POST OFFICE

3000 TYPE RELAY
DATA SHEETS

TELECOMMUNICATIONS DEVELOPMENT DEPT.

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DESIGN INFORMATION

1. INTRODUCTION

1.1 This book provides detailed information in a list of preferred 3000-type relay designs to enable Post Office design engineers to select relays without reference to a specialist relay group. Information is given on individual designs in the form of relay data sheets indexed in contact action order.

1.2 With the advent of the preferred list a new series of P.O. codes has been initiated commencing from 20,000. These designs are not approved by the Bulk Supply Agreement (B.S.A) manufacturers and do not therefore carry B.C.C. numbers.

1.3 Communication concerned with this document should be addressed to the Relay Applications Group, THQ/TD 1.2.3. 432-2377

2. GENERAL

2.1 The relay data sheets are filed in contact action order using the following sequence:-

Make (M)/Break (B)/Changeover (C)/Make before Break (K)

On each data sheet the relationship is given between contact action and spring numbering.

2.2 Relays available with a particular contact action are listed on each data sheet in the order of:-

(i) single winding coils - plain, with slugs or nickel iron sleeves.

(ii) double winding coils - "

(iii) treble winding coils - "

(iv) quadruple winding coils.

Within these sections coils are placed in decreasing order of resistance.

2.3 All the relay designs shown are based on either 12 or 14 mil spring thickness, these are identified by green (G) or white (W) colour labels respectively on which is printed the P.O. code number. Red label relays requiring special adjustments for current tests are not included and any advice on these designs should be sought from the relay applications group.

2.4 Two attached cross references are available which provide a quick guide to all combinations of coils and contact actions appearing in the P.O. Preferred List of Relays, viz:-

Circuit Function/Contact Action/Coil Cross Reference, Special Applications.

Suggested Contact Action Cross Reference, General Purpose Applications.

Use of these cross references may assist in the choice of a preferred relay design to suit a specific application before selection from the data sheets.

2.5 The relay codes quoted in the Data Sheets form the Post Office preferred list of relays. This list is divided into two main categories:-

(i) General Purpose (or Donkey) relays comprising seven different types of coil:-

Single plain coils	- 6500, 2000, 1000, 500 ohms
Double " "	- 2000 + 2000 ohms
Slugged coils	- 1" Front End, 1500 ohms
	1½" Heel End, 800 ohms

Three of these coils, viz. 2000, 1000 and 2000 + 2000 ohms are available with all the preferred contact actions. The other coils are restricted to specific actions in the preferred list of contact actions.

The contact actions (71 in number) have been selected from the full range up to and including eight actions and are based on a knowledge of those most widely used.

(ii) Special Applications. These relays are used in the standard functions of guard (B), pulse control (B, CD), high impedance bridging (D, I, L), ring-trip (F), release alarm (RA), routiner test (TL), testing-in (SA, SK) and wiper switching (H, HA/HB). Investigation of previous usage has determined the number of designs selected for each circuit application.

Three 10-make and one 6-changeover comb relays (Type 10) are also included in the Data Sheets.

2.6 Ideally there should be no spare springs and designers should draft circuits and allocate relays with this in mind. By choosing relays from a highly restricted list there will inevitably be some spare springs; these are permissible but with careful use of the preferred list the percentage to the total need should remain low.

In cases where the exact design is not available from the list and it is known that a large quantity of the design will be manufactured, then to avoid the necessity of spare springs or the use of two relays in place of one for the correct choice of contact material combination etc, a specific design might be necessary. Application should be made in writing to the Relay Group TD 1.2.3 with Staff Engineer approval to select from a supplementary list or exceptionally to provide a new design.

2.7 The list of contact actions includes a proportion with palladium contacts. The standard contact material is silver which with 50-volt working may be used to carry or disconnect currents up to 300 mAs. For circuits carrying heavier currents up to 1A at 50V, palladium contacts are used. Contacts controlling lamps are a special case, however, as the load, although non-inductive, has a high initial "surge" value at the instant of make. The number of lamps which may be operated on a single silver contact, for a contact life of 10^6 operations is based on a loading of 40 watts under steady state condition or a maximum initial surge current of 20A. (Design Guide 6504 refers).

Palladium should only be used when it is considered essential; if the required combination of contact material is not given, palladium may then be used in place of silver when it is known that only a limited quantity of the design will be produced. Due consideration should be given to the possibility of leaving palladium contacts spare.

2.8 The circuit designer is responsible for allocating suitable quenches to the equipment from a knowledge of the function and the life expected from the circuit elements. Information regarding quenching techniques to be applied to relay contacts and selector mechanisms is given in Design Guides 2005 and 2006 respectively.

2.9 Information concerning P.O. coded relays other than the Standard 3000-type will be available from a second data book.

3. COIL DATA

3.1 The Design Resistance R1 is based on an ambient temperature of 20°C; the maximum and minimum coil resistances R2 and R3 allow for the following manufacturing tolerances:-

Table 1

Coil resistance	Resistance tolerance	Turns tolerance
50 ohms and above	± 10%	Turns exact
Less than 50 ohms but over 10 ohms	± 15%	" ± 3%
Less than 10 ohms	± 20%	" ± 3%

3.2 Changes in coil resistance occur with variations in ambient temperature and heat dissipation within coils. The temperature coefficient of resistance of a relay coil may be defined as the change in its resistance caused by a temperature rise of 1°C expressed as a percentage of its resistance at a standard temperature. For copper the resistance temperature coefficient is taken as 0.4% per °C and thus variations in ambient temperature from 20°C to 55°C and 20°C to 5°C effect resistance changes of +14% and -6% respectively.

Relay data has been calculated for the limiting ambient temperature by using the standard limit circuit factors of safety together with the addition of the resistance tolerance.

3.3 The fully-wound coils used in the general purpose section of the preferred list are as follows:-

Table 2

Resistance	Turns	Resistance	Turns
Plain Coils		Coils with Slugs	
6500	38000	1500 1" F.E.	14600
2000	22600	800 1½" H.E.	8200
1000	15900		
500	10700	Double winding coils	
		2000 + 2000	15700 + 13400

4. CURRENT LIMITS

4.1 The current figures are based directly on the limit circuit factors of safety quoted in the standard design data (Par. 9.1 refers). An asterisk shows where reduced factors of safety have been applied.

4.2 The limit circuit operate factor of safety (F.O.S.) of some single winding 1000 ohm relays has been reduced from four in some instances to satisfy the circuit design criterion that under minimum circuit voltage conditions, any 1000 ohm relay may be connected in series with any other 1000 ohm relay. In no case has the factor of safety been reduced below three, thus in practice the relay will meet the temperature limit conditions.

5. WATTAGE DISSIPATION

5.1 Table 3 shows the internal temperature rise above ambient for 3000 type relay coils for a range of wattage dissipations. The data applies to half/fully wound coils enclosed by a cover type AN.

Table 3

Watts	Temperature rise above ambient °C
1	15
2	30
3	40
4	55
5	65
6	75
7	85

Note:- Coils reach their maximum temperature after approximately one hour.

The maximum internal temperature of a coil is restricted by breakdown temperature of the insulation to 105°C (British Standard No. 156).

5.2 As a guide, the safe power dissipation for various periods of coil energisation are given in Table 4. Cooling times of not less than the energising times should be

allowed where six or more watts are dissipated and not less than a quarter of the enerization time for 4-6 watts dissipation.

Table 4

Watts	Maximum Energisation Time
3	Unlimited
4	60 minutes
5	30 "
6	15 "
7	10 "

5.3 Further information on coil temperature rise with applied power may be obtained from P.O. Circuit laboratory reports and Manufacturers' tests (Par. 10, Reference).

6. VOLTAGE LIMITS

6.1 The coil voltage figures are obtained directly from the current and resistance limits; the minimum operate voltage being I1.R2, the minimum hold voltage I2.R2, the maximum non-operate voltage I3.R3 and the maximum release voltage I4.R3.

7. TIMING

7.1 General

The operate and release lags of a 3000 type relay are calculated from standard data. If the calculated lag is less than 100 milliseconds the figure is rounded off to the nearest 5, if the calculated lag is greater than 100 ms it is rounded to the nearest 10 ms. This figure is the estimated minimum lag and should be used as a guide to the relay's performance.

The maximum lag may be estimated as twice the minimum.

It may be noted from the Data Sheets that the lags quoted for two apparently identical relays are different; this is accounted for by a difference in the coil front cheek material. Relays fitted with bakelite front cheeks (SREP) have shorter operate and release lags than relays with copper cheeks. A typical example is 1C, 500 ohms, 6800 turns - PO 18983 has SREP cheek, silver contacts, PO 4867 has copper front cheek, palladium contacts.

7.2 Operate lags

7.2.1 The operate lag of a 3000 type relay depends upon such factors as:-

inductive effect of the winding,
eddy current paths,
leakage flux, and the
margin between the circuit energisation and the energisation required just to operate the relay i.e. the 'test' operate current value which is quoted on P.O. relay sheets. This is known as the circuit or operating margin.

As a result, operate lags are subject to considerable variations in practice and in consequence they are not normally quoted on P.O. relay sheets unless essential. If the circuit margin is greater than 1.5 the variation of operate lag with a change of battery from 52 to 46 volts is 85% to 170% of the quoted time.

7.2.2 The operate times shown on the data sheets have been calculated assuming 50 volts to be connected directly across the winding. A resistor connected in series with a relay coil can appreciably increase its operate lag. This is more marked on relays fitted with front end slugs. Non-inductive resistance in parallel with a winding is without effect if the relay is operated locally but if series resistance is also present the effect is more complicated.

7.2.3 Owing to the armature movement taking an appreciable time, different contacts function at different times. In the operating mode, break contacts open before make contacts close and contacts of the same type may not function at the same time. The operate time quoted is therefore referred to the lowest numbered pair of springs which open when the relay is operated, unless otherwise stated. Relays fitted with make contacts only, springs 1 and 2 apply. It is not possible to specify the operate times for 'x' or 'y' contact actions.

7.2.4 The preferred coil selected for general purpose application is the 1500 ohm, 14600 turns, 1" F.E. slug. This provides a nominal minimum range of 30-55 ms, dependent on load.

7.3 Release lags

7.3.1 General

The release lag of a 3000type relay depends upon the springset load and residual gap. A relay may be released either by disconnecting or short-circuiting its winding. The data sheets show the minimum release times obtained by each method at 50 volts and also at the minimum operate voltage.

In the case of disconnecting a relay, the coil may be either plain or slugged. The addition of a heel end slug provides the relay with an increased release time due to the substantial eddy current path of the slug. A front end slug gives a similar delay but is normally used to provide operate lags.

By short-circuiting a relay a circulating current is set up within the winding causing an additional release lag. No release times are quoted in the data sheets for relays shunted by resistors or for slugged relays released by short-circuit.

If a silicon diode is connected in parallel with a relay the timing of the relay is modified and will be dependent on the residual value of the relay and the diode employed and varies between approximately 75% and 95% of the short-circuit release time of the relay. On a slugged relay the figure is nearer 90%.

In circuits where a 3000type relay forms the collector load of a transistor, shunt diodes are used to eliminate the inductive surges on release of the relay; the release time of the relay is however considerably increased (Design Guide 3009 refers).

7.3.2. Saturation

Relays saturate if the ampere turns energisation is 450 or more for at least 200 milliseconds. Accurate use can then be made of the timing data. If the energisation is below 450 ATs the timing figures should be used as a guide.

A check can be made to determine whether full saturate ampere turns are available in a winding by applying the following expression:-

$$\text{Ampere turns (ATs)} = \frac{46 \times \text{Total turns (Col. 4)}}{\text{Max. Nominal Resistance (Col. 2)}}$$

A. Full Saturation

Release lags are specified on a P.O. relay sheet only when the relay fully saturates. As the residual gap has a marked effect on the release lag and the gauging of this gap does not necessarily indicate the effective magnetic gap, wide limits on the specified release lag could be expected. Relays, therefore, requiring controlled release times are fitted with screw residuals. The manufacturer is permitted under the sliding residual scheme (S.R.S.A.) to deviate from the design residual figure in order to obtain the specified lag and then mark this value on the label. This figure is enclosed in brackets indicating that the residual is sliding and should be maintained near to this empirical value.

The release times of relay codes in the data sheets which show empty brackets '( )' in the residual column are guaranteed to fall within the minimum value quoted and an upper value of twice the minimum.

The preferred design selected for the general purpose applications is the 800 ohm, 8200 turns, 1½" heel end slug. Two values of minimum release lag have been chosen, the lighter springset loads provide approximately 250 ms, the heavier loads provide 150 ms.

B. Partial Saturation

Release lags are shown for relay designs after partial saturations down to the order of 100 ampere turns. A compensating time factor is subtracted from the full release lag and this is applied to both open and short circuit release lags. At "minimum operate volts" almost all relays will be partially saturated and the release times shown on the data sheets are adjusted accordingly. At 50 volts fewer relay designs are partially saturated.

As in the case of operate lags (par. 7.2.3) different contacts on a relay function at different times. On release, make contacts open before break contacts close and contacts of the same type may not function at the same time. The release time quoted is therefore referred to the lowest numbered pair of springs which open on release, unless otherwise stated. Relays fitted with break springs only, springs 1 and 2 apply.

7.4 Pulse control relays

7.4.1 A selection of pulse control relays is included in the data sheets. A common requirement in pulsing circuits is for a relay to remain operated during a train of pulses; the energising period to the coil may not be long enough to allow the flux to rise to its full value between pulses.

7.4.2 A guard relay or B function in selector circuits for example, is required to hold after an energisation of about 200 ms during up to ten dialled pulses at 9-12 pulses per second, with a maximum break of 80 ms (break period of pulsing relay A). Laboratory tests have shown that by specifying a short circuit release lag of 150 ms, this design will provide the required pulsing performance under circuit conditions. In some circuits a heel end slug is used and a release lag of 230 ms minimum is specified.

7.4.3 Similarly, a pulse control relay or CD function is required to operate during an energisation of about 30 ms and then hold during pulses with a maximum break of about 60 ms (make period of relay A). If the initial energisation to CD relay is about 200 ms, a short circuit release time of 100 ms is necessary.

It is to be noted that pulsing relays (i.e. relays designed to respond to pulse trains), are red label designs or Type 19 and are not shown in this data book.

8. LABEL DETAILS

Label details shown on the data sheets for each relay design comprise the P.O. code number, spring thickness (determined by the colour) and the residual marking as follows:-

Table 5

Type of Residual	Marking on Relay Label	Marking on P.O. Relay Sheet	
		P.O. Label (E-in-C 2264A)	Residual Value (E-in-C 2264B)
Stud	A B C	A B C	4 mils 12 " 20 "
Screw (Normal tolerances	Design figure	Design figure	Design figure Adj.

Type of Residual	Marking on Relay Label	Marking on P.O. Relay Sheet	
		P.O. Label (E-in-C 2264A)	Residual Value (E-in-C 2264B)
Screw (Restricted tolerance)	Manufacturers' determined figure in brackets	Empty brackets	Design figure SRSA
X or Y action	X or Y appear	X or Y appear	-

9. SPECIAL FEATURES

Explanatory notes are given on items which appear in the Special Features column of the data sheets:-

9.1 Factors of Safety (F.O.S.)

Factors of Safety are applied to relay designs to allow for reasonable tolerances on:-

(i) the applied voltage,

(ii) the characteristics of the relays as manufactured,

(iii) the variations in the mechanical adjustment of the relays under service conditions.

Typical multiplying factors applied to the basic gram load of the springsets in determining the required limit circuit ampere turns are:-

Operate	4.0
Hold	2.0-2.5
Release	0.33
Non-Operate	0.4

For release and non-operate conditions it is the maximum permissible ampere turns which are required.

In the case of slow releasing relays requiring an energisation of 450 ATs or above, the operate F.O.S. is deliberately exceeded.

For a line relay subject to line loop conditions the limit circuit F.O.S. operate value may be calculated on the specified test operate value (shown on P.O. relay sheet) + 10% + 10 ampere turns.

9.2 Nickel iron sleeves

Relays employed in speech transmission bridge circuits should offer high impedance to speech currents but provide a low resistance path to D.C. This feature is achieved by fitting three cylindrical nickel iron split sleeves over the relay core. The coils use bakelite front cheeks.

9.3 A shunt field relay has a closed magnetic circuit formed by two connected cores around which are wound the line and polar coils. The polar coil is energised locally and the line coil is energised over the junction loop. When the flux from both coils assist the shunt field relay operates. The springset load is limited to two units.

9.4 'x' Contact unit

An 'x' contact unit operates in advance of any other contact units on a relay and must be the lowest numbered springs in the right hand springset. Armature travel is increased to 43 mils to cater for a packing piece introduced under the buffer block.

In the case of contact action 2B3C a separate page in the data sheets is provided for the X action as the normal springset combination differs from that incorporating an X break.

SUGGESTED CONTACT ACTION CROSS-REFERENCE

GENERAL PURPOSE APPLICATIONS

NOTE

1. A dash in the first choice columnindicates that it is not possible to cover this requirement with a preferred contact action.

2. For contact actions provided with 2 choices, the first choice is available with 3 types of coil, viz. 2000, 1000 and 2000 + 2000 ohms, whilst the second choice may be used with all 7 types of coil (par. 2.5 (i) refers). Certain 7 and 8 contact actions excepted.

Contact actions provided with a single choice are available with all 7 types of coil. Certain 7 and 8 contact actions excepted.

3. In some cases "M" and "B" actions are obtained from the make or break parts of a "K" action. It should be noted that the break of a "K" action will open after the ordinary break contacts open and the make of a "K" action may close before the ordinary make contacts close on energization of the relay, and vice-versa on release of the relay. These cases are shown ϕ.

4. Contact actions shown with * are available with silver and palladium contact variants.

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
1	M	M	C
	B	B	–
	C *	C	–
	K	MK	–
2	2M	2M	–
	MB	MB	MC
	MC *	MC	–
	MK	MK	–
	2B	2C	–
	BC	2C	–
	BK	MCK	M2K ø
	2C *	2C	–
	CK	MCK	2MCK
	2K	M2K	–
3	3M	3M	2MC
	2MB	2MB	2MC
	2MC *	2MC	–
	2MK	MCK	M2K ø
	M2B	MBC	M2C
	MBC	MBC	M2C
	MBK	MCK	M2K ø
	M2C *	M2C	–
	MCK	MCK	2MCK
	M2K	M2K	–
	3B	M2BC	MB2C
	2BC	M2BC	MB2C
	2BK	MBCK	2C2K
	B2C	M2BC	MB2C
	BCK	MBCK	2C2K
	B2K	2C2K	–
	3C	MB2C	–
	2CK	MBCK	2C2K
	C2K	2C2K	–
	3K	–	–

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
4	4M	4M	3MC
	3MB	3MB	3MC
	3MC	3MC	–
	3MK	3MK	2MCK
	2M2B	2MBC	–
	2MBC	2MBC	–
	2MBK	2MCK	–
	2M2C	M3C	4C
	2MCK *	2MCK	–
	2M2K	2C2K	–
	M3B	M2BC	MB2C
	M2BC	M2BC	MB2C
	M2BK	MBCK	2C2K ø
	MB2C *	MB2C	–
	MBCK	MBCK	2C2K ø
	MB2K	2C2K	–
	M3C *	M3C	4C
	M2CK	2C2K ø	–
	MC2K	2C2K	–
	M3K	–	–
	4B	3BC	4C
	3BC *	3BC	4C
	3BK	2C2K ø	–
	2B2C	2B2C	4C
	2BCK	2C2K ø	–
	2B2K	2C2K	–
	B3C	4C	–
	B2CK	2C2K ø	–
	BC2K	2C2K	–
	B3K	–	–
	4C *	4C	–
	3CK	M3CK	–
	2C2K	2C2K	–
	C3K	–	–
	4K	–	–

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
5	5M	4MC	3M2C
	4MB	4MC	3M2C
	4MC	4MC	3M2C
	4MK	M3CK	-
	3M2B	3MBC	3M2C
	3MBC	3MBC	3M2C
	3MBK	M3CK	-
	3M2C *	3M2C	-
	3MCK	M3CK	-
	3M2K	3C2K	-
	2M3B	2MB2C	-
	2M2BC	2MB2C	-
	2M2BK	M3CK	-
	2MB2C	2MB2C	-
	2MBCK	M3CK	-
	2MB2K	3C2K	-
	2M3C *	2M3C	-
	2M2CK	M3CK	-
	2MC2K	3C2K	-
	2M3K	-	-
	M4B	MB3C	M3CK ø
	M3BC	MB3C	M3CK ø
	M3BK	M3CK	-
	M2B2C	MB3C	M3CK ø
	M2BCK	M3CK	-
	M2B2K	3C2K	-
	MB3C	MB3C	M3CK ø
	MB2CK	M3CK	-
	MBC2K	3C2K	-
	MB3K	-	-
	M4C	5C	-
	M3CK	M3CK	-
	M2C2K	3C2K	-

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
5	MC3K	-	-
	M4K	-	-
	5B	2B3C	5C
	4BC	2B3C	5C
	4BK	3C2K ø	-
	3B2C	2B3C	5C
	3BCK	3C2K ø	-
	3B2K	3C2K	-
	2B3C	2B3C	5C
	2B2CK	3C2K ø	-
	2BC2K	3C2K	-
	2B3K	-	-
	B4C	5C	-
	B3CK	3C2K ø	-
	B2C2K	3C2K	-
	BC3K	-	-
	B4K	-	-
	5C *	5C	-
	4CK	M4CK	-
	3C2K	3C2K	-
	2C3K	-	-
	C4K	-	-
	5K	-	-
6	6M	5MC	-
	5MB	5MC	-
	5MC *	5MC	-
	5MK	M4CK	-
	4M2B	4MBC	3MB2C
	4MBC	4MBC	3MB2C
	4MBK	M4CK	-
	4M2C	2M4C	-
	4MCK	M4CK	-

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
6	4M2K	4C2K	-
	3M3B	3MB2C	-
	3M2BC	3MB2C	-
	3M2BK	M4CK	-
	3MB2C	3MB2C	-
	3MBCK	M4CK	-
	3MB2K	4C2K	-
	3M3C	2M4C	-
	3M2CK	M4CK	-
	3MC2K	4C2K	-
	3M3K	-	-
	2M4B	2M2B2C	2M4C
	2M3BC	2M2B2C	2M4C
	2M3BK	M4CK	-
	2M2B2C	2M2B2C	2M4C
	2M2BCK	M4CK	-
	2M2B2K	4C2K	-
	2MB3C	2M4C	-
	2MB2CK	M4CK	-
	2MBC2K	4C2K	-
	2MB3K	-	-
	2M4C *	2M4C	-
	2M3CK	M4CK	-
	2M2C2K	4C2K	-
	2MC3K	-	-
	2M4K	-	-
	M5B	M2B3C	M4CK ø
	M4BC	M2B3C	M4CK ø
	M4BK	M4CK	-
	M3B2C	M2B3C	M4CK ø
	M3BCK	M4CK	-
	M3B2K	4C2K	-
	M2B3C	M2B3C	M4CK ø
	M2B2CK	M4CK	-
	M2BC2K	4C2K	-

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
6	M2B3K	-	-
	MB4C	M4CK ø	-
	MB3CK	M4CK	-
	MB2C2K	4C2K	-
	MBC3K	-	-
	MB4K	-	-
	M5C	6C	-
	M4CK	M4CK	-
	M3C2K	4C2K	-
	M2C3K	-	-
	MC4K	-	-
	M5K	-	-
	6B	6C	-
	5BC	6C	-
	5BK	4C2K ø	-
	4B2C	6C	-
	4BCK	4C2K ø	-
	4B2K	4C2K	-
	3B3C	6C	-
	3B2CK	4C2K ø	-
	3BC2K	4C2K	-
	3B3K	-	-
	2B4C	6C	-
	2B3CK	4C2K ø	-
	2B2C2K	4C2K	-
	2BC3K	-	-
	2B4K	-	-
	B5C	6C	-
	B4CK	4C2K ø	-
	B3C2K	4C2K	-
	B2C3K	-	-
	BC4K	-	-
	B5K	-	-
	6C *	6C	-
	5CK	-	-

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
6	4C2K	4C2K	–
	3C3K	–	–
	2C4K	–	–
	C5K	–	–
	6K	–	–
7	7M	4M3C	–
	6MB	5MBC	4M3C
	6MC	4M3C	–
	6MK	3M2C2K ø	–
	5M2B	5MBC	4M3C
	5MBC	5MBC	4M3C
	5MBK	3M2C2K ø	–
	5M2C	4M3C	–
	5MCK	3M2C2K ø	–
	5M2K	3M2C2K	–
	4M3B	4MB2C	4M3C
	4M2BC	4MB2C	4M3C
	4M2BK	3M2C2K ø	–
	4MB2C	4MB2C	4M3C
	4MBCK	3M2C2K ø	–
	4MB2K	3M2C2K	–
	4M3C *	4M3C	–
	4M2CK	3M2C2K ø	–
	4MC2K	3M2C2K	–
	4M3K	–	–
	3M4B	3M4B	3M4C
	3M3BC	3MB3C	3M4C
	3M3BK	3M2C2K ø	–
	3M2B2C	3MB3C	3M4C
	3M2BCK	3M2C2K ø	–
	3M2B2K	3M2C2K	–
	3MB3C	3MB3C	3M4C
	3MB2CK	3M2C2K ø	–

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
7	3MBC2K	3M2C2K	–
	3MB3K	–	–
	3M4C *	3M4C	–
	3M3CK	–	–
	3M2C2K *	3M2C2K	–
	3MC3K	–	–
	3M4K	–	–
	2M5B	2M2B3C	2MB4C
	2M4BC	2M2B3C	2MB4C
	2M4BK	M2B3CK	2MB3CK
	2M3B2C	2M2B3C	2MB4C
	2M3BCK	M2B3CK	2MB3CK
	2M3B2K	–	–
	2M2B3C	2M2B3C	2MB4C
	2M2B2CK	M2B3CK	2MB3CK
	2M2BC2K	–	–
	2M2B3K	–	–
	2MB4C	2MB4C	–
	2MB3CK	2MB3CK	–
	2MB2C2K	–	–
	2MBC3K	–	–
	2MB4K	–	–
	M6B	M2B4C	M2B3CK ø
	M5BC	M2B4C	M2B3CK ø
	M5BK	M2B3CK	–
	M4B2C	M2B4C	M2B3CK ø
	M4BCK	M2B3CK	–
	M4B2K	–	–
	M3B3C	M2B4C	M2B3CK ø
	M3B2CK	M2B3CK	–
	M3BC2K	–	–
	M3B3K	–	–
	M2B4C *	M2B4C	–
	M2B3CK	M2B3CK	–

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
7	M2B2C2K	-	-
	M2BC3K	-	-
	M2B4K	-	-
	7B	M5B2C	-
	6BC	M5B2C	-
	6BK	-	-
	5B2C	M5B2C	-
	5BCK	-	-
	5B2K	-	-
	4B3C	M5B2C	-
	4B2CK	-	-
	4BC2K	-	-
	4B3K	-	-
	3B4C	-	-
	3B3CK	-	-
	3B2C2K	-	-
	3BC3K	-	-
	3B4K	-	-
8	8M	6M2C	-
	7MB	6M2C	-
	7MC	6M2C	-
	7MK	6MCK	-
	6M2B	6M2C	-
	6MBC	6M2C	-
	6MBK	6MCK	-
	6M2C *	6M2C	-
	6MCK	6MCK	-
	6M2K	-	-
	5M3B	4M2B2C	5MB2C
	5M2BC	4M2B2C	5MB2C
	5M2BK	4M2BCK	5MBCK
	5MB2C	5MB2C	-
	5MBCK	5MBCK	-

Total Units	Contact Action Required	Contact Action to be Used	
		1st Choice	2nd Choice
8	5MB2K	5MB2K	-
	4M4B	4M2B2C	-
	4M3BC	4M2B2C	-
	4M3BK	4M2BCK	-
	4M2B2C *	4M2B2C	-
	4M2BCK	4M2BCK	-
	4M2B2K	-	-
	3M5B	2M4B2C	3M3B2C
	3M4BC	2M4B2C	3M3B2C
	3M4BK	-	-
	3M3B2C	3M3B2C	-
	3M3BCK	-	-
	3M3B2K	-	-
	2M6B	2M4B2C	-
	2M5BC	2M4B2C	-
	2M5BK	-	-
	2M4B2C *	2M4B2C	-
	2M4BCK	-	-
	2M4B2K	-	-
	M7B	6B2C	M5B2C
	M6BC	6B2C	M5B2C
	M6BK	-	-
	M5B2C	M5B2C	-
	M5BCK	-	-
	M5B2K	-	-
	8B	6B2C	-
	7BC	6B2C	-
	7BK	-	-
	6B2C *	6B2C	-
	6BCK	-	-
	6B2K	-	-

CIRCUIT FUNCTION/CONTACT ACTION/COIL CROSS-REFERENCE

SPECIAL APPLICATIONS

NOMINAL CIRCUIT FUNCTION		COIL		Retard	one		two					three						
		Type	Resistance		M	C	2M	M.Mpd	MB	MC	M.Cpd	2C	3M	MB.Mpd	2MC	MC.Mpd	2M.Cpd	MBC	BC.Mpd	B2C
Backward Guard	BG		15000			X						X							
Called Party Supy.	D		200	X	X	X						X							
		Shunt Field	400 + 2000						X										
Guard	B		1500				X								X				
	BA, GD, H		2000 + 7000			X						X			X				
High Impedance, Bridging and Line Signalling	D, I, L	3 N.I. Sleeves	200	X	X	X						X							
			500 + 500	X															
			200 + 200	X		X						X							X
			50 + 50			X						X							
			200 + 200 + 570	X		X						X							
Pulse Control	B, CD		500				X						X		X				
			100					X						X					
	CD		500 + 2000															X	
			5 + 700																X
Release Alarm	RA		4				X											X	
			0.5 + 0.5				X			X			X						
Ring Trip	F	1" F.E.	400 + 300																
		1" F.E.	400 + 900																
Rotary Hunt Control	G		400 + 2000																
Routiner Test	TL		500 + 2000								X					X			
Sleeve Relay	S		85 + 5000		X		X			X			X						
Testing In:- Cordless	SA		25 + 1500																
Sleeve Control	SK		50 + 1500																
Wiper Selecting	WS		200 + 1000																
Wiper Switching	H		400 + 900																
	HA/HB		1500 + 750 + 400																
Time Pulse	TP		1000 + 1000 + 1000 + 1000																
PULSING PULSE GENERATION Page XV	A PU	3 NI Sleeves	200 + 200 500(a-b) + 1500(d-e)		25 travel Stgs 1&2 pt. Jams. Arm. 2K Platinum						X		PO 19/26 PO 19/3(7181) PO 5112						
DIVIDER			1000 + 1000		M2C														

2YB.Mpd

four									five						
2VB.Mpd	3NC	2NC.Mpd	3M.Cpd	2MBC	MB2C	MBCK -	2C.BBxpd	B2C.Bpd	3VB.Mpd	4MC	4M.Cpd	4MK	MB3C	M5CK	B3C:Bxpd
		X								X					
					X										
	X			X						X					
X									X						
													X		
						X									
													X		
							X							X	
								X							
			X								X				
												X			

See also page 4:3 & 8

six							seven							
5MC	5M.Cpd	4M2K	3MB2C	3MBC	MxM4C	M2B3C	6MB	5MB.Mpd	4MB.2Mpd	5MBC	4MB C	3M3BC	3M4C	2M2B3C
x							x	x						
x				x		x			x			x		
	x													
		x												
					x									
			x							x	x		x	x

eight					COIL		NORMAL CIRCUIT FUNCTION	
5M2BK	5MB2C	4MØBC	3M2BBx2C	5BBx2C	Resistance	Type		
					1500Ω		Backward Guard	BG
					200 400 + 200Ω	Shunt Field	Called Party Supy.	D
	X				1300 2000 + 7000		Guard	B BA, GD, H
					200 500 + 500 200 + 200 50 + 50 200 + 200 + 570	) 3 N.I. Sleeves	High Impedance, Bridging and Line Signalling	D, I, L
					500 100 500 + 2000 5 + 700		Pulse Control	B, CD CD
					4 0.5 + 0.5		Release Alarm	RA
			X		400 + 300 400 + 900	1st F.E. 1st F.E.	Ring Trip	F
					400 + 2000		Rotary Hunt Control	G
					500 + 2000		Routiner Test	TL
					85 + 5000		Sleeve Relay	S
X					25 + 1500 50 + 1500		Testing in:- Cordless Sleeve Control	SA SK
					200 + 1000		Wiper Selecting	WS
	X				400 + 900 1500 + 750 + 400		Wiper Switching	H HA/HB
					1000 + 1000 + 1000 + 1000		Time Pulse	TP

CONTACT ACTION RETARD

3000-TYPE RELAY DATA SHEET

LEFT RIGHT
SPRING NUMBERING 1 2 3 4 5 6 7 8 9 10 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION RETARD

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V DC	RELEASE AT 50V SC	RELEASE AT OP VOLTS DC	RELEASE AT OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
200	220	180	7000	A-E														W 3460	12	
200	220	180	6250	A-E														W 8403	10	3 NI SLEEVES
HIGH Z																				ISTHMUS ARMATURE
200	230	190	3980	A-B														W 8433	10	3 NI SLEEVES
200	230	190	4020	D-E																
HIGH Z																				
500	550	450	6470	A-B														W 3449	10	3 NI SLEEVES
500	550	450	6530	D-E																
HIGH Z																				
200	230	190	3980	A-B														W 8460	10	3 NI SLEEVES
200	230	190	4020	B-C																
570	627	513	1700	D-E																
HIGH Z																				
570				A-B														3435		3 NI SLEEVES
200				B-C																
200				D-E																

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*																		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT OC	SC	AT OP VOLTS OC	MIN SC	W RESID		
2000	2200	1800	15700	A-E	6,6	3,2	0,7	0,0	15	7,0	1,3	0,0	10	25	140	15	95	W 9539	B	
1000	1100	900	8260	A-E	13	6,1	1,3	0,0	14	6,7	1,2	0,0	5	25	90	15	60	W 15342	B	
200	220	180	7000	A-E	15	7,1	1,6	0,0	3,3	1,6	0,3	0,0	15	40	270	25	190	W 3501	B	
200 HIGH Z	220	180	6250	A-E	16	5,8	2,1	0,0	3,5	1,3	0,4	0,0	10	40	300	30	240	W 3887	7	3 NI SLEEVES
2000	2200	1800	15700	A-B	6,6	3,2	0,7	0,0	15	7,0	1,3	0,0	15	35	150	25	110	W 3549	B	
2000	2200	1800	13400	D-E	7,8	3,7	0,8	0,0	17	8,2	1,5	0,0	10	35	120	25	90			
85	94	77	4200	A-B	23	8,6	3,1	0,0	2,2	0,8	0,2	0,0	15	45		35		W 5737	7	
5000	5500	4500	10000	AB+DE	6,8	2,5	0,9	0,0	38	14	4,2	0,0	15	35		35				
50	55	45	2450	A-B	36													G 17911	9	
50	55	45	2450	D-E																

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*																	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP	RELEASE				COLOUR		SPECIAL FEATURES
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL	AT 50V	AT OC	50V SC	AT OP	MIN VOLTS SC	CODE	RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
6500	7150	5850	38000	A-E	3.4	1.2	0.7	0.0	24	8.7	3.8	0.0	30	35	250	30	210	W 3598	B	
2000	2200	1800	15700	A-E	8.2	2.9	1.6	0.0	18	6.4	2.9	0.0	15	30	150	20	120	W 11129	B	
1500	1650	1350	14600	A-E	11	4.8	2.3	0.5	18	7.9	3.1	0.7	30	190		160		W 6457	C	1" FE
1000	1100	900	7200	A-E	18	6.4	3.5	0.0	20	7.0	3.1	0.0	10	30	80	20	65	W 16367	B	
800	880	720	8200	A-E	52	7.9	3.9	0.9	46	7.0	2.8	0.6	10	250		250		W 20000	()	1.5"HE
500	550	450	10700	A-E	12	4.3	2.3	0.0	6.6	2.4	1.1	0.0	15	40	270	30	220	W 6337	B	
2000	2200	1800	15700	A-B	8.2	2.9	1.6	0.0	18	6.4	2.9	0.0	15	40	160	30	130	W 12360	B	
2000	2200	1800	13400	D-E	9.6	3.4	1.9	0.0	21	7.6	3.4	0.0	15	40	120	30	100			

3000-TYPE RELAY DATA SHEET

LEFT RIGHT

SPRING NUMBERING 1 2 3 4 5 6 7 8 9 10 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION C *

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN R1	MAX R2	MIN R3			OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
6500	7150	5850	38000	A-E	3.5	1.6	0.7	0.0	25	11	3.8	0.0	35	30	200	25	160	W 7812	B	
6500	7150	5850	38000	A-E	3.5	1.6	0.7	0.0	25	11	3.8	0.0	25	20	170	15	130	W 20002	B	ALL SPRINGS PD
2000	2200	1800	15700	A-E	10	5.9	2.1	1.0	22	13	3.8	1.7	15	20	90	15	65	W 10911	C	
2000	2200	1800	15700	A-E	8.4	3.8	1.6	0.0	18	8.4	2.9	0.0	15	30	130	25	100	W 4491	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	9.1	4.1	1.7	0.0	15	6.8	2.3	0.0	30	200		160		W 20168	B	
1500 1" FE	1650	1350	14600	A-E	9.1	4.1	1.7	0.0	15	6.8	2.3	0.0	30	200		160		W 20001	B	ALL SPRINGS PD
1000	1100	900	7200	A-E	19	8.3	3.5	0.8	21	9.2	3.1	0.8	10	20	55	15	40	W 17152	B	
1000	1100	900	10000	A-E	13	6.0	2.5	0.6	14	6.6	2.3	0.5	10	30	110	25	85	W 4618	B	ALL SPRINGS PD
800 1.5"HE	880	720	8200	A-E	52	7.3	3.0	0.7	46	6.4	2.2	0.5	10	250		250		W 19013	()	
800 1.5"HE	880	720	8200	A-E	52	8.0	2.9	0.9	46	7.1	2.1	0.6	10	250		250		G 18927	()	ALL SPRINGS PD
15000	16500	13500	54900	A-E	1.9	0.7	0.3	0.0	31	11	4.7	0.0	40	35	220	35	200	G 12693	8	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*																	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	DC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
500	550	450	6800	A-E	19	8,8	3,7	0,9	10	4,9	1,7	0,4	10	20	90	15	65	W	18983	B
500	550	450	6800	A-E	19	8,8	3,7	0,9	10	4,9	1,7	0,4	10	30	110	25	80	W	4867	B ALL SPRINGS PD
200	220	180	7000	A-E	16	8,6	3,9	0,9	3,5	1,9	0,7	0,2	15	35	230	20	160	G	5515	12 OP FOS 10%+10AT
200	220	180	6250	A-E	16	5,4	2,6	0,0	3,5	1,2	0,5	0,0	10	45	330	35	270	G	5693	6 3 NI SLEEVES
HIGH Z																				
2000	2200	1800	15700	A-B	8,6	3,8	1,6	0,0	19	8,4	2,9	0,0	15	30	130	25	100	W	4187	B
2000	2200	1800	13400	D-E	10	4,5	1,9	0,0	22	9,9	3,4	0,0	15	30	100	25	80			
2000	2200	1800	15700	A-B	8,6	3,8	1,6	0,0	19	8,4	2,9	0,0	15	20	110	15	80	W	20003	B ALL SPRINGS PD
2000	2200	1800	13400	D-E	10	4,5	1,9	0,0	22	9,9	3,4	0,0	10	20	80	15	65			
2000	2200	1800	15700	A-B	8,5	3,8	1,6	0,0	19	8,4	2,9	0,0	15	30	130	25	100	W	12284	B
7000	7700	6300	27200	D-E	4,9	2,2	0,9	0,0	38	17	5,8	0,0	30	25	100	25	90			
200	230	190	3980	AB+DE	17			0,8	7,8			0,3	10	20		15		W	3645	B 3 NI SLEEVES
200	230	190	4020																	
HIGH Z																				
50	55	45	2110	AB+DE	31			1,4	3,4			0,1	10	20		15		W	12169	B 3 NI SLEEVES
50	55	45	2130																	
HIGH Z																				

CONTACT ACTION C & K

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*																	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	DC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
570	627	513	1700	AB+BC	49			0.0	42			0.0	10	35		35		W 4947	4	3 NI SLEEVES
200	230	190	3980	BC+DE	16			0.0	7.4			0.0	10	35		30				OP FOS 10%+10AT
200	230	190	4020																	
HIGH Z																				
200				AB+DE 17				4.0										G 19/1		3NI SLEEVES. make silver, break pd. K contact. Pulsing relay.
200																				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*									M	*								

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	3,8	2,0	0,7	0,0	27	14	3,8	0,0	25	15	130	10	100	W 16381	B	
2000	2200	1800	15700	A-E	9,0	4,8	1,6	0,6	20	11	2,9	1,0	15	15	85	10	60	W 13949	B	
1500	1650	1350	14600	A-E	10	5,1	1,7	0,6	17	8,5	2,3	0,8	35	150		120		W 8043	10	1" FE
1300	1430	1170	17900	A-E	25	5,4	1,9	0,8	36	7,7	2,2	1,0	25	20	150	20	150	W 11896	()	
1000	1100	900	8260	A-E	17	9,1	3,0	1,1	19	10,0	2,7	1,0	10	15	55	10	40	W 4559	B	
800	880	720	8200	A-E	52	7,6	2,8	0,0	46	6,7	2,0	0,0	10	250		250		W 5316	()	1,5"HE
500	550	450	6800	A-E	21	11	3,7	1,3	12	6,1	1,7	0,6	10	25	90	20	65	W 3296	B	
500	550	450	10700	A-E	42	9,1	3,2	1,4	23	5,0	1,4	0,6	15	20	150	20	150	W 10184	()	
100	110	90	5000	A-E	90	21	7,0	3,4	9,9	2,3	0,6	0,3	15	20	150	20	150	W 8002	()	PD (1-2)
4,0	4,8	3,2	1020	A-E	140	74	25	8,8	0,7	0,4	0,1	0,0	15	25		20		W 18485	B	
2000	2200	1800	15700	A-B	9,2	4,8	1,6	0,6	20	11	2,9	1,0	15	15	85	10	60	W 13537	B	
2000	2200	1800	13400	D-E	11	5,6	1,9	0,7	24	12	3,4	1,2	10	15	65	10	50			

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*									M	*								

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS* MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	AT OP VOLTS OC	AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
85	94	77	4200	A-B	28	9,5	4,8	0,0	2,6	0,9	0,4	0,0	15	40		30		W 3764	A	
5000	5500	4500	10000	AB+DE	8,1	2,8	1,4	0,0	45	16	6,4	0,0	25	30		30				
0,5	0,6	0,4	300	A-B	390	133	67	0,0	0,2	0,1	0,0	0,0	10	40		35		W 4914	A	
0,5	0,6	0,4	200	D-E	580	200	100	0,0	0,3	0,1	0,0	0,0	5	40		35				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	B	*									M	*								

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	15700	A-E	10	4,6	2,0	0,6	22	10	3,6	1,0	15	15	90	10	70	W 14992	B	
1000	1100	900	7200	A-E	21	10	4,3	1,3	23	11	3,9	1,1	10	15	45	10	35	W 6087	B	OP FOS 3.5
2000	2200	1800	15700	A-B	10	4,6	2,0	0,6	22	10	3,6	1,0	20	25	110	20	90	W 5105	B	
2000	2200	1800	13400	D-E	12	5,4	2,3	0,7	26	12	4,2	1,2	15	25	85	20	75			
400	440	360	11600	A-E	8,8				3,9									G 3200	()	SHUNT FLD; POLAR COIL B-D ENRISD FIRST; WINDINGS ASSISTING.
2000	2200	1800	9150	B-D	22				48											

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*									M	*							

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT MIN VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	4.4	2.2	0.8	0.0	31	16	4.8	0.0	40	20	140	20	130	W 3503	B	
6500	7150	5850	38000	A-E	4.4	2.2	0.8	0.0	31	16	4.8	0.0	30	10	110	10	95	W 20004	B	ALL SPRINGS PD
2000	2200	1800	15700	A-E	11	5.4	2.0	0.9	24	12	3.6	1.6	15	15	75	10	60	W 13809	B	
2000	2200	1800	15700	A-E	11	5.4	2.0	0.9	24	12	3.6	1.6	20	25	95	20	80	W 3872	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	12	5.8	2.1	1.0	20	9.6	2.9	1.3	35	130		110		W 18910	B	
1500 1" FE	1650	1350	14600	A-E	12	5.8	2.1	1.0	20	9.6	2.9	1.3	35	130		110		W 20006	B	ALL SPRINGS PD
1000	1100	900	10500	A-E	16	8.1	3.0	1.3	18	8.9	2.7	1.2	10	15	70	10	55	W 14373	B	
1000	1100	900	10000	A-E	17	8.5	3.1	1.4	19	9.4	2.8	1.3	15	25	85	20	70	W 3873	B	ALL SPRINGS PD
800 1.5"HE	880	720	8200	A-E	52	8.0	3.7	0.7	46	7.1	2.6	0.5	10	250		250		W 4890	()	
800 1.5"HE	880	720	8200	A-E	52	8.0	3.7	0.7	46	7.1	2.6	0.5	10	250		250		W 20005	()	ALL SPRINGS PD
500	550	450	10700	A-E	16	7.9	2.9	1.3	8.8	4.4	1.3	0.6	20	25	160	20	130	W 3770	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*									M	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
500	550	450	6800	A-E	25	13	4.6	2.1	14	6.9	2.1	0.9	10	15	60	10	45	W 20007	B	ALL SPRINGS PD
2000	2200	1800	15700	A-B	11	5.4	2.0	0.9	24	12	3.6	1.6	15	15	75	10	60	W 17057	B	
2000	2200	1800	13400	D-E	12	6.3	2.3	1.0	26	14	4.2	1.9	15	15	55	10	45			
2000	2200	1800	15700	A-B	11	5.4	2.0	0.9	24	12	3.6	1.6	20	25	95	20	80	W 18888	B	ALL SPRINGS PD
2000	2200	1800	13400	D-E	12	6.3	2.3	1.0	26	14	4.2	1.9	15	20	75	20	60			
500	550	450	7800	A-B	21	11	4.0	1.8	12	6.0	1.8	0.8	10	15	75	10	55	W 18197	B	PD (1-3)
2000	2200	1800	16000	D-E	10	5.3	1.9	0.9	22	12	3.5	1.6	15	15	75	10	55			
85	94	77	4200	A-B	28	8.3	5.0	0.0	2.6	0.8	0.4	0.0	15	40		35		G 3877	4	
5000	5500	4500	10000	AB+DE	8.2	2.5	1.5	0.0	46	14	6.8	0.0	20	35		35				
0.5	0.6	0.4	300	A-B	450	150	97	3.3	0.3	0.1	0.0	0.0	10	35		30		W 9533	A	
0.5	0.6	0.4	200	D-E	675	225	145	5.0	0.4	0.1	0.1	0.0	5	35		30				

CONTACT ACTION MK & CK

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION K * M *

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	AT MIN OP VOLTS OC	AT MIN OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	5.1	3.0	0.9	0.5	36	22	5.1	3.1	45	15	100	15	90	W 16624	C	
2000	2200	1800	15700	A-E	9.6	5.0	1.6	0.6	21	11	2.9	1.1	15	25	100	20	80	W 3256	B	
1500 1" FE	1650	1350	14600	A-E	10	5.3	1.7	0.7	17	8.8	2.3	0.9	30	150		120		W 20008	B	
1000	1100	900	10500	A-E	14	7.4	2.4	1.0	15	8.2	2.1	0.9	10	15	80	10	55	W 9628	B	
800 1.5"HE	880	720	8200	A-E	52	7.2	3.0	0.0	46	6.3	2.2	0.0	10	250		250		W 7184	()	
500	550	450	6800	A-E	18	6.2	2.9	0.0	9.9	3.4	1.3	0.0	10	35	120	30	110	W 12114	A	
2000	2200	1800	15700	A-B	9.6	5.0	1.6	0.6	21	11	2.9	1.1	15	25	100	20	80	W 16587	B	
2000	2200	1800	13400	D-E	11	5.8	1.9	0.7	24	13	3.4	1.3	15	25	80	20	65			
4000				A-E	5													W 10837	B	1-2-3 pd.

200 B-C
200 D-E
570 A-B
(A-B+D-E) 32(LC) 27(T) 4.5(T)

1 2 3
C

21 22 23
K

R 13383(25) all ships Pd

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*									C	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V				COLOUR CODE			SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT OC	AT SC	OP AT OC	OP AT SC	MIN VOLTS		RESID	
15000	16500	13500	54900	A-E	2,3	0,6	0,5	0,0	38	10	6,4	0,0	50	35	210	35	200	G 9046	3		
6500	7150	5850	38000	A-E	4,9	2,6	1,1	0,0	35	18	6,2	0,0	45	20	130	20	120	W 8688	B		
6500	7150	5850	38000	A-E	3,3	1,1	0,7	0,0	24	7,5	4,0	0,0	35	35	250	35	220	G 11668	A	ALL SPRINGS PD	
2000	2200	1800	15700	A-E	12	6,2	2,5	1,1	26	14	4,6	2,1	15	15	65	10	55	W 12958	B		
2000	2200	1800	15700	A-E	12	6,2	2,5	1,1	26	14	4,6	2,1	20	20	85	20	75	W 8035	B	ALL SPRINGS PD	
1500 1" FE	1650	1350	14600	A-E	11	3,5	2,5	0,0	18	5,8	3,4	0,0	40	200		180		W 18912	4		
1500 1" FE	1650	1350	14600	A-E	18	9,9	3,5	2,1	30	16	4,7	2,9	40	75		65		W 9259	15	ALL SPRINGS PD	
1000	1100	900	10000	A-E	19	9,7	4,0	1,8	21	11	3,6	1,6	15	20	75	20	65	W 6320	B		
1000	1100	900	10000	A-E	19	9,7	4,0	1,8	21	11	3,6	1,6	15	20	75	20	65	W 8017	B	ALL SPRINGS PD	
800 1,5"HE	880	720	8200	A-E	52	7,6	3,5	0,7	46	6,7	2,5	0,5	10	250		250		G 18929	()		
800 1,5"HE	880	720	8200	A-E	52	7,6	3,5	0,7	46	6,7	2,5	0,5	10	250		250		G 15870	()	ALL SPRINGS PD	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*									C	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V			OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
500	550	450	10700	A-E	17	9,1	3,7	1,7	9,4	5,0	1,7	0,8	20	20	150	20	120	W 7800	B	
500	550	450	6800	A-E	28	14	5,9	2,6	15	7,8	2,6	1,2	10	20	75	20	60	W 11402	B	ALL SPRINGS PD
200	220	180	7000	A-E	23	11	4,4	1,6	5,1	2,4	0,8	0,3	15	25	190	20	150	G 7695	B	
200	220	180	6250	A-E	24	8,2	5,8	0,0	5,3	1,8	1,0	0,0	10	25	170	20	150	W 7692	A	3 NI SLEEVES
HIGH Z																				
50	55	45	2110	AB+DE	36			0,7	4,0			0,1	10	25		20		W 19014	A	3 NI SLEEVES
50	55	45	2130																	
HIGH Z																				
200	230	190	3980	AB+DE	19			2,3	8,7			0,9	10	15		10		W 5230	B	3 NI SLEEVES
200	230	190	4020																	OP FOS 10%+10AT
HIGH Z																				
2000	2200	1800	15700	A-B	12	6,2	2,5	1,1	26	14	4,6	2,1	20	20	85	20	75	W 9009	B	
2000	2200	1800	13400	D-E	14	7,2	3,0	1,3	31	16	5,4	2,4	20	20	65	20	60			
2000	2200	1800	15700	A-B	12	6,2	2,5	1,1	26	14	4,6	2,1	20	20	85	20	75	W 18893	B	ALL SPRINGS PD
2000	2200	1800	13400	D-E	14	7,2	3,0	1,3	31	16	5,4	2,4	20	20	65	20	60			
2000	2200	1800	15700	A-B	10	3,7	2,3	0,0	22	8,1	4,1	0,0	15	20	100	15	85	W 13969	5	
7000	7700	6300	27200	D-E	6,0	2,1	1,3	0,0	46	16	8,3	0,0	30	15	75	15	75			

CONTACT ACTION 26

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*									C	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
570	627	513	1700	AB+BC	33			3.2	28			2.2	10	15		10		W	16917 B	3 NI SLEEVES
200	230	190	3980	BC+DE	23			2.3	11			0.9	10	15		10				
200	230	190	4020																	
HIGH Z																				
200	230	190	3980	~~BC~~ AB+DE	20			2.8												
200	230	190	4020																	
HIGH Z.																				

19/26( ) 3 NI SLEEVES Spgs 1-2 Pt.
Distances Arm. Pulling relay.
25° Travel.

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	M	*							M	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V			OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		DC	SC	DC	SC		RESID	
2000	2200	1800	15700	A-E	11	6,4	2,1	1,1	24	14	3,8	1,9	15	15	65	10	50	W	13576	B
1000	1100	900	10000	A-E	18	10	3,3	1,7	20	11	3,0	1,5	15	20	75	15	60	W	3747	B
500	550	450	10700	A-E	42	14	4,3	2,7	23	7,7	1,9	1,2	20	15	100	15	100	W	13375	()
2000	2200	1800	15700	A-B	11	6,4	2,1	1,1	24	14	3,8	1,9	15	15	65	10	50	W	13521	B
2000	2200	1800	13400	D-E	13	7,5	2,5	1,3	29	16	4,4	2,3	15	10	50	10	40			
85	94	77	4200	A-B	28	8,3	5,5	0,0	2,6	0,8	0,4	0,0	15	35		30		G	3860	3
5000	5500	4500	10000	AB+DE	8,3	2,5	1,6	0,0	46	14	7,4	0,0	25	30		30				
0,5	0,6	0,4	300	A-B	470	173	107	6,7	0,3	0,1	0,0	0,0	10	30		25		W	8186	A
0,5	0,6	0,4	200	D-E	700	260	160	10	0,4	0,2	0,1	0,0	5	30		25				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	B	*							M	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT	MIN VOLTS	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	15700	A-E	13	6,2	2,7	1,1	29	14	4,9	1,9	15	15	65	10	55	W 13449	B	
1000	1100	900	10000	A-E	20	9,7	4,3	1,7	22	11	3,9	1,5	15	20	75	20	65	W 5959	B	
100	110	90	5000	A-E	90	29	11	5,8	9,9	3,2	1,0	0,5	15	15	110	15	110	W 15345	()	PO (1-2)
2000	2200	1800	15700	A-B	13	6,2	2,7	1,1	29	14	4,9	1,9	15	15	65	10	55	W 16625	B	
2000	2200	1800	13400	D-E	15	7,2	3,2	1,3	33	16	5,8	2,3	15	10	50	10	45			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							M	*							

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50v	RELEASE AT 50V OC	RELEASE AT 50V SC	MIN VOLTS OC	MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	5.3	2.9	1.1	0.5	38	21	6.6	3.1	45	15	110	15	100	W 5004	B	
6500	7150	5850	38000	A-E	5.3	2.9	1.1	0.5	38	21	6.6	3.1	45	15	110	15	100	W 19128	B	PD (3-5)
2000	2200	1800	15700	A-E	13	7.1	2.7	1.3	29	16	4.9	2.3	15	10	60	10	50	W 13920	B	
2000	2200	1800	15700	A-E	13	7.1	2.7	1.3	29	16	4.9	2.3	20	20	75	15	65	W 9673	B	PD (3-5)
1500 1" FE	1650	1350	14600	A-E	14	7.6	2.9	1.4	23	13	4.0	1.8	40	95		80		W 5220	B	
1500 1" FE	1650	1350	14600	A-E	14	7.6	2.9	1.4	23	13	4.0	1.8	40	95		80		W 20010	B	PD (3-5)
1300	1430	1170	17900	A-E	25	4.0	1.7	0.0	36	5.8	2.0	0.0	25	30	150	30	150	G 7375	()	
1000	1100	900	15900	A-E	12	7.0	2.7	1.3	13	7.7	2.4	1.1	25	20	140	15	110	W 4297	B	
1000	1100	900	8750	A-E	21	13	4.9	2.3	23	14	4.4	2.1	10	10	40	10	30	W 20009	B	PD (3-5) OP FOS 3.4
800 1.5"HE	880	720	8200	A-E	52	7.9	3.7	0.7	46	7.0	2.6	0.5	10	250		250		G 6386	()	
800 1.5"HE	880	720	8200	A-E	52	7.9	3.7	0.7	46	7.0	2.6	0.5	10	250		250		G 20011	()	PD (3-5)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							M	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT	MIN	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC	VOLTS	RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4		OC	SC	OC	SC			
500	550	450	10700	A-E	18	10	4,0	1,9	9,9	5,7	1,8	0,8	20	20	130	15	110	W 6400	B	
500	550	450	6800	A-E	29	16	6,3	2,9	16	9,0	2,8	1,3	10	20	65	15	55	W 15862	B	PD (3-5)
500	550	450	10700	A-E	42	8,8	3,7	1,3	23	4,8	1,7	0,6	20	20	150	20	150	W 18388	( )	PD (1-2)
2000	2200	1800	15700	A-B	11	5,4	2,1	0,9	24	12	3,8	1,6	20	25	95	20	80	G 13390	B	
7000	7700	6300	27200	D-E	6,2	3,1	1,2	0,5	48	24	7,6	3,2	35	20	70	20	70			
2000	2200	1800	15700	A-B	13	7,1	2,7	1,3	29	16	4,9	2,3	20	20	75	15	65	W 7072	B	
2000	2200	1800	13400	D-E	15	8,3	3,2	1,5	33	18	5,8	2,7	20	20	60	15	50			
2000	2200	1800	15700	A-B	13	7,1	2,7	1,3	29	16	4,9	2,3	20	20	75	15	65	W 9899	B	PD (3-5)
2000	2200	1800	13400	D-E	15	8,3	3,2	1,5	33	18	5,8	2,7	20	20	60	15	50			
500	550	450	7800	A-B	26	14	5,5	2,6	14	7,8	2,5	1,2	10	10	65	10	50	W 20012	B	PD (3-5)
2000	2200	1800	16000	D-E	13	6,9	2,7	1,3	29	15	4,8	2,3	15	10	60	10	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	B	*							C		*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	15700	A-E	14	6,9	3,1	1,3	31	15	5,5	2,3	25	20	80	15	70	W 3079	B	
1000	1100	900	10000	A-E	21	11	4,8	2,0	23	12	4,3	1,8	15	20	70	15	60	W 7076	B	OP FOS 3,7
4,0	4,8	3,2	1020	A-E	265	160	58	33	1,3	0,8	0,2	0,1	15	15		15		W 8153	C	
2000	2200	1800	15700	A-B	14	6,9	3,1	1,3	31	15	5,5	2,3	20	10	60	10	50	W 14059	B	
2000	2200	1800	13400	D-E	16	8,1	3,6	1,5	35	18	6,4	2,7	15	10	45	10	40			
5,0	6,0	4,0	530	A-B	850	266	113	55	5,1	1,6	0,5	0,2	5	15	40	15	40	W 5399	()	PD (1-2) S/C TIME IS
700	770	630	12000	D-E	21	12	5,0	2,4	16	9,0	3,2	1,5	20	15		15				WITH D-E S/C

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION M * C * C *

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT MIN OP VOLTS OC	RELEASE AT MIN OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	.5850	38000	A-E	5,8	3,3	1,3	0,6	41	24	7,4	3,5	50	15	100	15	100	W 3767	B	
6500	7150	5850	38000	A-E	5,8	3,3	1,3	0,6	41	24	7,4	3,5	40	10	80	10	75	W 20021	B	PD (3-5)
6500	7150	5850	38000	A-E	5,8	3,3	1,3	0,6	41	24	7,4	3,5	40	10	80	10	75	W 20020	B	ALL SPRINGS PD
2000	2200	1800	15700	A-E	14	8,0	3,1	1,5	31	18	5,5	2,6	20	10	55	10	45	W 13927	B	
2000	2200	1800	15700	A-E	11	4,3	2,8	0,0	24	9,5	5,0	0,0	20	25	110	25	95	W 5641	A	PD (3-5)
2000	2200	1800	15700	A-E	14	8,0	3,1	1,5	31	18	5,5	2,6	25	15	70	15	60	W 8500	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	16	8,6	3,3	1,6	26	14	4,4	2,1	45	80		70		W 8529	B	
1500 1" FE	1650	1350	14600	A-E	16	8,6	3,3	1,6	26	14	4,4	2,1	45	80		70		W 20013	B	PD (3-5)
1500 1" FE	1650	1350	14600	A-E	16	8,6	3,3	1,6	26	14	4,4	2,1	45	80		70		W 20019	B	ALL SPRINGS PD
1000	1100	900	10000	A-E	21	13	4,8	2,3	23	14	4,3	2,1	15	20	65	15	50	W 6639	B	OP FOS 3,7
1000	1100	900	10000	A-E	21	13	4,8	2,3	23	14	4,3	2,1	15	20	65	15	50	W 12328	B	PD (3-5) OP FOS 3,7

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING — LEFT: 1 2 3 4 5 6 7 8 9 10 — RIGHT: 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION — LEFT: M * C * — RIGHT: C *

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
1000	1100	900	10000	A-E	21	13	4,8	2,3	23	14	4,3	2,1	15	20	65	15	50	W 3193	B	ALL SPRINGS PD OP FOS 3,7
800 1,5"HE	880	720	8200	A-E	52	13	5,7	2,1	46	11	4,1	1,5	15	150		150		W 20014	()	
800 1,5"HE	880	720	8200	A-E	52	13	5,7	2,1	46	11	4,1	1,5	15	150		150		W 20015	()	PD (3-5)
800 1,5"HE	880	720	8200	A-E	52	13	5,7	2,1	46	11	4,1	1,5	15	150		150		W 20018	()	ALL SPRINGS PD
500	550	450	8700	A-E	25	14	5,5	2,6	14	8,0	2,5	1,2	15	20	85	15	70	W 6650	B	
500	550	450	8700	A-E	25	14	5,5	2,6	14	8,0	2,5	1,2	15	20	85	15	70	W 12005	B	PD (3-5)
500	550	450	8700	A-E	25	14	5,5	2,6	14	8,0	2,5	1,2	10	10	70	10	55	W 20016	B	ALL SPRINGS PD
2000	2200	1800	15700	A-B	14	8,0	3,1	1,5	31	18	5,5	2,6	25	15	70	15	60	W 5543	B	
2000	2200	1800	13400	D-E	16	9,4	3,6	1,7	35	21	6,4	3,1	20	15	50	15	45			
2000	2200	1800	15700	A-B	14	8,0	3,1	1,5	31	18	5,5	2,6	25	15	70	15	60	W 14635	B	PD (3-5)
2000	2200	1800	13400	D-E	16	9,4	3,6	1,7	35	21	6,4	3,1	20	15	50	15	45			
2000	2200	1800	15700	A-B	14	8,0	3,1	1,5	31	18	5,5	2,6	20	10	55	10	45	W 20017	B	ALL SPRINGS PD
2000	2200	1800	13400	D-E	16	9,4	3,6	1,7	35	21	6,4	3,1	15	10	40	10	35			
1000			12180	A-B	18·1			0												
1000			9700	D-E	22·6			0										W S112	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*		C		*					K		*						

-RESISTANCE DESIGN R1 (COIL)	OHMS- MAX R2	MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT MIN-OP VOLTS OC	RELEASE AT MIN-OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	15700	A-E	13	7,3	2,7	1,3	29	16	4,9	2,3	20	20	75	15	65	W 3672	B	
1000	1100	900	10000	A-E	16	6,1	3,8	0,0	18	6,7	3,4	0,0	15	30	100	25	85	W 16950	A	
2000	2200	1800	15700	A-B	13	7,3	2,7	1,3	29	16	4,9	2,3	20	20	75	15	65	W 9753	B	
2000	2200	1800	13400	D-E	15	8,5	3,2	1,5	33	19	5,8	2,7	20	15	55	15	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	K	*								K	*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	OP AT OP VOLTS OC	MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	5.0	2.8	0.9	0.0	36	20	5.1	0.0	35	10	90	10	80	W 20102	B	
2000	2200	1800	15700	A-E	12	6.8	2.1	1.1	26	15	3.8	1.9	20	20	80	15	65	W 3827	B	
1500 1" FE	1650	1350	14600	A-E	14	7.3	2.3	1.2	23	12	3.1	1.6	40	100		85		W 20022	B	
1000	1100	900	10000	A-E	19	11	3.3	1.7	21	12	3.0	1.5	15	20	70	15	55	W 17153	B	
800 1.5"HE	880	720	8200	A-E	52	13	4.0	2.1	46	11	2.9	1.5	15	150		150		W 20023	( )	
500	550	450	6800	A-E	28	16	4.9	2.5	15	8.6	2.2	1.1	10	20	65	15	55	W 20167	B	
2000	2200	1800	15700	A-B	12	6.8	2.1	1.1	26	15	3.8	1.9	15	10	60	10	50	W 18890	B	
2000	2200	1800	13400	D-E	14	7.9	2.5	1.3	31	17	4.4	2.3	15	10	45	10	40			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*	C	*							C		*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE		SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS				
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
200	230	190	3930	AB+DE	30			2.9	14			1.1	10	10		10		W	7953	B
200	230	190	4020																	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*							C	*							

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE		SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP VOLTS				
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-B	13	5,5	3,2	0,8	29	12	5,7	1,4	25	20	90	20	80	W 9495	5	
7000	7700	6300	27200	AB+DE	4,7	2,0	1,2	0,0	47	20	9,4	0,0	60	20	120	20	120			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*							M	*	M	*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OP	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	13	8,3	2,7	1,4	29	18	4,9	2,5	15	10	55	5	45	W 13804	B	
1000	1100	900	15900	A-E	13	8,2	2,7	1,4	14	9,0	2,4	1,2	25	20	130	15	100	W 3627	B	
2000	2200	1800	15700	A-B	13	8,3	2,7	1,4	29	18	4,9	2,5	15	10	55	5	45	W 15885	B	
2000	2200	1800	13400	D-E	15	9,7	3,2	1,6	33	21	5,8	3,0	15	10	40	5	35			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*							M	*	B	*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	14	8,0	3,2	1,4	31	18	5,7	2,5	20	10	55	10	45	W 17349	B	
1000	1100	900	10000	A-E	21	13	5,0	2,2	23	14	4,5	2,0	15	20	65	15	50	W 6332	B	OP FOS 3,1
100	110	90	5000	A-E	90	20	11	3,6	9,9	2,2	1,0	0,3	15	20	150	20	150	G 8576	()	PD (1-2)
2000	2200	1800	15700	A-B	15	8,0	3,2	1,4	33	18	5,7	2,5	20	10	55	10	50	W 14896	B	
2000	2200	1800	13400	D-E	17	9,4	3,7	1,6	37	21	6,7	3,0	20	10	40	10	35			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							M	*	M	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE 50V SC	RELEASE AT OP OC	RELEASE MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	5,0	2,7	1,1	0,0	36	19	6,2	0,0	35	10	95	10	85	G 13010	B	
2000	2200	1800	15700	A-E	15	9,4	3,2	1,7	33	21	5,7	3,0	20	10	50	5	40	W 14432	B	
1500 1" FE	1650	1350	14600	A-E	17	10	3,4	1,8	28	17	4,6	2,4	45	70		60		W 20025	B	
1300	1430	1170	17900	A-E	25	5,8	2,2	1,0	36	8,2	2,6	1,2	25	20	150	20	150	G 5546	()	PD (1-2)
1000	1100	900	12000	A-E	19	12	4,2	2,2	21	14	3,8	2,0	15	10	60	5	45	W 20026	B	
800 1,5"HE	880	720	8200	A-E	52	12	5,6	1,6	46	11	4,0	1,1	15	150		150		W 5040	()	
500	550	450	10700	A-E	22	14	4,7	2,4	12	7,6	2,1	1,1	20	15	110	15	90	W 8828	B	
500	550	450	10700	A-E	42 (20)	8,9	3,6	1,4	23	4,9	1,6	0,6	20	20	150	20	150	G 15307	()	42 m/a for 150 m/s lag.
2000	2200	1800	15700	A-B	15	9,4	3,2	1,7	33	21	5,7	3,0	20	10	50	5	40	W 12937	B	
2000	2200	1800	13400	D-E	17	11	3,7	1,9	37	24	6,7	3,5	20	10	35	5	30			
500	550	450	7800	A-B	29	19	6,4	3,3	16	10	2,9	1,5	10	10	50	5	40	W 20024	B	PD (3-5)
2000	2200	1800	16000	D-E	14	9,3	3,1	1,6	31	20	5,6	2,9	20	10	50	5	40			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	K	*							M	*	M	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	15700	A-E	14	8,6	2,7	1,5	31	19	4,9	2,6	25	15	65	15	55	W 5654	B	
1000	1100	900	15900	A-E	13	8,5	2,7	1,4	14	9,3	2,4	1,3	25	15	130	15	100	W 7062	B	
2000	2200	1800	15700	A-B	11	3,9	2,4	0,0	24	8,7	4,4	0,0	20	15	85	15	75	W 12143	B	
2000	2200	1800	13400	D-E	13	4,6	2,8	0,0	29	10	5,1	0,0	15	15	65	15	60			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*							M	*	B	*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR		SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				CODE	RESID	
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	OP DC	MIN VOLTS SC			
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
6500	7150	5850	38000	A-E	6.6	3,8	1,4	0.7	47	27	8.5	4.0	60	15	95	15	95	W 5721	B	
2000	2200	1800	15700	A-E	16	9,1	3,5	1.7	35	20	6,3	3,0	20	10	50	10	45	W 16631	B	
1500 1" FE	1650	1350	14600	A-E	20	9,8	3,8	1.8	33	16	5.1	2.4	50	75		65		W 15546	B	
1000	1100	900	15900	A-E	16	9,0	3,5	1,6	18	9,9	3,1	1,5	30	15	120	15	110	W 8308	B	
800 1.5"HE	880	720	8200	A-E	52	13	6,3	2,0	46	12	4,6	1,4	15	150		150		W 20027	()	
500	550	450	8700	A-E	29	16	6,3	3,0	16	9,0	2,8	1,3	15	15	80	15	70	W 8584	B	
500	550	450	10700	A-E	42	8,7	4,1	1,4	23	4,8	1,9	0,6	20	25	150	25	150	G 13684	()	
2000	2200	1800	15700	A-B	16	9,1	3,5	1,7	35	20	6,3	3,0	20	10	50	10	45	W 18889	B	
2000	2200	1800	13400	D-E	19	11	4,1	1,9	42	23	7,4	3,5	20	10	35	10	35			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							M	*		K	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT 50V OC	AT 50V SC	MIN OP VOLTS OC	MIN VOLTS SC		RESID	
6500	7150	5850	38000	A-E	6,2	4,1	1,3	0,7	44	29	7,7	4,0	45	5	70	5	65	W 20030	B	
6500	7150	5850	38000	A-E	6,2	4,1	1,3	0,7	44	29	7,7	4,0	45	5	70	5	65	W 20028	B	PD (1-5)
2000	2200	1800	15700	A-E	15	9,8	3,2	1,7	33	22	5,7	3,0	25	15	60	15	55	W 3192	B	
2000	2200	1800	15700	A-E	15	9,8	3,2	1,7	33	22	5,7	3,0	20	10	50	5	40	W 20031	B	PD (1-5)
1500 1" FE	1650	1350	14600	A-E	18	11	3,4	1,8	30	17	4,6	2,4	45	70		60		W 20032	B	
1500 1" FE	1650	1350	14600	A-E	18	11	3,4	1,8	30	17	4,6	2,4	45	70		60		W 20033	B	PD (1-5)
1000	1100	900	12000	A-E	20	13	4,2	2,2	22	14	3,8	2,0	15	10	60	5	45	W 20034	B	
1000	1100	900	12000	A-E	20	13	4,2	2,2	22	14	3,8	2,0	15	10	60	5	45	W 20035	B	PD (1-5)
800 1,5"HE	880	720	8200	A-E	52	13	5,6	1,7	46	11	4,0	1,2	15	150		150		W 8109	()	
800 1,5"HE	880	720	8200	A-E	52	13	5,6	1,7	46	11	4,0	1,2	15	150		150		W 20036	()	PD (1-5)
500	550	450	6800	A-E	27	12	6,5	1,0	15	6,6	2,9	0,5	15	25	80	20	70	W 8508	A	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							M	*		K	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V			AT OP MIN VOLTS		COLOUR CODE	SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		DC	SC	DC	SC		RESID	
500	550	450	8700	A-E	27	18	5.7	3.0	15	9.7	2.6	1.3	15	10	60	5	50	W 20029	B	PD (1-5)
2000	2200	1800	15700	A-B	15	9.8	3.2	1.7	33	22	5.7	3.0	25	15	60	15	55	W 18894	B	
2000	2200	1800	13400	D-E	18	11	3.7	1.9	40	25	6.7	3.5	25	15	45	15	45			
2000	2200	1800	15700	A-B	15	9.8	3.2	1.7	33	22	5.7	3.0	20	10	50	5	40	W 20037	B	PD (1-5)
2000	2200	1800	13400	D-E	18	11	3.7	1.9	40	25	6.7	3.5	20	10	35	5	30			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							B	*	B	*					

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	15700	A-E	17	8,8	3,8	1,7	37	19	6,9	3,0	20	10	50	10	45	W 15721	B	
1000	1100	900	15900	A-E	17	8,7	3,8	1,6	19	9,5	3,4	1,5	30	15	120	15	110	W 8871	B	
2000	2200	1800	15700	A-B	17	8,8	3,8	1,7	37	19	6,9	3,0	25	15	65	15	60	W 4483	B	
2000	2200	1800	13400	D-E	20	10	4,5	1,9	44	23	8,1	3,5	25	15	50	15	50			

3000-TYPE RELAY DATA SHEET

		LEFT										RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION			M	*	C	*							B	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT OC	AT SC	AT OP OC	AT SC	MIN VOLTS		RESID	
6500	7150	5850	38000	A-E	5,5	2,3	1,4	0,0	39	16	8,5	0,0	55	20	150	20	140	W	11144	A	
6500	7150	5850	38000	A-E	5,5	2,3	1,4	0,0	39	16	8,5	0,0	45	15	130	15	120	W	20038	A	PD (1-5)
2000	2200	1800	15700	A-E	17	11	3,8	1,8	37	23	6,9	3,3	20	10	45	10	40	W	17268	B	
2000	2200	1800	15700	A-E	17	11	3,8	1,8	37	23	6,9	3,3	20	10	45	10	40	W	17501	B	PD (1-5)
1500 1" FE	1650	1350	14600	A-E	16	5,9	3,8	0,6	26	9,7	5,1	0,8	45	130		120		W	6249	A	
1500 1" FE	1650	1350	14600	A-E	23	11	4,1	2,0	38	19	5,5	2,7	50	65		60		W	20039	B	PD (1-5)
1000	1100	900	13600	A-E	20	12	4,4	2,1	22	13	4,0	1,9	20	10	70	10	60	W	14417	B	
1000	1100	900	12000	A-E	21	14	5,0	2,4	23	15	4,5	2,2	15	10	55	10	45	W	20054	B	PD (1-5) OP FOS 3,6
800 1,5"HE	880	720	8200	A-E	52	13	7,0	2,0	46	12	5,0	1,4	15	150		150		W	20040	()	
800 1,5"HE	880	720	8200	A-E	52	13	7,0	2,0	46	12	5,0	1,4	15	150		150		W	20041	()	PD (1-5)
500	550	450	10700	A-E	25	15	5,6	2,7	14	8,5	2,5	1,2	20	15	100	15	90	W	10124	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							B	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT	MIN VOLTS	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
500	550	450	8700	A-E	32	19	6,9	3,3	18	10	3,1	1,5	15	10	60	10	50	W 20042	B	PD (1-5)
2000	2200	1800	15700	A-B	13	5,5	3,5	0,6	29	12	6,3	1,0	25	25	95	20	85	W 4664	A	
2000	2200	1800	13400	D-E	16	6,4	4,1	0,7	35	14	7,4	1,2	25	25	75	20	70			
2000	2200	1800	15700	A-B	17	11	3,8	1,8	37	23	6,9	3,3	25	15	60	15	55	W 18892	B	PD (1-5)
2000	2200	1800	13400	D-E	20	12	4,5	2,2	44	27	8,1	3,9	25	15	45	15	45			
200	230	190	3980	AB+DE	34			3,6	16			1,4	15	10		10		W 14581	B	3 NI SLEEVES
200	230	190	4020																	
HIGH Z																				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*							B	*		K	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP VOLTS OC	MIN SC		RESID	
2000	2200	1800	15700	A-E	16	9,4	3,5	1,7	35	21	6,3	3,0	25	15	60	15	55	W 11120	B	
1000	1100	900	15900	A-E	12	5,0	3,1	0,0	13	5,5	2,8	0,0	25	25	170	20	160	W 6782	A	
2000	2200	1800	15700	A-B	16	9,4	3,5	1,7	35	21	6,3	3,0	25	15	60	15	55	W 12989	B	
2000	2200	1800	13400	D-E	19	11	4,1	1,9	42	24	7,4	3,5	25	15	45	15	45			
5,0	6,0	4,0	530	A-B	850	279	104	49	5,1	1,7	0,4	0,2	5	15	100	15	100	W 11949	()	S/C TIME IS
700	770	630	12000	D-E	22	12	4,6	2,2	17	9,5	2,9	1,4	20	15		15				WITH D-E S/C

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*							M	*		C		*			

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE			SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	MIN OP VOLTS OC	MIN OP VOLTS SC		RESID	
2000	2200	1800	15700	A-E	18	8.9	3.8	2.0	40	20	6.9	3.7	25	15	55	10	50	W 3175	B	
2000	2200	1800	15700	A-E	18	8.9	3.8	2.0	40	20	6.9	3.7	25	15	55	10	50	W 9395	B	PD (1-6)
1000	1100	900	15900	A-E	13	4.7	3.5	0.6	14	5.2	3.1	0.6	25	20	150	20	140	W 6812	A	
1000	1100	900	12000	A-E	21	12	5.0	2.7	23	13	4.5	2.4	15	10	50	5	40	W 20173	B	OP FOS 3.5 PD (1-6)
2000	2200	1800	15700	A-B	11	4.1	2.9	0.0	24	9.1	5.3	0.0	20	20	95	15	85	G 18101	A	
2000	2200	1800	13400	D-E	13	4.9	3.4	0.0	29	11	6.2	0.0	15	20	75	15	65			
2000	2200	1800	15700	A-B	18	8.9	3.8	2.0	40	20	6.9	3.7	25	15	55	10	50	W 11451	B	PD (1-6)
2000	2200	1800	13400	D-E	20	10	4.5	2.4	44	23	8.1	4.3	25	10	40	10	40			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*	C	*							B	*	B	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	RESISTANCE MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP AT OC	MIN VOLTS SC		RESID	
2000	2200	1800	15700	A-E	19	8,5	4,0	1,7	42	19	7,2	3,0	30	15	65	15	65	W	11113 B	
2000	2200	1800	15700	A-E	19	8,5	4,0	1,7	42	19	7,2	3,0	25	10	55	10	50	W	17722 B	ALL SPRINGS PD
1000	1100	900	13600	A-E	21	9,8	4,6	1,9	23	11	4,2	1,7	20	10	80	10	70	W	19045 B	OP FOS 3,9
1000	1100	900	13600	A-E	21	9,8	4,6	1,9	23	11	4,2	1,7	20	10	80	10	70	W	17606 B	OP FOS 3,9 ALL SPRINGS PD
2000	2200	1800	15700	A-B	19	8,5	4,0	1,7	42	19	7,2	3,0	30	15	65	15	65	W	9077 B	
2000	2200	1800	13400	D-E	21	9,9	4,7	1,9	46	22	8,5	3,5	30	15	50	15	50			OP FOS 3,8
2000	2200	1800	15700	A-B	19	8,5	4,0	1,7	42	19	7,2	3,0	25	10	55	10	50	W	20166 B	ALL SPRINGS PD
2000	2200	1800	13400	D-E	21	9,9	4,7	1,9	46	22	8,5	3,5	20	10	40	10	40			OP FOS 3,8

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*	C	*							B	*		C	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	AT OP VOLTS OC	AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	15700	A-E	19	10	4.0	1.8	42	22	7.2	3.3	30	15	60	15	60	W 14209	B	
1000	1100	900	15900	A-E	14	5.2	3.7	0.6	15	5.7	3.3	0.5	30	25	170	20	160	W 13696	A	
2000	2200	1800	15700	A-B	19	10	4.0	1.8	42	22	7.2	3.3	30	15	60	15	60	W 9422	B	
2000	2200	1800	13400	D-E	21	12	4.7	2.2	46	26	8.5	3.9	30	15	45	15	45			OP FOS 3.8
400	440	360	4720	A-B	38	12	10	0.8	17	5.2	3.7	0.3	10	20	60	20	55	G 11630	A	PD (1-2)
2000	2200	1800	18200	D-E	10	3.1	2.7	0.0	22	6.8	4.8	0.0	20	20	140	20	120			
400	440	360	4450	A-B	100				44									W 17735	B	OP FOS 3.6
300	330	270	5200	D-E	29				9.6											PD (1-2,21-22)
1" FE																				×B (21-22)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*							C	*	C	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V			MIN VOLTS		COLOUR CODE	SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP OC	SC	RESID	
6500	7150	5850	38000	A-E	4.9	1.9	1.3	0.0	35	13	7.5	0.0	50	25	170	25	150	G 10380 A	
6500	7150	5850	38000	A-E	6.0	2.2	1.6	0.0	43	15	9.1	0.0	45	10	110	10	110	W 20044 A	ALL SPRINGS PD
2000	2200	1800	15700	A-E	19	9.9	4.0	2.2	42	22	7.2	4.0	30	10	50	10	50	W 4569 B	
2000	2200	1800	15700	A-E	19	9.9	4.0	2.2	42	22	7.2	4.0	30	10	50	10	50	W 9027 B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	28	11	4.3	2.4	46	18	5.8	3.2	50	50		50		W 20043 B	DP FOS 3.9
1500 1" FE	1650	1350	14600	A-E	28	11	4.3	2.4	46	18	5.8	3.2	50	50		50		W 20045 B	DP FOS 3.9 ALL SPRINGS PD
1000	1100	900	15900	A-E	19	9.8	4.0	2.2	21	11	3.6	2.0	30	15	100	10	85	W 11272 B	
1000	1100	900	15900	A-E	19	9.8	4.0	2.2	21	11	3.6	2.0	30	15	100	10	85	W 11247 B	ALL SPRINGS PD
800 1.5"HE	880	720	8200	A-E	52	12	6.2	2.0	46	11	4.5	1.4	15	150		150		G 16887 ( )	
800 1.5"HE	880	720	8200	A-E	52	12	6.2	2.0	46	11	4.5	1.4	15	150		150		G 20046 ( )	ALL SPRINGS PD
500	550	450	10700	A-E	28	15	5.9	3.3	15	8.0	2.6	1.5	20	15	90	10	80	W 5332 B	

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*							C	*	C	*					

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE 50V SC	RELEASE AT OP OC	RELEASE MIN VOLTS SC	COLOUR CODE	COLOUR RESID	SPECIAL FEATURES
500	550	450	10700	A-E	28	15	5.9	3.3	15	8.0	2.6	1.5	20	15	90	10	80	W 12204	B	ALL SPRINGS PD
2000	2200	1800	15700	A-B	19	9.9	4.0	2.2	42	22	7.2	4.0	30	10	50	10	50	W 16675	B	
2000	2200	1800	13400	D-E	21	12	4.7	2.6	46	26	8.5	4.7	30	10	35	10	35			OP FDS 3.7
2000	2200	1800	15700	A-B	14	5.2	3.8	0.7	31	11	6.8	1.3	25	20	80	20	75	W 12227	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	17	6.1	4.4	0.8	37	13	7.9	1.5	25	20	65	20	60			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	K	*							C	*		K	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				PST MIN LAG MSECS OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT 50V OC	AT 50V SC	MIN VOLTS OC	MIN VOLTS SC		RESID	
6500	7150	5850	38000	A-E	6.4	3.5	1.4	0.8	46	25	8.5	4.6	50	5	60	5	60	W 20047	B	OP FOS 3.5
2000	2200	1800	15700	A-E	17	8.5	3.5	1.9	37	19	6.3	3.4	25	15	55	15	50	W 3911	B	
1500	1650	1350	14600	A-E	22	9.2	3.8	2.1	36	15	5.1	2.8	50	60		55		W 20048	B	
1" FE																				
1000	1100	900	15900	A-E	17	8.4	3.5	1.9	19	9.3	3.1	1.7	30	15	110	15	95	W 12459	B	
800	880	720	8200	A-E	52	13	5.4	2.2	46	11	3.9	1.6	15	150		150		G 20175	()	
1.5"HE																				
500	550	450	8700	A-E	31	15	6.3	3.4	17	8.5	2.8	1.6	15	10	55	5	45	W 20049	B	
2000	2200	1800	15700	A-B	17	8.5	3.5	1.9	37	19	6.3	3.4	20	10	45	5	40	W 20050	B	
2000	2200	1800	13400	D-E	20	10	4.1	2.2	44	22	7.4	4.0	20	5	30	5	30			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	B	*					M	*	M	*						

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN OP VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
100	110	90	5000	A-E	90	20	9.2	3.2	9.9	2.2	0.8	0.3	15	20	150	20	150	G 9911	()	PD (1-2)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	M	*					M	*		C	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP MIN		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	17	9.2	3.5	2.0	37	20	6.3	3.6	25	15	55	10	50	W 3178	B	
1000	1100	900	13600	A-E	20	11	4.0	2.3	22	12	3.6	2.1	20	10	60	5	50	W 14993	B	
1300	1430	1170	17900	A-E	26	5.3	2.4	0.7	37	7.5	2.8	0.8	25	20	150	20	150	G 9762	()	
500	550	450	10700	A-E	42	8.8	4.0	1.2	23	4.8	1.8	0.5	20	20	150	20	150	G 9609	()	
2000	2200	1800	15700	A-B	17	9.2	3.5	2.0	37	20	6.3	3.6	25	15	55	10	50	W 8657	B	
2000	2200	1800	13400	D-E	20	11	4.1	2.3	44	24	7.4	4.2	25	10	40	10	40			
500	550	450	7800	A-B	34	18	7.1	4.0	19	10	3.2	1.8	10	10	45	5	35	W 20174	B	PO (23-25)
2000	2200	1800	16000	D-E	17	9.0	3.4	1.9	37	20	6.2	3.5	20	10	40	5	40			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	M	*					M	*		K		*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP AT OC	MIN VOLTS SC	RESID	
1000	1100	900	7200	A-E	35	19	6,9	3,9	39	20	6,3	3,5	15	15	30	15	30	W 14546 B	
1000	1100	900	7300	B-E	34	18	6,8	3,8	37	20	6,2	3,5	15	15	30	15	30		
1000	1100	900	7400	C-E	34	18	6,8	3,8	37	20	6,1	3,4	15	15	30	15	30		
1000	1100	900	7300	D-E	34	18	6,8	3,8	37	20	6,2	3,5	15	15	30	15	30		

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	M	*	B	*					M	*		C	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	AT OP VOLTS OC	AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	15700	A-E	18	8,9	3,8	2,0	40	20	6,9	3,6	30	15	55	10	50	W 3675	B	
1000	1100	900	15900	A-E	18	8,8	3,8	1,9	20	9,7	3,4	1,8	30	15	100	10	90	W 5599	B	
2000	2200	1800	15700	A-B	18	8,9	3,8	2,0	40	20	6,9	3,6	30	15	55	10	50	W 4986	B	
2000	2200	1800	13400	D-E	21	10	4,5	2,3	46	23	8,1	4,2	30	10	40	10	40			

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION M * M * C * M * C *

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN R1	MAX R2	MIN R3			OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
6500	7150	5850	38000	A-E	4.7	1.9	1.2	0.0	34	14	7.2	0.0	45	25	160	20	150	G 7109	A	
6500	7150	5850	38000	A-E	5.7	2.2	1.5	0.0	41	16	8.8	0.0	45	10	100	10	100	W 20056	A	PD (1-7)
2000	2200	1800	15700	A-E	18	10	3.8	2.2	40	23	6.9	3.9	30	10	50	10	45	W 3236	B	
2000	2200	1800	15700	A-E	18	10	3.8	2.2	40	23	6.9	3.9	25	5	35	5	35	W 20057	B	PD (1-7)
1500 1" FE	1650	1350	14600	A-E	20	7.4	4.0	1.4	33	12	5.5	1.8	50	80		75		W 19122	()	
1500 1" FE	1650	1350	14600	A-E	26	11	4.1	2.3	43	18	5.5	3.1	50	45		45		W 20055	B	PD (1-7)
1000	1100	900	15900	A-E	18	10	3.8	2.1	20	11	3.4	1.9	30	15	95	10	85	W 8022	B	
1000	1100	900	12000	A-E	21	14	5.0	2.8	23	15	4.5	2.6	15	10	45	5	35	W 20058	B	PD (1-7) OP FOS 3.3
800 1.5"HE	880	720	8200	A-E	52	12	6.0	1.8	46	11	4.3	1.3	15	150		150		G 5317	()	
800 1.5"HE	880	720	8200	A-E	52	12	6.0	1.8	46	11	4.3	1.3	15	150		150		G 20053	()	PD (1-7)
500	550	450	10700	A-E	27	15	5.6	3.2	15	8.3	2.5	1.4	15	10	70	5	60	W 20052	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	M	*	C	*					M	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		AT OC	SC	OP AT OC	MIN VOLTS SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
500	550	450	10700	A-E	27	15	5.6	3.2	15	8.3	2.5	1.4	15	10	70	5	60	W 20051	B	PD (1-7)
2000	2200	1800	15700	A-B	18	10	3.8	2.2	40	23	6.9	3.9	30	10	50	10	45	W 3591	B	
2000	2200	1800	13400	D-E	21	12	4.5	2.5	46	27	8.1	4.6	30	10	35	10	35			
2000	2200	1800	15700	A-B	18	10	3.8	2.2	40	23	6.9	3.9	25	5	35	5	35	W 20059	B	PD (1-7)
2000	2200	1800	13400	D-E	21	12	4.5	2.5	46	27	8.1	4.6	20	5	25	5	25			

3000-TYPE RELAY DATA SHEET

		LEFT										RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION			M	*	B	*	C	*					M	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	MIN OP	MIN HOLD	MAX NON-OP	MAX REL	MIN OP	MIN HOLD	MAX NON-OP	MAX REL	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP OC	RELEASE AT OP SC	MIN VOLTS	COLOUR CODE	RESID	SPECIAL FEATURES
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4									
6500	7150	5850	38000	A-E	6.1	2.2	1.6	0.0	44	15	9.5	0.0	45	10	110	10	110		W 18096	A	
2000	2200	1800	15700	A-E	20	9.9	4.2	2.2	44	22	7.6	3.9	25	5	40	5	35		W 18974	B	
1500 1" FE	1650	1350	14600	A-E	20	5.6	4.2	1.0	33	9.3	5.7	1.3	50	100		95			W 17020	4	
1000	1100	900	13600	A-E	17	6.0	4.6	0.8	19	6.6	4.1	0.7	20	15	95	10	90		W 6252	A	
800 1.5"HE	880	720	8200	A-E	52	12	6.3	1.8	46	11	4.6	1.3	15	150		150			G 17605	()	
500	550	450	10700	A-E	29	15	6.2	3.2	16	8.0	2.8	1.4	25	15	90	10	80		W 8532	B	
2000	2200	1800	15700	A-B	20	9.9	4.2	2.2	44	22	7.6	3.9	25	5	40	5	35		W 19132	B	
2000	2200	1800	13400	D-E	21	12	4.9	2.5	46	26	8.9	4.6	20	5	25	5	25				OP FOS 3.5

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION M * C * C * M * C *

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE 50V SC	RELEASE AT OP OC	RELEASE MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,1	2,5	1,6	0,0	44	18	9,5	0,0	45	10	95	10	95	W 20066	A	
6500	7150	5850	38000	A-E	6,1	2,5	1,6	0,0	44	18	9,5	0,0	45	10	95	10	95	W 20060	A	ALL SPRINGS PD
2000	2200	1800	15700	A-E	20	12	4,2	2,3	44	26	7,6	4,1	25	5	35	5	35	W 18850	B	
2000	2200	1800	15700	A-E	20	12	4,2	2,3	44	26	7,6	4,1	25	5	35	5	35	W 20065	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	24	8,4	4,2	1,5	40	14	5,7	2,0	50	75		70		W 3565	6	
1500 1" FE	1650	1350	14600	A-E	19	6,4	4,2	0,8	31	11	5,7	1,1	50	90		90		W 20064	A	ALL SPRINGS PD
1000	1100	900	12000	A-E	21	15	5,5	3,0	23	17	5,0	2,7	25	10	55	10	45	W 13004	B	OP FOS 3,0
1000	1100	900	12000	A-E	21	15	5,5	3,0	23	17	5,0	2,7	20	5	45	5	30	W 19058	B	OP FOS 3,0 ALL SPRINGS PD
800 1,5"HE	880	720	8200	A-E	52	15	7,6	2,7	46	13	5,4	1,9	20	100		100		W 4648	()	
800 1,5"HE	880	720	8200	A-E	52	13	6,3	2,1	46	12	4,6	1,5	15	150		150		G 20063	()	ALL SPRINGS PD
500	550	450	10700	A-E	30	17	6,2	3,4	17	9,5	2,8	1,5	20	5	65	5	55	W 20062	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					M	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
500	550	450	6800	A-E	34	14	9,1	1.8	19	7,6	4,1	0.8	15	20	60	15	55	W 8921	A	ALL SPRINGS PD
2000	2200	1800	15700	A-B	20	12	4,2	2.3	44	26	7,6	4,1	25	5	35	5	35	W 17402	B	
2000	2200	1800	13400	D-E	21	14	4,9	2,7	46	30	8,9	4,8	20	5	25	5	25			OP FOS 3,5
2000	2200	1800	15700	A-B	20	12	4,2	2,3	44	26	7,6	4,1	25	5	35	5	35	W 20061	B	ALL SPRINGS PD
2000	2200	1800	13400	D-E	21	14	4,9	2,7	46	30	8,9	4,8	20	5	25	5	25			OP FOS 3.5

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	B	*	C	*						C	*		C	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	15	7,8	3,1	1,6	33	17	5,6	2,9	30	10	70	5	65	W 17250	B	
1000	1100	900	15900	A-E	21	11	4,4	2,3	23	12	4,0	2,0	30	15	90	10	85	W 15429	B	
2000	2200	1800	15700	A-B	13	4,9	3,4	0,0	29	11	6,2	0,0	25	25	100	20	90	G 7254	A	
2000	2200	1800	13400	D-E	15	5,7	4,0	0,5	33	13	7,3	0,9	20	25	75	20	70			
5,0	6,0	4,0	530	A-B	850	181	106	26	5,1	1,1	0,4	0,1	5	20	100	20	100	G 4773	()	S/C TIME IS
700	770	630	12000	D-E	19	8,0	4,7	1,2	15	6,2	2,9	0,7	20	20		20				WITH D-E S/C

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	C	*						C	*		K	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6.2	2.6	1.6	0.0	44	18	9.5	0.0	45	10	95	10	95	W 20070	A	
2000	2200	1800	22600	A-E	15	8.5	2.9	1.6	33	19	5.3	2.9	40	10	90	10	80	W 4312	B	
1500 1" FE	1650	1350	14600	A-E	19	6.6	4.2	0.8	31	11	5.7	1.1	55	90		90		W 20067	A	
1000	1100	900	15900	A-E	15	6.1	3.9	0.8	17	6.7	3.5	0.7	30	15	130	15	120	W 9426	A	
800 1.5"HE	880	720	8200	A-E	52	9.8	6.2	1.2	46	8.6	4.5	0.9	15	190		190		G 16420	()	
500	550	450	10700	A-E	30	18	6.2	3.5	17	9.8	2.8	1.6	20	5	65	5	55	W 20068	B	
2000	2200	1800	15700	A-B	15	6.2	3.9	0.8	33	14	7.1	1.4	20	10	60	10	55	W 20069	A	
2000	2200	1800	13400	D-E	18	7.2	4.6	0.9	40	16	8.3	1.6	20	10	45	10	45			
500	550	450	9500	A-B	47	13	5.7	2.2	26	7.3	2.6	1.0	20	20	100	20	100	G 13470	()	A-B S/C AFTER
2000	2200	1800	11000	D-E	21	11	4.9	1.9	46	25	8.8	3.4	25	15	40	15	40			SATURATION

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*	B	*	C	*					C	*		C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	17	5,6	4,5	0,8	37	12	8,1	1,4	30	20	75	20	75	W 4137	A	
1000	1100	900	15900	A-E	17	5,5	4,5	0,8	19	6,1	4,0	0,7	30	20	140	20	130	W 4134	A	
2000	2200	1800	15700	A-B	17	5,6	4,5	0,8	37	12	8,1	1,4	25	10	65	10	65	W 20071	A	
2000	2200	1800	13400	D-E	20	6,6	5,3	0,9	44	14	9,5	1,6	25	10	50	10	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*							×B	*	B	*		C	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP VOLTS	MIN	COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
400	440	360	4450	A-B	100				44									W	20072×B	OP FOS 2,9
300	330	270	5200	D-E	29				9.6											×B PD (21-22)
1" FE																				

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION C * C * C * C * C *

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,4	3,3	1,9	0,0	46	24	11	0,0	65	15	95	15	95	W 14255	A	OP FOS 3,6
6500	7150	5850	38000	A-E	5,5	1,9	1,5	0,0	39	13	8,8	0,0	45	15	120	15	110	G 20079	A	ALL SPRINGS PD
2000	2200	1800	22600	A-E	17	11	3,2	1,9	37	24	5,8	3,3	45	10	80	10	75	W 4185	B	
2000	2200	1800	22600	A-E	17	11	3,2	1,9	37	24	5,8	3,3	45	10	80	10	75	W 17760	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	16	4,9	3,9	0,7	26	8,0	5,3	0,9	45	120		110		G 12830	A	
1500 1" FE	1650	1350	14600	A-E	16	4,9	3,9	0,7	26	8,0	5,3	0,9	45	120		110		G 20078	A	ALL SPRINGS PD
1000	1100	900	15900	A-E	21	15	4,6	2,6	23	17	4,1	2,4	30	10	80	10	70	W 8520	B	OP FOS 3,6
1000	1100	900	15900	A-E	17	7,9	4,5	0,9	19	8,6	4,0	0,8	30	15	110	15	110	W 11048	A	ALL SPRINGS PD
800 1,5"HE	880	720	8200	A-E	52	9,8	7,1	1,8	46	8,6	5,1	1,3	15	150		150		G 20077	()	
800 1,5"HE	880	720	8200	A-E	52	9,8	7,1	1,8	46	8,6	5,1	1,3	15	150		150		G 20076	()	ALL SPRINGS PD
500	550	450	10700	A-E	35	23	6,8	3,9	19	13	3,1	1,8	20	5	55	5	55	W 20074	B	

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					C	*	C	*					

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT	MIN VOLTS	COLOUR CODE	RESID	SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC			
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4	%							
500	550	450	10700	A-E	35	23	6.8	3.9	19	13	3.1	1.8	20	5	55	5	55	W 20075	B	ALL SPRINGS PD
2000	2200	1800	15700	A-B	13	4.5	3.6	0.6	29	9.9	6.5	1.1	25	20	90	20	80	G 15971	A	
2000	2200	1800	13400	D-E	16	5.3	4.3	0.7	35	12	7.7	1.3	25	20	70	20	65			
2000	2200	1800	15700	A-B	13	4.5	3.6	0.6	29	9.9	6.5	1.1	20	15	75	15	70	G 20073	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	16	5.3	4.3	0.7	35	12	7.7	1.3	20	15	60	15	55			

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	K	*					C	*		K	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,4	2,7	1,6	0,0	46	19	9,5	0,0	50	10	95	10	90	W 20083	A	
2000	2200	1800	15700	A-E	16	6,4	3,9	0,8	35	14	7,1	1,5	30	15	70	15	65	W 10965	A	
1500	1650	1350	14600	A-E	20	6,9	4,2	0,9	33	11	5,7	1,2	55	90		90		W 20082	A	1" FE
1000	1100	900	15900	A-E	16	6,4	3,9	0,8	18	7,0	3,5	0,7	30	15	120	15	120	W 11154	A	
800	880	720	8200	A-E	52	13	6,2	1,8	46	11	4,5	1,3	15	150		150		G 20081	()	1,5"HE
500	550	450	10700	A-E	31	19	6,2	3,5	17	10	2,8	1,6	20	5	60	5	55	W 20080	B	
2000	2200	1800	15700	A-B	16	9,9	3,5	1,7	35	22	6,3	3,1	20	10	45	10	40	G 20084	B	
2000	2200	1800	13400	D-E	19	12	4,1	2,0	42	26	7,4	3,6	20	10	35	10	35			

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING LEFT 1 2 3 4 5 6 7 8 9 10 RIGHT 21 22 23 24 25 26 27 28 29 30
CONTACT ACTION M * M * C * M * M * M *

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT OC	RELEASE 50V SC	RELEASE AT OP OC	RELEASE MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,4	3,0	1,5	0,0	46	21	8,9	0,0	40	15	90	15	90	W 11895	5	
6500	7150	5850	38000	A-E	5,8	2,6	1,5	0,0	41	18	8,8	0,0	45	10	95	10	90	W 20085	A	PD (1-7)
2000	2200	1800	15700	A-E	20	12	3,8	2,2	44	27	6,9	4,0	25	5	35	5	30	W 14265	B	
2000	2200	1800	15700	A-E	20	12	3,8	2,2	44	27	6,9	4,0	25	5	35	5	30	W 20090	B	PD (1-7)
1500 1" FE	1650	1350	14600	A-E	19	10	3,4	1,8	31	17	4,6	2,4	50	70		65		G 15376	B	
1500 1" FE	1650	1350	14600	A-E	17	6,6	3,9	0,8	28	11	5,3	1,1	50	90		85		W 20086	A	PD (1-7)
1300	1430	1170	17900	A-E	25	5,6	2,7	0,7	36	8,1	3,1	0,8	30	20	150	20	150	G 10464	()	
1000	1100	900	13600	A-E	21	14	4,4	2,6	23	15	4,0	2,3	20	5	50	5	40	W 15188	B	
1000	1100	900	12000	A-E	21	16	5,0	2,9	23	18	4,5	2,6	20	5	40	5	30	W 20091	B	PD (1-7)
800 1,5"HE	880	720	8200	A-E	52	12	5,9	1,6	46	11	4,2	1,1	15	150		150		G 20087	()	
800 1,5"HE	880	720	8200	A-E	52	12	5,9	1,6	46	11	4,2	1,1	15	150		150		G 20088	()	PD (1-7)

PO TELECOMMUNICATIONS HEADQUARTERS
TELECOMMUNICATIONS DEVELOPMENT
(TD1.2.3)

CONTACT ACTION 5MC

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	C	*					M	*	M	*	M	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN				OP AT 50V	RELEASE AT 50V				OP VOLTS		
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	AT OP OC	MIN SC	COLOUR CODE	RESID	SPECIAL FEATURES
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
500	550	450	10700	A-E	29	18	5.6	3.3	16	9.8	2.5	1.5	25	10	80	10	70	W 10297	B	
500	550	450	10700	A-E	29	18	5.6	3.3	16	9.8	2.5	1.5	20	5	65	5	55	W 20177	B	PD (1-7)
500	550	450	10700	A-E	42	8.4	4.5	1.0	23	4.6	2.0	0.5	20	20	150	20	150	G 16937	()	
2000	2200	1800	15700	A-B	14	6.2	3.6	0.8	31	14	6.5	1.4	25	15	70	15	65	W 5771	A	
2000	2200	1800	13400	D-E	16	7.2	4.3	0.9	35	16	7.7	1.6	25	15	55	15	50			
2000	2200	1800	15700	A-B	20	12	3.8	2.2	44	27	6.9	4.0	25	5	35	5	30	W 20089	B	PD (1-7)
2000	2200	1800	13400	D-E	21	14	4.5	2.6	46	31	8.1	4.7	20	5	25	5	25			OP FOS 3.5
500	550	450	7800	A-B	41	24	7.7	4.5	23	13	3.5	2.0	15	5	35	5	30	W 20178	B	PD (5-7)
2000	2200	1800	16000	D-E	20	12	3.8	2.2	44	26	6.8	3.9	25	5	35	5	35			

3000-TYPE RELAY DATA SHEET

		LEFT										RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	M	*	C	*					M	*	M	*	B	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V			OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	DC	SC			RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4									
2000	2200	1800	22600	A-E	15	8,1	2,9	1,5	33	18	5,3	2,8	48	10	90	10	85		W 3567	B	
1000	1100	900	15900	A-E	15	5,9	3,9	0,8	17	6,5	3,5	0,7	30	20	130	15	120		W 11512	A	
2000	2200	1800	15700	A-B	15	6,0	3,9	0,8	33	13	7,1	1,4	30	20	75	15	70		W 9739	A	
2000	2200	1800	13400	D-E	18	7,0	4,6	0,9	40	15	8,3	1,6	25	20	55	15	55				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	K	*					M	*	M	*	K	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
50	55	45	2300	A=B	103	63	20	10	5,7	3,5	0,9	0,5	10	15		15		G 3265	B	
1500	1650	1350	10000	AB+DE	19	12	3,7	2,0	32	20	5,1	2,7	20	15		15				

3000-TYPE RELAY DATA SHEET

		LEFT									RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	M	*	C	*					M	*	B	*	C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V					COLOUR CODE	SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON OP	REL	OP	HOLD	NON OP	REL		OP OC	OP SC	MIN VOLTS OC	MIN VOLTS SC			RESID
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
6500	7150	5850	38000	A-E	5,3	2,2	1,4	0,0	38	16	8,3	0,0	40	15	130	15	120	G	15287	A
2000	2200	1800	22600	A-E	17	9,2	3,1	1,7	37	20	5,7	3,0	30	5	65	5	65	W	20093	B
1500	1650	1350	14600	A-E	22	7,3	4,5	0,9	36	12	6,1	1,2	55	85		85		W	3130	A
1" FE																				
1000	1100	900	15900	A-E	21	13	4,5	2,4	23	14	4,0	2,2	25	5	65	5	60	W	20092	B
800	880	720	8200	A-E	55	10	6,6	1,3	48	9,1	4,7	1,0	15	170		170		G	4937	()
1,5"HE																				
500	550	450	8700	A-E	30	12	7,6	1,5	17	6,7	3,4	0,7	20	15	80	15	75	W	10286	A
2000	2200	1800	15700	A-B	17	6,8	4,2	0,8	37	15	7,6	1,5	25	10	60	10	55	W	14884	A
2000	2200	1800	13400	D-E	19	7,9	4,9	1,0	42	17	8,9	1,7	20	10	45	10	45			
400	440	360	3800	A-B	53	22	14	2,1	23	9,8	5,1	0,8	18	15	35	15	30	G	4775	A
900	990	810	13600	D-E	15	6,3	4,0	0,6	15	6,2	3,2	0,5	20	15	120	15	110			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					M	*	M	*		C	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON OP	REL	OP	HOLD	NON OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
500	550	450	10700	A-E	42	6.7	5.0	1.1	23	3.7	2.3	0.5	20	20	150	20	150	G	15455	()

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	B	*	C	*					M	*	B	*	C	*				

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS								SPECIAL FEATURES
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS		COLOUR CODE			
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID		
	R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	22600	A-E		19	8,9	3,3	1,7	42	20	6,0	3,0	45	10	85	10	85	W	3780	B	
1000	1100	900	15900	A-E		18	9,9	4,0	1,8	20	11	3,6	1,6	25	10	95	10	80	G	14399	B	
2000	2200	1800	15700	A-B		17	6,6	4,5	0,8	37	14	8,1	1,5	30	15	70	15	70	W	8393	A	
2000	2200	1800	13400	D-E		20	7,7	5,3	1,0	44	17	9,5	1,7	30	15	55	15	55				

3000-TYPE RELAY DATA SHEET

	LEFT	RIGHT
SPRING NUMBERING	1 2 3 4 5 6 7 8 9 10	21 22 23 24 25 26 27 28 29 30
CONTACT ACTION	M * C * C *	M * C * C *

COIL: RESISTANCE OHMS DESIGN R1	MAX R2	MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA: MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE: MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS: OP AT 50V	RELEASE AT 50V DC	RELEASE AT 50V SC	RELEASE AT MIN OP VOLTS DC	RELEASE AT MIN OP VOLTS SC	COLOUR	CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,4	2,5	1,6	0,0	46	18	9,2	0,0	45	10	85	10	85	G	15140	6	
6500	7150	5850	38000	A-E	5,7	2,0	1,5	0,0	41	14	8,8	0,0	45	15	110	15	110	G	20099	A	ALL SPRINGS PD
2000	2200	1800	22600	A-E	19	13	3,3	1,9	42	30	6,0	3,4	35	5	60	5	60	W	13538	B	
2000	2200	1800	22600	A-E	19	13	3,3	1,9	42	30	6,0	3,4	35	5	60	5	60	W	20100	B	ALL SPRINGS PD
1500 1" FE	1650	1350	14600	A-E	27	11	4,9	1,1	45	18	6,6	1,5	60	70		70		W	20101	A	
1500 1" FE	1650	1350	14600	A-E	27	11	4,9	1,1	45	18	6,6	1,5	60	70		70		W	20095	A	ALL SPRINGS PD
1000	1100	900	15900	A-E	18	9,8	4,5	1,0	20	11	4,0	0,9	30	15	110	15	110	W	6810	A	
1000	1100	900	15900	A-E	21	19	4,7	2,7	23	21	4,2	2,4	25	5	60	5	50	W	20098	B	OP FOS 3,3 ALL SPRINGS PD
800 1,5"HE	880	720	8200	A-E	52	9,4	7,1	1,6	46	8,3	5,1	1,1	15	150		150		G	4938	()	
800 1,5"HE	880	720	8200	A-E	52	9,4	7,1	1,6	46	8,3	5,1	1,1	15	150		150		G	20094	()	ALL SPRINGS PD
500	550	450	10700	A-E	26	15	6,6	1,5	14	8,0	3,0	0,7	25	15	95	15	95	W	17389	A	

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	C	*					M	*	C	*	C	*				

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	MIN OP VOLTS OC	MIN OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
500	550	450	10700	A-E	26	15	6,6	1,5	14	8,0	3,0	0,7	20	10	85	10	85	W 20096	A	ALL SPRINGS PD
2000	2200	1800	15700	A-B	19	9,9	4,5	1,0	42	22	8,1	1,8	30	15	60	15	60	W 4802	A	
2000	2200	1800	13400	D-E	21	12	5,3	1,2	46	26	9,5	2,1	30	15	45	15	45			
2000	2200	1800	15700	A-B	18	9,9	4,5	1,0	40	22	8,1	1,8	25	10	50	10	50	M 20097	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	21	12	5,3	1,2	46	26	9,5	2,1	25	10	40	10	40			
200	220	180	6250	A-B	17	12	9,1	1,6	3,7	2,7	1,6	0,3	15	20	120	15	80	G 4712×	A	OP FOS 10%+10AT ×M (21-22)
1000	1100	900	7200	D-E	32	11	7,9	1,4	35	12	7,1	1,3	20	20	45	20	45			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					B	*	B	*		C	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP	MIN VOLTS	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	19	7,6	4,7	0,9	42	17	8,5	1,6	35	15	65	15	65	W 4102	A	
1000	1100	900	15900	A-E	19	7,5	4,7	0,9	21	8,2	4,2	0,8	30	15	110	15	110	W 19046	A	
2000	2200	1800	15700	A-B	19	7,6	4,7	0,9	42	17	8,5	1,6	35	15	65	15	65	W 9894	A	
2000	2200	1800	13400	D-E	21	8,9	5,5	1,0	46	20	9,9	1,9	30	15	50	15	50			OP FOS 3,8
5,0	6,0	4,0	530	A-B	850	306	125	51	5,1	1,8	0,5	0,2	5	15	100	15	100	G 4898	()	S/C TIME IS WITH D-E S/C
700	770	630	12000	D-E	22	14	5,5	2,3	17	10	3,5	1,4	25	15		15				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	K	*					M	*		C	*		C	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE OHMS			TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP	MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	OC	SC			RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4									
6500	7150	5850	38000	A-E	6,6	4,3	1,9	0,0	47	31	11	0,0	70	15	90	15	90	W	9172	A	OP FOS 3,5
2000	2200	1800	22600	A-E	20	14	3,3	1,9	44	31	6,0	3,4	48	10	75	10	75	W	6196	B	
1500	1650	1350	14600	A-E	27	10	4,3	2,2	45	17	5,8	3,0	50	55		55		G	20109	B	1" FE
1000	1100	900	15900	A-E	18	10	4,5	2,0	20	11	4,0	0,9	30	15	100	15	100	W	4236	A	
800	880	720	8200	A-E	52	9,5	7,0	1,2	46	8,4	5,0	0,9	15	150		150		G	19164	A	1,5"HE
500	550	450	10700	A-E	27	15	6,6	1,5	15	8,4	3,0	0,7	20	10	80	10	80	W	20108	A	
2000	2200	1800	15700	A-B	18	10	4,5	1,0	40	23	8,1	1,8	25	10	50	10	50	W	20107	A	
2000	2200	1800	13400	D-E	21	12	5,3	1,2	46	27	9,5	2,1	25	10	35	10	40				

For 3B3C see Page 43

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					C	*	C	*	C	*			

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
6500	7150	5850	38000	A-E	6,3	2,3	1,7	0,0	45	17	9,7	0,0	60	20	120	20	120	G 14251	A	
6500	7150	5850	38000	A-E	6,3	2,3	1,7	0,0	45	17	9,7	0,0	50	10	100	10	100	G 20106	A	ALL SPRINGS PD
2000	2200	1800	15700	A-E	21	14	4,9	1,2	46	31	8,8	2,2	25	10	45	10	45	W 18757	A	
2000	2200	1800	22600	A-E	15	9,7	3,4	0,8	33	21	6,1	1,5	40	10	90	10	90	W 4126	A	ALL SPRINGS PD
2000	2200	1800	15700	A-E	17	7,2	4,2	1,4	37	16	7,6	2,5	25	10	55	10	50	G 10/14	6	COMB TYPE
1500 1" FE	1650	1350	14600	A-E	20	6,0	4,3	0,8	33	9,9	5,8	1,1	55	95		95		G 20105	A	
1500 1" FE	1650	1350	14600	A-E	20	6,0	4,3	0,8	33	9,9	5,8	1,1	55	95		95		G 20104	A	ALL SPRINGS PD
1000	1100	900	13600	A-E	21	16	5,7	1,4	23	18	5,1	1,3	20	10	60	10	60	W 7804	A	OP FOS 3,5
1000	1100	900	15900	A-E	21													G 10/44	10	COMB TYPE.
1000	1100	900	15900	A-E	21	14	4,8	1,2	23	15	4,4	1,1	30	10	90	10	90	W 10558	A	ALL SPRINGS PD
800 1,5"HE	880	720	8200	A-E	52	14	8,0	2,7	46	12	5,8	1,9	20	100		100		G 5466	()	
800 1,5"HE	880	720	8200	A-E	52	14	8,0	2,7	46	12	5,8	1,9	20	100		100		G 20103	()	ALL SPRINGS PD

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					C	*	C	*	C	*			

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				TEST MIN LAG MSECS								
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS		COLOUR CODE			SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC			RESID	
500	550	450	10700	A-E	31	21	7,2	1,8	17	11	3,2	0,8	25	10	85	10	85	W	4377	A	
500	550	450	10700	A-E	31	21	7,2	1,8	17	11	3,2	0,8	25	10	85	10	85	W	18986	A	ALL SPRINGS PD
2000	2200	1800	15700	A-B	21	14	4,9	1,2	46	31	8,8	2,2	35	10	50	10	50	W	7191	A	
2000	2200	1800	13400	D-E	21	16	5,7	1,4	46	36	10	2,6	30	10	40	10	40				OP FOS 3,5
2000	2200	1800	15700	A-B	21	14	4,9	1,2	46	31	8,8	2,2	35	10	50	10	50	W	8281	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	21	16	5,7	1,4	46	36	10	2,6	30	10	40	10	40				OP FOS 3,5

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	K	*					C	*	C	*	K	*			

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS		TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS MIN		COLOUR CODE		SPECIAL FEATURES
DESIGN R1	MAX R2	MIN R3				OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
6500	7150	5850		38000	A-E	5,9	2,1	1,5	0.0	42	15	8,8	0.0	45	15	110	15	110	G	20114 A	
2000	2200	1800		22600	A-E	20	15	3,3	1,9	44	33	6,0	3,5	45	10	70	10	70	W	12449 B	
1500	1650	1350		14600	A-E	28	10	4,3	2,3	46	17	5,8	3,1	50	50		50		G	20113 B	
1" FE																					
1000	1100	900		15900	A-E	19	11	4,5	2,0	21	12	4,0	0,9	30	15	100	15	100	W	19064 A	
800	880	720		8200	A-E	52	9,8	7,1	1,7	46	8,6	5,1	1,2	15	150		150		G	20112 ()	
1,5"HE																					
500	550	450		10700	A-E	42	31	7,0	4,1	23	17	3,2	1,9	20	5	50	5	50	W	20111 B	
2000	2200	1800		15700	A-B	14	5,1	3,6	0,6	31	11	6,5	1,1	20	15	70	15	65	G	20110 A	
2000	2200	1800		13400	D-E	17	6,0	4,3	0,7	37	13	7,7	1,3	20	15	55	15	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	M	*					M	*	M	*	M	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EBT MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE	RESID	SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC			
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
1300	1430	1170	17900	A-E	25	5,6	3,0	0,7	36	8,0	3,5	0,8	30	20	150	20	150	G 9813	()	
1300	1430	1170	17900	A-E	25	5,6	3,0	0,7	36	8,0	3,5	0,8	30	20	150	20	150	G 4896	()	PD (1-2)
500	550	450	10700	A-E	42	8,2	4,8	0,9	23	4,5	2,1	0,4	20	25	150	25	150	G 18843	()	PD (1-4)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	C		*				M	*	M	*	M	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP AT 50V OC	MIN VOLTS SC		RESID	
2000	2200	1800	22600	A-E	18	11	3,2	1,8	40	25	5,8	3,2	35	5	60	5	60	W	14512 B	
1000	1100	900	15900	A-E	17	8,4	3,8	1,8	19	9,3	3,5	1,6	30	15	110	15	95	G	13877 B	
2000	2200	1800	15700	A-B	17	8,3	4,3	0,9	37	18	7,8	1,6	30	15	60	15	60	W	10435 A	
2000	2200	1800	13400	D-E	20	9,8	5,1	1,0	44	22	9,1	1,9	30	15	50	15	50			
400	440	360	3800	A-B	56	19	14	2,4	25	8,3	5,1	0,9	10	15	30	15	30	G	4889 A	
900	990	810	13600	D-E	16	5,3	4,0	0,7	16	5,2	3,2	0,5	20	15	120	15	110			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					M	*	M	*	M	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT	MIN VOLTS	COLOUR CODE		RESID	SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC				
2000	2200	1800	22600	A-E	20	13	3.4	1.9	44	30	6.1	3.3	35	5	60	5	60	W	13530	B	
1000	1100	900	15900	A-E	18	9.8	4.5	0.9	20	11	4.1	0.8	30	15	110	15	110	W	6811	A	
2000	2200	1800	15700	A-B	18	9.9	4.6	1.0	40	22	8.3	1.7	30	15	60	15	60	W	10003	A	
2000	2200	1800	13400	D-E	21	12	5.4	1.1	46	26	9.7	2.0	30	15	45	15	45				OP FOS 3.9

3000-TYPE RELAY DATA SHEET

SPRING NUMBERING	LEFT 1	2	3	4	5	6	7	8	9	10	RIGHT 21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					M	*		C	*	M	*	M	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE 50V SC	AT OP OC	AT OP SC	MIN VOLTS	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	20	17	3,4	1,9	44	38	6,1	3,5	35	5	55	5	55		W 14431	B	
2000	2200	1800	22600	A-E	20	17	3,4	1,9	44	38	6,1	3,5	35	5	55	5	55		W 20122	B	PD (1-8,21-22)
1500 1" FE	1650	1350	14600	A-E	28	11	4,4	2,3	46	18	5,9	3,1	50	45		50			G 20120	B	
1500 1" FE	1650	1350	14600	A-E	28	11	4,4	2,3	46	18	5,9	3,1	50	45		50			G 20121	B	PD (1-8,21-22)
1000	1100	900	15900	A-E	21	24	4,8	2,8	23	27	4,4	2,5	35	10	70	10	60		W 19126	B	OP FOS 3,16
1000	1100	900	15900	A-E	21	24	4,8	2,8	23	27	4,4	2,5	25	5	55	5	50		W 20119	B	OP FOS 3,16 PD (1-8,21-22)
800 1,5"HE	880	720	8200	A-E	52	10	7,2	1,7	46	9,0	5,2	1,2	15	150		150			G 20117	()	
800 1,5"HE	880	720	8200	A-E	52	10	7,2	1,7	46	9,0	5,2	1,2	15	150		150			G 20118	()	PD (1-8,21-22)
500	550	450	10700	A-E	27	18	6,7	1,6	15	10	3,0	0,7	25	15	90	15	90		W 4286	A	
500	550	450	10700	A-E	42	36	7,2	4,1	23	20	3,2	1,9	20	5	50	5	50		W 20116	B	PD (1-8,21-22)
2000	2200	1800	15700	A-B	14	4,6	3,7	0,7	31	10	6,6	1,3	20	15	65	10	60		G 13758	B	
2000	2200	1800	13400	D-E	16	5,4	4,3	0,8	35	12	7,8	1,5	20	15	50	10	45				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	C	*					M	*		C	*	M	*	M	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP OC	MIN VOLTS SC		RESID	
2000	2200	1800	15700	A-B	18	12	4,6	1,1	40	27	8,3	1,9	25	10	45	10	45	W 20115 A		PD (1-8,21-22)
2000	2200	1800	13400	D-E	21	15	5,4	1,3	46	32	9,7	2,3	25	10	35	10	35			
1500	1650	1350	9550	A-B	29	19	8,4	2,9	48	31	11	5,2	20	5		5		G 12689 11		OP FOS 3,36
750	825	675	5400	C-E	58	34	15	6,9	48	28	10	4,6	10	5		5				OP FOS 3,88
400	440	360	3300	D-E	97	55	24	11	43	24	8,7	4,0	10	5		5				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	B	*	B	*					M	*	M	*	B	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP VOLTS	MIN	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	22600	A-E	20	8,6	3,6	1,6	44	19	6,5	2,9	50	10	90	10	90	W 3559	B	OP FOS 3,8
1000	1100	900	15900	A-E	20	6,2	4,7	0,8	22	6,8	4,2	0,7	25	10	110	10	110	W 13719	A	
2000	2200	1800	15700	A-B	20	6,3	4,8	0,8	44	14	8,6	1,4	35	15	70	15	70	W 12395	A	
2000	2200	1800	13400	D-E	21	7,4	5,6	0,9	46	16	10	1,6	30	15	55	15	55			OP FOS 3,6

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	B	*	C	*					M	*	M	*	B	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON OP	REL	OP	HOLD	NON OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
5.0	6.0	4.0	530	A-B	850	306	126	49	5.1	1.8	0.5	0.2	5	15	100	15	100	G 13492 ()		S/C TIME IS
700	770	630	12000	D-E	25	14	5.6	2.2	19	10	3.5	1.4	25	15		15				WITH D-E S/C

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	C	*					M	*	C	*	M	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE OHMS			TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP	MIN VOLTS	COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	20	12	4.8	1.1	44	26	8.6	1.9	35	15	55	15	55	W 4220	A	
1000	1100	900	15900	A-E	20	12	4.7	1.1	22	13	4.2	1.0	30	15	100	15	100	W 15899	A	
2000	2200	1800	15700	A-B	20	12	4.8	1.1	44	26	8.6	1.9	35	15	55	15	55	W 10902	A	
2000	2200	1800	13400	D-E	21	14	5.6	1.3	46	30	10	2.3	30	15	45	15	45			OP FOS 3.6

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					M	*		C	*	M	*	M	*

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP AT 50V	RELEASE				COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4		AT 50V OC	AT 50V SC	AT OP OC	AT 50V MIN VOLTS SC		RESID	
2000	2200	1800	22600	A-E	20	21	3,6	2,0	44	47	6,5	3,7	40	5	55	5	55	W 13866	B	OP FOS 3,7
2000	2200	1800	15700	A-E	20	15	4,8	1,1	44	32	8,6	2,1	25	10	45	10	45	W 20123	A	PD (1-9,21-22)
1500 1" FE	1650	1350	14600	A-E	19	6,2	4,2	0,8	31	10	5,7	1,1	50	95		95		G 20170	A	
1500 1" FE	1650	1350	14600	A-E	19	6,2	4,2	0,8	31	10	5,7	1,1	50	95		95		G 20124	A	PD (1-9,21-22)
1000	1100	900	15900	A-E	15	5,7	3,9	0,8	17	6,2	3,5	0,7	30	20	140	15	130	G 6218	A	
1000	1100	900	15900	A-E	19	14	4,7	1,1	21	16	4,2	1,0	25	10	80	10	80	W 20125	A	PD (1-9,21-22)
800 1,5"HE	880	720	8200	A-E	52	11	7,6	2,0	46	9,7	5,4	1,4	15	120		120		G 8874	()	
800 1,5"HE	880	720	8200	A-E	52	11	7,6	2,0	46	9,7	5,4	1,4	15	130		130		G 20126	()	PD (1-9,21-22)
500	550	450	10700	A-E	22	8,4	5,8	1,1	12	4,6	2,6	0,5	25	20	120	15	120	G 16196	A	
500	550	450	10700	A-E	29	21	7,0	1,7	16	12	3,2	0,8	20	10	75	10	75	W 20127	A	PD (1-9,21-22)
2000	2200	1800	15700	A-B	20	15	4,8	1,1	44	32	8,6	2,1	35	10	50	10	50	W 13731	A	
2000	2200	1800	13400	D-E	21	17	5,6	1,3	46	38	10	2,4	30	10	40	10	40			OP FOS 3,6

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					M	*		C	*	M	*	M	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V AT OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS MIN OC	RELEASE AT OP VOLTS MIN SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	15700	A-B	20	15	4,8	1,1	44	32	8,6	2,1	25	10	45	10	45	W 20128 A		PD (1-9,21-22)
2000	2200	1800	13400	D-E	21	17	5,6	1,3	46	38	10	2,4	25	10	35	10	35			OP FOS 3,6
1500	1650	1350	9550	A-B	29	21	8,9	4,1	48	34	12	5,5	20	5		5		G 12839 11		OP FOS 3,14
750	825	675	5400	C-E	58	37	16	7,2	48	30	11	4,9	15	5		5				OP FOS 3,64
400	440	360	3300	D-E	110	60	26	12	48	26	9,3	4,3	10	5		5				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	K	*	K	*					M	*		C	*	M	*	M	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP MIN VOLTS OC	RELEASE AT OP MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	13	8,0	3,0	0,7	29	18	5,4	1,3	40	15	100	15	100	W 9741	A	
2000	2200	1800	15700	A-E	18	11	4,3	1,0	40	25	7,8	1,8	25	10	45	10	45	W 20136	A	PD (1-3,21-22)
1500 1" FE	1650	1350	14600	A-E	27	10	4,2	2,2	45	17	5,6	3,0	50	50	50	50	50	G 20135	B	
1500 1" FE	1650	1350	14600	A-E	27	10	4,2	2,2	45	17	5,6	3,0	50	50	50	50	50	G 20134	B	PD (1-3,21-22)
1000	1100	900	15900	A-E	15	5,1	3,4	0,6	17	5,6	3,1	0,6	30	20	150	20	140	G 6218	A	
1000	1100	900	15900	A-E	18	11	4,3	1,0	20	12	3,8	0,9	25	10	85	10	85	W 20133	A	PD (1-3,21-22)
800 1,5"HE	880	720	8200	A-E	52	9,9	6,8	1,6	46	8,7	4,9	1,1	15	150		150		G 20171	()	
800 1,5"HE	880	720	8200	A-E	52	9,9	6,8	1,6	46	8,7	4,9	1,1	15	150		150		G 20132	()	PD (1-3,21-22)
500	550	450	10700	A-E	26	17	6,4	1,5	14	9,3	2,9	0,7	20	10	80	10	75	W 20172	A	
500	550	450	10700	A-E	26	17	6,4	1,5	14	9,3	2,9	0,7	20	10	80	10	75	W 20131	A	PD (1-3,21-22)
2000	2200	1800	15700	A-B	19	9,7	3,9	2,0	42	21	7,0	3,7	25	5	40	5	35	G 20130	B	
2000	2200	1800	13400	D-E	21	11	4,6	2,4	46	25	8,2	4,3	20	5	25	5	25			OP FOS 3,9

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	K	*	K	*					M	*		C	*	M	*	M	*

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE		SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS				
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-B	19	9.7	3.9	2.0	42	21	7.0	3.7	25	5	40	5	35	G 20129 B		PD (1-3,21-22)
2000	2200	1800	13400	D-E	21	11	4.6	2.4	46	25	8.2	4.3	20	5	25	5	25			OP FOS 3,9

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	C	*					M	*		C	*	B	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS								
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	22600	A-E	16	7,8	3,5	0,8	35	17	6,3	1,4	40	15	100	15	100	W 4227	A	
1000	1100	900	15900	A-E	21	11	5,0	1,1	23	12	4,5	1,0	30	15	100	15	100	W 7438	A	OP FOS 3,9
2000	2200	1800	15700	A-B	16	5,1	4,2	0,7	35	11	7,6	1,3	38	20	80	20	80	G 9038	A	
2000	2200	1800	13400	D-E	18	6,0	4,9	0,8	40	13	8,9	1,5	25	20	65	20	65			
400	440	360	3800	A-B	64	21	17	2,9	28	9,3	6,3	1,0	10	15	30	10	30	G 4888	A	
900	990	810	13600	D-E	18	5,9	4,9	0,8	18	5,8	3,9	0,7	20	15	110	10	100			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					M	*		C	*	M	*	B	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP MIN VOLTS OC	RELEASE AT OP MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	16	9,7	3,5	0,8	35	21	6,3	1,4	40	10	90	10	90	W 3206	A	
1500 1" FE	1650	1350	14600	A-E	21	6,0	4,5	0,8	35	9,9	6,1	1,1	55	95		95		G 20137	A	
1000	1100	900	15900	A-E	21	14	5,0	1,1	23	15	4,5	1,0	30	10	90	10	90	W 14274	A	
800 1,5"HE	880	720	8200	A-E	55	11	8,0	2,0	48	9,4	5,8	1,4	15	130		130		G 5027	()	
500	550	450	10700	A-E	31	16	6,6	3,3	17	8,7	3,0	1,5	25	15	85	10	80	G 17388	B	
2000	2200	1800	15700	A-B	21	14	5,0	1,1	46	31	9,1	2,1	35	10	50	10	50	W 4656	A	OP FOS 3,9
2000	2200	1800	13400	D-E	21	16	5,9	1,3	46	36	11	2,4	30	10	40	10	40			OP FOS 3,3

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	K	*					M	*		C	*	M	*	B	*

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE			SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP OC	RELEASE AT MIN VOLTS SC		RESID	
2000	2200	1800	22600	A-E	15	8,6	3,3	0,8	33	19	6,0	1,4	40	15	95	15	95	W 7229	A	
1000	1100	900	10000	A-E	21	8,4	6,2	1,1	23	9,2	5,6	1,0	20	20	70	15	60	G 19123	A	OP FOS 3,3
2000	2200	1800	15700	A-B	20	12	4,8	1,1	44	27	8,6	1,9	35	15	55	15	55	W 12773	A	
2000	2200	1800	13400	D-E	21	15	5,6	1,3	46	32	10	2,3	30	15	40	15	45			OP FOS 3,5

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	C	*					M	*		C	*	B	*	B	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V AT OP DC	RELEASE AT 50V AT OP SC	RELEASE AT MIN VOLTS DC	RELEASE AT MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	17	9,3	3,7	0,8	37	20	6,7	1,4	45	15	95	15	95	W 4181	A	
2000	2200	1800	22600	A-E	17	9,3	3,7	0,8	37	20	6,7	1,4	35	10	80	10	80	W 20138	A	ALL SPRINGS PD
1000	1100	900	15900	A-E	16	5,4	4,3	0,8	18	5,9	3,9	0,7	25	15	120	10	120	G 14309	A	
1000	1100	900	15900	A-E	21	13	5,3	1,1	23	15	4,8	1,0	25	10	80	10	80	W 20139	A	OP FOS 3,7 ALL SPRINGS PD
2000	2200	1800	15700	A-B	16	5,5	4,4	0,8	35	12	7,9	1,4	30	20	75	20	75	G 4167	A	
2000	2200	1800	13400	D-E	19	6,4	5,1	0,9	42	14	9,3	1,6	25	20	60	20	60			
2000	2200	1800	15700	A-B	16	5,5	4,4	0,8	35	12	7,9	1,4	25	15	65	10	65	G 20140	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	19	6,4	5,1	0,9	42	14	9,3	1,6	20	15	50	10	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		C	*	C	*	K	*					M	*		C	*	B	*	B	*

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP	RELEASE				COLOUR		
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL	AT 50V	AT OC	50V SC	AT OP	MIN VOLTS SC	CODE	RESID	SPECIAL FEATURES
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	22600	A-E	16	8,2	3,5	0,8	35	18	6,3	1,4	40	15	100	15	100	W 7362	A	
1500 1" FE	1650	1350	14600	A-E	21	5,6	4,5	0,8	35	9,3	6,1	1,0	55	100		100		G 20141	A	
1000	1100	900	15900	A-E	21	12	5,0	1,1	23	13	4,5	1,0	30	15	100	15	100	W 9832	A	OP FOS 3,8
800 1,5"HE	880	720	8200	A-E	52	10	8,0	1,7	46	8,8	5,8	1,2	15	150		150		G 20142	()	
500	550	450	8700	A-E	29	9,4	7,6	1,3	16	5,2	3,4	0,6	15	15	80	10	75	G 9128	A	
2000	2200	1800	15700	A-B	21	9,9	4,5	2,2	46	22	8,1	3,9	25	5	40	5	40	G 13451	B	OP FOS 3,8
2000	2200	1800	13400	D-E	21	12	5,3	2,5	46	25	9,5	4,6	25	5	25	5	25			OP FOS 3,2

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	M	*			M	*		C	*	M	*	M	*	

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP OC	RELEASE AT MIN VOLTS SC	COLOUR CODE	COLOUR RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	20	23	3,5	2,0	44	50	6,2	3,6	50	10	65	10	65	W 8561	B	OP FDS 3,7
2000	2200	1800	22600	A-E	14	7,9	2,9	1,5	31	17	5,3	2,8	30	10	70	5	65	G 18168	B	PD (1-7,23-25)
1500 1" FE	1650	1350	14600	A-E	19	6,2	4,0	0,8	31	10	5,4	1,0	50	95		90		G 20148	A	
1500 1" FE	1650	1350	14600	A-E	19	6,2	4,0	0,8	31	10	5,4	1,0	50	95		90		G 20147	A	PD (1-7,23-25)
1000	1100	900	15900	A-E	20	15	4,5	1,1	22	17	4,1	1,0	30	10	85	10	85	W 15110	A	
1000	1100	900	15900	A-E	20	15	4,5	1,1	22	17	4,1	1,0	25	10	80	10	80	W 20146	A	PD (1-7,23-25)
800 1,5"HE	880	720	8200	A-E	52	13	7,3	2,2	46	11	5,3	1,6	15	120		120		G 15244	()	
800 1,5"HE	880	720	8200	A-E	52	13	7,3	2,2	46	11	5,3	1,6	15	120		120		G 20145	()	PD (1-7,23-25)
500	550	450	10700	A-E	29	23	6,7	1,6	16	13	3,0	0,7	25	10	80	10	80	W 12217	A	
500	550	450	10700	A-E	29	23	6,7	1,6	16	13	3,0	0,7	20	10	70	10	70	W 20144	A	PD (1-7,23-25)
2000	2200	1800	15700	A-B	20	16	4,6	1,1	44	34	8,3	1,9	25	10	40	10	40	W 16727	A	
2000	2200	1800	13400	D-E	21	18	5,4	1,3	46	40	9,7	2,3	25	10	30	10	35			OP FDS 3,6

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	M	*			M	*	C	*	M	*	M	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR	SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		CODE	
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC	RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4							
2000	2200	1800	15700	A-B	20	16	4,6	1.1	44	34	8,3	1,9	25	10	40	10	40	W 20143 A	PD (1-7,23-25)
2000	2200	1800	13400	D-E	21	18	5.4	1.3	46	40	9.7	2.3	25	10	30	10	35		OP FOS 3,6
1000	1100	900	12100	A-B	26													G18330.10	(TEST OP 16 A-B)
1000	1100	900	9780	D-E		18													(" HOLD 15 D-E)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	M	*			M	*		K	*	M	*	M	*	

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE 50V SC	AT OP VOLTS OC	MIN SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	20	20	3.2	1.9	44	43	5.8	3.5	40	5	55	5	55	W 16860	B	
1000	1100	900	10500	A-E	21	8.3	5.1	1.0	23	9.1	4.6	0.9	15	15	60	10	55	G 13919	A	OP FOS 3.8
2000	2200	1800	15700	A-B	19	14	4.3	1.0	42	30	7.8	1.8	25	10	45	10	45	W 20150	A	
2000	2200	1800	13400	D-E	21	16	5.1	1.2	46	35	9.1	2.1	25	10	35	10	35			OP FOS 3.8

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	K		*	M	*	B	*		M	*	M	*	M	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
25	29	21	1000	A-B	240	78	58	9.0	6.9	2.2	1.2	0.2	5	20	40	20	40	G	17165	A
1500	1650	1350	8000	AB+DE	26	8.7	6.4	1.0	44	15	8.8	1.4	20	20		20				

3000-TYPE RELAY DATA SHEET

		LEFT										RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C		*	M	*	M	*			M	*		C		*	M	*	B	*

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	COIL OHMS MIN R3	COIL TURNS	COIL WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	LIMIT CIRCUIT CURRENT MA MIN HOLD I2	LIMIT CIRCUIT CURRENT MA MAX NON-OP I3	LIMIT CIRCUIT CURRENT MA MAX REL I4	COIL VOLTAGE MIN OP E1	COIL VOLTAGE MIN HOLD E2	COIL VOLTAGE MAX NON-OP E3	COIL VOLTAGE MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	OP AT VOLTS OC	OP AT VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	20	21	3.7	2.0	44	47	6.6	3.6	50	10	70	10	70	W 14693	B	OP FOS 3.5
1000	1100	900	15900	A-E	21	14	4.8	1.1	23	16	4.3	1.0	25	10	80	10	80	W 12792	A	
2000	2200	1800	15700	A-B	21	15	4.8	1.1	46	32	8.7	1.9	35	10	50	10	50	W 16427	A	OP FOS 3.9
2000	2200	1800	13400	D-E	21	17	5.7	1.3	46	38	10	2.3	30	10	40	10	40			OP FOS 3.3
2000	2200	1800	15700	A-B	17	6.6	4.1	1.1	37	14	7.5	2.1	30	15	65	15	60	G 12525	5	
7000	7700	6300	27200	AB+DE	6.2				61											

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	M	*			M	*		K	*	M	*	B	*	

COIL RESISTANCE DESIGN R1	COIL RESISTANCE MAX R2	OHMS MIN R3	TURNS	WINDG	LIMIT CIRCUIT CURRENT MA MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	COIL VOLTAGE MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	EST MIN LAG MSECS OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT MIN OP VOLTS OC	RELEASE AT MIN OP VOLTS SC	COLOUR CODE	COLOUR RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	15	9,1	3,2	0,7	33	20	5,7	1,3	40	15	95	15	95	W 11195	A	
1000	1100	900	15900	A-E	20	13	4,5	1,0	22	14	4,1	0,9	25	10	80	10	80	W 14595	A	
2000	2200	1800	15700	A-B	20	13	4,6	1,0	44	29	8,3	1,8	25	10	45	10	45	W 20151	A	
2000	2200	1800	13400	D-E	21	15	5,4	1,2	46	34	9,7	2,1	25	10	35	10	35			OP FOS 3,5

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	K	*	M	*	M	*			M	*		K	*	M	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS					COLOUR CODE		SPECIAL FEATURES
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP VOLTS				
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	15700	A-E	20	9,7	3,9	2,0	44	21	7,0	3,6	25	5	40	5	35	G	13171	B
1000	1100	900	15900	A-E	21	22	4,6	2,6	23	24	4,1	2,4	30	5	55	5	50	W	20169	B
2000	2200	1800	15700	A-B	20	9,7	3,9	2,0	44	21	7,0	3,6	25	5	40	5	35	G	15101	10
2000	2200	1800	13400	D-E	21	11	4,6	2,3	46	25	8,2	4,2	20	5	25	5	25			

OP FOS 3.0

OP FOS 3.6

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	B	*			M	*	M	*	B	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		OP AT VOLTS	MIN	COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON OP I3	REL I4	OP E1	HOLD E2	NON OP E3	REL E4		OC	SC	OC	SC		RESID	
400	440	360	3500	A-B	70	23	19	4.0	31	10	6.9	1.4	10	10	25	10	25	G 13119 4		
900	990	810	13600	D-E	20	5.9	4.9	1.0	20	5.8	4.0	0.8	20	15	110	10	95			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	B	*	·		M	*	C	*	M	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4				OP VOLTS				
2000	2200	1800	22600	A-E	17	9,7	3,5	0,8	37	21	6,4	1,4	45	10	90	10	90	W 4496	A	
2000	2200	1800	22600	A-E	16	9,7	3,5	0,8	35	21	6,4	1,4	35	10	80	10	80	W 20152	A	PD (1-9,23-25, 28-29)
1500 1" FE	1650	1350	14600	A-E	28	15	5,5	1,2	46	25	7,4	1,6	65	65		65		W 20153	A	OP FOS 3,2
1500 1" FE	1650	1350	14600	A-E	28	15	5,5	1,2	46	25	7,4	1,6	65	65		65		W 20154	A	PD (1-9,23-25, 28-29)OP FOS3,2
1000	1100	900	15900	A-E	21	11	4,5	2,2	23	12	4,1	2,0	25	10	75	5	65	G 15757	B	OP FOS 3,8
1000	1100	900	15900	A-E	21	14	5,0	1,1	23	15	4,5	1,0	25	10	80	10	80	W 20155	A	PD (1-9,23-25, 28-29)OP FOS3,7
800 1,5"HE	880	720	8200	A-E	55	11	8,2	1,8	48	9,4	5,9	1,3	20	140		140		G 11527	()	
800 1,5"HE	880	720	8200	A-E	52	11	8,2	1,8	46	9,4	5,9	1,3	20	140		140		G 20156	()	PD (1-9,23-25, 28-29)
500	550	450	8700	A-E	30	10	7,6	1,3	17	5,6	3,4	0,6	15	15	75	15	75	G 19165	A	
500	550	450	10700	A-E	35	21	7,5	1,6	19	11	3,4	0,7	20	10	75	10	75	W 20157	A	PD (1-9,23-25, 28-29)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	B	*			M	*	C	*	M	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V				OP AT VOLTS			CULOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		OC	SC	OC	SC			RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4									
2000	2200	1800	15700	A-B	16	5.6	4.2	0.7	35	12	7.6	1.3	30	20	75	20	75	G	9075	A	
2000	2200	1800	13400	D-E	19	6.6	4.9	0.8	42	14	8.9	1.5	25	20	60	20	60				
2000	2200	1800	15700	A-B	16	5.6	4.2	0.7	35	12	7.6	1.3	25	15	65	10	60	G	20158	A	PO (1-9,23-25, 28-29)
2000	2200	1800	13400	D-E	19	6.6	4.9	0.8	42	14	8.9	1.5	20	15	50	10	50				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	M	*	B	*			M	*		K	*	M	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V					COLOUR CODE	SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	AT OP OC	AT OP SC	MIN VOLTS	RESID	
2000	2200	1800	22600	A-E	16	8.6	3.4	0.7	35	19	6.1	1.3	45	15	95	15	95	W	12477	A
1500 1" FE	1650	1350	14600	A-E	21	5.8	4.2	0.7	35	9.5	5.7	0.9	55	100		100		G	20161	A
1000	1100	900	15900	A-E	16	5.3	3.9	0.6	18	5.8	3.5	0.6	30	20	140	20	140	G	19145	A
800 1.5"HE	880	720	8200	A-E	52	13	7.9	2.3	46	11	5.7	1.7	20	110		110		G	11986	()
500	550	450	10700	A-E	32	18	7.1	1.5	18	10	3.2	0.7	20	10	75	10	75	W	20159	A
2000	2200	1800	15700	A-B	16	5.4	3.9	0.6	35	12	7.1	1.1	25	15	65	10	65	G	20160	A
2000	2200	1800	13400	D-E	18	6.3	4.6	0.7	40	14	8.3	1.3	20	15	50	10	50			

3000-TYPE RELAY DATA SHEET

		LEFT										RIGHT									
SPRING NUMBERING		1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		M	*	C	*	B	*	B	*			M	*		C	*	M	*	B	*	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN	MAX	OHMS MIN	TURNS	WINDG	MIN OP	MIN HOLD	MAX NON-OP	MAX REL	MIN OP	MIN HOLD	MAX NON-OP	MAX REL	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP MIN VOLTS OC	RELEASE AT OP MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
R1	R2	R8			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	22600	A-E	19	9,3	3,8	0,8	42	20	6,8	1,4	45	15	95	15	95	W 7000	A	
1000	1100	900	15900	A-E	17	5,4	4,5	0,7	19	5,9	4,0	0,6	25	15	120	15	120	G 20176	A	
2000	2200	1800	15700	A-B	17	5,5	4,5	0,7	37	12	8,1	1,3	30	20	75	20	75	G 13918	A	
2000	2200	1800	13400	D-E	20	6,4	5,3	0,8	44	14	9,5	1,5	30	20	60	20	60			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	B	*	B	*			×B	*	C	*	M	*	M	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS OP RELEASE AT 50V						COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	AT 50V OC	AT 50V SC	AT OP VOLTS OC	AT OP VOLTS SC	MIN VOLTS	RESID		
400	440	360	4450	A-B	100				44										G 11749×A		OP FOS 3.75
900	990	810	9300	D-E	15				15												×B (21-22)

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	B	*	B	*			M	*	C	*	B	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EBT MIN LAG MSECS							
					MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT MIN VOLTS		COLOUR CODE		SPECIAL FEATURES
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OC	SC		RESID	
2000	2200	1800	15700	A-E	18	5,4	4,6	0,7	40	12	8,4	1,3	25	15	65	15	65	G 13112	A	
2000	2200	1800	22600	A-E	18	7,1	3,5	1,5	40	16	6,3	2,8	35	10	75	10	75	G 20163	B	PD (1-9,21-25)
1000	1100	900	15900	A-E	21	10	5,0	2,2	23	11	4,5	2,0	35	15	95	10	90	G 19124	B	OP FOS 3,5
1000	1100	900	15900	A-E	21	10	5,0	2,2	23	11	4,5	2,0	25	10	75	5	70	G 20162	B	OP FOS 3,5 PD (1-9,21-25)
2000	2200	1800	15700	A-B	18	5,4	4,6	0,7	40	12	8,4	1,3	30	20	80	20	80	G 5765	A	
2000	2200	1800	13400	D-E	21	6,3	5,4	0,8	46	14	9,8	1,5	30	20	60	20	60			
2000	2200	1800	15700	A-B	18	5,4	4,6	0,7	40	12	8,4	1,3	25	15	65	15	65	G 20164	A	PD (1-9,21-25)
2000	2200	1800	13400	D-E	21	6,3	5,4	0,8	46	14	9,8	1,5	25	15	50	15	50			

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	C	*	B	*	B	*			B	*	C	*	B	*	B	*		

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE DESIGN R1	MAX R2	OHMS MIN R3	TURNS	WINDG	MIN OP I1	MIN HOLD I2	MAX NON-OP I3	MAX REL I4	MIN OP E1	MIN HOLD E2	MAX NON-OP E3	MAX REL E4	OP AT 50V	RELEASE AT 50V OC	RELEASE AT 50V SC	RELEASE AT OP VOLTS OC	RELEASE AT OP VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	13	3,7	3,4	0,0	29	8,1	6,1	0,0	40	20	140	20	140	G 10421	A	
1000	1100	900	15900	A-E	19	5,2	4,8	0,7	21	5,7	4,3	0,6	30	20	140	20	140	G 19125	A	
2000	2200	1800	15700	A-B	19	5,3	4,8	0,7	42	12	8,7	1,3	25	15	65	15	65	G 15580	A	
2000	2200	1800	13400	D-E	21	6,2	5,7	0,8	46	14	10	1,5	25	15	50	15	50			OP FOS 3,8

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION		B	*	C		*	B	*	B	*		B	*		C		*	B	*	B	*

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
		OHMS			MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V						
RESISTANCE DESIGN R1	MAX R2	MIN R3	TURNS	WINDG	OP I1	HOLD I2	NON-OP I3	REL I4	OP E1	HOLD E2	NON-OP E3	REL E4		OC	SC	OP AT OC	MIN VOLTS SC	COLOUR CODE	RESID	SPECIAL FEATURES
2000	2200	1800	22600	A-E	20	6,8	3,8	1,5	44	15	6,8	2,8	45	15	100	15	100	G 8197	B	
2000	2200	1800	15700	A-E	20	5,2	5,0	0,7	44	11	9,1	1,3	25	15	70	15	70	G 18747	A	ALL SPRINGS PD
1000	1100	900	15900	A-E	19	5,1	5,0	0,7	21	5,6	4,5	0,6	25	15	130	15	130	G 20179	A	
1000	1100	900	15900	A-E	19	5,1	5,0	0,7	21	5,6	4,5	0,6	25	15	130	15	130	G 20149	A	ALL SPRINGS PD
2000	2200	1800	15700	A-B	20	5,2	5,0	0,7	44	11	9,1	1,3	25	15	70	15	70	G 20165	A	
2000	2200	1800	13400	D-E	21	6,0	5,9	0,8	46	13	11	1,5	25	15	50	15	55			OP FOS 3,7
2000	2200	1800	15700	A-B	20	5,2	5,0	0,7	44	11	9,1	1,3	25	15	70	15	70	G 16212	A	ALL SPRINGS PD
2000	2200	1800	13400	D-E	21	6,0	5,9	0,8	46	13	11	1,5	25	15	50	15	55			OP FOS 3,6
400	440	360	4450	A-B	100				44									G 17552×A		OP FOS 3,4
300	330	270	5200	D-E	22				7,3											×B (21-22)
1" FE																				

3000-TYPE RELAY DATA SHEET

	LEFT										RIGHT									
SPRING NUMBERING	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30
CONTACT ACTION	M	*	M	*	M	*	M	*	M		M	*	M	*	M	*	M	*	M	

COIL					LIMIT CIRCUIT CURRENT MA				COIL VOLTAGE				EST MIN LAG MSECS							
RESISTANCE		OHMS	TURNS	WINDG	MIN		MAX		MIN		MAX		OP AT 50V	RELEASE AT 50V		AT OP	MIN VOLTS	COLOUR CODE		SPECIAL FEATURES
DESIGN	MAX	MIN			OP	HOLD	NON-OP	REL	OP	HOLD	NON-OP	REL		DC	SC	DC	SC		RESID	
R1	R2	R3			I1	I2	I3	I4	E1	E2	E3	E4								
2000	2200	1800	22600	A-E	20	10	2.9	1.9	44	22	5.2	3.4	20	5	65	5	65	G	10/94 10	COMB TYPE OP FOS 3.7
2000	2200	1800	15700	A-E	20														10/206	ALL CONTACTS Pt.
1000	1100	900	15900	A-E	16	6.3	3.4	0.8	17	6.9	3.1	0.7	15	10	110	10	95	G	10/78 3	COMB TYPE
1000	1100	900	10500	A-B	43	22	6.3	4.1	47	24	5.7	3.7	10	5	40	5	40	G	10/2271 0	COMB TYPE
1000	1100	900	11700	D-E	38	20	5.7	3.7	42	22	5.1	3.3	10	5	40	5	40			OP FOS 3.7