

/// Plug-in railway relay with 6 contacts

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

D6-U200N-W

Instantaneous relay, weld-no-transfer, 6 pole
Part of D-platform



Description

Plug-in safety critical railway relay with 6 weld-no-transfer single contacts. Also equipped with a back EMF suppression diode.

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 D6-U200N-W relay suitable to withstand corrosive atmospheres, low and high temperatures, shock & vibration and dry to very humid environments.

Compact design, choice of many options and a wide range of sockets makes the D6-U200N-W relay an easy and flexible solution to use.

Application

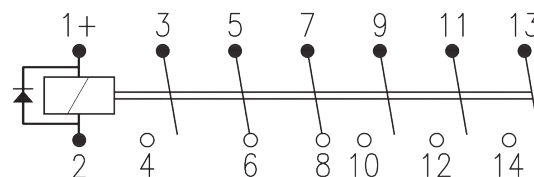
Rugged plug-in relays for safety critical, extreme reliable and long endurance applications in harsh environments.

These relays are designed for demanding rolling stock applications such as door control, traction control, braking systems etc.

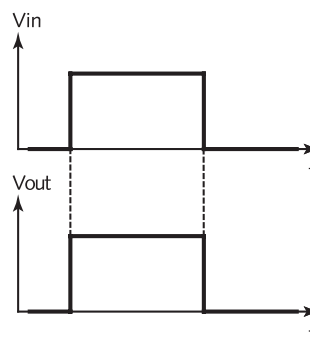
Features

- Compact plug-in design
- Instantaneous, 4 N/O - 2 N/C contacts
- Weld-no-transfer (WNT) contacts
- Standard back EMF suppression diode
- Flat, square silver plated relay pins for excellent socket connection
- Wide range sockets
- Integrated snap lock
- Red or green LED optional
- Flexibility by many options

Connection diagram



Timing diagram



Railway compliancy

EN 50155: 2017	EN 50121-3-2: 2016
IEC 60571: 2012	EN 45545-2: 2015
IEC 61373: 2010	NF F16-101/102



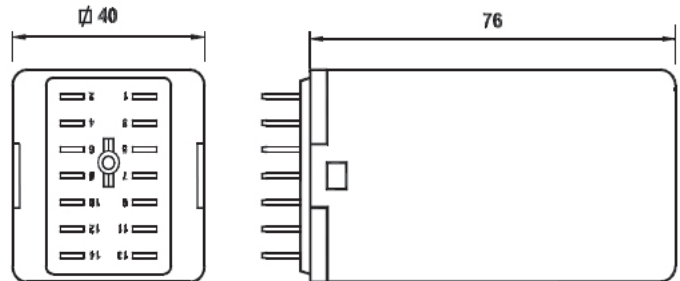
Instantaneous relay D6-U200N-W

Options

- LED indicators **green** or **red**
- Double zener diode
- No diode
- Keying (coding relay to correct socket)

Remark: Not all combinations possible

Dimensions (mm)



Weight

~ 110 g

Serializing

Each relay is marked with a unique serial number to which link important information and test results.

The GTIN (Global Trade Item Number) and part number are printed on each relay in both text and data matrix code according the worldwide recognized GS1 standard, being able to scan each relay for logistical and traceability purposes.

Sockets

		Mounting			
		Surface / Wall	35 mm rail	Panel / Flush	PCB
Terminal connection	Screw	V23	V23	-	-
	Screw - wide terminals	V22 BR	V23 BR	-	-
	Spring clamp	V29	V29	V33	-
	Faston	-	-	V31	-
	Crimp	-	-	V26	-
	Solder tag	-	-	V3	-
	PCB	-	-	-	V32

For more information see the respective datasheets

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

Technical specifications

Instantaneous relay D6-U200N-W

Coil characteristics

Operating voltage range	0.7 - 1.25 U _{nom}
Udrop-out	> 5 % U _{nom}

Type	U _{nom} (VDC)	U _{min} (VDC)	U _{max} (VDC)
D6-U201N-W	24	16.8	30
D6-U202N-W	48	33.6	60
D6-U203N-W	72	50.4	90
D6-U204N-W	110	77	137.5
D6-U207N-W	36	25.2	45

Other types on request

Remarks:

- U_{min} 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
- Always select the nominal voltage as close as possible to the actual voltage in the application

Contact characteristics

Amount and type of contacts	2 N/C - 4 N/O
Maximum make current	6 A
Maximum continuous current	6 A
Maximum switching voltage	250 VDC/AC
Minimum switching voltage	12 V
Minimum switching current	10 mA
Contact resistance	≤ 100 mΩ (initial)
Material	Ag + 0.2 μm Au (gold flash for storage purposes only)

Electrical characteristics

Dielectric strength	Pole-pole	3.5 kV, 50 Hz, 1 min acc. IEC 60664-1/EN 50124-1
	Cont-coil	2.5 kV, 50 Hz, 1 min acc. IEC 60664-1/EN 50124-1
	Open contacts	1.5 kV; 50 Hz; 1 min acc. IEC 60664-1/EN 50124-1
Pulse withstanding	IEC 60255-5	5 kV (1.2/50 μs) acc. IEC 60255-27

Mechanical characteristics

Mechanical life	10 x 10 ⁶ operations
Maximum switching frequency	Mechanical: 3600 ops/h Electrical: 360 ops/h

Environmental characteristics

Vibration	IEC 61373, Category I, Class B, Body mounted
Shock	IEC 61373, Category I, Class B, Body mounted
Operating temperature	-40 °C...+70 °C
Protection	IEC 60529, IP40
Fire & smoke	NF F 16-101, NF F 16-102, EN 45545-2: HL3 for requirements R22, R23, R26, UL 94/VO
Insulation materials	Cover: polycarbonate Base: nylon

Instantaneous relay D6-U200N-W

Product labeling

Part number identification	Part number mentioned on top side relay
Serial number identification	Serial number mentioned on top side relay Serial number = Lot number + year + week + reference number
Data matrix code	According GS1 standard, placed on top side relay 01 Global Trade Item Number 240 Part number 21 Serial number Example: 011234567890123240123456789211234562209001
Revision index identification	Linked to serial number
Terminals	Identification on bottom plate relay Relay to be used with Mors Smitt relay sockets which have clear terminal identification on each socket

Railway compliancy

EN 50155: 2017	Railway applications - Rolling stock - Electronic equipment
IEC 60571: 2012	Railway applications - Electronic equipment used on rolling stock
IEC 61373: 2010	Railway applications - Rolling stock equipment - Shock and vibration tests
EN 50121-3-2: 2016	Railway applications - Electromagnetic compatibility
NF F16-101/102	Railway rolling stock - Fire behavior
EN 45545-2: 2015	Railway applications - Fire protection on railway vehicles Part 2: Requirements for fire behavior of materials and components

Options

Code	Description	Remark	Cannot be combined with:
Standard options:			
Lg	Green LED indicator		
Lr	Red LED indicator		
Q	Double zener diode over coil	Unom ≤ 120 V. Maximum allowed peak voltage 180 V, higher voltage will damage the diode. Replaces back EMF diode.	Z
Z	No diode	Polarity independent	Q
Keying	Coding relay and socket		

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

Electrical life expectancy

Due to the safety nature of the D6-U200N-W relays, please contact Mors smitt with detailed contact load data. With this information, Mors Smitt can provide a correct advice in line with your specific application.

Required contact data:

- Voltage
- Current
- Inductance of load
- Kind of suppression used on load
- Required number of operations
- Switching frequency

Instantaneous relay D6-U200N-W

Mounting possibilities/sockets



Surface/wall mounting

338000302	V22BR	Screw socket, wall mount, front connection (9 mm terminals)
338000580	V23	Screw socket, wall mount, front connection (7.5 mm terminals)
338000610	V29	Spring clamp socket, wall mount, front dual connection (2.5 mm ²)

Rail mounting

338000580	V23	Screw socket, rail mount, front connection (7.5 mm terminals)
338000402	V23BR	Screw socket, rail mount, front connection (9 mm terminals)
338000610	V29	Spring clamp socket, rail mount, front dual connection (2.5 mm ²)

Panel/flush mounting

338100100	V3	Solder tag socket, panel mount, rear connection
328400100	V26	Crimp contact socket, panel mount, rear connection, A260 crimp contact
338000560	V31	Faston connection socket, rear dual connection (4.8 x 0.8 mm)
338000670	V33	Push-in terminal socket, panel mount, rear dual connection (3.3 mm ²)

PCB mounting

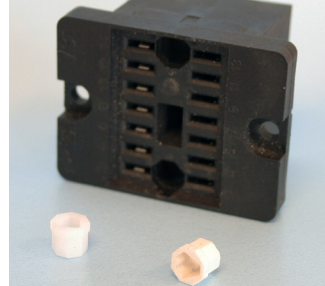
338000561	V32	PCB soldering socket
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No external retaining clip needed as the 'snap-lock' will hold the relay into the socket under all circumstances and mounting directions (according shock & vibration requirements IEC 61373, Category I, Class B, Body mounted). If regulations require external retaining clips, these are available as well.

For more details see datasheets of the sockets on www.morssmitt.com

Instantaneous relay D6-U200N-W

Mechanical keying relay and socket (optional)



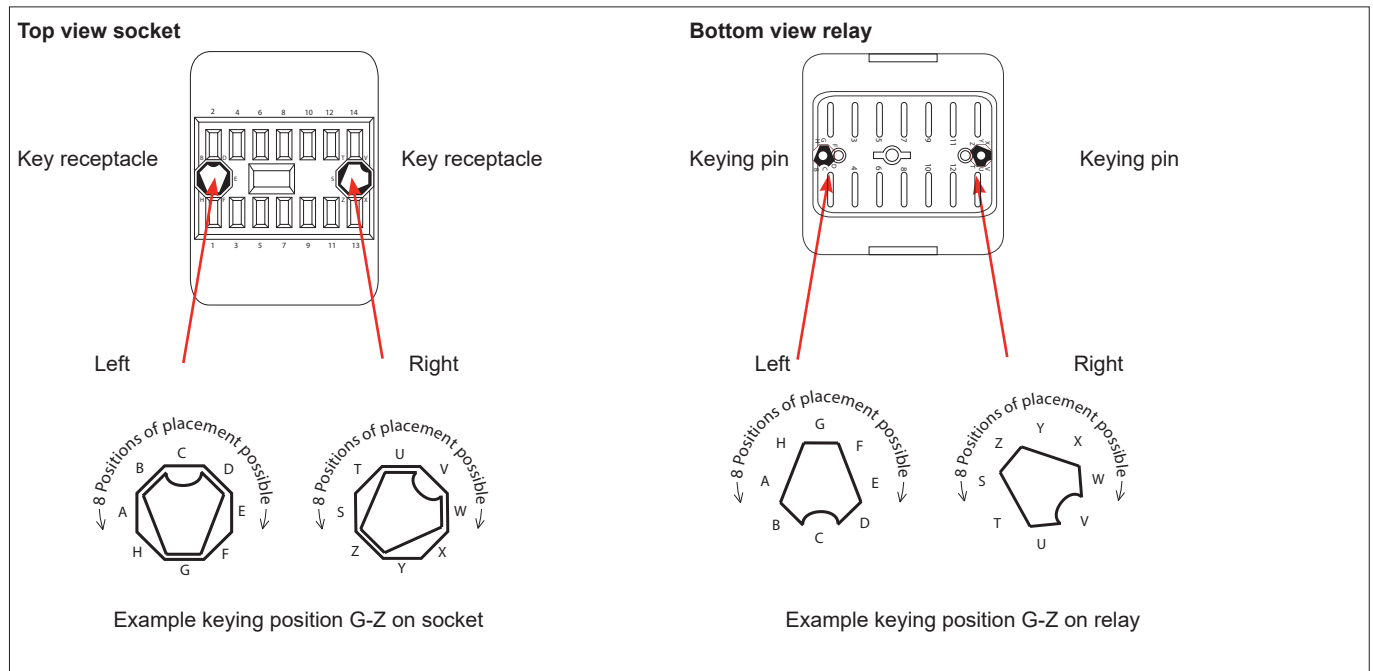
Function:

- To prevent wrong installation
- To prevent damage to equipment
- To prevent unsafe situations

Using keyed relays and sockets prevents a relay is inserted in a wrong socket. For example it prevents that a 24 VDC relay is put in a 110 VDC circuit. Positive discrimination is possible per different function, coil voltage, timing, monitoring, safety and non-safety.

The D relay keying option provides $8 \times 8 = 64$ possibilities. Upon ordering the customer simply indicates the need for the optional keying. Mors Smitt will assign a code to the relay and fix the pins into the relay. The sockets are supplied with loose key receptacles. Inserting the keys into the socket is very simple and self explanatory.

Remark: Sockets and relay shown are examples.



Instantaneous relay D6-U200N-W

Important for relay selection and operation

Make sure the relay is suitable for the application. For critical applications (for example: green loop applications) relays should be checked for proper operation during periodic inspection.

Recommendations for long time contact reliability

For relays to enable failure free performance over a very long operational time, it is important to create the right circumstances. In any relay, contact usage and atmospheric conditions influence the contact surface. To counter this effect it is common practice to use a safety factor of > 2 to ensure long time contact reliability.

Therefore for long time contact reliability we recommend:

- Silver contacts: a minimum contact current of 20 mA per contact
- When low currents are switched not frequently, e.g. 10 mA once a day, it is advised to put similar contacts within the same relay in parallel
- With higher load switching, e.g. 110 VDC and > 1 A, put relay contacts in series
- Rule of thumb: any relay works best with switching currents > 20 mA in DC environment when frequently switched. When not switched frequently a higher switching current like 50 mA is better for a long reliable operational time
- Check relays regularly

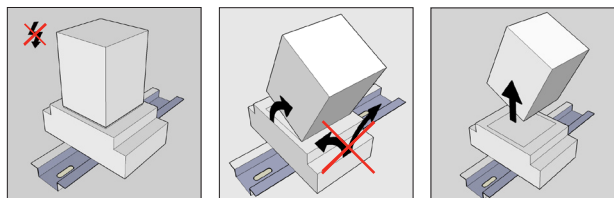
Instructions for use

Installation

Before installation or working on the relay: disconnect the power supply first (no hot swapping)! Install socket and connect wiring according to the terminal identification. Plug relay into the socket ensuring there is no gap between the bottom of relay and the socket. Reverse installation into the socket is not possible due to the mechanical blocking snap-lock feature. Check to ensure that the coil connection polarity is not reversed. Relays can be mounted tightly together to save space. When rail mounting is used, always mount the socket in the direction of the UP arrow, to have proper fixation of the socket on the rail.

Warning!

- Never use silicon in the proximity of the relays
- Do not use the relay in the presence of flammable gas as the arc generated from switching could cause ignition
- To remove relays from the socket, employ up and down lever movements. Sideway movement may cause damage to the coil wires



- Relays should never be swapped to other circuit positions when taken out of its socket for inspection or fault finding, always place it back into the original position to prevent contact resistance problems. Contact resistance problems can be created when swapping relays between different circuit loads due the contact wear/condition having changed during its operational life.

Operation

After installation always apply the rated voltage to the coil to check correct operation. Long term storage may corrode the silver on the relay pins. When plugging the relay into the socket, the female bifurcated or trifurcated receivers will automatically cut through the corrosion on the pins and guarantee a reliable connection.

Before actual use of relays, it is advised to switch the load several times with the contacts. The contacts will both be electrically and mechanically cleaned due to the positive wiping action. Sometimes a contact can build up increased contact resistance (≤ 15 m Ω when new). When using silver contacts one can clean the contact by switching a contact load a few times using >24 VDC & ~ 2 A. Increased contact resistance is not always problematic, as it depends on circuit conditions. In general a contact resistance of 1 Ω is no problem, consult Mors Smitt for more information.

Condensation inside the relay housing can occur when it moves from a warm (and humid) environment to a colder environment. This is a normal phenomenon and will not affect the function of the relay. Materials in the relay have no hygroscopic properties.

Instantaneous relay **D6-U200N-W**

Inspection / maintenance

If the relay does not seem to operate correctly, check for presence of the appropriate coil voltage and polarity using a suitable multimeter. If a LED is fitted, it indicates voltage presence to the coil. If coil voltage is present, but the relay does not operate, a short circuit of the suppression diode is possible (this may have been caused due to reversed coil connection).

If the relay doesn't work after inspection, replace the relay with a similar model. Do not attempt to open the relay cover or try to repair. Contacts are calibrated and in balance, touching can affect proper operation. Also resoldering may affect correct operation. Since 2009 relays have tamper proof seals fitted and once broken, warranty is void.

Most relay defects are caused by installation faults such as overvoltage, spikes/transients, reversed coil connection, high/short current far exceeding the relay specifications. When returning the relays for investigation, please provide all information on the RMA form. Send defective relays back to the manufacturer for repair or replacement. Normal wear and tear or external causes are excluded from warranty.

RMA procedure see www.morssmitt.com

Instantaneous relay

D6-U200N-W

Ordering scheme

D6-U2		N -	W024	Code	
Coil voltages	01				24 VDC
	03				72 VDC
	04				110 VDC
	07				36 VDC Cannot be combined with
Options (add as many options as needed)	Lg				Green LED indicator
	Lr				Red LED indicator
	Q				Double zener diode Z
	Z				No diode Q
Contact information (Double make / double break)			W024		Weld-no-transfer, 2 N/C - 4 N/O
Keying code (Optional, leave blank if not required)	BS				24 VDC
	BY				36 VDC
	AT				48 VDC
	CU				72 VDC
	BV				110 VDC

Example: D6-U201N-LrQW024 code BS

Description: D6-U200N relay, Unom: 24 VDC, red LED indicator, double zener diode, weld-no-transfer contacts 2 N/C - 4 N/O, keying code BS

Instantaneous relay
D6-U200N-W

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

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