## MRC, QRC & IRC SERIES

| Application | Types | | Poles | AC ratings | DC ratings | Page | Sockets | Page |
|---|---|---|---|---|---|---|---|---|
| **General purpose** | C2-A20 | 8 pin | 2 C | 10A / 250V | 0,5A @ 110V | 44 | S2 | 56 |
| | C3-A30 | 11 pin | 3 C | 10A / 250V | 0,5A @ 110V | 45 | S3 | 57 |
| | C4-A40 | 14 pin flat blade | 4 C | 10A / 250V | 0,5A @ 110V | 48 | S4 | 59 |
| | C5-A20 | 11 pin flat blade | 2 C | 16A / 500V | 0,5A @ 110V | 49 | S5 | 59 |
| | C5-A30 | 11 pin flat blade | 3 C | 16A / 500V | 0,5A @ 110V | 49 | S5 | 59 |
| | C7-A10 | 8 pin miniature flat blade | 1 C | 16A / 250V | 0,5A @ 110V | 51 | S7 | 60 |
| | C7-A20 | 8 pin miniature flat blade | 2 C | 10A / 250V | 0,5A @ 110V | 51 | S7 | 60 |
| | C9-A41 | 14 pin miniature flat blade | 4 C | 3A / 250V | 0,5A @ 110V | 53 | S9 | 61 |
| | C10-A10 | 5 pin flat blade | 1 C | 10A / 400V | 0,5A @ 110V | 54 | S10 | 61 |
| **Twin contacts**<br>**Low level loads** | C2-T21 | 8 pin | 2 C | 6A / 250V | Min. 5mA @ 5V | 44 | S2 | 56 |
| | C3-T31 | 11 pin | 3 C | 6A / 250V | Min. 5mA @ 5V | 45 | S3 | 57 |
| | C7-T21 | 8 pin miniature flat blade | 2 C | 6A / 250V | Min. 5mA @ 5V | 51 | S7 | 60 |
| | C10-T13 | 5 pin flat blade | 1 C | 6A / 400V | Min. 1mA @ 5V | 54 | S10 | 61 |
| **Open contacts**<br>**DC load switching**<br>Flag not available | C2-G20 | 8 pin | 2 NO | 10A / 250V | 1,2A @ 110V | 44 | S2 | 56 |
| | C3-G30 | 11 pin | 3 NO | 10A / 250V | 1,2A @ 110V | 45 | S3 | 57 |
| | C5-G30 | 11 pin flat blade | 3 NO | 16A / 500V | 1,2A @ 110V | 49 | S5 | 59 |
| | C7-G20 | 8 pin miniature flat blade | 2 NO | 10A / 250V | 0,8A @ 110V | 52 | S7 | 60 |
| **Double make**<br>**DC load switching**<br>Flag not available | C3-X10 | 11 pin | 1 DM | 10A / 250V | 7A @ 110V | 46 | S3 | 57 |
| | C4-X20 | 14 pin flat blade | 2 DM | 10A / 250V | 7A @ 110V | 48 | S4 | 59 |
| | C5-X10 | 11 pin flat blade | 1 DM | 10A / 250V | 7A @ 110V | 50 | S5 | 59 |
| | C7-X10 | 8 pin miniature flat blade | 1 DM | 10A / 250V | 6A @ 110V | 52 | S7 | 60 |
| **Magnet blow-out**<br>Flag not available | C3-M10 | 11 pin | 1 DM | 10A / 250V | 10A @ 220V | 46 | S3 | 57 |
| | C5-M10 | 11 pin flat blade | 1 DM | 16A / 500V | 10A @ 220V | 50 | S5 | 59 |
| **Latching**<br>LED not available | C3-R20 | 11 pin | 2 C | 10A / 250V | 0,5A @ 110V | 46 | S3 | 57 |
| | C4-R30 | 14 pin flat blade | 3 C | 10A / 250V | 0,5A @ 110V | 48 | S4 | 59 |
| | C5-R20 | 11 pin flat blade | 2 C | 10A / 250V | 0,5A @ 110V | 50 | S5 | 59 |
| | C9-R21 | 14 pin miniature flat blade | 2 C | 3A / 250V | 0,5A @ 110V | 53 | S9 | 61 |
| **Sensitive**<br>**250mW ... 800mW**<br>Flag not available<br>LED not available | C3-S14 | 11 pin | 1 C | 6A / 250V | 0,5A @ 110V | 47 | S3 | 57 |
| | C3-E24 | 11 pin | 2 C | 6A / 250V | 0,5A @ 110V | 47 | S3 | 57 |
| | C3-N34 | 11 pin | 3 C | 6A / 250V | 0,5A @ 110V | 47 | S3 | 57 |
| | C9-E21 | 14 pin miniature flat blade | 2 C | 3A / 250V | 0,5A @ 110V | 53 | S9 | 61 |
| **Lamp switching** | C7-W10 | Miniature, faston 187 | 1 NO | 10A / 250V | 0,5A @ 110V | 52 | S7 | 60 |
| **Time cube** | CT2 | 8 pin plug-in timer module | 2 C | 10A / 250V | 0,5A @ 110V | 55 | S2 | 56 |
| | CT3 | 11 pin plug-in timer module | 3 C | 10A / 250V | 0,5A @ 110V | 55 | S3 | 57 |

## PART NUMBER KEY

| C3 | A | 3 | 0 | | | X | 230A |
|---|---|---|---|---|---|---|---|

**Model series**
**C2** - MRC 8 pin
**C3** - MRC 11 pin
**C4** - MRC 14 pin flat blade
**C5** - MRC 11 pin flat blade
**C7** - QRC 8 pin miniature flat blade
**C9** - QRC 14 pin miniature flat blade
**C10** - IRC 5 pin flat blade

**Contact Type**
**A** - standard, change-over contacts
**T** - twin contacts (bifurcated)
**G** - open contacts
**X** - double make contacts
**M** - double make, magnetic blow out
**R** - remanence (latching)
**S** - sensitive coil, 250 mW
**E** - sensitive coil, 500 mW
**N** - sensitive coil, 800 mW
**W** - tungsten and silver contacts

**Number of contacts**

**Coil voltage**

**Led indication**

**Special executions**
**H** - Orange push only test button
**N** - Black blanking plug i.e. no test button
**P** - pins for printed circuit
**E** - cover for flange panel mounting

**Additions to the coil**
**D** - free wheeling diode (DC only)
**F** - polarity and free wheeling diodes (dc only)
**B** - rectifying bridge for AC/DC relays
**R** - RC suppressor (only MR-C types)

**Contact materials**
**0** - standard
**9** - gold-flashed contact, 0,2µ Au
**8** - gold-plated contact, 10µ Au
**4** - sensitive MRC relays
**2** - gold-plated 10µ Au (twin and C9 relays)
**1** - flashed 0,2µ Au (twin and C9 relays)

## GENERAL INFORMATION

**Contact materials**
Silver-nickel (AgNi) and silver-tin oxide ($AgSnO_2$) are used as standard contact materials for all models. Other contact materials are available on request.

**Gold Flash**
For relays that are intended to be stored or remain unoperated for any length of time, a 0,2µ layer of gold protects the contacts from oxidisation.

**Gold Plating**
A 10µ plate of gold increases the operational reliability. They should be used for switching low level currents.

**Contact Resistance**
Contact resistance is dependent on contact material, contact pressure and contact contamination.

High contact resistance raises the temperature of the contacts, therefore reducing their working life.
Typical contact resistance of the MR-C and QR-C relays is 50 mΩ.

**Contacts gap**
Contact gap and opening speed of the contacts have an influence on the length and the duration of the arc.

In the case of AC, a gap of 0,5 mm is sufficient to quench the arc which occurs automatically at the "zero point" of the cycle.
In the case of DC, the arc only quenches when the contact gap is sufficient for the voltage and current applied.
Please see tables of "Max. DC current".

**Maximum Intensity**
The "Max. switching current" indicated in every model, refers to the maximum stable current which should be possible in permanent conduction (**ITH**).

In the case of AC, the "Max. switchingcurrent" that the relay can support is the same for all the values of voltages ≤ of the "Max. switching voltage" specified in every model.
The product of the intensity and the voltage applied should not be higher than the values specified as "Max. AC load".

In the case of DC, the "Max. switching current" must be less than the current that causes the continuous arcing.
The tables of "Max. DC current" show the possible values of intensity in relation to the applied voltage.

**Maximum Voltage**
The maximum voltage on the contacts depends on the insulation between each contact (pole to pole) and between all contacts and the coil.

The EN60947 and VDE 0110 standards set out the maximum voltage values, taking into consideration the quality of the insulation materials, pollution degree as well as the shape and dimensions of the contact barriers (creepage distance).

**Contacts in series**
The connection of two or more contacts in series is equivalent to multiplying the contact gap by that amount. By using this method, a greater break capacity is achieved for DC switching.

**Contacts in parallel**
The connection of two or more contacts in parallel does not mean that it is poss-ible to switch a greater load. However, the stable current and the operational reliability of the relay is increased.

**Double break contacts**
The double break contact arrangement is equivalent to two contacts connected in series.
The maximum intensity supported corresponds to only one contact. This system allows for higher DC operating voltages.

**Bifurcated (twin) contacts**
The contact blade is divided into two parts, each with its own contact.
Both contacts press down each on their own independent fixed contacts.

This system is particularly good for reliably switching at very low levels.

**Contact protection**
The electrical life of contacts can be prolonged by components which eliminate or reduce the back EMF transients.
These voltages are generated by the reactive component of the load on disconnection, which increases the duration and the temperature of the arc.

For AC, RC suppressors or varistors can be connected in parallel with the load or the contacts.

For DC with an inductive load, the best method is to connect a diode in parallel with the load.

**Coil Materials**
Coils bobbins are moulded in polybutylene with fibreglass (130° C).
Enamelled wires of Class F specification are used (155° C).

They are wound on automatic precision winding machines, with the number of turns and wire tension accurately regulated and monitored.

**Tolerances**
Coil resistance is measured at 20° C and is regulated within ± 10% of specified value.

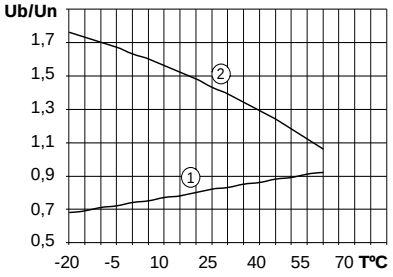
**Standard Windings**
The coil voltages indicated in the catalogue refer to standard windings.
Other coil voltages are available, including products for series connection and amperometric applications.
Please consult your distributor for details.

**Minimum working voltage** (pull in)
This is the minimum voltage that must be supplied to the coil to ensure that the relay energises, the contacts change over and are positively held in place without any vibration.
The values of voltage specified are those at or above which the relay must pull in.

DC relays ≥ 80% **Un**
AC relays ≥ 80% **Un**

**Maximum release voltage** (drop out)
This is the voltage at which the relay de-energises, the contacts change over and are positively held in place without any vibration.
The values of voltage specified are those at or below which the relay must drop out.

DC relays ≥ 10% **Un**
AC relays ≤ 15% **Un**

**Ambient temperature**
The ambient temperature has an influence on the coil resistence and on its thermal dissipation capacity.

Curve 1 represents the variations of the pull in voltage (% **Un**) in relation with the ambient temperature (**T**).
Curve 2 indicates the maximum values of the voltage applied (**Ub**) to the coil in relation with the nominal voltage (**Un**) at the ambient temperature (**T**).