2.2Nm | M8 = 12–13Nm | M10 = 15–20Nm
Wire section	min. 70mm2 / 0.109 sq.inch / AWG 3
Mounting position	optional

Electrical Characteristics

Min. Insulation Resistance	100MΩ
After IIve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	200A
Overload	2000A - 1sec / 500A - 20sec
Rupture current	2000A
Auxiliary contacts	Continuous current 2A / Make and Brake 6A

Rated contact load (12 & 24 / 28VDC)

Resistive load	50.000 cycles - 200A
Mechanical Life	100.000 cycles - 50A

Coil Data

	12VDC	**24 / 28 VDC**
Voltage range	10-15VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC
Pick up voltage max.	10VDC	18VDC
Drop out voltage	≤ 4VDC	≤ 6VDC
Pull in coil resistance	1,5Ω ± 20%	5,2Ω ± 20%
Pull in current max.	7A - 20msec	4/5A - 20msec
Coil resistance	48Ω ± 10%	120Ω ± 10%
Coil current max.	0,3A	0,25 / 0,30A

Operating times	**NO Contact**
Operate	max. 25msec
Bounce	max. 5msec
Release with suppression	max. 80msec
Release without suppression	max. 15msec

Operating times	**NC Contact**
Break time	max. 10msec
Make time with suppression	max. 60msec
Make time without suppression	max. 40msec

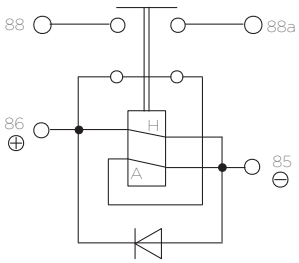
Available Types

	Type Ordering key	Contact		Clamping band	Side mounting	Suppression	Polarity protection	Auxiliary contact	Weight kg / pound
		NO	NC						
12V	26.08.21	x		x		x			0.60 / 1.32
	26.08.28	x			x	x			0.60 / 1.32
	26.28.28		x		x	x			0.60 / 1.32
24V / 28V	26.08.01	x		x		x			0.60 / 1.32
	26.08.07	x			x	x	x		0.60 / 1.32
	26.08.08	x			x	x			0.60 / 1.32
	26.08.09*	x			x				0.60 / 1.32
	26.08.78	x			x	x		x	0.62 / 1.37
	26.08.79	x			x			x	0.62 / 1.37
	26.28.07		x		x	x	x		0.60 / 1.32
	26.28.08		x		x	x			0.60 / 1.32
	26.28.09		x		x				0.60 / 1.32

Other types and customer specified types upon request / also available with current sensing / * Standard version

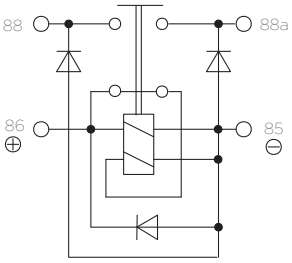
Circuits

NO- Contact



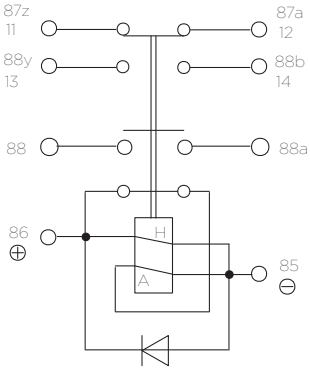
Suppression

NO- Contact



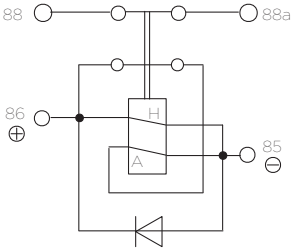
Suppression
Polarity protection

NO- Contact



Auxiliary contact
Suppression

NC- Contact

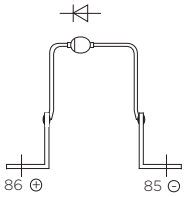


Suppression

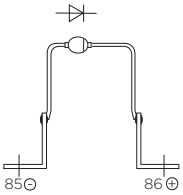
Accessories

Suppression diode

26.08.50

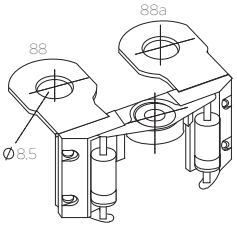


26.05.50.900
reverse polarity



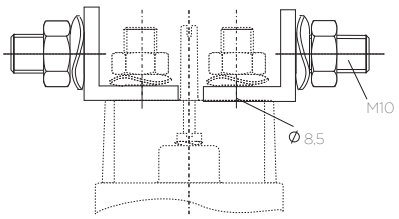
Polarity protection

26.08.51



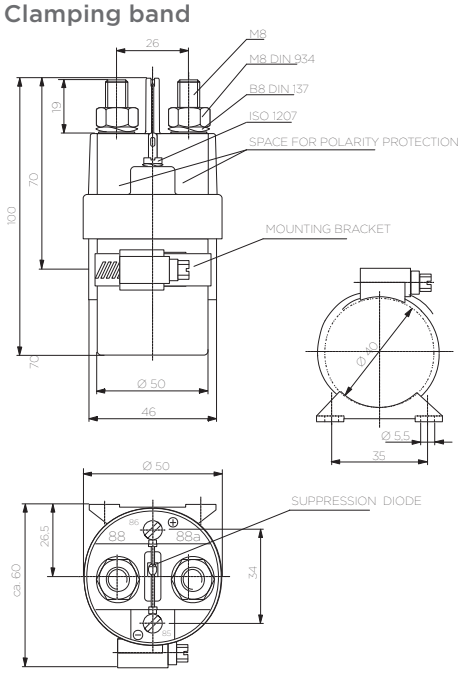
Angler adapter

26.08.52

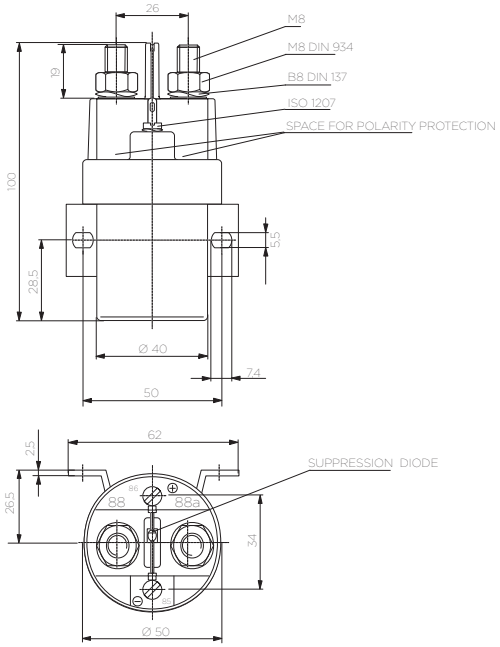


Technical drawings

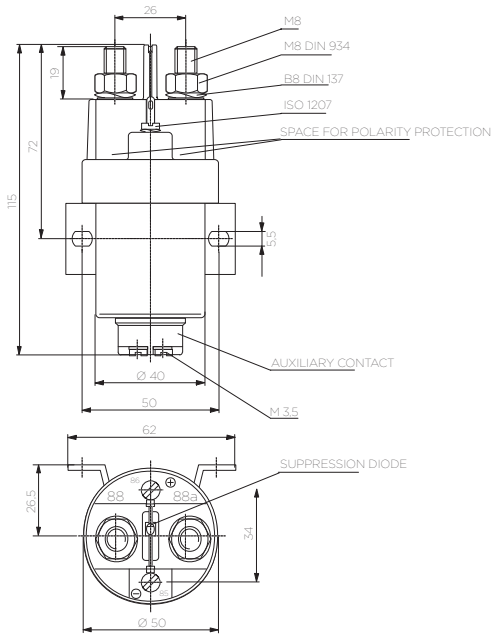
Clamping band



Side mounting



Side mounting - Auxiliary contact



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KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 300A - from TE Connectivity (TE)

KISSLING 26 series dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP69K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC), coil voltages (12 V, 24/28 V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coils and optional auxiliary contacts.

Features

- Sealed housing conforms to IP6K9K
- Dual-Coil monostable high performance relay with optional auxiliary contact
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military

Specification

Technical Data

Temperature range	-55°C to +74°C
Max. Altitude rating	50.000 ft
Protection	IEC 60529 & DIN 40050-9, IP67 (0,2 bar; 1min) & IP6K9K
Shock	30G - 11msec | VG 95210, MIL-STD-202, Test method 213, Half-sine, 11 msec / 30 G
Vibration	10G | VG 95210, MIL-STD-202, Test method 213, Test condition C / 10 G
Acceleration	15G
Thread sizes	M3.5 = 1.1–1.2Nm | M4 = 2.0–2.2Nm | M8 = 12–13Nm | M10 = 15–20Nm
Wire section	min. 95mm2 / 0.147 sq.inch / AWG 0000
Mounting position	optional

Electrical Characteristics

Min. Insulation Resistance	100MΩ
After llve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	300A
Overload	2500A - 1sec / 600A - 20sec
Rupture current	3000A
Auxiliary contacts	Continuous current 2A / Make and Brake 6A

Rated contact load (12 & 24 / 28VDC)

Resistive load	50.000 cycles - 300A
Mechanical Life	100.000 cycles - 75A

Coil Data

	12VDC	**24 / 28 VDC**
Voltage range	10-15VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC
Pick up voltage max.	10VDC	18VDC
Drop out voltage	≤ 4VDC	≤ 6VDC
Pull in coil resistance	1,5Ω ± 20%	5,2Ω ± 20%
Pull in current max.	7A - 20msec	4/5A - 20msec
Coil resistance	48Ω ± 10%	120Ω ± 10%
Coil current max.	0,3A	0,25 / 0,30A

Operating times	**NO Contact**
Operate	max. 25msec
Bounce	max. 5msec
Release with suppression	max. 80msec
Release without suppression	max. 15msec

Operating times	**NC Contact**
Break time	max. 10msec
Make time with suppression	max. 60msec
Make time without suppression	max. 40msec

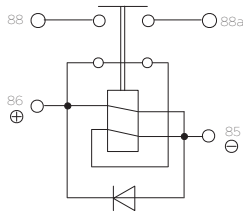
Available Types

	Type Ordering key	Contact NO	Contact NC	Clamping band	Side mounting	4-hole bottom mounting	Replaceable barrier	Suppression diode	Polarity protection	Auxiliary contact	Weight kg / pound
12V	26.56.22	x				x		x			0.93 / 2.05
	26.56.238	x			x		x	x			0.63 / 1.39
24V / 28V	26.56.01	x				x		x	x		0.93 / 2.05
	26.56.02	x				x		x			0.93 / 2.05
	26.56.03	x				x					0.93 / 2.05
	26.56.04	x		x				x	x		0.63 / 1.39
	26.56.05	x		x				x			0.63 / 1.39
	26.56.06*	x		x							0.63 / 1.39
	26.56.07	x			x			x	x		0.63 / 1.39
	26.56.08	x			x			x			0.63 / 1.39
	26.56.09	x			x						0.63 / 1.39
	26.56.31	x				x	x	x	x		0.93 / 2.05
	26.56.32	x				x	x	x			0.93 / 2.05
	26.56.33	x				x	x				0.93 / 2.05
	26.56.34	x		x			x	x	x		0.63 / 1.39
	26.56.35	x		x			x	x			0.63 / 1.39
	26.56.36	x		x			x				0.63 / 1.39
	26.56.37	x			x		x	x	x		0.63 / 1.39
	26.56.38	x			x		x	x			0.63 / 1.39
	26.56.39	x			x		x				0.63 / 1.39
	26.56.75	x		x				x		x	0.66 / 1.46
	26.56.78	x			x			x		x	0.66 / 1.46
	26.27.07		x		x			x	x		0.66 / 1.46
	26.27.08		x		x			x			0.66 / 1.46
	26.27.09		x		x						0.66 / 1.46

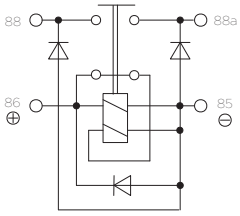
Other types and customer specified types upon request / * Standard version

Circuits

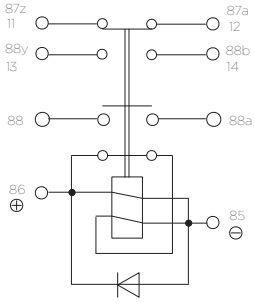
NO-Contact



Suppression diode

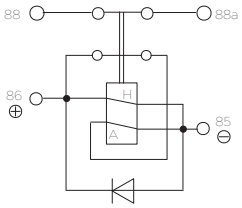


Suppression diode
Polarity protection



Suppression diode
Auxiliary contact

NC-Contact

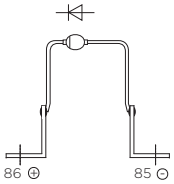


Suppression diode

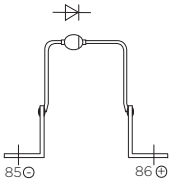
Accessories

Suppression diode

26.08.50

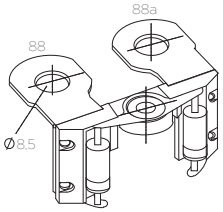


26.05.50.900
reverse polarity



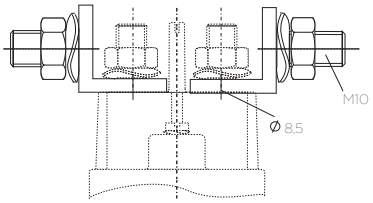
Polarity protection

26.08.51



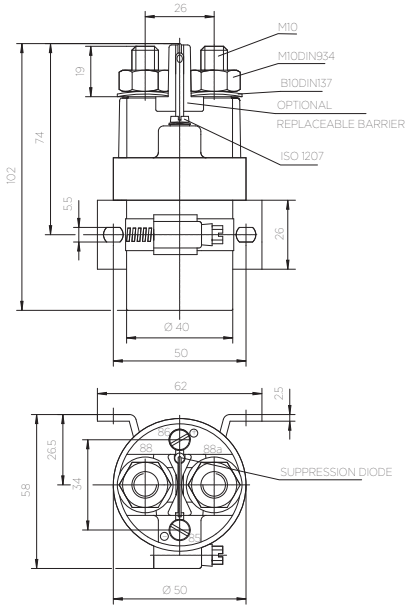
Angler adapter

26.08.52

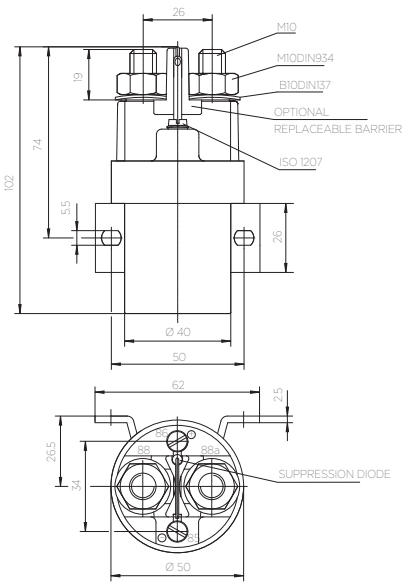


Technical drawings

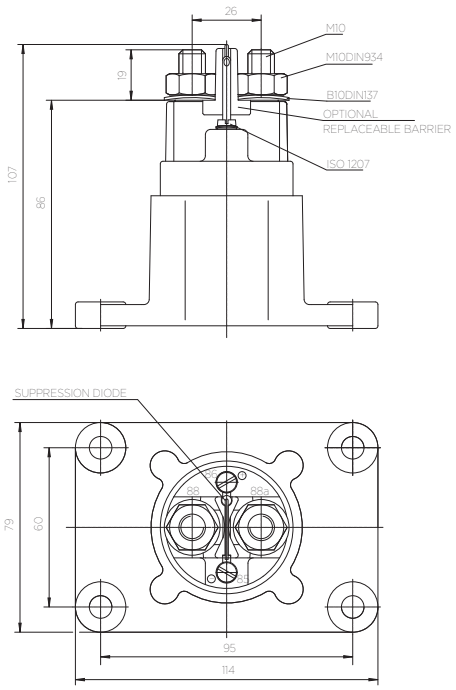
Clamping band



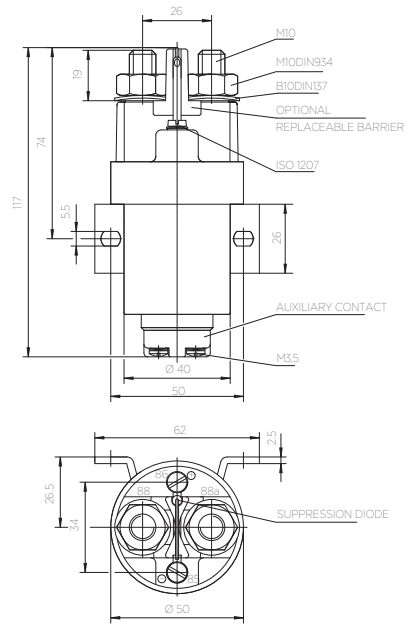
Side mounting



4-hole bottom mounting



Side mounting - Auxiliary contact



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KISSLING
LIGHT WEIGHT RELAY

Series 26 / 300A - from TE Connectivity (TE)

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This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP69K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding current, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC, NO/NC), coil voltages (12 V, 24/28 V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coil and optional auxiliary contacts.

Features

- Sealed housing conforms to IP6K9K
- Dual-Coil monostable high performance relay with optional auxiliary contact
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military
- Helicopter
- Motorsports (Racing cars)

Specification

Technical Data

Temperature range	-55°C to +74°C
Max. Altitude rating	50.000 ft
Protection	IEC 60529 & DIN 40050-9, IP67 (0,2 bar; 1min) & IP6K9K
Shock	30G - 11msec | VG 95210, MIL-STD-202, Test method 213, Half-sine, 11 msec / 30 G
Vibration	10G | VG 95210, MIL-STD-202, Test method 213, Test condition C / 10 G
Acceleration	15G
Thread sizes	M3.5 = 1.1–1.2Nm | M4 = 2.0–2.2Nm | M8 = 12–13Nm | M10 = 15–20Nm
Wire section	min. 95mm2 / 0.132 sq.inch / AWG 0000
Mounting position	optional

Electrical Characteristics		Rated contact load (12 & 24 / 28VDC)	
Min. Insulation Resistance	100MΩ	Resistive load	50.000 cycles - 300A
After llve or environmental	50MΩ	Mechanical Life	100.000 cycles - 75A
Dielectric withstanding voltage	1050VAC / 1min at 50Hz		
Max. Contact drop, initial	150mV		
Contact drop after life test	175mV		
Continuous current	300A		
Overload	2400A - 1sec / 900A - 10sec / 600A - 40sec		
Rupture current	3000A		
Auxiliary contacts	Continuous current 2A / Make and Brake 6A		

Coil data	12VDC	24 / 28 VDC
Voltage range	10-15VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC
Pick up voltage max.	10VDC	18VDC
Drop out voltage	≤ 4VDC	≤ 6VDC
Pull in coil resistance	1,4Ω ± 20%	3,6Ω ± 20%
Pull in current max.	12A - 20msec	6/8A - 20msc
Coil resistance	40Ω ± 10%	145Ω ± 10%
Coil current max.	0,35A	0,20 / 0,25A

Operating times	NO Contact
Operate	max. 25msec
Bounce	max. 5msec
Release with suppression diode	max. 80msec
Release with suppression device	max. 15msec
Release without suppression	max. 15msec

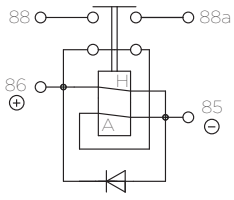
Available Types

	Type Ordering key	Contact NO	Mains Studs	Mains Screws	90° Version [1]	Side mounting	Side mount. with inserts	Suppres-sion diode	Suppres-sion device	Auxiliary contact	Weight kg / pound
12V	26.55.21	x	x				x	x			0.39 / 0.86
	26.55.22	x	x				x				0.39 / 0.86
	26.55.75	x	x				x	x		x	0.40 / 0.88
	26.55.76	x	x				x			x	0.40 / 0.88
	26.57.21	x		x		x			x		0.37 / 0.82
	26.57.22*	x		x		x					0.37 / 0.82
24V / 28V	26.55.01	x	x				x	x			0.39 / 0.86
	26.55.02	x	x				x				0.39 / 0.86
	26.55.010	x	x			x		x			0.39 / 0.86
	26.55.020*	x	x			x					0.39 / 0.86
	26.55.71	x	x				x	x		x	0.40 / 0.88
	26.55.72	x	x				x			x	0.40 / 0.88
	26.55.710	x	x			x		x		x	0.40 / 0.88
	26.55.720	x	x			x				x	0.40 / 0.88
	26.57.01	x		x		x			x		0.37 / 0.82
	26.57.02*	x		x		x					0.37 / 0.82
	26.57.03	x		x	x				x		0.37 / 0.82
	26.57.04	x		x	x						0.37 / 0.82
	26.57.71	x		x			x		x	x	0.39 / 0.86
	26.57.72	x		x			x			x	0.39 / 0.86
	26.57.73	x		x	x		x		x	x	0.39 / 0.86
	26.57.74	x		x	x		x			x	0.39 / 0.86
	26.57.710	x		x		x			x	x	0.39 / 0.86
	26.57.720	x		x		x				x	0.39 / 0.86

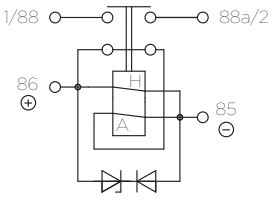
Other types and customer specified types upon request / 1) Main terminals in 90° position to the bracket / * Standard version

Circuits

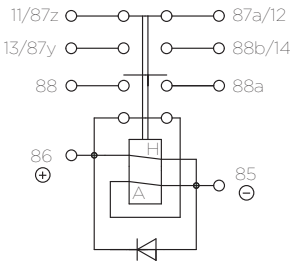
NO-Contact



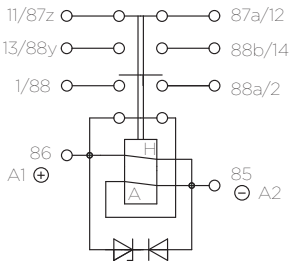
Suppression diode



Suppression device



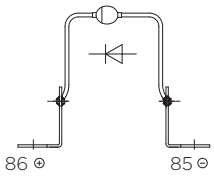
Suppression diode
Auxiliary contact



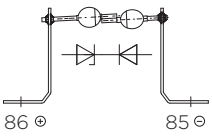
Suppression device
Auxiliary contact

Accessories

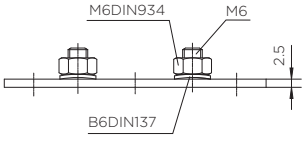
Suppression diode
for relays 26.55...
26.08.50



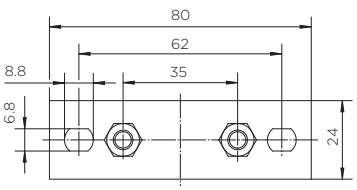
Suppression device
for relays 26.57...
26.57.50



Adapter
26.57.51

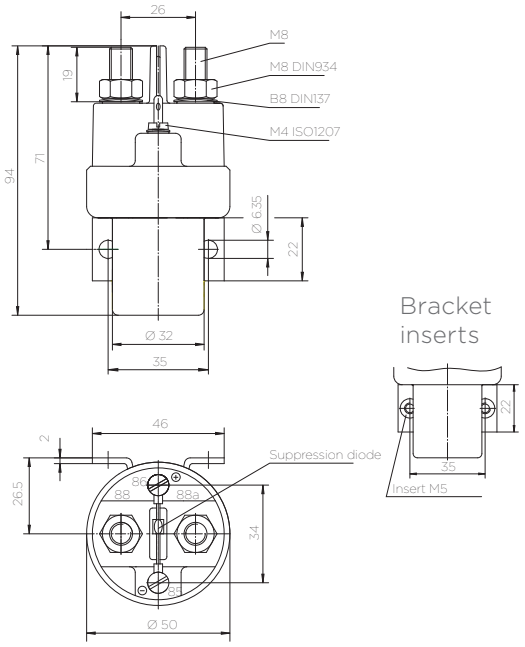


Mounting adaption
from 35 mm (1.38 inch)
to 62 mm (2.44 inch)

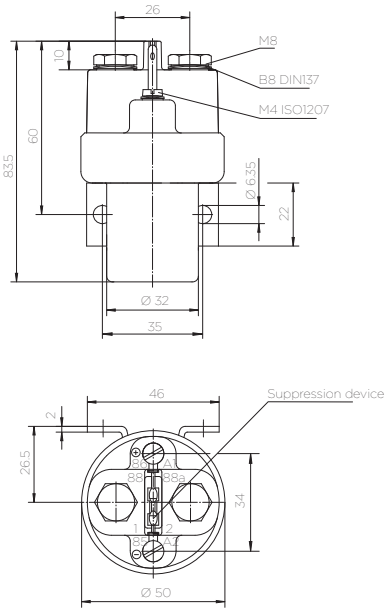


Technical drawings

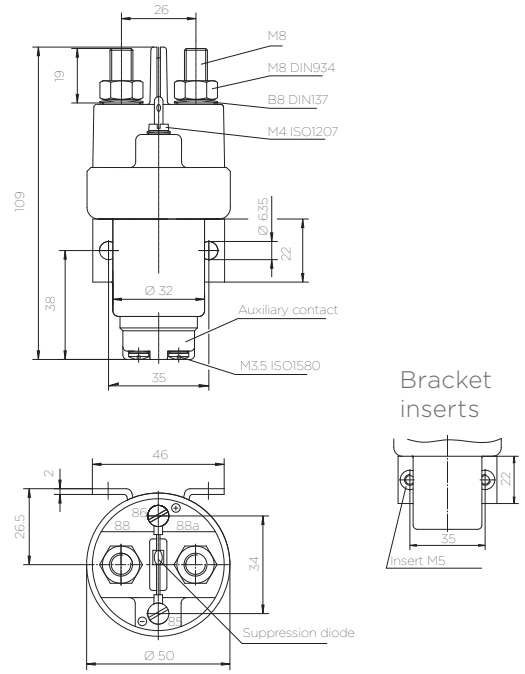
Studs



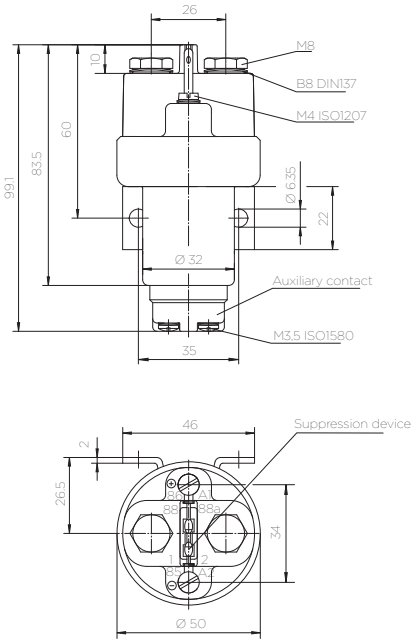
Screws



Studs- Auxiliary contact



Screws - Auxiliary contact



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KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 350A|500A - from TE Connectivity (TE)

KISSLING 26 series dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP69K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, low holding et, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing is corrosion resistant.

These relays are available with a wide variety of configuration options including contact configurations (NO, NC) coil voltages (12V, 24/28V) and various bracket styles to meet your installation conditions. Also available are optional suppression devices to eliminate electromagnetic interference at the coils and optional auxiliary contacts.

Features

- Sealed housing conforms to IP6K9K
- Dual-Coil monostable high performance relay with optional auxiliary contact
- Up to 30G shock & 10G vibration resistant
- Military grade performance
- Wide variety of configuration options for individual needs
- Meets the requirements of MIL-R-6106

Applications

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution
- Aviation industry
- Military

Specification

Technical Data	350A	500A
Temperature range	-55°C to +130°C	-55°C to +74°C
Max. Altitude rating	50.000 ft	
Protection	IEC 60529 & DIN 40050-9, IP67 (0,2 bar; 1min) & IP6K9K	
Shock	30G - 11msec | MIL-STD-202	
Vibration	10G (10-2000Hz) | MIL-STD-202	
Acceleration	15G	
Thread sizes	M4 = 2.0-2.2Nm / M12 = 18-22Nm	
Wire section	min. 150mm2 / 0.233 sq.inch / MCM 300	min. 240mm2 / 0.372 sq.inch / MCM 500
Mounting position	optional	

Electrical Characteristics	350A	500A
Min. Insulation Resistance	100MΩ	100MΩ
After llve or environmental	50MΩ	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV	150mV
Contact drop after life test	175mV	175mV
Continuous current	350A	500A
Overload	2400A - 1sec / 800A - 60sec / 600A - 300sec	4000A - 1sec / 1000A - 20sec
Rupture current	3500A	5000A
Auxiliary contacts	Continuous current 8A / Make and Brake 16A	

Coil Data	12VDC	24 / 28 VDC
Voltage range	9-16VDC	18-32VDC
Nominal voltage	12VDC	24/28VDC
Pick up voltage max.	9VDC	18VDC
Drop out voltage	≤ 4VDC	≤ 7VDC
Coil resistance	20Ω ± 10%	82Ω ± 10%
Coil current max.	0.60A	0.35 / 0.40A

Rated contact load (24/28VDC)	350A	500A
Resistive load	50.000 cycles - 350A	50.000 cycles - 500A
Mechanical Life	100.000 cycles - 85A	100.000 cycles - 125A

Operating times	NO Contact
Operate	max. 25msec
Bounce	max. 5msec
Release	max. 80msec

Operating times	NC Contact
Break time	max. 20msec
Make time ínc. bounce	max. 40msec

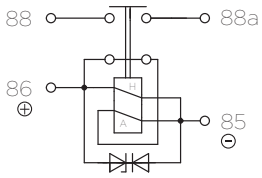
Available Types

	Type Ordering key	Contact NO	Contact NC	UNC threads	Side mounting	2-hole bottom mount.	4-hole bottom mount.	Suppression device	Polarity protection	Auxiliary contact	Weight kg / pound
24V / 28V 350A	26..06.01	x			x			x	x		1.20 / 2.70
	26..06.03	x			x			x	x	x	1.20 / 2.70
	26..06.11	x				x		x	x		1.25 / 2.80
	26..06.13	x				x		x		x	1.25 / 2.80
	26..06.21	x					x	x	x		1.30 / 2.90
12V 500A	26..05.251	x			x			x			1.20 / 2.70
24V / 28V 500A	26.05.01	x			x			x	x		1.20 / 2.70
	26.05.03	x			x			x	x	x	1.20 / 2.70
	26.05.11	x				x		x	x		1.25 / 2.80
	26.05.21	x					x	x	x		1.30 / 2.90
	26.05.51	x			x			x			1.20 / 2.70
	26.05.52	x		x	x			x			1.20 / 2.70
	26.05.61	x				x		x			1.25 / 2.80
	26.05.62	x		x		x		x			1.25 / 2.80
	26.05.63	x				x		x		x	1.25 / 2.80
	26.05.71	x					x	x			1.25 / 2.80
	26.25.01		x		x			x	x	x	1.20 / 2.70
	26.25.11		x			x		x	x	x	1.20 / 2.70
	26.25.21		x				x	x	x	x	1.25 / 2.80

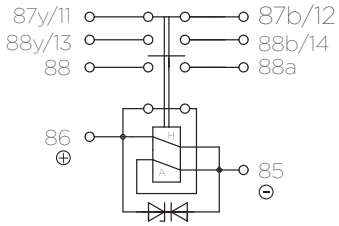
Other types and customer specified types upon request

Circuits

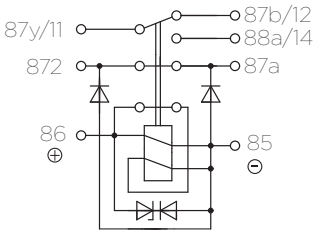
NO-Contact



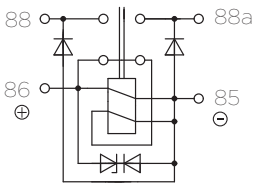
NO-Contact
with auxiliary contact



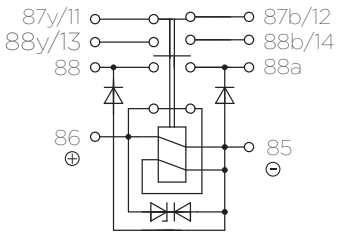
NO-Contact
with auxiliary contact and polarity protection



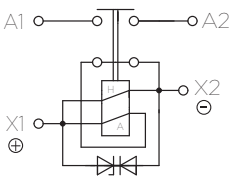
NO-Contact
with polarity protection



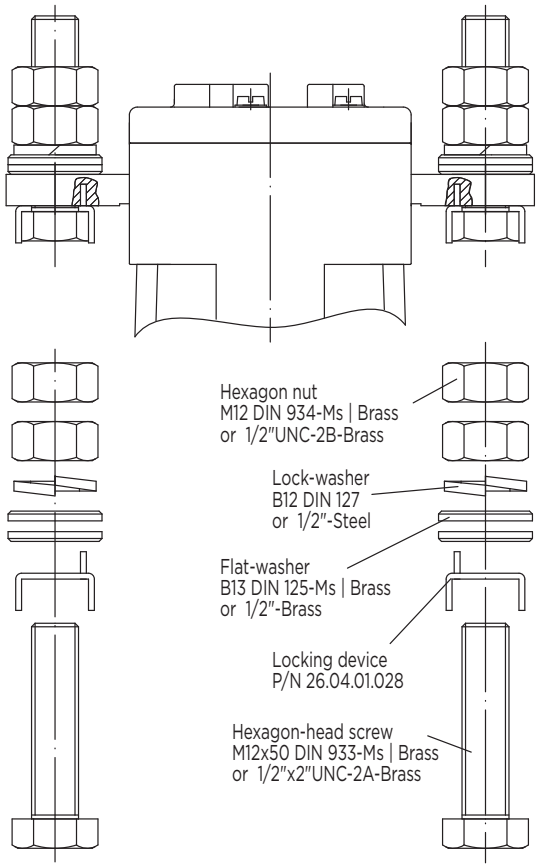
NO-Contact
with auxiliary contact and polarity protection



NO-Contact UNC-version
with US-Termination

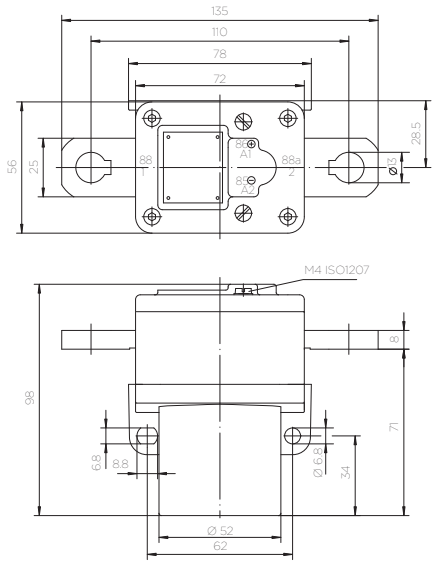


Accessories

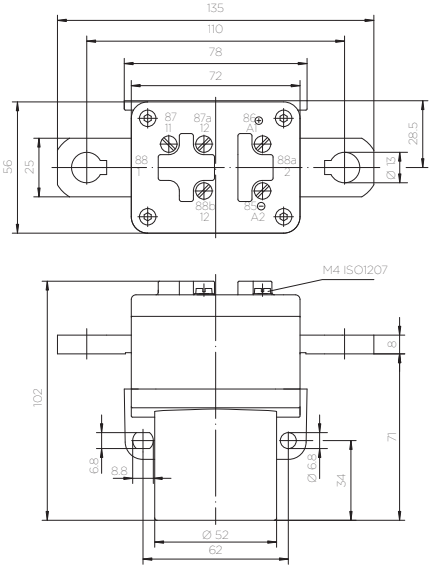


Technical drawings

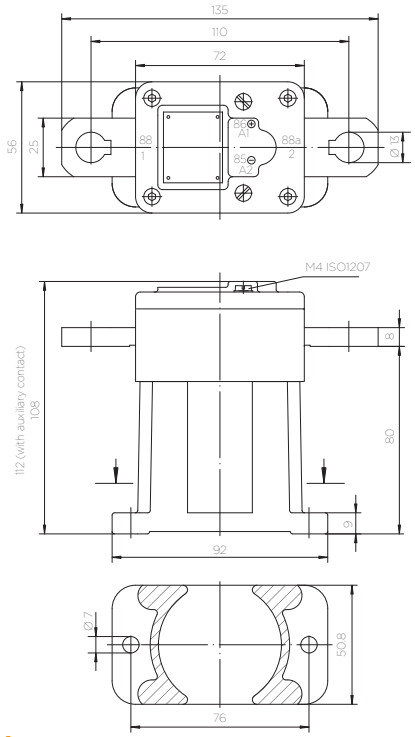
Side mounting



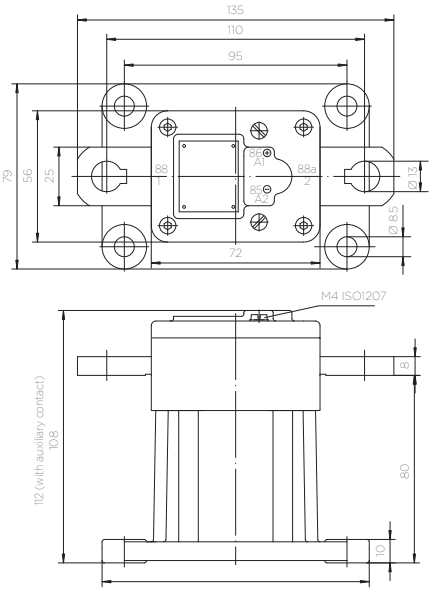
Side mounting NO-Contact with auxiliaries



2-hole bottom mounting



4-hole bottom mounting



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KISSLING
HIGH PERFORMANCE RELAYS

Series 26 / 1000A - from TE Connectivity (TE)

KISSLING 26 series monostable dual coil relays are developed using our competence and expertise gathered over decades of manufacturing to meet demanding operating requirements.

This dual coil system relay features extremely high shock and vibration resistance predominantly from careful design and an optimized magnetic circuit. The sealing technology used in these relays meet both the IP67 and IP69K (Steam pressure cleaning) protection standard. This relay series is well suited for various applications in severe commercial, military and aviation applications.

Other important advantages are low heat generation in the contact area based on low contact voltage drop, a compact design, silver alloy contact material and the use of mechanical and high thermal stability insulating compounds. Both the terminals and housing are corrosion resistant.

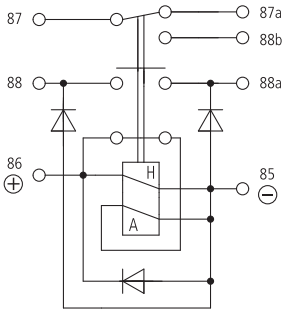
Features

- Sealed housing conforms to IP6K9K / IP67
- Dual-Coil monostable high performance relay
- Mechanical life tested for 100.000 mechanical cycles
- 50G shock & 10G vibration resistant
- Military grade performance
- Meets the requirements of MIL-R-6106
- VG 96928 approval

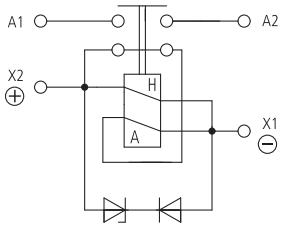
Applications (export license required)

- Truck
- Bus
- Ground support vehicles
- Construction and agricultural vehicles
- Power Distribution

Circuits



Auxiliary Contact
Suppression Diode
Ploarity protection



Suppression Device
Without auxiliary contact

Specification

Technical Data

Temperature range	-55°C to +74°C
Protection	IEC 60529 & DIN 40050-9 / IP67 (0,2 bar - 1min.) & IP6K9K
Shock	50G - 11msec / MIL-STD-202, Test methode 213, half-sine, 11msec / 50G
Vibration	10G (10-2000Hz) / MIL-STD-202, Test methode 213, Test condition C / 10G
Acceleration	15G
Thread sizes	M5 = 3.2-3.5Nm / M6 = 6.0-7.0Nm
Wire section	min. 500mm² / 0,775 sq.inch / MCM 1000 (2x 240mm²)

Electrical Characteristics

Min. Insulation Resistance	100MΩ
After llve or environmental	50MΩ
Dielectric withstanding voltage	1050VAC / 1min at 50Hz
Max. Contact drop, initial	150mV
Contact drop after life test	175mV
Continuous current	1000A
Overload	4000A - 1sec / 2000A - 120sec
Rupture current	10.000A

Rated contact load (24/28VDC)

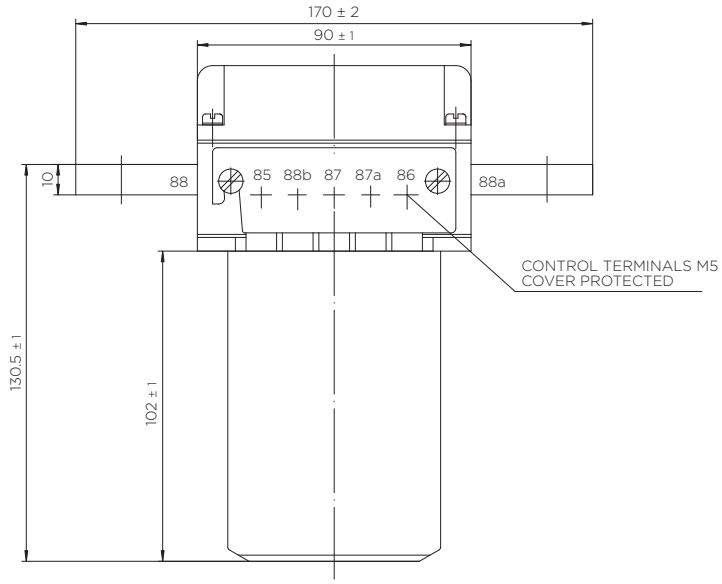
Resistive load	10.000 cycles - 1000A
Inductive load	5.000 cycles - 250A
Motor load	5.000 cycles - 500A
Mechanical Life	100.000 cycles - 250A
Auxiliary Contact	Type 26.02.14 only
Continuous current	25A
Make & break	40 A

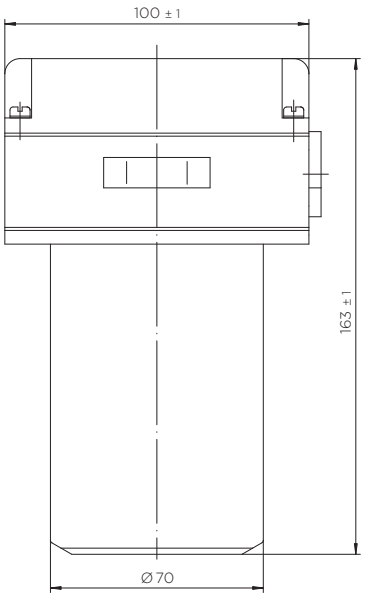
Coil Data	24/28VDC
Voltage range	18-32VDC
Nominal voltage	24/28VDC
Pick up voltage max.	18VDC
Drop out voltage	≤ 7VDC
Pull in coil resistance	0.8Ω ± 20%
Pull in current max.	35A/40A - 50msec
Coil resistance	18.5Ω ± 10%
Holding current max.	2A @ nominal voltage (20°C)

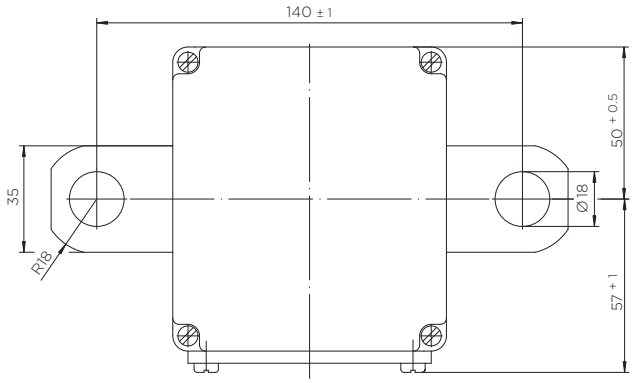
Operating times	NO Contact
Operate	max. 50msec
Bounce	max. 5msec
Release with suppression	max. 220msec
Release without suppression	max. 60msec

Technical drawings

Metric version
PN: 26.02.14

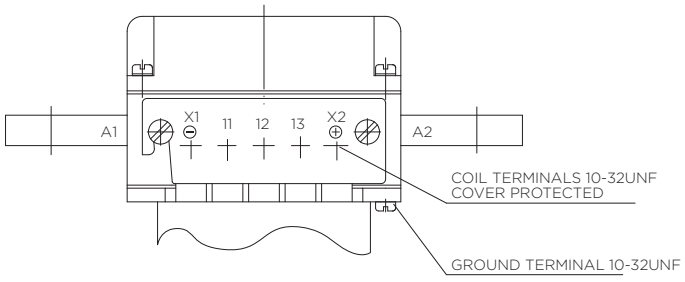






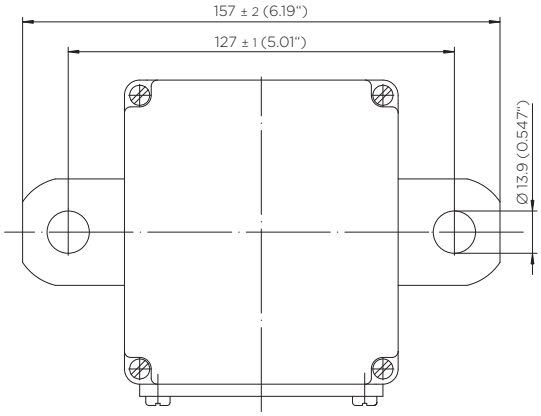
UNC-Version with references & approvals
PN: 26.02.15

UNC-Version
PN: 26.02.16



Residual dimensions see Type 26.02.14

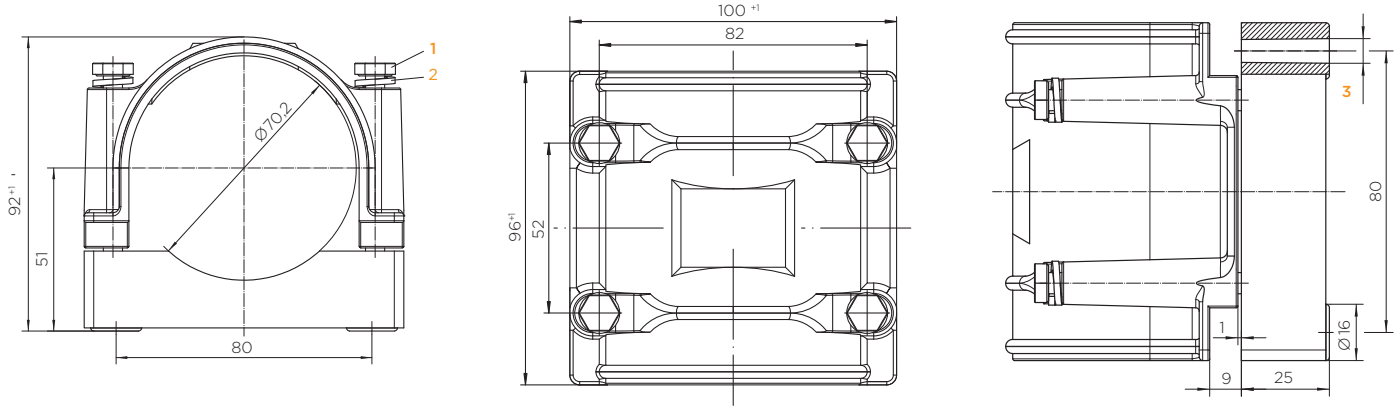
UNC-Version with short bus-bars
PN: 26.02.17



Coil and ground terminals as Type 26.02.15/16
Residual dimensions see Type 26.02.14

Accessories

Mounting brackets



Types and additional dimensions

Type	Ordering key	1 Hexagon head screw	2 Spring washer	3 Fastening	Surface
Metric standard bracket	26.50.00	M6	6 DIN 127	Ø 6.5 / 0.256”	RAL 6031-F9
UNC-Bracket	26.02.53	1/4 “ UNC	1/4 “ UNC	Ø 6.5 / 0.256”	RAL 6031-F9
UNC-Bracket	26.02.54	1/4 “ UNC	1/4 “ UNC	Ø 8.2 / 0.323”	RAL 6031-F9

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