/// Plug-in railway relay with 8 C/O contacts

Rugged plug-in relays for extreme reliability, within long endurance applications and harsh environments

KDN-U200

Latching relay

Part of D-platform

Description

Plug-in bistable railway relay with eight change-over contacts. The contacts remain in the last powered position, the position is clearly shown via a position indicator.

Bistable by means of two coils and a mechanical rocker mechanism. The two separate coils are galvanically isolated.

Standard equipped with magnetic arc blow-out for high breaking capacity and long contact life. No external retaining clip needed as integrated 'snap-lock' will hold relay into socket under all circumstances and mounting directions.

The construction of the relay and choice of materials makes the KDN-U200 relay suitable to withstand low and high temperatures, shock & vibrating and dry to very humid environments.

Application

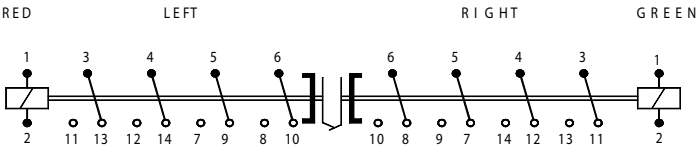
These relay series are designed for demanding rolling stock applications.

The KDN-U200 is used in applications where eight contacts are used in one relay and the contacts are set and reset with permanent power or impulses.

Features

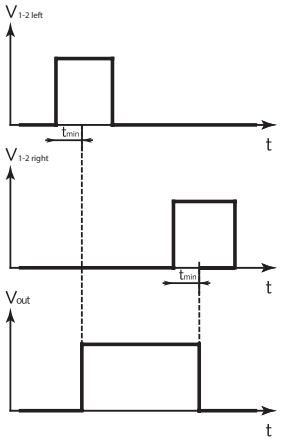
- Latching (bistable) relay
- Compact plug-in design
- 8 C/O contacts
- 2 galvanic isolated coils
- Clear position indicator
- Magnetic arc blow-out
- Flat, square and silver plated relay pins for excellent socket connection
- Wide range sockets
- 2 integrated snap locks
- Transparent cover
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Flexibility by many options

Connection diagram



Please note the relay will leave production in open state (with open armature at the left side, flag is green) with all contacts in the position shown in the connection diagram. Due to severe shocks far exceeding maximum levels mentioned in IEC 61373 (Category I, Class B, Body mounted), it can happen the left armature closes and stay closed. Therefore after installation all relays must be checked on correct state of the contacts and activate both coils 10 times alternately for correct operation.

Timing diagram



Railway compliancy

EN 50155	EN 50121
IEC 60571	EN 45545-2
IEC 60077	NF F16-101/102
IEC 60947	NF F 62-002
IEC 61373	IEC 60529

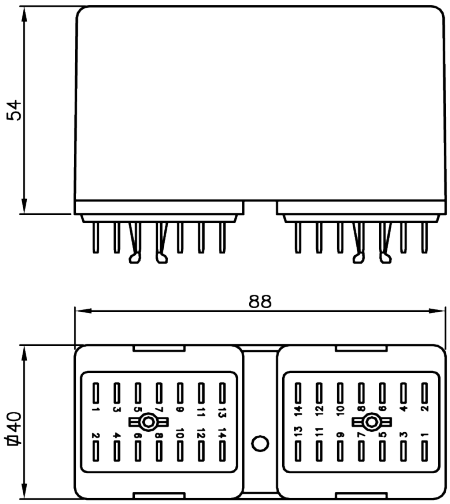
Latching relay
KDN-U200

Options

- Low temperature (-40 °C), max. contact current 8 A
- Back EMF protection diode
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Double zener diode
- Double make / double break contacts (-40 °C)

Remark: Not all combinations possible

Dimensions (mm)



Sockets

		Mounting			
		Surface / Wall	35 mm rail	Panel / Flush	PCB
Terminal connection	Screw	V93	V93	-	-
	Screw - wide terminals	V92BR	V93BR	-	-
	Spring clamp	V99	V99	V88	-
	Faston	-	-	V89	-
	Crimp	-	-	V97	-
	Solder tag	-	--	V96	-
	PCB	-		-	2x V32

For more information see the respective datasheets

For more detailed technical specifications, drawings and ordering information, go to the product page on www.morssmitt.com

Over 10 million Mors Smitt relays in use in rail transport applications worldwide!

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Technical specifications

Latching relay
KDN-U200

Coil characteristics

Minimum impulse time	50 ms
Operating times at nominal voltage (typical):	
Operate time N/O contacts	max 18 ms
Bounce time N/O contacts	≤ 4 ms
Bounce time N/C contacts	≤ 8 ms
Inductance L/R at Unom (typical):	
Energized	11 ms
Released	8 ms
Operating voltage range	70 % - 125 % Unom

Type	U_{nom} (VDC)	U_{min} (VDC)	U_{max} (VDC)	$U_{drop-out}$ (VDC)	R_{coil} * (Ω)	P_{nom} (W)
KDN-U201	24	16.8	30	9.6	174	3.3
KDN-U202	48	33.6	60	19.2	666	3.5
KDN-U203	72	50.4	90	28.8	1580	3.3
KDN-U204	110	77	137.5	44.0	3680	3.3
KDN-U205	96	67.2	120	38.4	2760	3.3
KDN-U206	12	8.4	15	4.8	44	3.3
KDN-U207	36	25.2	45	14.4	352	3.7

Other types on request
* The Rcoil is measured at room temperature and has a tolerance of ± 10%

Remarks:
- Umin is the must-operate voltage at which the relay has picked up in all circumstances (worst-case situation), in practice the relay picks up at a lower voltage
- Udrop-out is the must-release voltage at which the relay has dropped-out in all circumstances (worst-case situation), in practice the relay drops out at a higher voltage
- Always select the nominal voltage as close as possible to the actual voltage in the application

Remark: In June 2019 the coil tape color is changed to yellow. This change has no effect on any of the relay specifications or technical performance.

Contact characteristics

Amount and type of contacts		8 C/O
Maximum make current		16 A
Peak inrush current	NF F 62-002	200 A (withstand > 10 x 200 A @ 10 ms, 1 min)
Maximum continuous current		10 A
Maximum switching voltage		250 VDC, 440 VAC
Minimum switching voltage		12 V
Minimum switching current		10 mA
Maximum breaking capacity (> 50.000 operations)		72 VDC, 5 A (L/R ≤ 40 ms) 110 VDC, 10 A (resistive load) 110 VDC, 0.5 A (L/R ≤ 40 ms)
Maximum contact resistance		15 mΩ
Material		Ag standard (optional $AgSnO_2$, Au on Ag)
Contact gap		0.7 mm
Contact force		> 200 mN

Electrical characteristics

Dielectric strength EN50155	Pole-pole	IEC 60255-5	4 kV, 50 Hz, 1 min
	Cont-coil	IEC60077	2.5 kV, 50 Hz, 1 min
	Open contacts		2.5 kV; 50 Hz; 1 min
Pulse withstanding		IEC 60255-5	5 kV (1.2/50 µs)

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Latching relay
KDN-U200

Mechanical characteristics

Mechanical life	2 x 10^6 operations
Maximum switching frequency	Mechanical: 3600 ops/h Electrical: 1200 ops/h
Weight	305 g (without options)

Environmental characteristics

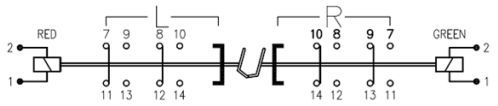
Environmental	EN 50125-1 and IEC 60077-1
Vibration	IEC 61373, Category I, Class B, Body mounted
Shock	IEC 61373, Category I, Class B, Body mounted
Operating temperature	-25 °C...+85 °C (optional: -40 °C)
Humidity	95% (condensation is permitted temporarily)
Maximum altitude	2000 meter. Higher altitudes are possible but have consequences mentioned in IEC 60664 (for example 5000 meter with bigger clearance distance)
Salt mist	IEC 60068-2-11, class ST4
Damp heat	IEC 60068-2-30, Test method Db variant 1
Protection	IEC 60529, IP40 (relay on socket) (with option K: IP50)
Fire & smoke	NF F 16-101, NF F 16-102, EN 45545-2: HL3 for requirements R22, R23, R26
Insulation materials	Cover: polycarbonate Base: polyester

Railway compliancy

EN 50155	Railway applications - Rolling stock - Electronic equipment
IEC 60571	Railway applications - Electronic equipment used on rolling stock
IEC 60077	Railway applications - Electric equipment for rolling stock
IEC 60947	Low-voltage switchgear and controlgear
IEC 61373	Railway applications - Rolling stock equipment - Shock and vibration tests
EN 50121	Railway applications - Electromagnetic compatibility
NF F16-101/102	Railway rolling stock - Fire behavior
EN 45545-2	Railway applications - Fire protection on railway vehicles Part 2: Requirements for fire behavior of materials and components
NF F 62-002	Railway rolling stock - On-off contact relays and fixed connections
IEC 60529	European standard describes the protection class (IP-code)

Latching relay
KDN-U200

Options

Code	Description	Remark	Cannot be combined with:
Standard options:			
C	Low temperature (-40 ºC)	Icontact < 8 A	
D	Back EMF protection diode		
E*	Au; Gold plated contacts (10 µm)		M
K	Extra dust protection	IP50 Cat 2 for the relays mounted in a Mors Smitt socket. Application PD1/PD2 and contact load > 0.5 A.	
N	No magnetic arc blow-out		
Q	Double zener diode over coil	Maximum allowed peak voltage 180 V, higher voltage will damage the diode	
Y	Double make/double break contacts	4 C/O DM/DB, -40 °C 	
Keying	Coil coding relay and socket		
Special options:			
M	$AgSnO_2$; “non-weldable” contacts	Icontact > 100 mA	E

* Gold plated contacts characteristics	
Material	Ag, 10 µm gold plated
Maximum switching voltage	60 V (higher voltages may be possible, contact Mors Smitt for more information)
Maximum switching current	400 mA (at higher rate gold will evaporate, then the standard silver contact rating of minimum 10 mA and 12 V is valid)
Minimum switching voltage	5 V
Minimum switching current	1 mA

Remark: For application support or technical product support, contact your local Mors Smitt sales office (see contact details on last page).

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Latching relay
KDN-U200

Ordering scheme

KDN-U2 [ ] - [ ]			
Coil voltages	01	24 VDC	
	02	48 VDC	
	03	72 VDC	
	04	110 VDC	
	05	96 VDC	
	06	12 VDC	Cannot be combined with:
	07	36 VDC	
Options (add as many options as needed)	C	Low temperature (-40 °C) - Max contact current 8 A	
	D	Back EMF protection diode	
	E	Gold plated contacts	M
	K	Extra dust protection, IP50	
	N	No magnetic arc blow-out	
	Q	Double zener diode	
	Y	Double make/ double break (-50 °C)	
Special options (minimum order quantity: 20)	M	$AgSnO_2$ contacts, highly resistant to welding	E

Example: KDN-U204-C
Description: KDN-U200 relay, Unom: 110 VDC, low temperature (-40 °C)