

# D2600 Relays

**L G M**  
**PRODUCTS**



fig 1. D2600 Relay

## Relays

High integrity plug-in relays with transparent covers and a choice of front or rear terminal sockets and racks. Extensively used throughout industry for power, switchgear and safety related systems. Available with a choice of contact combinations and materials to suit most applications. All relays and sockets can be fitted with fouling pins to prevent interchangeability between different relays.

## RELAY TYPES

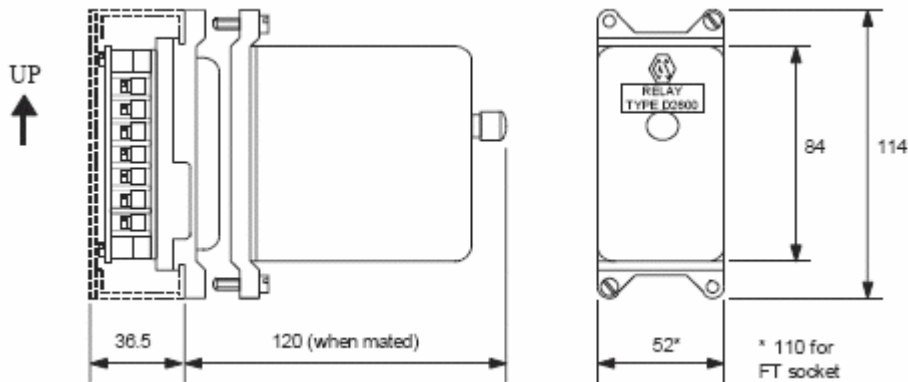
- D2600 Up to 6 normally open or closed pairs, or 4 changeover sets.
- D2600/B Relay with magnetic arc quenching, for DC power applications.
- D2600/LES Latching relays with electrical reset.
- D2600/LM Latching relay with manual reset
- D2600/FG Relay with flag indication of operations state.
- D2600/IR Relays with 'AC withstand' capability to CEGB-CCS (1960)
- D5455/B7 Adjustable delay on energising of between 1 second and 64 minutes.
- D2600/CF One contact set with fleeting operation when relay energised or de-energised.
- D4970/FR70 Flashing relays with one set of volt free contacts.

## TECHNICAL DATA

<b>Coil Data</b>	Max. Coil Voltage:	440V 50Hz or 250Vdc
	Voltage Tolerances:	AC -15% to +1-%, DC -20% to +10%
	Release:	AC 50% (or less) DC 25% (or less) (approx 70% of Min Op Volts)
	Coil Power (nominal):	3.5W DC or AC (typically 10VA @ 110V 50Hz).
	Coil Suppression:	Diodes or VDRs fitted internally if requested.
<b>Operate Times</b>	Pull in = 45 ms maximum, Drop-out = 35ms maximum	
<b>Voltage Withstand</b>	2KV rms 50Hz for 1 minutes between a) current carrying parts and frame, b) contact sets, c) coil and contacts.	
	1KV rms 50Hz for 1 minute across open contacts.	
<b>Insulation</b>	Greater than 100MΩ @ 500Vdc.	
<b>Environment</b>	Temperature:	Operating: -20°C to +55°C      Storage:-20°C to +70°C
	Humidity:	12 Cycles to +55°C and 93% RH
	Shock	Operational: 11ms duration, 100m/s <sup>2</sup> peak (10g), 10 pulses to each plan, no contact separation. Survival: 11ms duration, 150m/s <sup>2</sup> peak (15g), 10 pulses in 3 directions.
	Vibration:	IEC 255-21-1, Class 1
	Seismic:	IEEE 344-1975 paragraph 6.3.1
<b>Electromagnetic:</b>	Radiated Immunity and Fast Transient: EN 50082-1 & EN 50082-2.	
<b>Compatibility:</b>	Radiated and Conducted Emissions: EN 50081-1 & EN 50081-2.	
<b>Mechanical Life:</b>	6 x 10 <sup>6</sup> operations for standard relay.	
<b>Weight:</b>	750g (based on standard D2600 relay with D2600/FT socket ).	

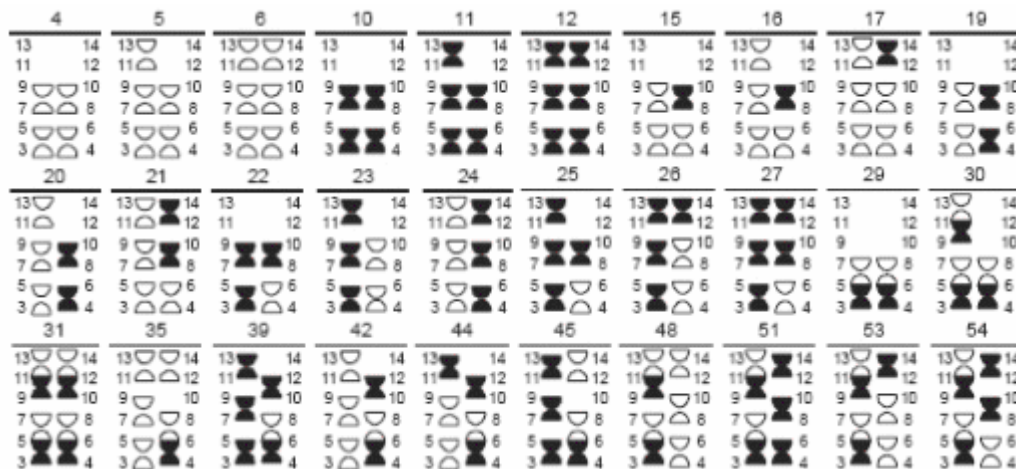
## DIMENSIONS

fig 2. Relay outline drawing (shown with RT socket and 35mm rack).



## CONTACT ARRANGEMENTS

fig 3. Available contact arrangements (Keycodes). Contact pin numbers are a viewed on the rear of the relay.



**NOTE:** Only the most popular arrangements are shown above, other arrangements are available on request. Changeover contacts are break-before-make on above codes. Make-before-break keycodes are also available but the connections are different to standard changeovers. Contacts will be supplied in silver unless specified otherwise.

## CONTACT RATINGS

### Silver Contacts

These are standard contacts for most applications. Each contact pair is capable of switching the loads given in the table but subject to the Relay Total Current Carrying Capacity as defined below.

DC LOADS (Non-inductive)	AC LOADS
250Vdc @ 0.5A max 130Vdc @ 0.5A max 85Vdc @ 1.5A max 50Vdc @ 5A max 35Vdc @ 7A max	250Vac @ 10A max. With a power factor of not less than 0.8.
For intermediate values interpolate between the nearest two levels.	For more inductive loads multiply the max. current (10A) by the power factor to determine the allowed switching current.

### Palladium Copper

These contacts are virtually tarnish free in normal atmospheres. They have a smaller contact dome to provide higher contact pressure and more wiping action. Mainly used for low energy switching (typically 5V at 10mA) but they will handle up to 2A (subject to a maximum of 40W or 4VA). Specified by adding PdCu to the relay description code.

### Silver Cadmium Oxide (D54X)

These contacts are fitted as standard with magnetic blow-outs to provide maximum resistance to arcing for heavier inductive DC loads. They will break DC inductive loads of up to 10A at 120V or 5A at 250V, but it is recommended that two contacts are used in series for highly inductive loads above 200Vdc. For optimum arc quenching, always connect the more positive supply to the highest number contact of a pair. For changeover contact this applies to the pair breaking the highest or most inductive current. Silver Cadmium Oxide contact with magnetic blow-out are specified by adding a 'B' to the relay descriptive code. Silver Cadmium Oxide may also be used without blow-out magnets for AC loads and for intermediate DC loads (add D54X to relay descriptive code). Switching capacity is the same as for silver contacts but contact life will be improved due to the greater arc resistance of these contacts.

## ARC SUPPRESSION

Blow-out magnets are fitted as standard to relays with Silver Cadmium Oxide contacts. They may also be fitted with other contact materials where arc quenching is required to improve contact life. External arc suppression (e.g. diodes or VDR's) should also be considered for inductive loads where contact arcing is likely to occur.

## RELAY TOTAL CURRENT CARRYING CAPACITY

To limit internal heating, relays are subject to a maximum overall relay current calculated as follows:

$$I_1^2 + I_2^2 \dots \dots \dots I_n^2 \leq 100.$$

Where  $I_1^2$  etc are the currents carried simultaneously by individual contacts. Where possible the current should be shared between the two contact stacks for optimum heat distribution within the relay. Individual contact loading must not exceed the specified limit for the contact material.

## ELECTRICAL (CONTACT) LIFE

For light loads the contact life will approach the mechanical life of the relay. This will be reduced in more arduous duty depending on load (particularly breadki8ng o heavy inductive DC loads), frequency and number of operations and local environmental conditions. Greater reliability and contact life can be obtained by sharing heavy loads between contact and by using blow-out magnets where appropriate. Typical contact lives for heavy resistive loads (under laboratory conditions) are:

- >10<sup>6</sup> operations @ 4A and 127Vdc for all contact types with blow-out magnet fitted.
- >10<sup>5</sup> operations @ 7A and 120Vdc for silver cadmium oxide or silver contacts with blow-out magnet fitted.
- >3x10<sup>4</sup> operations @ 10A and 120Vdc for silver cadmium oxide contacts with blow-out magnet fitted.

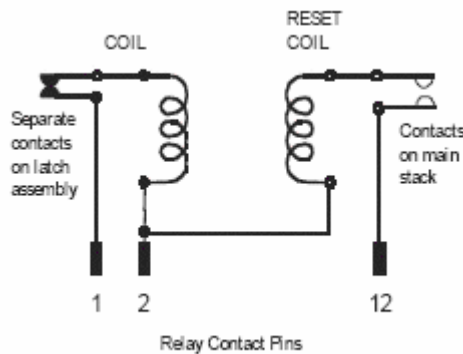
**NOTE:** The information given above is for guidance only and derives from test on contacts used under 'normal' operating conditions. For abnormal and critical applications, tests should be carried out to confirm suitability.

## Latching Relays

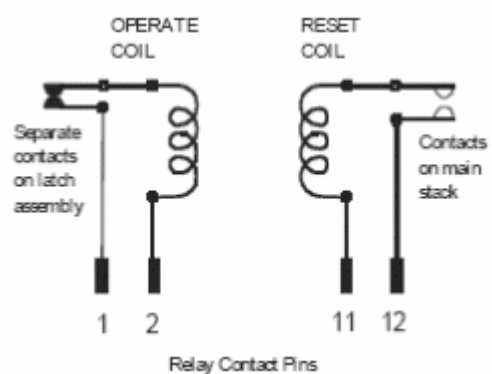
### LATCHING RELAYS WITH ELECTRICAL RESET

Externally identical to the standard D2600 relay and compatible with the standard sockets and racks. Contact materials and types are as the standard relay. Blow-out magnets are available on relays fitted with N/O or N/C contacts. All types require a minimum pulse of 80ms to operate the relay and 100ms to reset. Coils are available for operation on DC voltages between 6V and 250V with AC operation provide via bridge rectifier. Coils can be wired as circuit A (internally commoned on one side, three wire—see fig 4) or circuit B (independent, four wire—see fig 5). Suppression diodes (specify polarity when ordering) or VDR's are available on request.

*figs 4 & 5. Internal Relay wiring. Relays are shown in the detached state with no power to either coil. LES types are shown. LE is similar but without contacts in the operate coil.*



**fig 4. Circuit A wiring (3-wire).** Standard Keycodes available 5, 11, 16, 20, 23, 25 & 30



**fig 5. Circuit B wiring (4-wire).** Standard Keycodes available 4, 10, 15, 19, 22 & 29

### D2600/LES & D2600 LES/B - Suicide Contacts on both coils.

Bi-stable relay with suicide contacts protection for both operate and reset coils. Coils are rated for intermittent operation and the specified minimum voltage must be applied to ensure the relay changes state and breaks the associated suicide contact. Current drain from the supply is limited to approximately 100ms from application to either coil. Supply must not be applied to both circuits simultaneously or the relay may malfunction or overheat.

Provided with up to five externally available N/O or N/C contacts (four for Circuit B wiring) or up to three C/O contacts. In addition the relay will have a N/O contact on the main contact stack to 'arm' the reset coil and a separate N/C contact on the latch assembly to disarm the operate coil. These additional contacts should not be included when determining the keycode of the relay, which refers to the externally available contacts only.

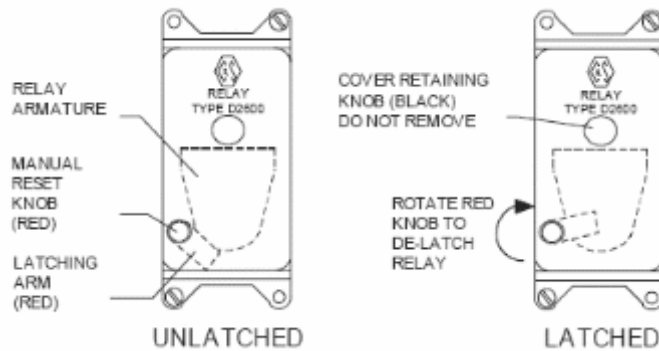
### D2600/LE & D2600/LE/B - Suicide Contacts on Reset coil only

Similar to the D2600/LES relay but the suicide contact is omitted from the operate coil circuit. The operate coil can be continuously energised but supply must not be applied to both circuits simultaneously or the reset coil may overheat.

## LATCHING RELAYS WITH MANUAL RESET

Latching relays type D2600/LM are externally similar to the D2600 relays and are compatible with standard sockets and racks. Contact materials and types are the same as the standard relay and the full number of contacts and blow-outs magnets can be fitted. On energising, a spring loaded latch arm moves across the armature, thereby locking it in the energised position when the coil is de-energised. The latching arm can be reset by rotating the red knob on the front of the relay and is coloured red to give clear indication of relay state.

fig 6. D2600/LM.  
Front view of  
Latching Relay  
with manual reset.



## Relays with Timing Functions

### DELAY OPERATION TIMING RELAY - D5455/B7

Solid state delay-to-operate timer relay with delays of up to 64 minutes in six bands (factory pre-set, please specify band when ordering), mounted in a D2600 case. LED indication of when unit is timing.

- Supply** 12V, 24V, 36V, 50V, 100V or 240V (+10% -20%) DC or AC(50Hz to 110Hz). Full-wave rectified (internally)
- Output contacts** Standard contact arrangement is two N/O plus two N/C silver Contacts. Other materials and contact combinations available on request. Blow-out magnets cannot be fitted to this relay.
- Repetitive Accuracy** +/- 0.5% at constant operating conditions
- Ambient Temp. Range** -30°C to +55°C
- Fouling pins** A number of fouling pins (U to Z, determined by supply voltage) are available in addition to the standard range.

DELAY	LINK
1-4 seconds	A
4-16 seconds	B
16-64 seconds	C
1-4 minutes	D
4-16 minutes	E
16-64 minutes	F

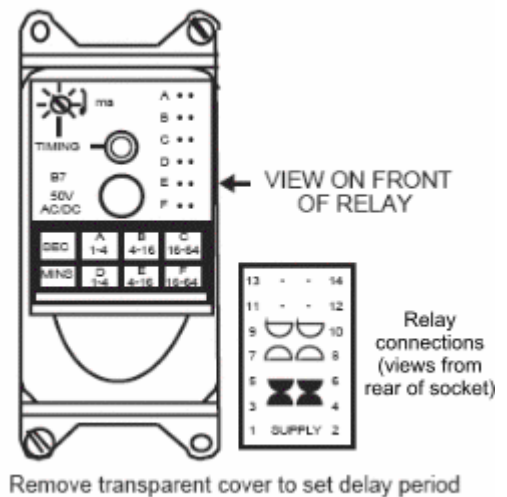


fig 7. D4544/B& Delay operation timing relay.

### FLEETING CONTACT RELAY - D2600/CF\*\*

One set of contacts operates for a brief time when the relay is energised, de-energised or both, irrespective of how long the main coil remains energised. The fleeting contacts can be applied as normally or normally closed with changeover contacts available on request.

- Pulse Length** Fleeting contacts operate for between 100 to 300ms (not adjustable)
- Recovery Time** Less than 500ms
- Supply Voltages** 24V, 50V, 100V or 240V (+10% -20%) DC or AC(50Hz to 110Hz). Full-wave rectified (internally)
- Fleeting contact rating** 110Vac 5A (non-inductive). 110Vdc 30W (non-inductive)
- Non-Fleeting Contacts** Blow out magnets are not available. Can be supplied in all available materials to the following Keycodes:

FLEETING CONTACTS ON RELAY PINS	NON-FLEETING CONTACTS KEYCODES AVAILABLE
11 & 13 12 & 14	4, 10, 15, 19, 22 & 29 5, 11, 16, 20, 23, 25 & 30

**Fouling Pins** This relay can be fitted with the full range of fouling pins.

## FLASHING RELAY—D4970/FR70

A self-contained pulse unit with a PCB mounted control circuit and one set of volt free changeover contacts, mounted in a D2600 case. Two pre-set potentiometers are provided to set the pulse rate and the on/off ratio. If the supply is disconnected the relay return to the de-energised state i.e. with contacts 3 and 5 closed to maintain a path for the alarm condition.

<b>Pulse Rate</b>	Typical adjustment range between 60 and 180 pulses/min.
<b>On-Off Ratio</b>	Typical Adjustment Range between 3:1 and 1:3.
<b>Supply Voltages</b>	24VDC (or 50VAC) 50VDC (or 110VAC) 110VDC (or 250VAC)
	<b>NB</b> The relay is diode protected against supply reversal (pin 1 positive for DC supplies)
<b>Output Contacts</b>	Single pole changeover. Silver Cadmium Oxide (with blow-out magnets).
<b>Fouling pins</b>	The standard range of fouling may be used with the exception of: 6, 12, 18, 24, 30, 36, 42, 48, 60, 66, and 72.

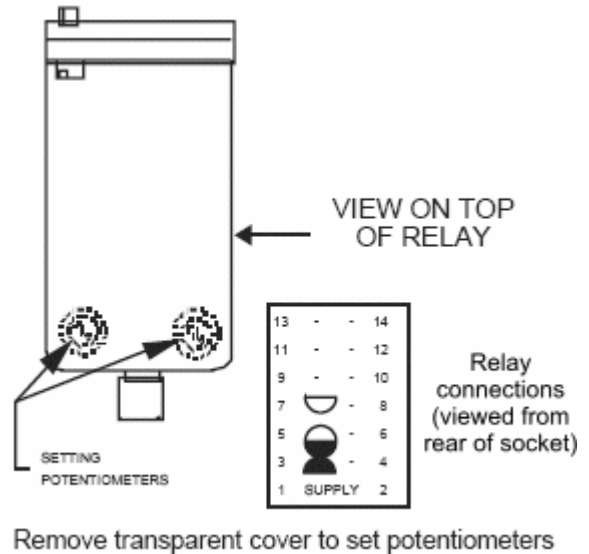


fig 8 D4970/FR70 Flashing relay

## Relay Sockets

Sockets are rated at 440Vac and the RT and FT types are the subject of Small Components Certificates 100A and 156A. Anti-tracking barriers are provided between the socket tags, but the leads should be sleeved for voltages above 250V.

The sockets should be mounted so that the relay contacts are uppermost as shown in fig 9. For most applications the relays may be mounted close together. Where they are likely to be energised for long periods (and particularly if the contacts are also carrying heavy currents) a gap must be left between sockets to allow air to circulate freely. A spacing of 10mm between sockets has been found to be the optimum for relays at maximum dissipation. Adequate heat transfer methods/ventilation must be provided for enclosed cabinets.

### D2600/ST and D2600/LT

These sockets are designed for slide mounting on the racks (see fig 8). The ST & LT types have solder terminals and can be fitted to either rack type (10 or 35mm). They can also be mounted directly to a panel using the inner M4 fixing holes (84 centres) but the panel must be insulated from the terminals for the ST and a cut out provided for the terminals for the LT. The outer fixing holes (105 centres) can be used for mounting both type to plan rails if required.

### D2600/RT

The RT socket has rear terminal blocks and can be slide mounted to the 35mm rack. Terminal screws are M4 and there is an 8mm spacing between barriers to accommodate tags or wires. The inner fixing holes are not available for panel mounting this socket but the outer holes may be used for mounting to plain rails if required.

### D2600/FT

The socket is similar to the RT but has front mounted terminals. It can be directly mounted to a panel using the two diagonal M5 fixing holes. The FT socket can be slide mounted to the 35mm rack but their wider profile limits the number than can be accommodated on the single rack.

## DIMENSIONS

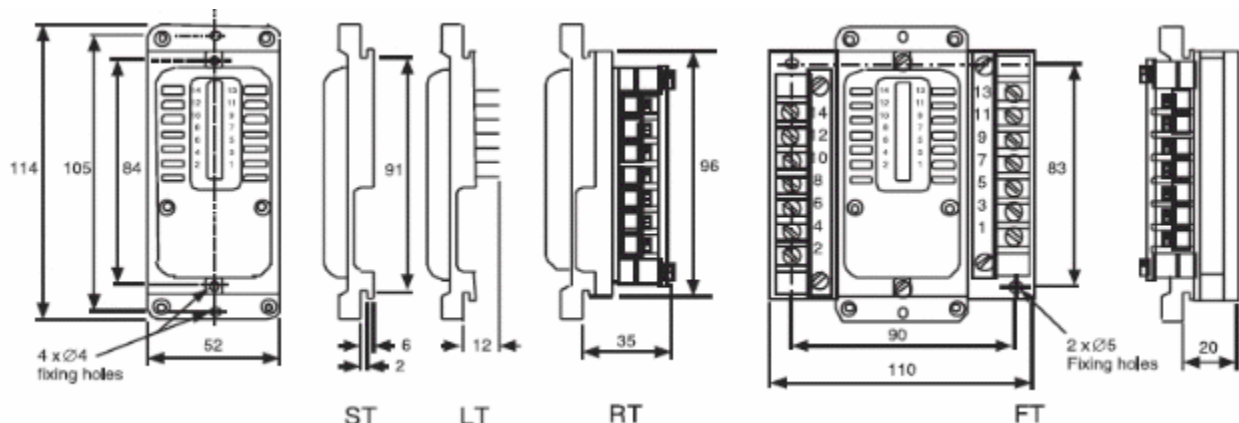
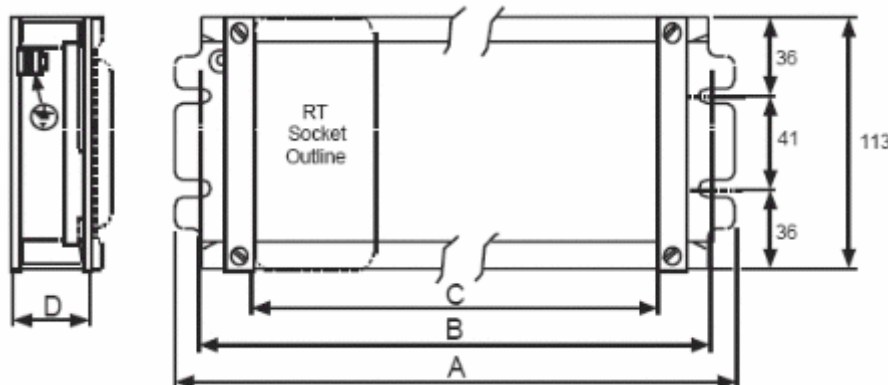


fig 9 Dimensions (mm) of available sockets

## Mounting Racks

Where there is adequate ventilation and the relays are not permanently energised, racks can be populated with up to the maximum number of relays stated below. Where the relays are permanently energised or carrying heavy current (particularly if mounted in an enclosed cabinet), additional spacing of approximately 10mm should be allowed between relays. Where two dimensions are given for C in the table, there is an additional cross rail fitted which must be retained to prevent bowing of the channels. The relay spacing must therefore be calculated separately for the two sections.

### DIMENSIONS



MAX NO OF RELAYS	A mm	B mm	C mm
1	128	103	52
2	180	156	104
3	232	208	156
4	285	260	208
5	337	311	260
6	389	364	312
7	441	416	208+156
8	493	468	208+208
9	545	521	260+208
10	597	572	260+260
11	649	624	312+260
12	701	676	312+312
13	753	728	364+312

fig 8 Mounting Rack dimensions (mm)

Rack Part No: D2630 Accepts Socket Types: ST & LT Depth D: 19

Rack Part No: D4532 Accepts Socket Types: ST, LT, RT & FT (accepts FT with reduced number of relay) Depth: 35

## Multi-Contact Relay D3300

Based on the D2600 Relay but intended for applications where a larger number of contacts are required or where an open style, directly wired unit is preferred. A single fixing bracket is factory fitted as standard in the position shown. If request this can be factory fitted facing inwards or on the opposite side of the relay. Two brackets can also be factory fitted (one either side) for applications where shock or vibration may be encountered. The D3300 Relay can be supplied as a latching relay with electrical reset, similar to the D2600 version.

**Supply Voltage** Up to 440VAC or 250VDC. Operation on AC voltages is limited to the number of contacts specified below but rectifiers can be fitted to allow a DC relay to operate on an AC supply. Coil suppression diodes or VDRs can also be fitted.

**Weight** 570g (with maximum number of contacts)

**Output Contacts** All the standard D2600 contact keycodes, materials and blow-out magnets can be used. Additional contact sets can be fitted to the D3300 Relay up to the maximum specified below but blow-out magnets (if fitted) will only be effective on the contact sets nearest to the coil, up to a maximum of four C/O or six N/O or N/C

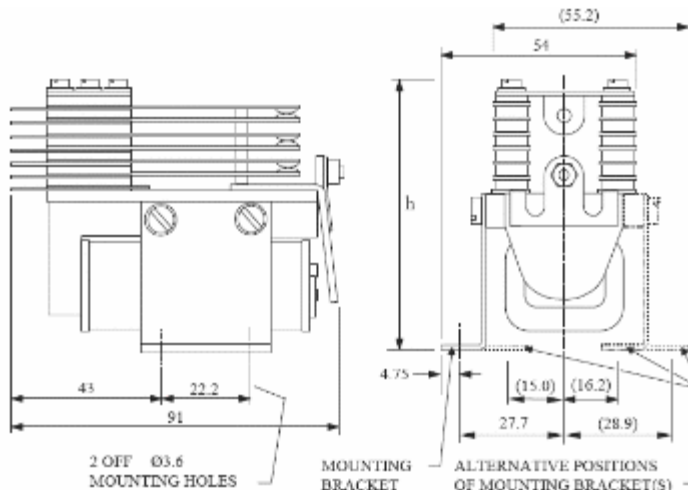
**DC Supplies up to 250Vdc** Up to six C/O or ten N/O or N/C sets may be fitted on each relay.

**AC supplies up to 250Vac** Up to six C/O or ten N/O or N/C sets may be fitted on each relay but if a total of more than six contacts sets are fitted then no more than five of the sets can be C/O or N/C contacts (due to the extra armature loading of these types).

**AC Supplies above 250Vac** Up to four C/O or six N/O or N/C sets may be fitted on each relay.

### DIMENSIONS

Fig 9 D3300 relay dimensions (mm)



CONTACTS	HEIGHT
2 M or B	64
2 C/O	70
4 M or B	75
6 M or B	85
4 C/O	85
8 M or B	95
6 C/O	101
10 M or B	106

## Order Codes

The order code for any given relay consists of the following elements:

**Relay Type/Variants/Flag/Contact Materials/Contact Arrangement/Fouling Pins/Coil Voltage**

<b>Relay Types</b>	D2600, D,3300. D5455/B7, D4970/FR70
<b>Variants</b>	Unspecified - Standard Relay LES, LE - Latching relay, electrical reset LM - Latching relay, mechanical reset TC - Twin Coil CFab - Fleeting contact a = M (N/O contacts) B (N/C contacts) C (C/O contacts) b = E (Fleeting on energising), D (Fleeting on de-energising) or ED (Both)
<b>Flag</b>	Unspecified - Standard relay without flag. FG - Flag
<b>Contact Materials</b>	Unspecified = Silver PdCu = Palladium copper B = Silver cadmium oxide with magnet blow-out D54X - Silver cadmium oxide without magnetic blow-out
<b>Contact Arrangement</b>	<b>## - Keycode from relay data sheet or other contact arrangement to special order</b>
<b>Fouling Pins</b>	Unspecified—No fouling pins fitted FP## - Fouling pin code
<b>Coil Voltage</b>	Coil Voltage (DC or AC with frequency)

## RELAY SOCKETS

### D2600/Termination/Fouling Pins

<b>Socket Type</b>	D2600
<b>Termination</b>	ST - Short Tag LT - Long Tag RT - Rear Terminal FT - Front Terminal
<b>Fouling Pins</b>	Unspecified - No fouling pins fitted FP## - Fouling pin code

## NOTES

1. Relays and sockets are allocated a unique computer code (e.g. 2LD265008), which will be quoted on our quotations and invoices. This will be marked on the relay as a shortened reference code (e.g. 6L5008). These codes must be quoted whenever possible to ensure that the correct relay is supplied, particularly for replacement of spares orders. If fouling pins are specified, the FP code will be marked on both the relay and the socket.
2. The order of the descriptive elements in the code may not always be exactly as shown above. This is not critical as long as all relevant elements are included. In certain cases, two or more elements from one category may be included.
3. Other features not covered by the relay code system should be included in the relay description. E.g. Diodes or VDRs to be fitted across coils (polarity of coil supply must be included for diodes e.g. positive to pin 1).

**LGM PRODUCTS LTD  
UNIT 18 RIVERSIDE INDUSTRIAL ESTATE  
FARNHAM  
SURREY GU9 7UG  
UNITED KINGDOM**

**TEL +44 (0) 1252 725257  
FAX +44 (0) 1252 727627  
E-mail Sales@Lgmproducts.com  
www.Lgmproducts.com**