

Product Bulletin

# 2CR

## Motor Starting Relay

All position, current-type



Designed for all position operation, the Klixon™ 2CR is a current-type motor starting relay which can be used on both split-phase and capacitor-start motors. It has broad application versatility which includes business and computing machines, power tools, food machinery, portable appliances and dishwashers.

The compact 2CR can be mounted and operated in any position, either in the motor, or at a convenient location away from the motor. This allows motor size to be reduced since a space-consuming centrifugal switch is not required.

### Construction

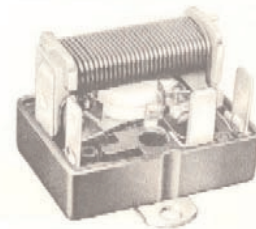
The 2CR relay utilizes a rotating balanced armature which is held normally open by a biasing spring. Rotation of the armature, which carries the movable contact arm, is caused by the magnetic field produced by motor current in the relay coil. Large "make" and "break" contact forces are developed by using a large iron cross-section in the magnetic circuit and a high number of ampere-turns. A beryllium copper contact arm of high conductivity assures excellent current carrying capability. Stable calibration values are achieved by biasing the armature with a stainless steel torsion spring having a large number of turns and low spring rate. All parts are fully enclosed in a rugged phenolic case.

### Operation

The 2CR relay coil is in series with the main winding of the motor and the normally open contacts are in series with the start winding. When voltage is applied to the motor, the in-rush current of the main winding through the relay coil creates a magnetic force which instantly rotates the armature. This action closes the relay contacts and energizes the motor start winding. As motor speed increases, the current in the main winding and relay coil decreases to a point where the armature biasing spring force is greater than the decreasing magnetic force and the armature rotates back to its original open position. This opens the relay contacts and disconnects the start winding.

### Mounting and terminals

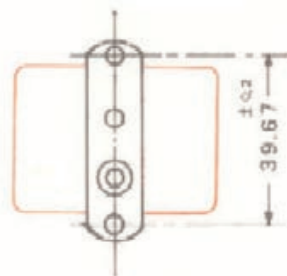
Standard relays are furnished with either type A or B mounting brackets as shown below. Quick-connect terminals are used on standard relays. Screw and solder type terminals are also available.



Open view of 2CR relay

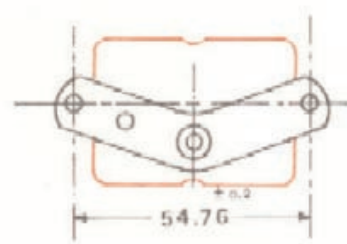
### Key Benefits

- All position performance - balanced armature allows mounting and operation in any position
- Wide range of pick-up and drop-out ratings
- Small size for installation in compact equipment
- Clean, positive contact "breaks" and "makes" with wiping action - high contact forces developed by magnetic circuit with more iron and copper
- Stable operating values - continuously open magnetic circuit eliminates residual magnetism
- Rugged, all welded construction, fully enclosed in phenolic case



"A" BRACKET

2CR3



"B" BRACKET

2CR4

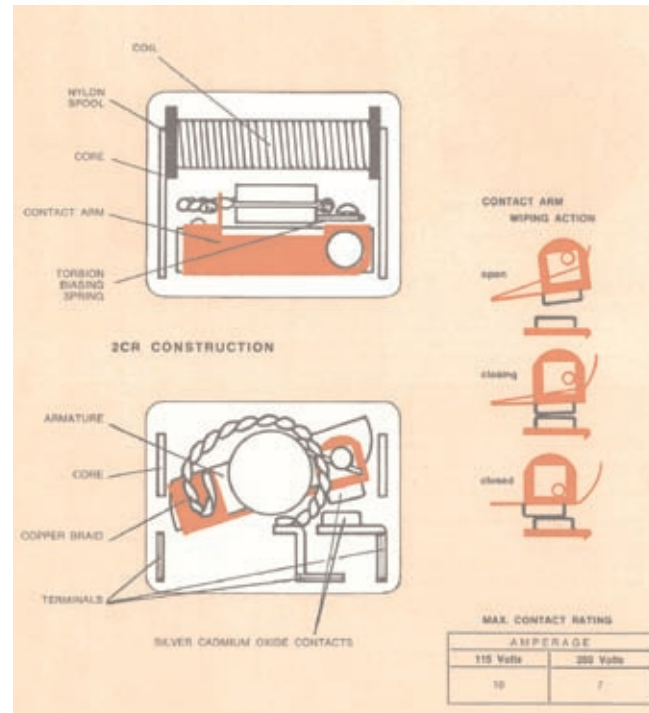
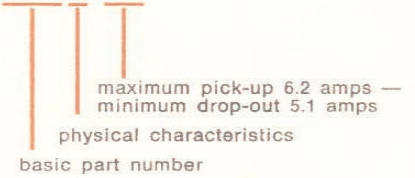
KLIXON Rating No.	Relay Operating Characteristics in Amps		KLIXON Rating No.	Relay Operating Characteristics in Amps		KLIXON Rating No.	Relay Operating Characteristics in Amps	
	Max. Pick-Up	Min. Drop-Out		Max. Pick-Up	Min. Drop-Out		Max. Pick-Up	Min. Drop-Out
100	1.01	0.83	162	6.30	5.20	224	15.00	12.40
101	1.07	0.88	163	6.40	5.30	225	15.20	12.50
102	1.12	0.93	164	6.50	5.35	226	15.40	12.70
103	1.17	0.97	165	6.60	5.45	227	15.60	12.80
104	1.22	1.01	166	6.70	5.50	228	15.80	13.00
105	1.27	1.06	167	6.80	5.60	229	16.00	13.20
106	1.32	1.10	168	6.90	5.70	230	16.20	13.40
107	1.38	1.13	169	7.00	5.80	231	16.40	13.50
108	1.42	1.17	170	7.10	5.90	232	16.60	13.70
109	1.47	1.22	171	7.20	5.90	233	16.80	13.90
110	1.53	1.27	172	7.30	6.00	234	17.00	14.00
111	1.58	1.30	173	7.40	6.10	235	17.30	14.30
112	1.63	1.35	174	7.50	6.20	236	17.50	14.40
113	1.68	1.38	175	7.60	6.30	237	17.70	14.60
114	1.73	1.43	176	7.70	6.30	238	17.90	14.80
115	1.78	1.47	177	7.80	6.40	239	18.10	14.90
116	1.83	1.51	178	7.90	6.50	240	18.30	15.10
117	1.88	1.55	179	8.00	6.60	241	18.50	15.30
118	1.93	1.59	180	8.10	6.70	242	18.70	15.40
119	1.98	1.64	181	8.20	6.80	243	18.90	15.60
120	2.03	1.68	182	8.30	6.80	244	19.10	15.80
121	2.13	1.76	183	8.40	6.90	245	19.30	15.90
122	2.23	1.84	184	8.50	7.00	246	19.50	16.10
123	2.33	1.92	185	8.60	7.10	247	19.70	16.30
124	2.43	2.02	186	8.70	7.20	248	19.90	16.40
125	2.54	2.10	187	8.80	7.30	249	20.10	16.60
126	2.63	2.17	188	8.90	7.40	250	20.30	16.70
127	2.74	2.26	189	9.00	7.50	251	20.50	16.90
128	2.85	2.35	190	9.10	7.50	252	20.70	17.10
129	2.95	2.45	191	9.20	7.60	253	20.90	17.20
130	3.05	2.50	192	9.30	7.70	254	21.10	17.40
131	3.15	2.60	193	9.40	7.80	255	21.30	17.60
132	3.25	2.70	194	9.50	7.80	256	21.50	17.70
133	3.35	2.75	195	9.60	7.90	257	21.70	17.90
134	3.45	2.85	196	9.70	8.00	258	21.90	18.10
135	3.55	2.95	197	9.80	8.10	259	22.10	18.20
136	3.65	3.05	198	9.90	8.20	260	22.30	18.40
137	3.75	3.10	199	10.00	8.30	261	22.50	18.60
138	3.85	3.20	200	10.20	8.40	262	22.70	18.80
139	3.95	3.30	201	10.40	8.60	263	22.90	18.90
140	4.05	3.35	202	10.60	8.70	264	23.10	19.10
141	4.15	3.45	203	10.80	8.90	265	23.30	19.20
142	4.25	3.55	204	11.00	9.10	266	23.60	19.50
143	4.35	3.60	205	11.20	9.20	267	23.90	19.70
144	4.45	3.70	206	11.40	9.40	268	24.30	20.10
145	4.55	3.80	207	11.60	9.60	269	24.60	20.30
146	4.65	3.85	208	11.80	9.70	270	25.00	20.60
147	4.75	3.95	209	12.00	9.90	271	25.30	20.90
148	4.85	4.00	210	12.20	10.10	272	25.60	21.10
149	4.95	4.10	211	12.40	10.20	273	26.10	21.50
150	5.10	4.20	212	12.60	10.40	274	26.40	21.80
151	5.15	4.25	213	12.80	10.60	275	26.70	22.00
152	5.25	4.35	214	13.00	10.70	276	27.10	22.30
153	5.40	4.45	215	13.20	10.90	277	27.40	22.60
154	5.50	4.55	216	13.40	11.00	278	27.90	23.00
155	5.60	4.60	217	13.60	11.20	279	28.40	23.40
156	5.70	4.70	218	13.80	11.40	280	28.90	23.90
157	5.80	4.75	219	14.00	11.50	281	29.40	24.30
158	5.90	4.85	220	14.20	11.70	282	29.90	24.70
159	6.00	4.95	221	14.40	11.90	283	30.40	25.10
160	6.10	5.05	222	14.60	12.10	284	31.00	25.50
161	6.20	5.10	223	14.80	12.20	285	31.50	26.00

### Pick-up and Drop-out ratings

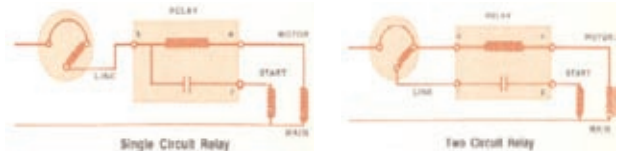
Ratings indicate maximum pick-up and minimum drop-out current limits. Pick-up is the current through the relay coil required to close the relay contacts. Drop-out is the current through the relay coil at which the contacts open. A production relay of a given rating will have a pick-up and drop-out current within the rating limits.

### Sample code

Part No. **2CR3-161**



### Schematic diagrams



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