

Components

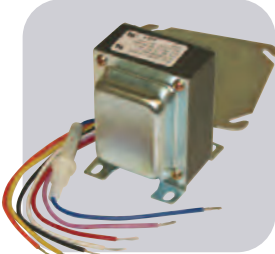


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Electrolytic Capacitors for Motor Starting Applications

Start capacitor case dimensions chart. Capacitor accessories on page C-9.

Features:

- The largest assortment of replacements in the industry!
- Smallest dimensions for general replacements.
- Hermetically sealed black Bakelite case permanently protects the capacitor from oil, dirt, grease or moisture.
- New and improved terminal construction capable of withstanding increased heat. This terminal will generate less heat when applied under severe hot humid environment.
- 50/60 Hz
- UL/ULc



110/125 Dual Voltage AC

MARS NO.	MICROFARAD MIN - MAX.	CASE SIZE
11002	21-25	1
11003	25-30	1
11004	30-36	1
11005	36-43	1
11006	43-56	1
11007	56-72	1
11008	72-88	1
11009	88-108	1
11010	108-130	1
11112	124-156	1
11011	130-156	1
11013	145-175	1
11014	161-193	1
11015	189-227	1
11016	200-240	1
11017	216-259	1
11018	233-292	1
11019	270-324	1
11020	300-360	1
11021	324-388	1
11022	340-408	2
11023	378-440	2
11024	400-480	2
11071	430-516	2
11025	460-552	2
11026	540-648	4
11027	590-708	4
11047	645-774	4
11028	708-850	4
11072	815-970	4
11029	829-995	4
11073	850-1020	4
11030	1000-1200	7
11074	1290-1548	7

MARS suggests applying a bleed resistor (MARS PN 93007) on start capacitors used in conjunction with starting relays

*Capacitors may be put in different case sizes occasionally, but will not be larger than those stated.

165 Volts AC

MARS NO.	MICROFARAD MIN - MAX.	CASE SIZE
11075	72-88	1
11076	88-108	1
11077	108-130	1
11031	124-149	1
11032	145-175	1
11033	161-193	1
11034	189-227	1
11078	216-259	4
11035	233-292	4
11036	270-324	4
11079	340-408	4
11080	378-455	4
11037	400-480	4
11081	540-648	4
11082	710-850	7
11083	810-972	7

220/250 Dual Voltage AC

MARS NO.	MICROFARAD MIN - MAX.	CASE SIZE
11038	21-25	1
11039	25-30	1
11040	30-36	1
11041	36-43	1
11042	43-56	1
11043	56-72	1
11084	59-71	1
11137	64-77	4
11044	72-88	4
11045	88-108	4
11046	108-130	4
11148	124-156	4
11049	145-175	4
11050	161-193	6
11051	189-227	6
11052	216-259	6
11053	233-292	6
11054	270-324	6
11085	280-336	7
11086	320-384	7
11087	340-408	7
11088	378-455	7
11089	400-480	7
11090	430-516	7
11091	630-750	8

330 Volts AC

MARS NO.	MICROFARAD MIN - MAX.	CASE SIZE
11055	21-25	2
11056	25-30	2
11057	30-36	2
11058	36-43	2
11059	43-56	4
11060	56-72	4
11160	64-77	4
11061	72-88	4
11062	88-108	4
11063	108-130	7
11064	130-156	7
11165	124-156	7
11092	135-162	7
11066	145-175	7
11067	161-193	7
11068	189-227	7
11069	216-259	7
11070	270-324	7
11093	300-360	7

The Turbo® 200 Family Products

Universal Run & Start Capacitor Replacement. Have the right capacitor for the job every time. The perfect solution for off hour emergency service calls.

Universal HardStart Replacement. One "2-Wire" Turbo® Easy-Start Hardstart can replace any one of four compressor hardstart kits on the market.



MARS NO.	DESCRIPTION	MICROFARAD
12100	Turbo® 200 Mini	2.5 mfd - 12.5 mfd, 370V or 440V
12500	Turbo® 200 Mini - Oval	2.5 mfd - 12.5 mfd, 370V or 440V
12200	Turbo® 200	2.5 mfd - 67.5 mfd, 370V or 440V
12300	Turbo® 200 X	5.0 mfd - 97.5 mfd, 370V or 440V
11200	Turbolytic™ 50 Universal Motor Start Capacitor	23 mfd - 302 mfd, 125V to 330V
11100	Turbolytic™ JR	23 mfd - 208 mfd, 125V to 330V
86150	TurboMeter™ See the dual values develop simultaneously on the screen as you create the ratings needed.	
12400	Turbo® Easy-Start "4" Hardstart Universal Hardstart	Up to 1 ton 108-130 mfd 1 to 2 tons 189-227 mfd 2.5 to 3 tons 233-280 mfd 3.5 to 5 tons 270 to 324 mfd
12600	Turbo® Easy-Start Hardstart	Up to 1 ton 108-130 mfd 1 to 2 tons 189-227 mfd 2.5 to 3 tons 233-280 mfd 3.5 to 5 tons 270 to 324 mfd

MARS Capacitor Tester

Features:

- Easy to use
- 9V battery and test leads included
- Low battery indicator

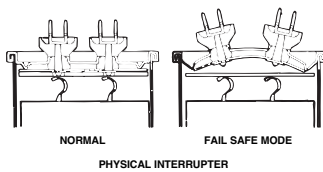
MARS NO.	RANGE	RESOLUTION	ACCURACY	TEST FREQUENCY
65746	200 pF	0, 1pF	± (0.5% rdg + 1 dgt + 0.5 pF)	820Hz
	2000 pF 20 nF 200 nF 2 nF	1 pF 10 pF 100 pF 1 nF	± (0.5% rdg + 1 dgt)	
	20 µF	10 nF		82 Hz
	200 µF	100 nF	± (2.0% rdg. + 1dgt)	8.2 Hz
	2000 µF	1 µF		
	20 mF	10 µF	± (4.0% rdg. + 1dgt)	

Single Section Run Capacitors

Capacitor accessories on page C-9.

Features:

- MARS offers the widest selection of ratings in the industry
- Non-PCB capacitors. Physical interrupter makes our capacitors safe
- Perfect for general replacements—smallest dimensions available
- UL and CSA listings available
- 50/60 Hz



Single Section 370 Volt Round

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12092	2	M	2.000
12093	3	M	2.000
12094	4	M	2.000
12095	5	M	2.000
12096	6	M	2.000
12097	7.5	M	2.000
12098	10	M	2.000
12099	12.5	M	2.000
12210	15	M	2.375
12211	16	M	2.375
12212	17.5	M	2.375
12214	20	M	2.625
12215	25	M	3.000
12217	30	M	3.000
12218	35	M	3.750
12221	40	M	3.750
12223	45	N	3.375
12225	50	N	3.750
12226	55	N	3.750
12227	60	N	4.750
12128	65	N	4.750
12229	70	N	4.750
12199	80	N	4.750
12116	100	P	4.750

Single Section 440/370 Volt Oval

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12026	2	A	1.500
12019	2.5	A	1.500
12027	3	A	2.000
12028	4	A	2.000
12029	5	A	2.375
12030	6	A	2.375
12031	7.5	A	2.625
12032	10	A	3.750
12033	12.5	A	3.750
12034	15	C	2.375
12036	17.5	C	2.375
12037	20	C	2.625
12040	25	C	3.000
12041	30	C	3.750
12043	35	C	3.750
12045	40	C	4.750
12048	45	C	4.750
12049	50	C	4.750
12050	55	C	4.750
12051	60	D	3.750
12052	65	D	3.750
12130	70	D	3.750
12135	75	D	3.750
12140	80	D	4.750

Single Section 370 Volt Oval

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12002	2	A	1.500
12003	3	A	1.500
12004	4	A	1.500
12005	5	A	1.500
12006	6	A	1.500
12007	7.5	A	2.375
12008	10	A	2.625
12009	12.5	A	3.000
12010	15	A	3.750
12012	17.5	A	3.750
12014	20	C	2.375
12015	25	C	2.625
12017	30	C	2.625
12018	35	C	3.000
12021	40	C	3.750
12023	45	C	3.750
12025	50	C	3.750
12024	55	C	4.250
12087	60	C	4.750
12011	65	C	4.750
12089	70	C	4.750
12090	80	D	3.750

Single Section 440/370 Volt Round

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12102	2	M	2.000
12103	3	M	2.000
12104	4	M	2.000
12105	5	M	2.000
12106	6	M	2.000
12107	7.5	M	2.000
12232	10	M	2.375
12233	12.5	M	2.375
12234	15	M	2.625
12236	17.5	M	2.750
12237	20	M	3.000
12240	25	M	3.750
12241	30	N	3.375
12243	35	N	3.750
12245	40	N	3.750
12248	45	N	4.750
12251	50	P	3.375
12252	55	P	3.750
12254	60	P	3.750
12357	65	P	3.750
12258	70	P	4.750
12259	80	P	4.750
12068	90	P	4.750

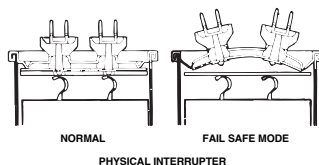
Dual Section Motor Run Capacitors

Dual section run capacitors are used primarily to serve two microfarad applications. They can, however, by making various combinations of parallel connections, be used to obtain many other microfarad ratings.

Capacitor accessories on page C-9.

Features:

- MARS offers the widest selections of ratings in the industry
- Non-PCB capacitors. Physical interrupter makes our capacitors safe
- Perfect for general replacements—smallest dimensions available
- UL and CSA listings available
- 50/60 Hz



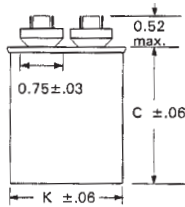
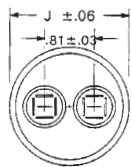
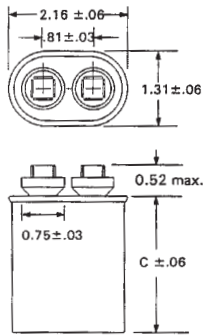
Dual Section 370 Volt Oval

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12141	15/3	C	2.625
12056	15/4	C	2.625
12057	15/5	C	2.625
12058	15/10	C	3.000
12059	17.5/4	C	2.375
12060	17.5/5	C	2.375
12061	20/3	C	2.625
12062	20/4	C	2.625
12063	20/5	C	2.625
12064	20/10	C	2.625
12164	20/15	C	4.750
12142	25/3	C	2.625
12065	25/4	C	2.625
12066	25/5	C	2.625
12143	25/7.5	C	2.625
12131	25/8	C	3.000
12167	25/10	C	3.000
12133	25/15	C	3.000
12144	30/3	C	3.000
12145	30/4	C	3.000
12069	30/5	C	3.000
12146	30/7.5	C	3.000
12147	30/10	C	3.375
12148	35/3	C	3.000
12071	35/4	C	3.750
12072	35/5	C	3.750
12149	35/7.5	C	3.000
12150	35/10	C	3.750
12151	40/3	C	3.750
12158	40/4	C	3.750
12171	40/5	C	3.750
12152	40/7.5	C	3.750
12134	40/10	C	3.750
12173	45/3	C	3.750
12174	45/5	C	3.750
12153	45/7.5	C	3.750
12136	45/10	C	4.750
12137	45/15	C	4.750
12138	50/5	C	4.750
12154	55/5	C	4.750
12155	55/7.5	C	4.750
12139	60/5	D	4.750
12156	60/7.5	C	4.750
12157	60/10	C	4.750
12159	65/5	D	4.750
12163	80/5	D	4.750
12123	80/7.5	D	4.750

Dual Section 370 Volt Round

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12121	15/3	N	3.125
12122	15/4	N	3.125
12203	15/5	N	3.125
12204	15/10	N	3.125
12205	17.5/4	N	3.125
12206	17.5/5	N	3.125
12207	20/4	N	3.125
12260	20/5	N	3.125
12016	20/7.5	N	3.125
12208	20/10	N	3.125
12209	20/15	N	3.125
12242	25/3	N	3.125
12175	25/4	N	3.125
12261	25/5	N	3.125
12262	25/7.5	N	3.125
12213	25/10	N	3.125
12244	30/3	N	3.125
12263	30/4	N	3.125
12264	30/5	N	3.125
12224	30/7.5	N	3.125
12228	30/10	N	3.125
12039	30/15	N	3.875
12082	35/3	N	3.875
12231	35/4	N	3.125
12266	35/5	N	3.875
12235	35/7.5	N	3.125
12238	35/10	N	3.875
12074	40/3	N	3.875
12267	40/4	N	3.875
12178	40/5	N	3.875
12268	40/7.5	N	3.875
12246	40/10	N	3.875
12073	45/3	N	3.875
12247	45/4	N	3.875
12269	45/5	P	3.875
12249	45/7.5	N	3.875
12250	45/10	N	3.875
12075	50/3	P	3.125
12191	50/5	N	3.875
12192	50/7.5	P	3.125
12239	50/10	P	3.875
12193	55/5	N	4.75
12194	55/7.5	N	4.75
12067	55/10	N	4.75
12076	60/3	P	3.875
12195	60/5	P	3.875
12196	60/7.5	N	4.75
12265	60/10	P	3.125
12042	65/5	N	4.75
12053	70/5	P	3.875
12054	70/7.5	P	3.875
12055	70/10	P	3.875
12044	75/5	P	3.875
12046	75/7.5	P	3.875
12084	75/10	P	3.875
12197	80/5	P	3.875
12198	80/7.5	P	3.875
12201	80/10	P	3.875
12202	80/12.5	P	4.75
12129	85/5	P	4.75
12230	85/7.5	P	4.75
12222	85/10	P	4.75

Capacitor Base Dimensions



Dual Section 440/370 Volt Round

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12111	10/5	N	3.125
12118	15/5	N	3.125
12356	15/10	N	3.125
12350	17.5/5	N	3.125
12115	20/5	N	3.125
12354	20/7.5	N	3.125
12351	20/10	N	3.875
12112	20/15	N	3.875
12353	25/3	N	3.875
12355	25/4	N	3.875
12278	25/5	N	3.875
12279	25/7.5	N	3.875
12113	25/10	N	3.625
12114	25/15	N	3.875
12126	30/3	N	3.875
12120	30/4	N	3.875
12281	30/5	N	3.875
12282	30/7.5	N	3.875
12352	30/10	N	4.750
12077	35/3	N	3.875
12070	35/4	N	3.875
12283	35/5	N	3.875
12119	35/6	N	4.750
12284	35/7.5	P	3.875
12091	35/10	N	4.750
12078	40/3	P	3.125
12285	40/4	P	3.125
12286	40/5	P	3.125
12220	40/6	N	4.750
12287	40/7.5	P	3.875
12088	40/10	N	4.750
12079	45/3	P	3.875
12219	45/4	N	3.750
12288	45/5	P	3.875
12127	45/6	N	4.750
12289	45/7.5	N	3.875
12172	45/10	P	3.875
12290	50/5	P	3.875
12291	50/7.5	P	3.875
12124	50/10	P	3.875
12253	50/12.5	P	3.875
12292	55/5	P	3.875
12293	55/7.5	P	3.875
12299	55/10	P	3.875
12160	60/3	P	4.750
12294	60/5	P	3.875
12295	60/7.5	P	3.875
12296	60/10	P	3.875
12161	60/12.5	P	4.750
12358	65/5	P	4.750
12359	65/7.5	P	4.750
12162	65/10	P	4.750
12255	70/5	P	4.750
12166	70/7.5	P	4.750
12169	70/10	P	4.750
12168	75/5	P	4.750
12125	75/7.5	P	4.750
12047	75/10	P	4.750
12257	80/5	P	4.875
12216	80/7.5	P	4.750
12117	80/10	P	4.750
12022	85/5	P	4.750
12020	85/7.5	P	4.750
12001	85/10	P	4.750

Dual Section 440/370 Volt Oval

MARS NO.	MICROFARAD	BASE	HEIGHT IN.
12360	5/5	C	2.625
12165	10/5	C	3.125
12170	10/10	C	3.125
12270	15/4	C	2.625
12271	15/5	C	2.625
12177	15/10	C	3.750
12180	20/5	C	2.625
12083	20/15	D	3.000
12184	25/5	D	3.000
12182	25/7.5	C	3.750
12183	25/10	C	3.750
12186	25/15	D	3.000
12181	30/4	C	3.750
12187	30/5	D	3.750
12038	30/7.5	C	3.750
12035	30/10	C	3.750
12085	35/3	C	4.750
12179	35/4	C	3.750
12185	35/5	C	4.750
12188	35/7.5	C	3.750
12176	35/8.5	C	3.750
12272	35/10	C	4.750
12080	40/3	C	4.750
12086	40/5	C	4.750
12189	40/7.5	C	4.750
12273	40/10	C	4.750
12190	45/5	D	4.750
12274	45/7.5	C	4.750
12108	50/5	D	4.750
12013	50/7.5	C	4.750
12275	55/5	D	4.750
12276	55/10	D	4.750
12109	60/5	D	4.750
12110	60/7.5	D	4.750
12101	65/10	D	4.750
12297	80/5	D	5.750
12298	80/7.5	D	5.750

Base Dimension Key - Oval

KEY	DEPTH IN.	WIDTH IN.	DESCRIPTION
A	1.31	2.16	oval fan size
C	1.91	2.91	oval
D	1.97	3.66	oval

Base Dimension Key - Round

KEY	DEPTH IN.	MOUNTING STRAP
M	1.75	93031
N	2.00	93032
P	2.50	93033

MARS USA Capacitors



Features:

- Product of USA
- Tested and approved by every major US motor company and compressor company
- 440/370 Dual Voltage Rated
- Meets EIA-456A Test Standard (simulates 60,000 hours of operation)
- Meets Tecumseh H-115
- OEM Grade
- CSA approved and UL recognized
- 5 year warranty



Single Section

MARS USA NO.	DESCRIPTION	BASE	HEIGHT
14005	5 MFD 370V Oval	A	1.500
14029	5 MFD 440/370V Oval	A	2.375
14105	5 MFD 440/370V Round	M	2.000
14007	7.5 MFD 370V Oval	A	2.375
14031	7.5 MFD 440/370V Oval	A	2.625
14107	7.5 MFD 440/370V Round	M	2.000
14008	10 MFD 370V Oval	A	2.625
14032	10 MFD 440/370V Oval	A	3.750
14232	10 MFD 440/370V Round	M	2.375
14009	12.5 MFD 370V Oval	A	3.000
14033	12.5 MFD 440/370V Oval	A	3.750
14010	15 MFD 370V Oval	A	3.750
14034	15 MFD 440/370V Oval	C	2.375
14234	15 MFD 440/370V Round	M	2.625
14237	20 MFD 440/370V Round	M	3.000
14240	25 MFD 440/370V Round	M	3.750
14241	30 MFD 440/370V Round	N	3.375
14243	35 MFD 440/370V Round	N	3.750
14245	40 MFD 440/370V Round	N	3.750
14248	45 MFD 440/370V Round	N	4.750
14251	50 MFD 440/370V Round	P	3.375
14252	55 MFD 440/370V Round	P	3.750
14254	60 MFD 440/370V Round	P	3.750
14256	65 MFD 440/370V Round	P	3.750
14258	70 MFD 440/370V Round	P	4.750
14259	80 MFD 440/370V Round	P	4.750

Dual Section

MARS USA NO.	DESCRIPTION	BASE	HEIGHT
14353	25/3 MFD 440/370V Round	N	3.875
14278	25/5 MFD 440/370V Round	N	3.875
14126	30/3 MFD 440/370V Round	N	3.875
14281	30/5 MFD 440/370V Round	N	3.875
14282	30/7.5 MFD 440/370V Round	N	3.875
14077	35/3 MFD 440/370V Round	N	3.875
14283	35/5 MFD 440/370V Round	N	3.875
14284	35/7.5 MFD 440/370V Round	P	3.875
14091	35/10 MFD 440/370V Round	N	4.750
14078	40/3 MFD 440/370V Round	P	3.125
14286	40/5 MFD 440/370V Round	P	3.125
14287	40/7.5 MFD 440/370V Round	P	3.875
14088	40/10 MFD 440/370V Round	N	4.750
14288	45/5 MFD 440/370V Round	P	3.875
14289	45/7.5 MFD 440/370V Round	N	3.875
14172	45/10 MFD 440/370V Round	P	3.875
14290	50/5 MFD 440/370V Round	P	3.875
14291	50/7.5 MFD 440/370V Round	P	3.875
14292	55/5 MFD 440/370V Round	P	3.875
14293	55/7.5 MFD 440/370V Round	P	3.875
14299	55/10 MFD 440/370V Round	P	3.875
14296	60/10 MFD 440/370V Round	P	3.875
14294	60/5 MFD 440/370V Round	P	3.875
14295	60/7.5 MFD 440/370V Round	P	3.875
14358	65/5 MFD 440/370V Round	P	3.875
14359	65/7.5 MFD 440/370V Round	P	3.875
14162	65/10 MFD 440/370V Round	P	4.750
14169	70/10 MFD 440/370V Round	P	4.750
14255	70/5 MFD 440/370V Round	P	4.750
14166	70/7.5 MFD 440/370V Round	P	4.750
14257	80/5 MFD 440/370V Round	P	4.875
14216	80/7.5 MFD 440/370V Round	P	4.750
14117	80/10 MFD 440/370V Round	P	4.750

Base Dimension Key - Oval

KEY	DEPTH IN.	WIDTH IN.	DESCRIPTION
A	1.31	2.16	oval fan size
C	1.91	2.91	oval
D	1.97	3.66	oval

Base Dimension Key - Round

KEY	DEPTH IN.	MOUNTING STRAP
M	1.75	93031
N	2.00	93032
P	2.50	93033

MARS Mini-Split Run Capacitors

MARS mini-split motor run capacitors are epoxy/resin sealed and widely used as the start-up and/or run capacitor for your motor. They feature very small dissipation factor and inherent temperature rise, high insulation resistance, and stable capacitance.





MARS NO.	DESCRIPTION	DIMENSIONS		
		H	D	W
12380	1 MFD X 450V	1-1/2	X 1/2	X 1
12381	1.5 MFD X 450V	1-1/2	X 1/2	X 1
12382	2 MFD X 450V	1-1/2	X 1/2	X 1
12383	2.5 MFD X 450V	1-1/2	X 3/4	X 1-1/4
12384	3 MFD X 450V	1-1/2	X 3/4	X 1-1/4
12385	3.5 MFD X 450V	1-7/8	X 3/4	X 1-3/8
12386	4 MFD X 450V	1-7/8	X 3/4	X 1-3/8
12388	5 MFD X 450V	1-7/8	X 7/8	X 1-3/8
12390	6 MFD X 450V	1-7/8	X 1	X 1-1/2



Technical Specification:

- Ambient temperature: 70° C
- Rated voltage: 450 VA
- Capacitance tolerance: ±5
- 50/60 Hz
- Standard: IEC252-2001









Accessories For Relays & Capacitors

QC-6 Kit	
93001	For conversion of screw-type connections on relays 
Resistor for Start Capacitors	
93007	2 watt (15,000 ohm) Resistors, 10/Pk 
QC-13 for Start Capacitors	
93106	10 pc 2 watt (15,000 ohm) resistors with .25-in female spade connectors, 10/Pk 
Snap-on Mounting Brackets for Motor Start Capacitors	
93026	2.75 in
93027	3.38 in
93028	4.38 in
Sold in 10 pack 	

Case Dimensions*

CASE SIZE	DIAMETER	LENGTH
1	1.44	2.75
2	1.44	3.38
4	1.81	3.38
5	1.81	4.38
6	2.06	3.38
7	2.06	4.38
8	2.56	4.38

*Capacitors may be put in different case sizes occasionally, but will not be larger than those stated.

Protector (boots) for Motor Run Capacitors	
93011	1 Hole Boot, 25/Pk 
93012	2 Hole Boot, 25/Pk 
Wrap-Around Brackets for Motor Run Capacitors	
93014	Oval 1.94 x 2.78 for base A, 10/Pk 
93015	Oval 1.97 x 2.94 for base C, 10/Pk 
93116	Oval 2.25 x 3.66 for base D, 10/Pk 
Mounting Brackets for Round Capacitors	
93031	For 1.63 in and 1.75 in diam
93032	For 2.0 in diam
93033	For 2.50 in diam
Sold in 5 pack 	
Bakelite End Caps for Motor Start Capacitors	
93018	BEC-1 1.44 in
93019	BEC-2 1.81 in
93020	BEC-3 2.06 in
93021	BEC-4 2.56 in
Sold in 10 pack 	
For mounting OFF MOTOR. Leads on top side.	
93022	TEC-1 1.44 in
93023	TEC-2 1.81 in
93024	TEC-3 2.06 in
93025	TEC-4 2.56 in
Sold in 10 pack 	

MARS 780 Definite Purpose Contactors

MARS 780 - 1 pole with shunt contactors are designed for demanding applications. The enclosed body design provides quiet operation and improved durability by reducing the intrusion of dust and dirt. Silver-cadmium oxide contacts provide increased contact life when switching inductive loads.

Features:

- Enclosed body and coil – standard cover
- Push to test button
- Quad quick connects
- Box lugs - large window arch design
- Screw terminals and or box lugs available on 30 amp
- Coils - class F insulation
- UL File E96705



1 Pole with Shunt 30 - 40 Amps

MARS NO.	FURNAS NO.	FLA	LOCKED ROTOR AMPS		NON INDUCTIVE AMPS	COIL VOLTS	TERMINATION
			240V	277V			
61320	45EG10AJA, 45CG10AJA, 45DG10AJA					24	
61321	45EG10AFA, 45CG10AFA, 45DG10AFA					120	
61322	45EG10AGA, 45CG10AGA, 45DG10AGA	30	180	180	40	208-240	Screw Type
61323	45EG10ALA, 45CG10ALA, 45DG10ALA					277	
61324	45EG10AHA, 45CG10AHA, 45DG10AHA					480	
61720	45EG10AJAL					24	
61721	45EG10AFAL					120	
61722	45EG10AGAL	30	180	180	40	208-240	Box Lug
61723	45EG10ALAL					277	
61724	45EG10AHAL					480	
61730	45GG10AJAL, 45FG10AJA, 45GG10AJA					24	
61731	45GG10AFAL, 45FG10AFA, 45GG10AFA					120	
61732	45GG10AGAL, 45FG10AGA, 45GG10AGA	40	240	240	50	208-240	Box Lug
61733	45GG10ALAL, 45FG10ALA, 45GG10ALA					277	
61734	45GG10AHAL, 45FG10AHA, 45GG10AHA					480	

MARS 780 Definite Purpose Contactors

MARS 780 - 2 pole contactors are designed for demanding applications. The enclosed body design provides quiet operation and improved durability by reducing the intrusion of dust and dirt. Silver-cadmium oxide contacts provide increased contact life when switching inductive loads.

Features:

- Enclosed body and coil – standard cover
- Push to test button
- Quad quick connects
- Box lugs - large window arch design
- Screw terminals and or box lugs available on 30 amp
- Coils - class F insulation
- UL File E96705



2 Pole 30 - 40 Amps

MARS NO.	FURNAS NO.	FLA	LOCKED ROTOR AMPS			NON INDUCTIVE AMPS	COIL VOLTS	TERMINATION
			240V	480V	600V			
61345	45EG20AJ, 45CG20AJ, 45DG20AJ					24		
61346	45EG20AF, 45CG20AF, 45DG20AF					120		
61347	45EG20AG, 45CG20AG, 45DG20AG	30	180	150	120	40	208-240	
61348	45EG20AL, 45CG20AL, 45DG20AL					277		
61349	45EG20AH, 45CG20AH, 45DG20AH					480		
61745	45EG20AJL					24		
61746	45EG20AFL					120		
61747	45EG20AGL	30	180	150	120	40	208-240	
61748	45EG20ALL					277		
61749	45EG20AHL					480		
61755	45GG20AJL, 45FG20AJ, 45GG20AJ					24		
61756	45GG20AFL, 45FG20AF, 45GG20AF					120		
61757	45GG20AGL, 45FG20AG, 45GG20AG	40	240	200	160	50	208-240	
61758	45GG20ALL, 45FG20AL, 45GG20AL					277		
61759	45GG20AHL, 45FG20AH, 45GG20AH					480		

MARS 780 Definite Purpose Contactors

MARS 780 Definite Purpose Contactors

MARS 780 - 2 pole "Large Body" contactors feature a 2 pole configuration in a 3 pole body for increased durability in demanding applications.

Features:

- Large arch window box lugs
- Recessed push to test button
- Accepts MARS 780 and Furnas auxiliary switches
- Use standard MARS 780 replacement coils
- Dual QC coil terminals plus screw terminal for easy termination and jumper arrangements
- Coils - class F insulation
- UL File E96705



2 Pole - Large Body 30 - 40 Amp

MARS NO.	FURNAS NO.	FLA	LOCKED ROTOR AMPS			NON INDUCTIVE AMPS	COIL VOLTS	HORSEPOWER		TERMINATION
			240V	480V	600V			1 PH 240V	3 PH 240V	
61425	42BF15AJ, 42AF15AJ	30	180	150	120	40	24	3 HP	7.5 HP	Box Lug
61426	42BF15AF, 42AF15AF						120			
61427	42BF15AG, 42AF15AG						208-240			
61428	42BF15AL, 42AF15AL						277			
61440	42CF15AJ	40	240	200	160	50	24	5 HP	10 HP	Box Lug
61441	42CF15AF						120			
61442	42CF15AG						208-240			
61443	42CF15AL						277			

MARS 780 - 3 Pole Contactors

MARS 780 - 3 pole contactors are designed for demanding applications. The enclosed body design provides quiet operation and improved durability by reducing the intrusion of dust and dirt. Side attachment rails for auxiliary switches (30-60 amp contactors) allow attachment of MARS 780 or Furnas auxiliary switches. Silver-cadmium oxide contacts provide increased contact life when switching inductive loads.

Features:

- Large arch window box lugs
- SEMS screws or box lugs available on 30 amp contactors
- Recessed push to test button (not on 75 and 90 amp contactors)
- Enclosed body design
- Accepts MARS 780 and Furnas auxiliary switches
- Use standard MARS 780 replacement coils
- Dual QC coil terminals plus screw terminal for easy termination and jumper arrangements
- Coils - class F insulation • 600 volt rating • Foot print compatible
- UL File E96705

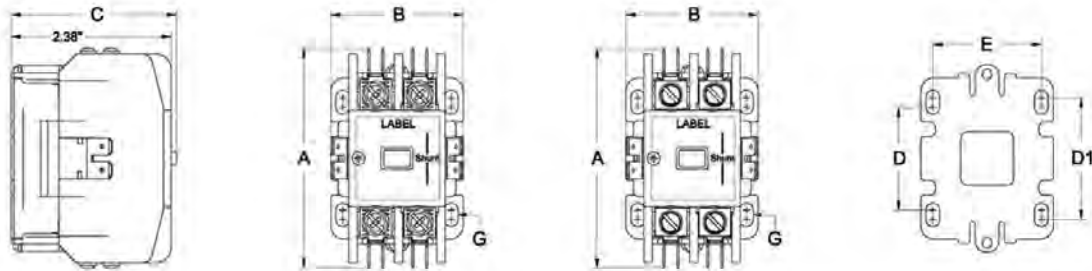


3 Pole 30 - 90 Amp

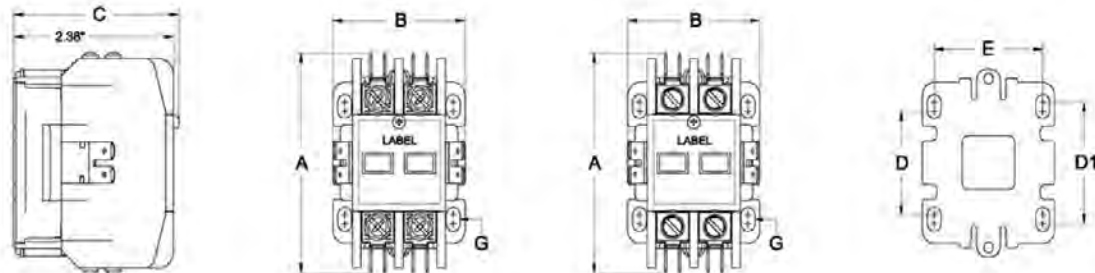
* For 25 Amp Contactors - Use 30 Amp in Place of 25Amp

MARS NO.	FURNAS NO.	FLA	LOCKED ROTOR AMPS			NON INDUCTIVE AMPS	COIL VOLTS	HORSEPOWER				TERMINATION
			240V	480V	600V			1 PH 240V	240V	3 PH 480V	600V	
61430*	42BF35AJ	30	180	150	120	40	24	3 HP	7.5 HP	10 HP	15 HP	Screw Type
61431*	42BF35AF						120					
61432*	42BF35AG						208-240					
61433*	42BF35AL						277					
61434*	42BF35AH						480					
61750	-	30	180	150	120	40	24	3 HP	7.5 HP	10 HP	15 HP	Box Lug
61751	-						120					
61752	-						208-240					
61753	-						277					
61754	-						480					
61445	42CF35AJ	40	240	200	160	50	24	5 HP	10 HP	15 HP	20 HP	Box Lug
61446	42CF35AF						120					
61447	42CF35AG						208-240					
61448	42CF35AL						277					
61449	42CF35AH						480					
61460	42DF35AJ	50	300	250	200	63	24	5 HP	15 HP	20 HP	25 HP	Box Lug
61461	42DF35AF						120					
61462	42DF35AG						208-240					
61463	42DF35AL						277					
61464	42DF35AH						480					
61470	42EF35AJ	60	360	300	240	75	24	7.5 HP	20 HP	25 HP	30 HP	Box Lug
61471	42EF35AF						120					
61472	42EF35AG						208-240					
61473	42EF35AL						277					
61474	42EF35AH						480					
61480	42FE35AJ106	75	450	375	300	94	24	15 HP	25 HP	40 HP	40 HP	Box Lug
61481	42FE35AF106						120					
61482	42FE35AG106						208-240					
61483	42FE35AL106						277					
61484	42FE35AH106						480					
61490	42GE35AJ106	90	540	450	360	120	24	15 HP	30 HP	50 HP	50 HP	Box Lug
61491	42GE35AF106						120					
61492	42GE35AG106						208-240					
61493	42GE35AL106						277					
61494	42GE35AH106						480					

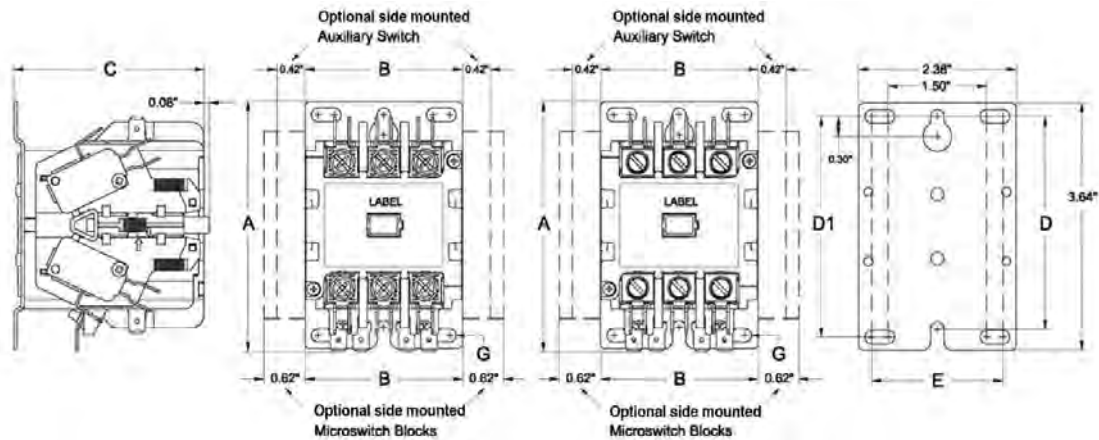
30-40A 1 Pole with Shunt



30-40A 2 Pole



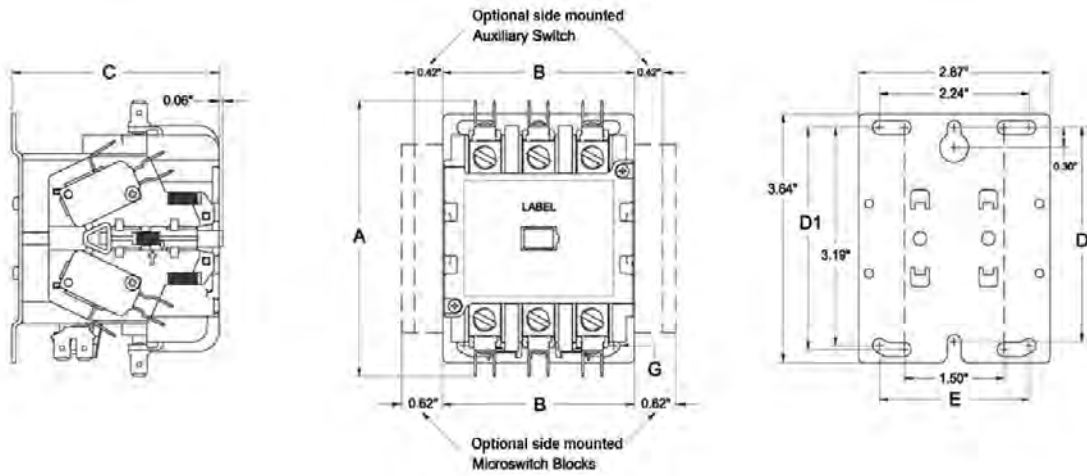
30-40A 2* Pole & 3 Pole



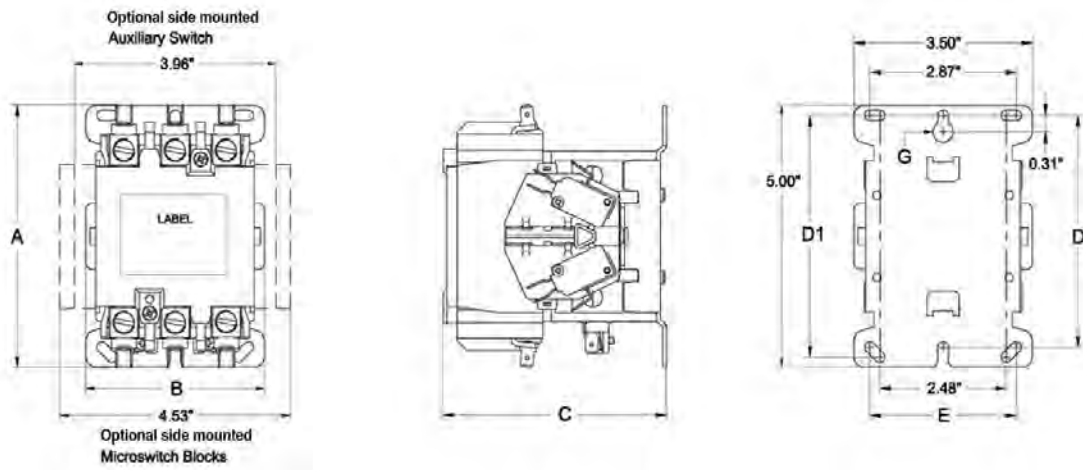
Note - 2* Pole is a 3 pole body with center contacts removed.

MARS NO.	FLA	POLES	A	B	C	D	D1	E	MTG SCREW G	MAX WIRE SIZE
61320-61324	30	1	3.19	1.97	2.46	1.5	1.77	1.61	10	8
61720-61724 61730-61734	30-40	1	3.19	1.97	2.46	1.5	1.77	1.61	10	4
61345-61349	30	2	3.19	1.97	2.46	1.5	1.77	1.61	10	8
61745-61749 61755-61759	30-40	2	3.19	1.97	2.46	1.5	1.77	1.61	10	4
61430-61434	30	3	3.69	2.38	2.87	3.13	3.25	1.98	10	8
61750-61754 61445-61449	30-40	3	3.69	2.38	2.87	3.13	3.25	1.98	10	4
61425-61428 61440-61443	30-40	2(at 3P)*	3.69	2.38	2.87	3.13	3.25	1.98	10	4

50-60A 3 Pole



75-90A 3 Pole

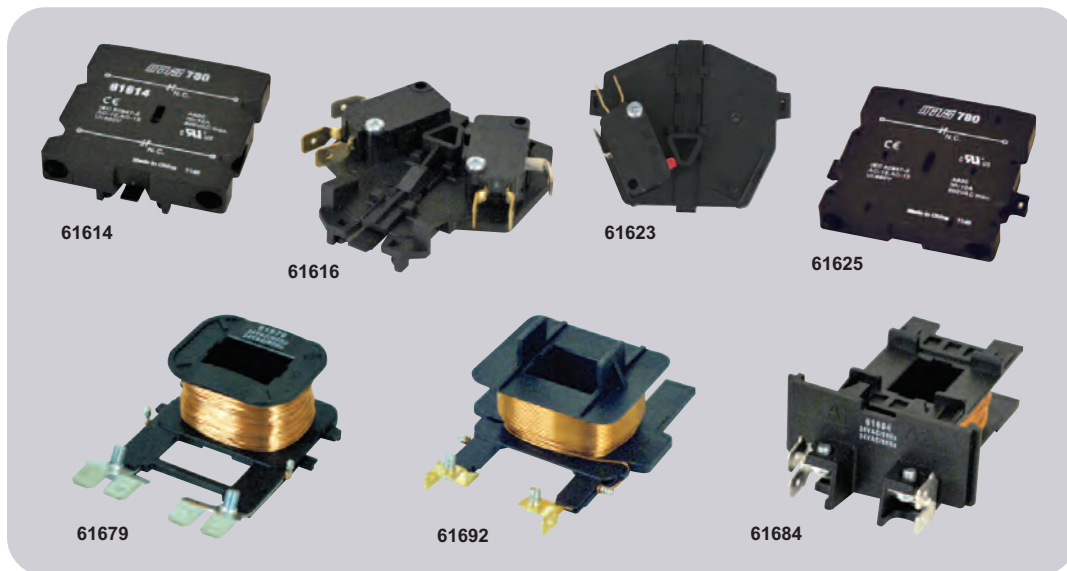


MARS NO.	FLA	POLES	A	B	C	D	D1	E	MTG SCREW G	MAX WIRE SIZE
61460-61464 61470-61474	50-60	3	4.04	2.87	3.11	3.13	3.25	2.24	10	2
61480-61484 61490-61494	75-90	3	5.02	3.5	4.39	4.43	4.63	2.87	10	1/10

MARS 780 Definite Purpose Contactors

Renewal Parts and Accessories

- Snap on side mounted auxiliary switches
- Replacement coils



Auxiliary Switches

MARS NO.	FURNAS NO.	DESCRIPTION	CONTACTOR F.L.A.	USED ON
61610	49ACRO	1 NO	30 - 60	61320-61324 61720-61724 61730-61734 61345-61349 61745-61749 61755-61759 61430-61434 61750-61754 61445-61449 61425-61428 61440-61443 61460-61464 61470-61474
61611	49ACRC	1 NC		
61612	49ACR6	1 NO- 1 NC		
61613	49ACR7	2 NO		
61614	49ACR8	2 NC		
61615	49D36098001	SPDT		
61616	49D36098003	DPDT	75-90	61480-61484 61490-61494
61623	-	SPDT		
61624	-	1 NO		
61625	-	1 NC		

MARS 780 Replacement Coils

MARS NO.	FURNAS NO.	CONTACTOR SIZE	COIL VOLTAGE
61679	-	3 Pole 30-40 Amp	24V
61680	-		120V
61681	-		208-240V
61682	-		277V
61683	-	3 Pole 50-60 Amp	480V
61684	-		24V
61685	-		120V
61687	-		208-240V
61690	-	3 Pole 75-90 Amp	277V
61691	-		480V
61692	-		24V
61693	-		120V
61694	-		208-240V
61695	-		277V
61696	-		480V

MARS 780 Contactor Coil Characteristics

Contactor Series	Inrush VA	Sealed VA	Sealed Watts
1 Pole with shunt 30 to 40 amp	40	7.5	2.5 - 3.5
2 Pole - Small Body 30- 40 Amp	45	8	2.5 - 4.0
2 Pole Large Body 30- 40 Amp	90	16	3.5 - 5.0
3 Pole 30 - 40 Amp	90	16	3.5 - 5.0
3 Pole 50 - 60 Amp	145	20	5.0 - 7.0
3 Pole 75 - 90 Amp	235	32	10.0 - 12.0

Furnas NEMA Contactors & Starters

Application:

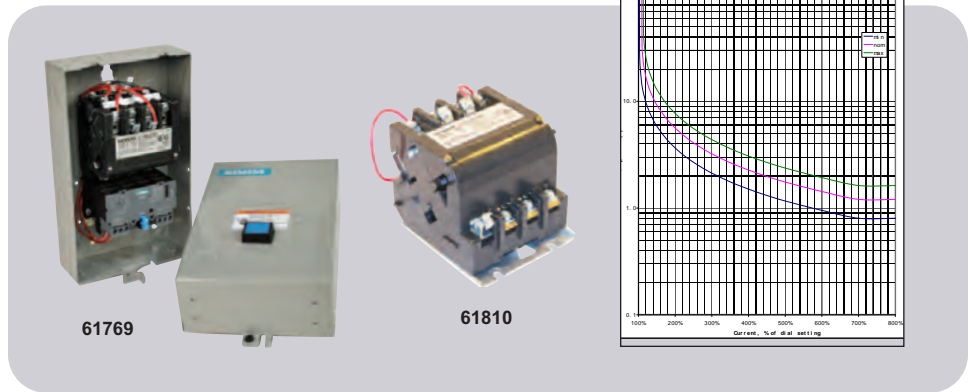
NEMA heavy duty contactors and starters are designed for across the line starting of 3 phase motors. Typical applications include cooling towers, refrigeration equipment, and commercial HVAC. NEMA contactors provide the switching (on/off) function. NEMA starters consist of a NEMA contactor with the addition of motor protection via a solid state overload relay which includes phase loss protection.

Standard NEMA Contactor Features:

- Rugged industrial design epoxy encapsulated coil seals out moisture, promotes heat transfer, and resists electrical, mechanical, and thermal stresses. The 45 degree wedge action contacts reduce tracking and provide faster arc quenching. The resulting self-cleaning and reduced contact bounce mean cooler operation and longer life for the large silver cadmium oxide contacts
- Dual Voltage Coils
120/240 VAC is standard
24 VAC and 240/480 VAC are available as accessories
- Easy coil access. Top mounted coil requires no tools to change

Standard NEMA Starter Features:

- NEMA Contactor
- True phase loss protection
Trips within 3 seconds and is self protected from short circuits
- High accuracy +/- 2% repeat trip accuracy
- Self powered requires no hard wiring or separate power source
- Heaterless construction minimizes energy costs. Does not require the use of complicated heater charts. Simply set the dial on the overload relay to the motor F.L.A.
- Overload trip class 20



NEMA Starters

MARS NO.	SEIMENS NO.	NEMA SIZE	AMP RATING	200V	HORSEPOWER 230V	460V	OVERLOAD RANGE	COIL VOLTAGE	ENCL.
61769	14BUB32BA	0	9	1/2	3/4	1-1/2	.75-3A	120/240	NEMA 1
61770	14CUC32BA	0	18	2	2	5	2.5-10A	120/240	NEMA 1
61771	14CUD32BA	0	18	3	3	-	9-18A	120/240	NEMA 1
61772	14DUC32BA	1	27	2	2	5	2.5-10A	120/240	NEMA 1
61773	14DUD32AA	1	27	3	3	10	9-18A	120/240	Not Included
61774	14DUD32BA	1	27	3	3	10	9-18A	120/240	NEMA 1
61775	14DUE32AA	1	27	7-1/2	7-1/2	-	13-27A	120/240	Not Included
61776	14DUE32BA	1	27	7-1/2	7-1/2	-	13-27A	120/240	NEMA 1
61777	14ESG32BA	1-3/4	27	10	10	15	10-40A	120/240	NEMA 1
61779	14FUF32AA	2	45	-	-	15	13-52A	120/240	Not Included
61780	14FUF32BA	2	45	10	15	25	22-45A	120/240	NEMA 1
61782	14HUG32BA	3	90	25	30	50	45-90A	120/240	NEMA 1
61783	14HUG32AA	3	90	25	30	50	45-90A	120/240	Not Included

NEMA Contactors

MARS NO.	SEIMENS NO.	NEMA SIZE	AMP RATING	200V	HORSEPOWER 230V	460V	COIL VOLTAGE	ENCL.
61810	40CP32AA	0	18	3	3	5	120/240	Not Included
61811	40DP32AA	1	27	7-1/2	7-1/2	10	120/240	Not Included
61813	40FP32AA	2	45	10	15	25	120/240	Not Included
61815	40HP32AA	3	90	25	30	50	120/240	Not Included

Parts & Accessories for Starters & Contactors

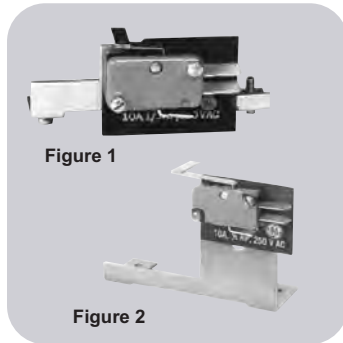
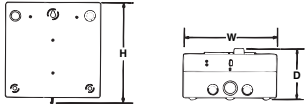
MARS NO.	SEIMENS NO.	DESCRIPTION	NEMA SIZE
61652	75D73070J	Coil 24VAC	0-2.5
61650	75D73070A	Coil 120/240V	0-2.5
61653	75D73070C	Coil 240/480V	0-2.5
61654	75D73070D	Coil 208V	0-2.5
61656	75CF14	Replacement Contact Kits*	0
61657	75DF14	Replacement Contact Kits*	1
61658	75FP14	Replacement Contact Kits*	2
61659	49AB10	N.O. Auxiliary Contact	0-3
61660	49AB01	N.C. Auxiliary Contact	0-3
61671	49SBBIX637	NEMA 1 Hand-Off Auto Kit	-

* Replacement contacts are sold in kits that will re-build 1 power pole. For example: Use (3) 75CF14 contact kits to re-build a 3 pole device.

GE Definite Purpose Contactors

Auxiliary Contacts & Enclosures for GE Contactors and Starters

Enclosure Dimensions (See Chart Below)



Auxiliary Contacts 10 Amp at 240 VAC

MARS NO.	SWITCH ACTION	USED ON MARS NOS.	GE NOS.	APPLICATION	FIG. NO.
92301	SPDT	13110-13118, 13413-13455, 13513-13555, 13613-13627	CR153A, B, C, D, DA, CR154BV, CV, DV, CR253DB CR253EB, FB, CR353AB, AC, AD, FE, FF, CR354AB, AC, AD, FE	One switch can be added	1
92302	SPDT	13200-13272, 13473-13495, 13573-13575	CR153EB, FB, GB, L, CR154EV, FV, GV, LV, CR253GB, LB, CR353EE, EF, EG, EH	One switch can be added to each side	2

Model 453 Definite Purpose Contactors

The compact models feature universal mount bases, taped coils, and combination phillips/slot head screws. All of the GE compact designs feature "no burn" coil design. These are self-protecting coils that meet the Trane specification. The Series 453 GE compact design contactors all meet ARI 780. Some other manufacturer's economy model compact contactors do not meet this rigorous spec. All of this is now available at attractive pricing!



Features:

- Compact overall size
- Combo phillips/slothead screws/hexhead on 30 amp
- Universal mount base

Specifications:

CR453C Compact, 30A, 40A, 1-Pole Plus Shunted Pole & 2-Pole

FULL LOAD AMPS	RESISTIVE AMPS PER POLE	LOCKED ROTOR AMPS SINGLE PHASE, 50/60 HZ			POLES
		240/277V	480V	600V	
30	40	180	150	120	1 + Shunt 2

* Ratings shown are for 1-phase, 2-pole.

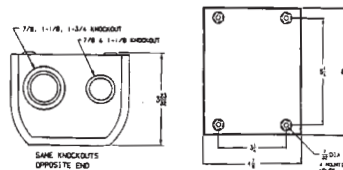
MARS NO.	FLA	RESISTIVE RATING PER POLE	POLES	VOLTAGE	GE MODEL	HEIGHT	DIM. WIDTH	DEPTH
13101	30	40	1-1/2	24	453CC3HAAAM	2-9/16	2	3-1/4
13104	30	40	2	24	453CC2HAAAM	2-3/4	2	2-7/16
13105				120	453CC2AAAAM			

COMPONENTS

Universal Enclosure

Universal Contactor Enclosure

The MARS 92680 Universal Contactor enclosure will fit contactors from 20 to 40 amp. This enclosure will also fit the new smaller frame ACC533 and ACC633 contactors. Each enclosure comes with all the necessary mounting screws.



MARS NO.	MFG. PART NO.	DESCRIPTION
92680	AHK425A	Universal Contactor Enclosure

MARS Definite Purpose Contactors

MARS definite purpose contactors are designed for use on refrigeration, air conditioning, and electric heating systems. They are available in one pole with shunt (one and one half pole) configurations, from 30 thru 40 amps. MARS brand definite purpose contactors are also available in 2 pole models (30 and 40 amp) and 3 pole models (30 through 75 amp). The universal mounting base allows replacement of most contactor brands. Straight-thru wiring and small size speeds installation.

Features:

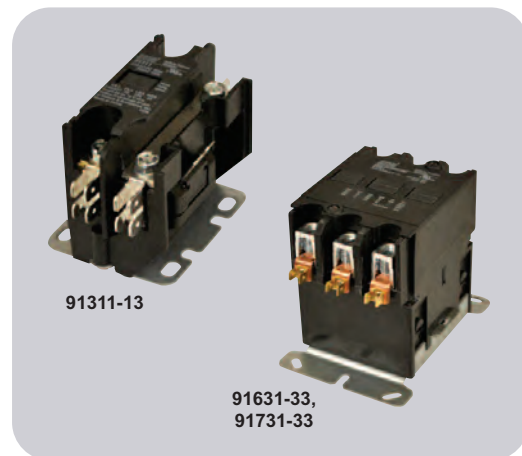
- Used in air conditioning, heating and refrigeration
- Box lug terminations speed installation
- Universal mounting base
- Contact cover and enclosed coils reduce dirt and insect intrusion
- Compact design
- Silver-Cadmium contacts

Specifications:

- Meets ARI 780/790 requirements
- cULus Approval
- 1,000,000 Cycle mechanical life

Auxiliary Switches

MARS NO	DESCRIPTION	USED ON
61623	SPDT	All 3 Pole 910
61624	1 NO	
61625	1 NC	



MARS NO.	FLA	POLES	LOCKED ROTOR AMPS				RES. AMPS	COIL VOLTS	TERMINATION	HORSEPOWER			
			240	277	480	600				1 PH 240	240	3 PH 480	600
91311	30	1 Pole w/Shunt	180	180			40	24	Screw Type	-	-	-	-
91312								120					
91313								208/230					
91315	30	1 Pole w/Shunt	180	180			40	24	Box Lug	-	-	-	-
91316								120					
91317								208/230					
91321	30	2	180	-	150	120	40	24	Screw Type	-	-	-	-
91322								120					
91323								208/230					
91325	30	2	180	-	150	120	40	24	Box Lug	-	-	-	-
91326								120					
91327								208/230					
91331	30	3	180	-	150	120	40	24	Screw Type	3 HP	7.5 HP	10 HP	15 HP
91332								120					
91333								208/230					
91335	30	3	180	-	150	120	40	24	Box Lug	3 HP	7.5 HP	10 HP	15 HP
91336								120					
91337								208/230					
91411	40	1 Pole w/Shunt	240	240	-	-	50	24	Box Lug	-	-	-	-
91421	40	2	240	-	200	160	50	24	Box Lug	-	-	-	-
91422								120					
91423								208/230					
91431	40	3	240	-	200	160	50	24	Box Lug	5 HP	10HP	15 HP	20 HP
91432								120					
91433								208/230					
91531	50	3	300	-	250	200	63	24	Box Lug	5 HP	15 HP	20 HP	25 HP
91532								120					
91533								208/230					
91631	60	3	360	-	300	240	75	24	Box Lug	7.5 HP	20 HP	25 HP	30 HP
91632								120					
91633								208/230					
91731	75	3	450	-	375	300	94	24	Box Lug	15 HP	25 HP	40 HP	40 HP
91732								120					
91733								208/230					

MARS IEC Contactors

MARS IEC Contactors are designed for demanding high reliability applications. Contactors are available with 3 Pole switching and integral auxiliary contacts with normally open or normally closed. MARS contactors are designed for modular snap together assembly and can be panel mounted or DIN rail mounted. Additional accessories allow contactors to be customized to fit numerous applications which require thermal overloads and additional auxiliary switches.

Features:

- Three pole switching plus a NO or NC auxiliary contact
- Design allows for snap on DIN rail mounting or direct panel mount with screws
- Efficient 50/60 Hz coils
- Thermal overloads
- Side mount and top mount auxiliary switches
- Finger safe terminals meet IP20 requirements
- Comply with UL, CSA and IEC standards



Specifications:

- 1,000,000 contact life cycle capability
- Insulation voltage 690V
- Dielectric strength 2500V for 1 minute

MARS NO.	CONTACT ARRANGEMENT	INDUCTIVE CONTACT RATING	COIL VOLTAGE
62000	3 Pole with NO Aux	12 Amps	24 VAC
62001	3 Pole with NC Aux	12 Amps	24 VAC
62002	3 Pole with NO Aux	12 Amps	110 VAC
62003	3 Pole with NC Aux	12 Amps	110 VAC
62004	3 Pole with NO Aux	12 Amps	220 VAC
62005	3 Pole with NC Aux	12 Amps	220 VAC
62006	3 Pole with NO Aux	18 Amps	24 VAC
62007	3 Pole with NC Aux	18 Amps	24 VAC
62008	3 Pole with NO Aux	18 Amps	110 VAC
62009	3 Pole with NC Aux	18 Amps	110 VAC
62010	3 Pole with NO Aux	18 Amps	220 VAC
62011	3 Pole with NC Aux	18 Amps	220 VAC
62012	3 Pole with NO Aux	25 Amps	24 VAC
62013	3 Pole with NC Aux	25 Amps	24 VAC
62014	3 Pole with NO Aux	25 Amps	110 VAC
62015	3 Pole with NC Aux	25 Amps	110 VAC
62016	3 Pole with NO Aux	25 Amps	220 VAC
62017	3 Pole with NC Aux	25 Amps	220 VAC
62018	3 Pole with NO Aux	32 Amps	24 VAC
62019	3 Pole with NC Aux	32 Amps	24 VAC
62020	3 Pole with NO Aux	32 Amps	110 VAC
62021	3 Pole with NC Aux	32 Amps	110 VAC
62022	3 Pole with NO Aux	32 Amps	220 VAC
62023	3 Pole with NC Aux	32 Amps	220 VAC
62024	3 Pole with 1NO/1NC Aux	40 Amps	24 VAC
62025	3 Pole with 1NO/1NC Aux	40 Amps	110 VAC
62026	3 Pole with 1NO/1NC Aux	40 Amps	220 VAC
62027	3 Pole with 1NO/1NC Aux	50 Amps	24 VAC
62028	3 Pole with 1NO/1NC Aux	50 Amps	110 VAC
62029	3 Pole with 1NO/1NC Aux	50 Amps	220 VAC

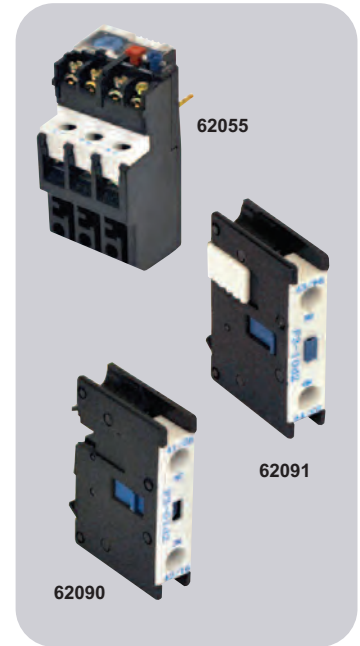
Accessories for IEC Contactors

Accessory Features:

- Thermal overloads
- Side mount and top mount auxiliary switches
- Modular snap together assembly

Specifications:

- Thermal overload ratings - 0.16 Amps through 40 Amps
- Auxiliary switches available with single pole or double pole action
- Auxiliary switch contact ratings – 10 Amps



Thermal Overloads

MARS NO.	DESCRIPTION	CURRENT RANGE	CURRENT RANGE
62055	Thermal Overload	0.1 to 0.16 A Overload Relay	09-32A
62056	Thermal Overload	0.16 to 0.25A Overload Relay	09-32A
62057	Thermal Overload	0.25 to 0.4A Overload Relay	09-32A
62058	Thermal Overload	0.4 to 0.63A Overload Relay	09-32A
62059	Thermal Overload	0.63 to 1.0A Overload Relay	09-32A
62060	Thermal Overload	1.0 to 1.6A Overload Relay	09-32A
62061	Thermal Overload	1.6 to 2.5A Overload Relay	09-32A
62062	Thermal Overload	2.5 to 4.0A Overload Relay	09-32A
62063	Thermal Overload	4 to 6A Overload Relay	09-32A
62069	Thermal Overload	5.5A to 8A Overload Relay	09-32A
62070	Thermal Overload	7A to 10A Overload Relay	09-32A
62071	Thermal Overload	9A to 13A Overload Relay	12-32A
62072	Thermal Overload	12A to 18A Overload Relay	18-32A
62064	Thermal Overload	17-25A Overload Relay	25-32A
62065	Thermal Overload	23-32A Overload Relay	32A
62066	Thermal Overload	28-36A Overload Relay	32A
62067	Thermal Overload	23-32A Overload Relay	40-80A
62068	Thermal Overload	30-40A Overload Relay	40-80A

Auxiliary Switches

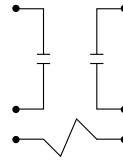
MARS NO.	DESCRIPTION	CONFIGURATION	MOUNTING	FITS CONTRACTOR TYPE
62090	AUX Switch	SPNC	Top Mount	25-80A
62091	AUX Switch	SPNO	Top Mount	25-80A
62092	AUX Switch	1NO 1NC	Top Mount	09-80A
62093	AUX Switch	1NO 3NC	Top Mount	09-80A
62094	AUX Switch	1NO 1NC	Side Mount	09-80A
62095	AUX Switch	DPNO	Side Mount	09-80A

30 Amp Two Pole Contactors

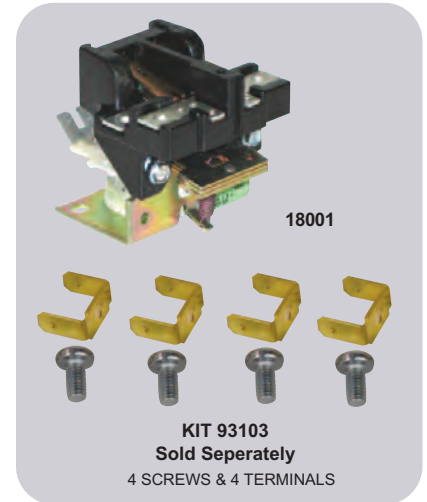
The MARS Series 180 contactors are designed primarily to replace contactors used in air conditioning and electric heating to control blower motors. In addition they are used to switch pumps and computer power supplies. Replace General Electric Contactors and other manufacturers including WR, Essex/RBM and Honeywell.

Features:

- Replace all 3ARR8, 9, 27, and 28 General Electric contactors
- Replace WR, Essex/RBM and Honeywell
- Instructions and cross reference chart included
- Non-positional
- UL and CSA listings available



COIL schematic



Cross Reference

GEMLINE	HONEYWELL NO.	MARS REPLACEMENT
MC11	R850B1146	18001

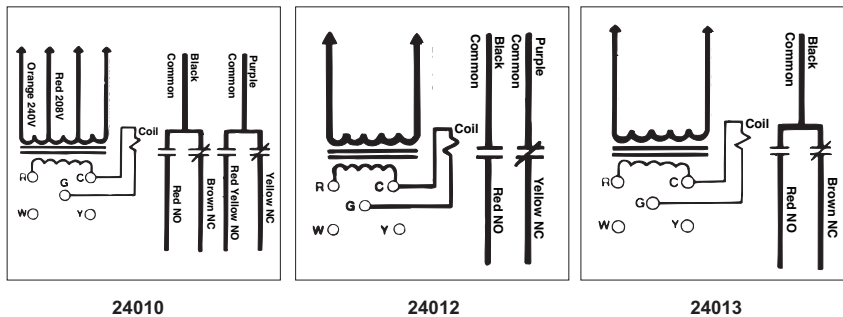
MARS NO.	DESCRIPTION	FULL LOAD AMPS	RESISTIVE AMPS	LOCKED ROTOR AMPS	COIL VOLTAGE	POLES	COIL VOLT	PICK-UP HOT	MAX COLD
18001	30 Amp 2 Pole Magnetic Line Contactor	30	30	120	24	2	24	20.5	19.2
93103	Push-On Terminals Adapters and Screws.	-	-	-	-	-	-	-	-

Fan Centers

MARS Relay/Transformer Fan Control Centers

MARS series 240 fan centers provide convenient low voltage control of one and two speed fan motors and auxiliary circuits in heating, cooling, or heating/cooling applications. Each MARS fan center is a reliable, compact unit consisting of a

Schematic:



24 volt control transformer and a plug-in switching relay mounted on a 4" square electrical junction box cover. All line voltage connections are made inside the box with color coded pre-stripped leads. Low voltage connections are made at a convenient terminal board mounted to the transformer.

Features:

- Choice of SPDT, SPNO / SPNC or DPDT relay switching options
- UL 1585 40VA transformer
- Color coded leads
- Low voltage terminal board
- Mounts directly to 4" electrical box
- 50/60 Hertz

40VA 3/4 HP

MARS NO.	TRANSFORMER				RELAY	CONTACT RATINGS			
	PRIMARY		SECONDARY			120V AC (AMPS)		240V AC (AMPS)	
	VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS		FULL LOAD	LOCKED ROTOR	FULL LOAD	LOCKED ROTOR
24010	120/208/240	Color coded leads, pre-stripped	24V	Terminal board with 5 screw terminals	DPDT	13.8	82.8	6.9	41.4
24012	120	Color coded leads, pre-stripped	24V	Terminal board with 5 screw terminals	SPNO/SPNC	13.8	82.8	6.9	41.4
24013	120	Color coded leads, pre-stripped	24V	Terminal board with 5 screw terminals	SPDT	13.8	82.8	6.9	41.4

MARS Control Transformers NEMA Class II Open Construction

MARS compact open construction transformers are less than 2-1/4" in height. This makes them ideal as replacements within existing equipment.

MARS control transformers are available with various outputs and voltages for special applications.

Application:

Provide power source for control circuit for air conditioning, heating, or refrigeration systems.

Features:

- UL class 2 recognized
- Low heat rise
- Primary color coded leads
- Secondary color coded leads, or 1/4" male quick connects
- Foot-mount



Foot-Mount Open Construction

MARS NO.	FORMER MARS2 NO.	VA RATING	HZ	PRIMARY		SECONDARY	
				VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50351	-	20	50/60	120	Color coded leads	24	Color coded leads
50352	50201	40	50/60	120	Color coded leads	24	Color coded leads
50353	-	40	50/60	208/240	Color coded leads	24	Color coded leads
50354	50203	40	50/60	120/208/240	Color coded leads	24	Color coded leads
50355*	-	40	60	120	Color coded leads	12/24	Color coded leads
50350	-	20	50/60	120/208/240	Color coded leads	24	Color coded leads
50357	-	40	50/60	277	Color coded leads	24	Color coded leads
50359 ⁽¹⁾	-	40	50/60	120/208/240	Color coded leads	24/12/2.5	Color coded leads
50308	-	50	50/60	120/208/240	Color coded leads	24	Color coded leads

* Not UL listed (1) In line fuse protection

Foot-Mount Open Construction With Primary & Secondary Quick Connects

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50362	40	50/60	120	1/4" Male quick connects	24	1/4" Male quick connects
50364	40	50/60	120/208/240	1/4" Male quick connects	24	1/4" Male quick connects
50363	50	50/60	208/240	1/4" Male quick connects	24	1/4" Male quick connects

MARS Control Transformers NEMA Class II End Bell Type

MARS end bell transformers provide enclosures for the primary and secondary windings, MARS multi-mount models offer three mounting options - Foot, Plate, or Conduit mount.

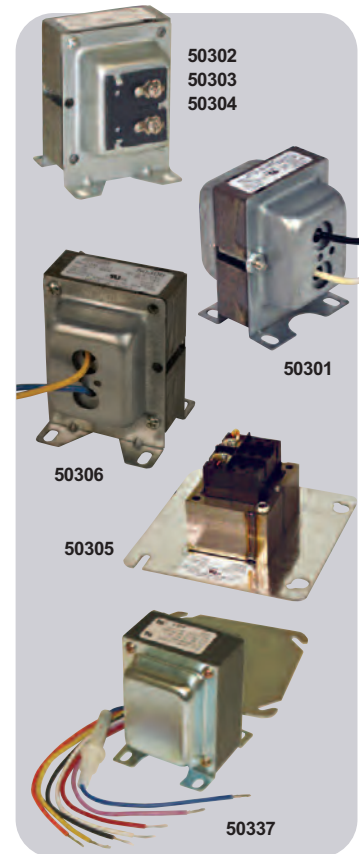
MARS control transformers are available with various outputs and voltages for special applications.

Application:

Provide power source for control circuit for air conditioning, heating, or refrigeration systems.

Features:

- UL class 2 recognized
- Low heat rise
- Primary color coded leads
- Secondary color coded leads, or screw terminals
- Multi-mount or plate-mount



Foot-Mount End Bell Type

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50301	20	60	120	Color coded leads	24	Color coded leads

Multi-Mount End Bell Type

MARS NO.	FORMER MARS2 NO.	VA RATING	HZ	PRIMARY		SECONDARY	
				VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50302	50210 ⁽¹⁾ , 50213	40	50/60	120	Color coded leads	24	Screw terminals
50303	-	40	50/60	208/240	Color coded leads	24	Screw terminals
50304	50215	40	60	120/208/240	Color coded leads	24	Screw terminals
50306*	-	48	60	277	Color coded leads	24	Color coded leads
50314	50212, 50216 ⁽²⁾	50	50/60	120/208/240	Color coded leads	24	Color coded leads
50333*	-	48	50/60	120/208/240	Color coded leads	24/12/2.5	Color coded leads
50337	-	75	50/60	120/208/240	Color coded leads	24	Color coded leads

* Not UL listed (1) Color coded leads on secondary, (2) Screw terminals on secondary

Plate-Mount End Bell Type

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50305	40	50/60	120	Color coded leads	24	Screw terminals

MARS Control Transformers NEMA Class II

Hub-Mounted Transformers
with Circuit Breakers and
Multiple Inputs of
120/208/240/480 VAC

Available either in 50VA or 75VA, these 2 versatile transformers replace Honeywell® AT150F and AT175F. All leads pass through the chase nipple.

- MARS 50319, 50VA, MARS 50372, 75VA
- 3 Way mounting
- Four inputs including 120/208/240/480 VAC
- UL Recognized



Fully Enclosed Junction Box Ready

- Several models with dual voltage input
- Welded laminations for quiet operation
- Conservative heat rise characteristics
- UL 506

Hub Mount End Bell Type

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50319	50	50/60	120/208/240/480	Color coded leads	24	Color coded leads
50372	75	50/60	120/208/240/480	Color coded leads	24	Color coded leads

Fully Enclosed

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50332	50	50/60	240/480	Color coded leads	120	Color coded leads
50374	100	50/60	240/480	Color coded leads	120	Color coded leads

MARS Control Transformers NEMA Class II Heavy Duty End Bell Type

MARS control transformers are available with various outputs and voltages for special applications.

Application:

MARS heavy duty end bell transformers offer a wide variety of higher VA rated models. These models are the choice when extra power is the solution.

Features:

- UL class 2 recognized
- 50/60 Hz
- Low heat rise
- Color coded leads
- Foot-mount



Foot-Mount End Bell Type

MARS NO.	FORMER MARS2 NO.	VA RATING	HZ	PRIMARY		SECONDARY	
				VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50316	-	60	50/60	208/240	Color coded leads	24	Color coded leads
50320 ⁽¹⁾	50225	75	50/60	120/208/240/480	Color coded leads	24	Color coded leads
50324	-	75	50/60	208/240	Color coded leads	24	Color coded leads
50326	-	75	50/60	480	Color coded leads	24	Color coded leads
50340*	-	100	50/60	120/208/240/480	Color coded leads	24	Color coded leads

*100 VA does not qualify for NEMA Class II

(1) Inline fuse

Foot Mounted Open Construction

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50339 ⁽²⁾	75	50/60	480	Color coded leads	120	Color coded leads

(2) UL 506

MARS Control Transformers NEMA Class II Manual Reset Style

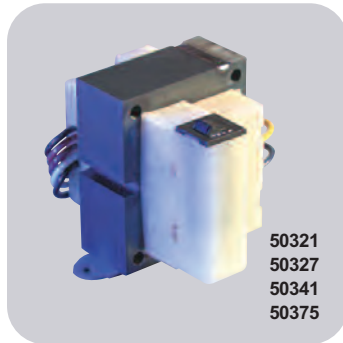
MARS control transformers are available with various outputs and voltages for special applications.

Application:

Provide power source for control circuit for air conditioning, heating, or refrigeration systems.

Features:

- UL class 2 recognized
- Low heat rise
- Color coded leads or quick connect terminals
- Foot-mount



50321
50327
50341
50375

Foot-Mount End Bell Type with Manual Reset

MARS NO.	FORMER MARS2 NO.	VA RATING	HZ	PRIMARY		SECONDARY	
				VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50327	50227	50	60	120/208/240/480	Color coded leads	24	Color coded leads
50321	50231	75	50/60	120/208/240/480	Color coded leads	24	Color coded leads
50375	-	75	50/60	120/208/240/575	Color coded leads	24	Color coded leads
50341*	50232	100	50/60	120/208/240/480	Color coded leads	24	Color coded leads
50312	50230	60	50/60	120/208/240/480	Color coded leads	24	Color coded leads
50370	-	75	50/60	120/277/380/575	Color coded leads	24	Color coded leads
50371	-	100	50/60	120/208/277/575	Color coded leads	24	Color coded leads

* 100VA and higher does not qualify for NEMA Class II

MARS Power Transformers

Application:

Provide 120V power source for air conditioning, heating, or refrigeration systems. MARS power transformers provide dual purpose options — 120V or 24V secondary with 208V/240V/480V primary connections. Three VA selections offer a true powerhouse!

Features:

- Color coded leads
- Compact size
- Low heat rise



50380

Power Transformers Foot-Mount Open Construction

MARS NO.	VA RATING	HZ	PRIMARY		SECONDARY	
			VOLTAGE	CONNECTIONS	VOLTAGE	CONNECTIONS
50380 ⁽¹⁾	50	60	208/240/480	Color coded leads	120/24	Color coded leads
50381 ⁽²⁾	100	60	208/240/480	Color coded leads	120/24	Color coded leads

(1) Not UL listed

(2) UL 506

GE Type Ip Core and Coil Transformers

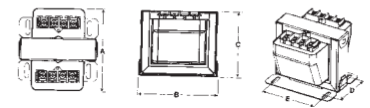
GE type IP transformers are core and coil units designed for industrial control, panel board, HVAC and general purpose applications. They conform to ANSI C89.2, and are UL listed and CSA certified. These transformers are lightweight, small and designed for minimum mounting dimensions.



50502

Features:

- 60 Hz
- Encapsulated thru 500VA
- Control power applications
- UL listed, UL-506 File E2739
- CSA certified, C22.2 Number 66, File 3272
- 50 Hz available on special order basis



top view

front view

Encapsulated Style Views

Encapsulated

MARS NO.	CONT. KVA	PRIMARY	SECONDARY	DIMENSIONS				
				A	B	C	D	E
50502	.075	240/480	120/240	4.22	3.29	2.79	2.41	2.50
50503	.100	240/480	120/240	4.17	4.04	3.29	2.16	3.12
50504	.150	240/480	120/240	4.67	4.04	3.29	2.66	3.12
50505	.200	240/480	120/240	4.92	4.04	3.29	2.91	3.12
50506	.250	240/480	120/240	5.17	4.04	3.29	3.16	3.12
50507	.300	240/480	120/240	5.17	4.04	3.29	3.16	3.12
50509	.500	240/480	120/240	5.82	4.79	3.92	3.31	3.79

Hub-Mounted Transformers with Circuit Breakers and Multiple Inputs of 120/208/240/480 VAC



Available either in 50VA or 75 VA, these 2 versatile transformers replace Honeywell® AT150F and AT175F. All leads pass through the chase nipple.

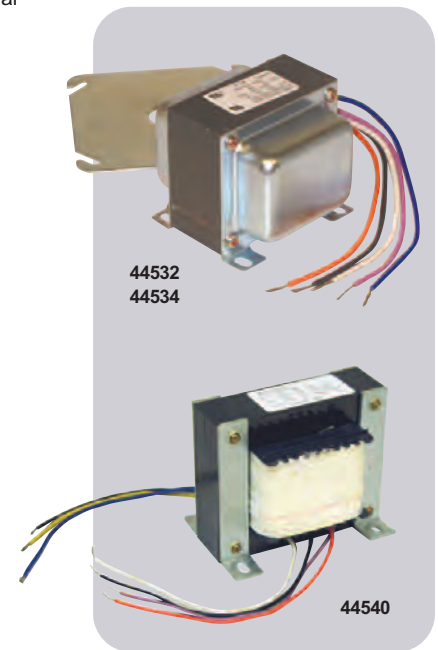
- Model 5041MCB, 50 VA, Model 7541MCB, 75 VA
- Plate mount or foot mount
- Four inputs including 120/208/240/480 VAC
- UL Recognized



Fully Enclosed Junction Box Ready



- Several models with dual voltage output
- Welded laminations for quiet operation
- Conservative heat rise characteristics
- UL 506



MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44519	5041MCB	50	120/208/240/480	24
44520	7541MCB	75	120/208/240/480	24

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44532	5048PC	50	240/480	120
44533	5048STPC	50	208/277/575	120
44534	10048PC	100	240/480	120
44535	10048STPC	100	208/277/575	120

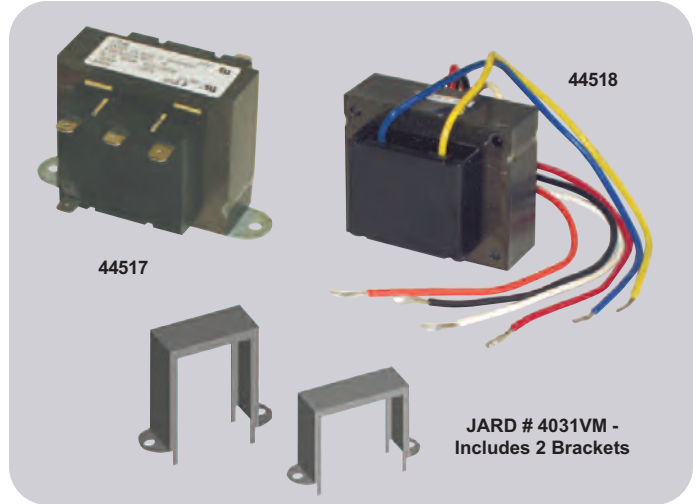
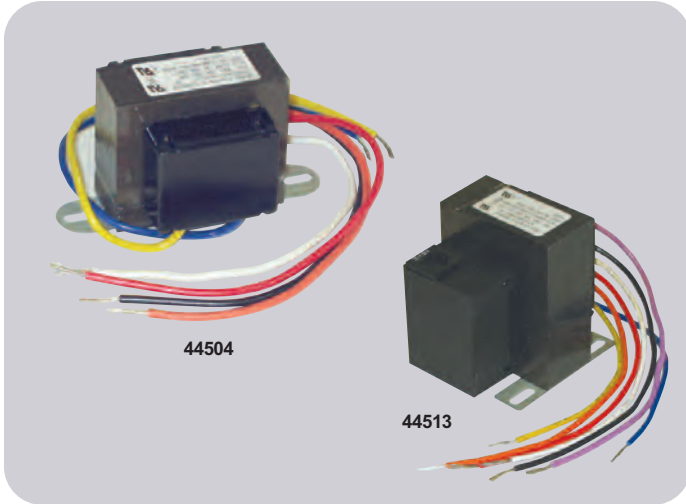
Multi-Mount Transformers Closed Construction, 4" x 4" Plate

- Optional 3-way mounting for maximum flexibility
- Safety agency approved
- Welded laminations for quiet operation

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44522	4011M	40	120	24
44523	4021M	40	208/240	24
44524	4031M	40	120/208/240	24
44525	5031M	50	120/208/240	24
44526	5032M	48	120/208/240	2.5/12/24
44527	7541M	75	120/208/240/480	24
44528	7541STM	75	120/240/277/575	24

Open Construction Foot Mount Wire Leads

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44536	5024P	50	208/240	120/24
44538	7524P	75	208/240	120/24
44539	75481P	75	480	120



Open Construction, Wire Leads

- Safety agency approved

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44501	2031F	20	120/208/240	24
44502	4011F	40	120	24
44503	4021F	40	208/240	24
44504	4031F	40	120/208/240	24
44505	4032F	40	120/208/240	2.5/12/24
44506	40241F	40	240	24
44507	40271F	40	277	24
44508	5031F	50	120/208/240	24
44509	5032F	50	120/208/240	2.5/12/24
44510	7531F	75	120/208/240	24

Closed Construction Quick Connect

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44517	4031OEM	40	120/208/240	24

Versatile 3-Way Mounting

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44518	4031VM	40	120/208/240	24

Closed Construction With Circuit Breaker

- All models feature a UL recognized manual reset circuit breaker
- Safety agency approved

MARS NO.	JARD NO.	VA	PRIMARY VAC	SECONDARY VAC
44511	5041C	50	120/208/240/480	24
44512	6041C	60	120/208/240/480	24
44513	7541C	75	120/208/240/480	24
44514	7541STC	75	120/277/380/575	24
44515 ⁽¹⁾	10041C	100	120/208/240/480	24
44516 ⁽¹⁾	10041STC	100	120/208/277/575	24

(1) Not UL, UL506

MARS Side Open Disconnect Boxes with Internal Surge

MARS Disconnect with integrated surge protector provides a unitized design for quick and clean installation. The metal weather-resistant enclosure provides additional robustness and security. MARS Surge Protectors provide the performance necessary to protect critical components in high efficiency mini-split and unitary HVAC equipment.

Features:

- Side open disconnect
- Integrated internal surge protector
- Thermally Protected MOV's
- Metal-weather resistant enclosure
- External - Green & Red LED Status Indicators
- cULus rating
- 3 Year Warranty
- \$7,500 Connected Equipment Warranty

Specifications Disconnect:

- Single phase 240V
- 10,000 Amp rating
- NEMA 3R enclosure
- Weather proof enclosure
- Available in fused and non-fused

Surge Protector Ratings:

- 120/240V Single (Split) Phase 50/60Hz
- Short Circuit Current Rating
 - 22,000 Amps
- MCOV L-N 150V / L-L 330V
- Voltage Protection Rating
 - L-N 800V / L-L 1200V
- UL 1449 4th Edition
- Type 1 or 2 Surge Protection Rating

Protects:

- Compressors
- Heat Pumps
- Ideal for Ductless System Inverter Boards
- ECM Motors
- Control Boards
- Transformers
- Relays
- Sensors



MARS NO.	DESCRIPTION	VOLTAGE	WIRE CONFIGURATION	SPD TYPE	MCOV	ENCLOSURE	UL 1449 4TH EDITION
83915	60 Amp Non-Fused	120/240	L1,L2,L/N-G	1 or 2	150/300	NEMA 3R, Rainproof	cULus
83916	30 Amp Fused	120/240V	L1,L2,L/N-G	1 or 2	150/300	NEMA 3R, Rainproof	cULus
83917	60 Amp Fused	120/240V	L1,L2,L/N-G	1 or 2	150/300	NEMA 3R, Rainproof	cULus

MARS NO.	DESCRIPTION
83914	Replacement Surge Module

MARS HVAC Surge Protective Device

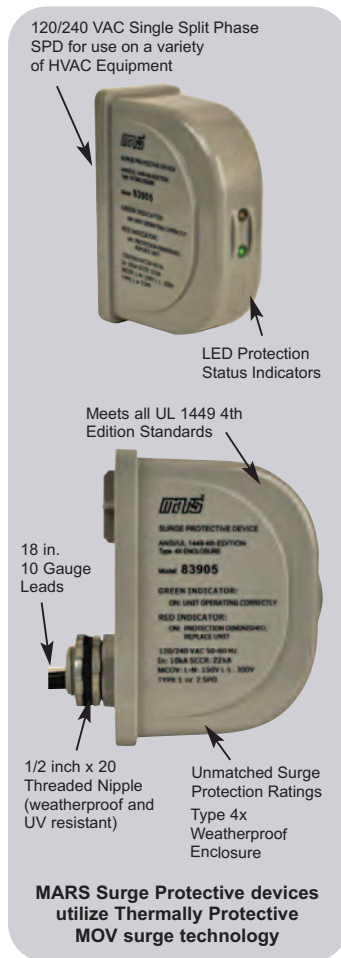
The MARS SPD is designed to protect your HVAC equipment from power spikes, surges and transients. Power spikes and surges can damage compressors, control boards, sensors and ECM motors resulting in costly repairs and down time. The MARS SPD utilizes Thermally Protected MOV technology to provide safe and reliable surge protection.

Protects:

- Compressors
- Heat Pumps
- Ideal for Ductless Systems
 - Inverter Boards
- ECM Motors
- Control Boards
- Transformers
- Relays
- Sensors

Features:

- Easy Installation to Disconnect
- Weatherproof 4X Enclosure
- 18" Pre-stripped Leads
- Green & Red LED Status Indicators
- Thermally Protected MOVs
- 120/240V Single (Split) Phase 50/60Hz
- Short Circuit Current Rating
 - 22,000 Amps
- MCOV L-N 150V / L-L 330V
- Voltage Protection Rating
 - L-N 800V / L-L 1200V
- UL 1449 4th Edition
- Type 1 or 2 Surge Protection Rating
- 3 Year Warranty
- \$7,500 Connected Equipment Warranty



MARS NO.	VOLTAGE	WIRE CONFIGURATION	SPD TYPE	MCOV	ENCLOSURE	UL 1449 4TH EDITION
83905	120/240	L1,L2,L/N-G	1 or 2	150/300	Type 4X	cULus

MARS HVAC Surge Protective Device

The MARS 83904 SPD is designed specifically for 120V furnace and air handler applications. The furnace and air handler contain components that must be protected from surges such as, ECM motors, Control Boards, Transformers. The MARS Surge utilizes thermally protected MOV technology for safe and reliable protection of equipment. The 120V Surge Device is easy to install with only 2 wires to connect.

Protects:

- Ideal for 120V Ductless Systems
- Furnace & Air Handlers
- Inverter Boards
- ECM Motors
- Control Boards
- Transformers
- Relays
- Sensors

Features:

- Easy 2 Wire Installation
- 10" Pre-stripped Leads
- Green LED Status Indicator
- Thermally Protected MOVs
- 120V Single Phase 50/60Hz
- Short Circuit Current Rating
 - 10,000 Amps
- MCOV L-N 150V
- Voltage Protection Rating
 - L-N 700V
- UL 1449 4th Edition
- Type 1 or 2 Surge Protection Rating
- 3 Year Warranty
- \$7,500 Connected Equipment Warranty



MARS NO.	VOLTAGE	WIRE CONFIGURATION	SPD TYPE	MCOV	ENCLOSURE	UL 1449 4TH EDITION
83904	120	L1,L2,L/N-G	1 or 2	150	Type 2	cULus

COMPONENTS

Condensate Pumps

MARS Condensate Pump - 24' Lift

MARS new line of medium condensate pumps are designed to out-perform the competition while providing quiet operation and reliability.

The MARS pump design couples industry leading performance with the installation flexibility and features you need to get the job done.

The quick release silicone check valve allows for quick and efficient servicing without the need to remove the condensate line.

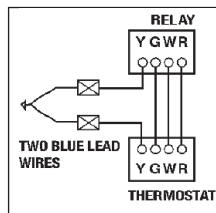
The integrated safety switch can be wired for equipment shut down or directly to a high level alarm.

Features:

- 24 foot lift
- 125 gph
- 0.5 gal reservoir
- Patent pending, quick release check valve
- Field serviceable "duck bill" check valve
- Rubber isolation feet
- Drip proof housing design
- Solid float
- Integrated safety switch 250 volt and float switches
- ABS and stainless steel construction



21780



MARS NO.	DESCRIPTION
21780	115 V, 60 Hz, 0.91 Amps, 71 Watts 6' Cord, 3/8" Check Valve, Safety Switch Medium Reservoir
21781	115 V, 60 Hz, 0.91 Amps, 71 Watts 6' Cord, 3/8" Check Valve, Safety Switch 20' Tubing, Medium Reservoir
21782	230 V, 60 Hz, 0.6 Amps, 75 Watts 6' Cord, 3/8" Check Valve, Safety Switch Medium Reservoir
21783	230 V, 60 Hz, 0.6 Amps, 75 Watts 6' Cord, 3/8" Check Valve, Safety Switch 20' Tubing, Medium Reservoir

Gallons Per Hour Pump Performance Comparison Chart

FOOT LIFT	1	5	10	15	20	24
MARS	125	98	74	70	43	7
Comp. 1	84	75	60	42	10	0
Comp. 2	117	98	70	58	11	0
Comp. 3	105	95	73	36	0	0

Specifications: Performance-Gallons Per Hour @ Height In Feet

MODEL NO.	1	5	10	15	20	24
21780	125	98	74	70	43	7
21781	125	98	74	70	43	7
21782	139	119	70	50	28	7
21783	139	119	70	50	28	7

Check Valve Replacement

MARS NO.	DESCRIPTION
21787	Check Valve Replacement Kit



21787

MARS Low Profile 22' Pump

Features:

- Low profile pump
- Compact design
- Integrated safety switch
- Quick service check valve
- Drip proof housing
- Class leading performance



21784

MARS NO.	DESCRIPTION
21784	115 V, 60 Hz, 1.03 Amps, Low Profile, 22' Lift, 3/8 Check Valve, Safety Switch
21785	230 V, 60 Hz, 0.52 Amps, Low Profile, 22' Lift, 3/8 Check Valve, Safety Switch

MARS 16' Pump

Features:

- 16' lift pump
- Whisper quiet
- 1/2 gal reservoir
- Rubber isolation feet
- Quick service check valve
- Class leading performance



21786

MARS NO.	DESCRIPTION
21786	115 V, 60 Hz, 0.75 Amps, 16' Lift, 3/8 Check Valve, Safety Switch, Medium Reservoir

MODEL NO.	DIMENSIONS		
	LENGTH	WIDTH	HEIGHT
21780	10.25	5.125	6.375
21781	10.25	5.125	6.375
21782	10.25	5.125	6.375
21783	10.25	5.125	6.375
21784	10.25	5.04	5.28
21785	10.25	5.04	5.28
21786	10.25	5.125	6.375

Condensate Pump vs. Competition

FEATURE	MARS	COMP. 1	COMP. 2	COMP. 3
24 ft. Lift	●			
Motor Corrosion Protection	●			
Drip Proof Motor Housing	●	●		●
Drip Proof Motor & Switches	●			
Vibration Absorbing Rubber Feet	●	●	●	
Side Mount	●	●	●	●
Quick Release Check Valve	●	●		
Internal Safety Switch	●		●	
Solid Float	●	●		●

MERCURY Mini-Split Pump Kit

Mercury pumps are designed for wall mount ductless mini-split AC units and evaporator coil applications. Pump mounting is flexible and can be installed in the evaporator unit, duct channel or above the unit in the ceiling.

Kit Includes – Pump, reservoir with safety switch, adapter, cable ties, tubing to connect pump and reservoir, velcro mounting tape for ease of installation and service.

Features:

- Self priming, fully potted pump
- Silent operation
- 26 Ft lift
- 2.6 Gallon per hour condensate capacity
- Standard safety switch provides connections for unit shut down and alarm.
- For use with equipment up to 25,000 BTU's



MARS NO.	VOLTAGE	HEAD	0 FT.	13 FT.	20 FT.	26 FT.
21790	115V 60Hz	GPH	2.64	2.38	1.59	0.92
21791	115/220V 60Hz	GPH	2.64	2.38	1.59	0.92

MARS AllStart™ Hard Start Device

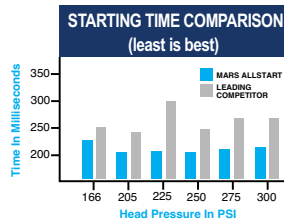
The MARS AllStart™ is a two wire hard start device designed to provide maximum starting torque for single phase PSC and CSIR compressors up through 10HP. The MARS AllStart™ recycles instantly for maximum convenience on troublesome hard start jobs.

Independent testing has determined that the MARS AllStart™ provides more starting torque than other competitive models, and this results in quicker starts. Test results on a range of head pressures from 166 to 300 PSI indicate that the MARS AllStart™ started the test compressor in an average of 21.7% less time than the leading competitor! More available starting torque means less time to get problem compressors started.

MARS offers the largest assortment of refrigeration and air conditioning compressor starting components. When the proper starting relay and capacitor combination is a must, they are available from MARS. When getting a problem compressor started in the field "NOW" is the job, rely on the new MARS AllStart.™

Features:

- Maximum starting torque!
- More than 20% faster starts!
- Easy two wire installation
- Recycles instantly
- Individually packaged with wiring instructions



SUPPLIER	PART NO.	MARS REPLACEMENT
KICKSTART	TO5	32708
SUPCO	SPP8	32708
WATSCO	WSX-1	32708

MARS NO.	MODEL NO.	H.P.	VOLT MAX.
32708	AllStart	1/2 to 10	115-277V

MARS Combination Starters

The MCS is a combination start relay, start capacitor, and motor overload. It is designed to replace those components on a 115 volt single phase refrigeration compressor installed on a capillary tube system.

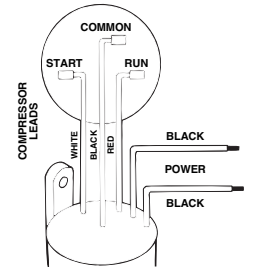
The MCS is factory wired and comes with a connection diagram on the product label for maximum convenience.



Features:

- Maximum starting torque!
- More than 20% faster starts!
- Easy two wire installation
- Recycles instantly
- Individually packaged with wiring instructions

SUPPLIER	PART NO.	MARS REPLACEMENT
GEMLINE	HS 410	32741
	HS 810	32781
ROBERTSHAW	600-410	32741
	600-810	32781
SUPCO	RCO 410	32741
	RCO 810	32781



MARS NO.	MODEL NO.	H.P.	VOLT MAX.
32741	MCS 41	1/4 TO 1/3	115V
32781	MCS 81	1/12 to 1/5	115V

MARS Motor Torque Multiplier

The MARS MTX 100, MTX 200 and MTX 300 motor torque multipliers feature a combination PTC solid state device, and start capacitor in one compact unit.

The MTX 100 is designed for use on PSC motors and compressors up to 5HP, 277V maximum; the MTX 200 is designed for use on PSC motors and compressors up to 10HP, 277V maximum; and the MARS MTX 300 is designed for use on PSC motors & compressors from 1-1/2 up to 10HP, 115-230V. These units are easily installed by connecting the two leads from the MTX unit to the motor run capacitor terminals.

Features:

- Totally solid state integrated design
- Fast, easy two wire installation
- Three mounting options; clip, screw, or capacitor bracket
- Individually packaged

SUPPLIER	PART NO.	MARS REPLACEMENT
GEMLINE	HS 600	32701
	HS 650	32702
ROBERTSHAW	600-052	32701
	600-057	32702
SUPCO	SPP5	32701
	SPP6	32702

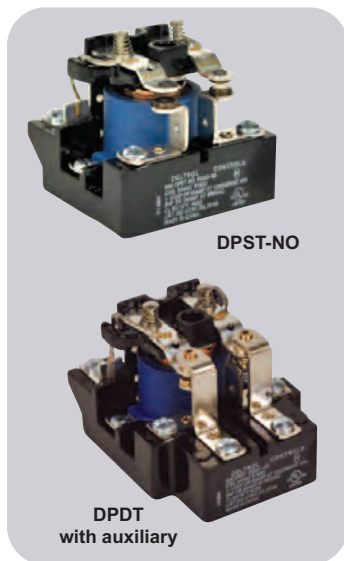


MARS NO.	MODEL NO.	H.P.	VOLT MAX.
32701	100	1/2 to 5	277V
32702	200	1/2 to 10	277V

For Motor Starting Circuits up to One Horsepower

Features:

- Replace Potter & Brumfield PR series, Deltrol, Guardian, Magnacraft, etc.
- Plastic enclosed coil minimizes damage, resists dirt and moisture
- 5/16" diameter silver contacts for long life
- Tough phenolic base
- Reinforced screw terminals
- UL and CSA listings available



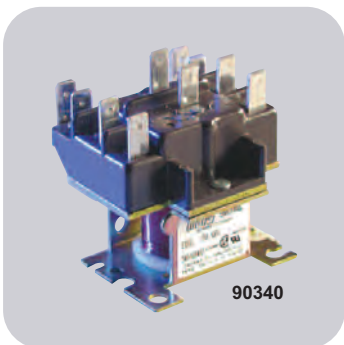
MARS NO.	P & B SERIES	CONTACTS ARRANGEMENT	AMP	COIL VOLTAGE	COIL RES. IN OHMS	NOM. POWER
43008	PRD7AY0	DPST-NO	25	120	290	9.8VA
43014	PRD11AY0	DPDT	25	120	290	9.8VA

Cross Reference Information

POTTER & BRUMFIELD	MARS NO.	DETROL NO.	MARS NO.
PR7AY0-120V	43008	20240-83D	43008
PR11AY0-120V	43014	20241-83D	43014

Replacement Relay for Fan Control Centers

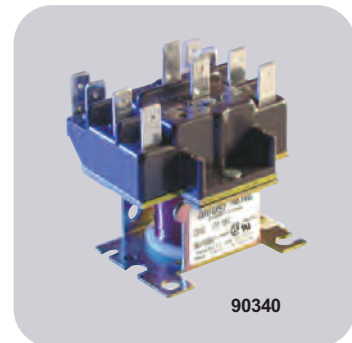
Provides quick and easy plug-in installation to restore like new operation without replacing the entire fan center. The universal relay will cover all MARS fan centers and many competitive brands.



MARS NO.	USED ON	DESCRIPTION
90340	24010, 24012, 24013	DPDT universal plug-in replacement relay

2-Pole Air Conditioning Relays

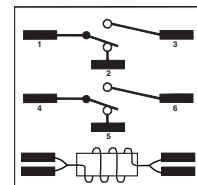
The MARS Series 903 switching relays are intended for many applications in air conditioning, refrigeration, and heating. Other uses include general purpose switching in appliances, fan controls, and vending machines. Our relays are available in 24, 110/120, and 208/240 coil voltages with various combinations of power and pilot duty contacts.



Features:

- Replaces Honeywell and White-Rodgers/RBM - cross reference on package
- Double quick-connect terminals on coil
- 2.13 x 1.88 x 2.25 in.
- Base is designed for easy replacement of competitive relays
- Molded terminal numbers and circuit diagram on top of relay
- UL and CSA listings available

	POWER		PILOT	
	120V	208/240V	120V	208/240V
Full Load Amps	12	6	-	-
Resistive Amps*	15	15	3	3
Locked Rotor Amps	60	35	-	-
Horsepower	3/4	3/4	1/10	1/10



*277 VAC

MARS NO.	COIL VOLTAGE	TERMINALS 1-2-3	TERMINALS 4-5-6
90340	24		
90341	110/120	Power	Power
90342	208/240		
90343	24		
90344	110/120	Power	Pilot
90345	208/240		
90346	24	Pilot	Pilot
90348	208/240		

Cross Reference Information

WR/RBM NO.	MARS REPLACEMENT	HONEYWELL NO.	MARS REPLACEMENT
90-340	90340	R4222B1082	90344
90-341	90341	R4222B1090	90345
90-342	90342	R4222D1013	90341
90-343	90343	R4222D1021	90342
90-344	90344	R4222N1010	90348
90-345	90345	R4222V1002	90344
90-346	90346	R4222V1010	90345
90-348	90348	R8222B1067	90343
		R4222D1014	90340
		R8222N1011	90346
		R8222V1003	90343

MARS General Purpose Switching Relays

SPST and SPDT Fan Relays

The MARS Series 903 relays are among the most popular relays used in air conditioning today. They will replace the WR/Essex/RBM Type 84 (90-290 thru 90-295) quick-connect and screw terminal versions.

Features:

- 0.25 inch quick-connect terminals
- Packaged with instructions and cross reference
- Replace 90-290 thru 90-295 and 90-290Q thru 90-295Q
- Dimensions: 2.38 x 1.63 x 1.50 in.
- UL and CSA listings available



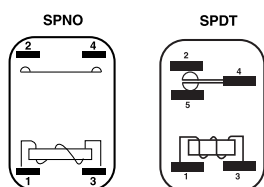
COIL VOLTAGE	MARS NO. SPST	MARS NO. SPDT
24	90290	90293
110/120	90291	90294
208/240	90292	90295

Contact Rating— All Models/Amps

VOLTAGE	FULL LOAD	LOCKED ROTOR	RESISTIVE
120	12	60	18
240	8	48	18
277	7	42	18

Cross Reference Information

WR/RBM NO.	MARS NO.	WR/RBM NO.	MARS NO.
90-290	90290	90-293	90293
90-290Q	90290	90-293Q	90293
90-291	90291	90-294	90294
90-291Q	90291	90-294Q	90294
90-292	90292	90-295	90295
90-292Q	90292	90-295Q	90295



Coil Data:
24-240 VAC @ 50/60 Hz;
5 VA Max. Inrush; 3.0 VA Max. Sealed

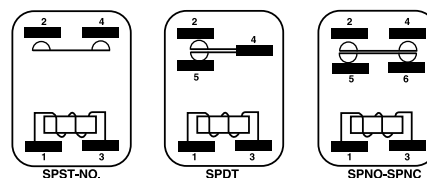
Heavy Duty Fan Relays

MARS Heavy Duty Fan Relays are used on heating and air conditioning equipment to provide switching of heavier loads with a compact size relay. MARS Heavy Duty Fan Relays replace WR/Essex/RBM type 184.



Features:

- 0.25 inch quick-connect terminals
- Packaged with instructions and cross reference
- Replaces WR/Essex/RBM Type 184
- Universal mounting bracket
- UL and CSA listings available



Contact Rating— All Models/Amps

VOLTAGE	FULL LOAD	LOCKED ROTOR	RESISTIVE
120	12	60	18
240	8	48	18
277	7	42	18

Coil Data

COIL VOLTAGE	MAX INRUSH	MAX SEALED
24	5 VA	3 VA
120	5 VA	3 VA
208/240	5 VA	3 VA

Cross Reference

COIL VOLTAGE	MARS NO. SPST	MARS NO. SPDT	MARS NO. SPNO-SPNC	WR/RBM NO.	MARS NO.	WR/RBM NO.	MARS NO.
24	90360	90370	90380	90-360	90-360	90-374	90374
110/120	90362	90372	90382	90-362	90-362	90-380	90380
208/240	90364	90374	90384	90-364	90-364	90-382	90382
277		90377		90-370	90-370	90-384	90384
				90-372	90-372		

MARS Enclosed Switching Relays

MARS enclosed switching relays are heavy duty general purpose relays suitable for a variety of applications. They are commonly used in heating, air conditioning, vending machines, office machines, control panels and other general purpose applications. They are available in single pole, two pole and three pole models for either bracket or plug-in mounting. All MARS enclosed switching relays are protected by a tough polycarbonate cover to keep out dust and dirt. Blade type terminals fit standard plug-in mounts plus allow use with 3/16 inch quick-connect terminals or direct soldering.

Features:

- Simple connections
- One, two and three pole models
- Plug-in or bracket mount
- See-through protective cover
- Three-way blade terminals, plug-in, quick-connect or solder
- UL and CSA listings available

Specifications:

Dimensions: 2.0 X 1 1/2 X 1 3/8

Terminals: 3/16 blade

Coil Data: 2.0 VA

Contact Material: Silver alloy, gold flashed



MARS Current Relays - Universal Replacement

MARS current relays manufactured by General Electric can replace almost any current relay found on refrigerators, freezers, water cooler, pumps and vending machines.



Features:

- Replace plug-on, bracket-type, split-phase, and capacitor-start current relays
- Covers replacement needs of 1/12 H.P. 115V to 1/8 H.P. 115V
- Clearly labeled terminals for fast wiring
- Each relay packaged with installation instructions and wiring diagrams
- UL and CSA listings available

MARS NO.	GE NO. 3ARR12 PAC	MAX PICK-UP	MIN DROP OUT	APPLICATION SURVEY BY HORSEPOWER1 (AT 115)2							
				1/12	1/8	1/6	1/5	1/4	1/3	1/2	3/4
27001	309A	3.8	3.2	■	□	□	□	□	□	□	□
27002	310A	5.2	4.4	□	■	□	□	□	□	□	□

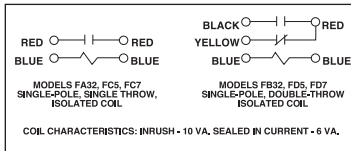
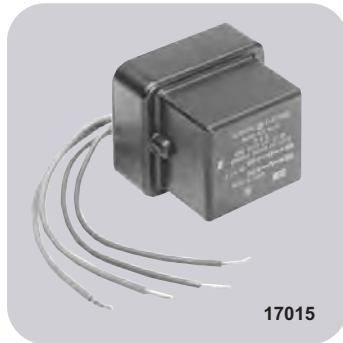
1. Current relays cannot be replaced by horsepower, amperage, or nameplate data alone. Refer to cross reference information for proper replacement of original equipment current relays by part numbers.
2. These current relays are often used on 230 volt applications, however this horsepower survey refers only to 115 volt applications.

MARS NO.	COIL VOLTAGE	HZ	AMP RATING	HORSEPOWER		SWITCH ACTION	TYPE MOUNT
				120V	240V		
43050	24	50/60	13	1/3	1/2	SPDT	bracket
43053	24	50/60	13	1/3	1/2	DPDT	bracket
43054	120						
43056	24						
43057	120	50/60	13	1/3	1/2	3PDT	bracket
43058	240						
43060	24	50/60	13	1/3	1/2	SPDT	plug-in
43063	24						
43064	120	50/60	13	1/3	1/2	DPDT	plug-in
43065	240						
43066	24						
43067	120	50/60	13	1/3	1/2	3PDT	plug-in
43068	240						
93058	Socket Base. Can be surface or DIN rail mounted.						

Totally Enclosed Switching Relays

Features:

- Replaces GE, Honeywell, WR/Essex/RBM, White-Rodgers, etc.
- Designed for standard conduit box mounting for remote control of air conditioning and heating systems and remote power switching of motors, power tools, fans and blowers.
- Totally enclosed with heavy, impact resistant phenolic cover
- Non-positional
- Color-coded lead wires
- UL and CSA listings available



MARS NO.	GE NO.	COIL VOLTAGE	CONTACT ARR.	MAX. HP @ 240V		LOCKED MOTOR AMPS		LEAD LENGTH
				N.O.	N.C.	N.O.	N.C.	
17015	3ARR4 FA32	24				—	—	16 in.
17016	3ARR4 FC7	120	SPST	1-1/2	—	18	55	6 in.
†17019	3ARR4 FD7	120	SPDT	1-1/2	3/4	18	55 35	6 in.

† S.P.D.T relays may be used on S.P.S.T. applications by eliminating use of yellow lead for normally open applications or eliminating use of black lead for normally closed applications.

Cross Reference Information

WHITE-RODGERS NO.	MARS NO.	HONEYWELL NO.	MARS NO.
90-120	17015		
90-121	17016	R8225B	17015
90-122	17017		
90-124	17019		

Switching and Shunt Relays

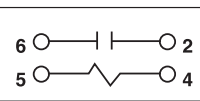
Features:

- MARS 17001—Economical replacement for SPST relays with 24 volt coil
- Reduce inventory on 3ARR4 relays.
- Used for remote control of heating and air conditioning systems and remote power switching of motors, power tools, fans and blowers on GE, Day & Night, Carrier, York, Bryant, American Standard, Lennox, etc.
- Purchase of 93001 QC-6 Kit converts screw-on to push-on type terminals for even more replacements
- UL and CSA listings available

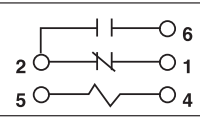


To replace relays w/quick-connect terminal use our relays in conjunction w/93001 QC-6 Kit.

WIRING DIAGRAMS



SPST-NO



SPDT



93001 QC-6 KIT

MARS NO.	GE CAT. NO.	COIL VOLTAGE	F.L.A.	LOCKED MOTOR AMPS		CONTACT ARRANGEMENT
				N.O. CONTACTS	N.C. CONTACTS	
17001	3ARR4 A32	24	18	55	—	SPST-NO
93001					QC-6	

Cross Reference Information

WHITE-RODGERS NO.	MARS NO.
90-104	17001

Coil Data: 24-240 VAC @ 50/60 Hz; 10 VA Max. inrush; 6 VA Max. Sealed

For Submersible Pump Applications

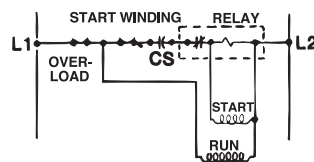
The MARS 550 and 551 relays were specifically developed for submersible pump and other motor starting applications in high moisture environments. Because the control panels for these are often located in areas of high humidity, the components on them must resist the effects of moisture. Chrome plating on the core and armature and the relatively small area of contact eliminates armature sticking due to organic contaminants which was the number one cause of relay failure.

Features:

- Used on F.E. Meyers, Franklin Electric, Jacuzzi, Red Jacket, Sta-Rite, and Tait
- 2 relays replace over 25 O.E.M. relays
- Universal break-off bracket on each relay. Simply snap off parts not needed
- UL and CSA listings available



19550



MARS NO.	MARS MODEL NO.	CONTINUOUS COIL VOLTAGE	PICK-UP		DROP-OUT	
			MIN.	MAX.	MIN.	MAX.
19550	MARS 550	130	111	134	15	40
19551	MARS 551	332	244	270	40	90

MARS NO.	G.E. NO.	USED BY
16104	3ARR3J3G3	Barnes [Burks, Decator] & Myers

MANUF.	OEM NO.	GE CAT. NO.	MARS NO.	MANUF.	OEM NO.	GE CAT. NO.	MARS NO.
F.E. Myers	13178-A	3ARR3D7J4	19550	Jacuzzi	23-1308-26	3ARR3EA9V5	19551
	13179-A	3ARR3D3V4	19551		23-1308-00	3ARR3EA7J5	19550
	13180-A	3ARR3D3A4	19551		23-1308-18	3ARR3EA7BB5	19550
	17891-A	3ARR3EA3A4	19551		23-1308-34	3ARR3EA5U5	19551
	17890-A	3ARR3EA3V4	19551		23-1308-42	3ARR3EA7M5	19550
	17889-A	3ARR3EA7J4	19550		23-1308-49	3ARR3EA5C5	19551
Franklin Electric	155031-101	3ARR3J7J4	19550	Red Jacket	71-69	3ARR3EA7M5	19550
	155031-102	3ARR3J9V4	19551		71-70	3ARR3EA5B5	19551
	155031-104	3ARR3J2P3	19550		71-47	3ARR3J3V2	19551
	155031-103	3ARR3J9U4	19551		U18-325	3ARR3J3V3	19551
	155031-105	3ARR3J7M1	19550		U18-665	3ARR3J3A3	19551
Sta-Rite				U18-810	3ARR3J2P3	19550	
				U18-811	3ARR3J5V3	19551	
				A124P2	3ARR3EA5A5	19551	
				A124P1	3ARR3EA7K5	19550	

One-On-One™ Direct Replacement Potential Relays

The relays are exact replacements for Bristol & Copeland applications. They conform to specifications and in most cases are the one-on-one™ replacement relay used by the manufacturer

Other relays available on special order. Contact your local wholesaler or MARS Customer Service.



16028

BRISTOL	MARS	COPELAND	MARS	COPELAND	MARS
650058	16028	040-0001-34	16099	040-0001-64	16098
650855	16051	040-0001-35	16090	040-0001-68	16099
		040-0001-48	16093	040-0001-71	16116
		040-0001-50	16085	040-0001-74	16122
BRISTOL	MARS	040-0001-53	16095	040-0001-78	16121
650971	16083	040-0001-54	16089	040-0001-79	16152
		040-0001-55	16023		
COPELAND	MARS	040-0001-59	16090	COPELAND	MARS
040-0001-00	16086	040-0001-60	16091	040-0001-88	16151
040-0001-01	16093	040-0001-61	16086	040-0001-89	16155
040-0001-04	16085	040-0001-62	16035		
040-0001-12	16098				
040-0001-17	16095				
040-0001-19	16089				
040-0001-20	16023				
040-0001-25	16035				
040-0001-26	16022				

Universal Replacement

Quick Reference Relay Selection Chart For General Electric Relays

1. Determine the General Electric model number of the Relay to be replaced the "FORM" and "GROUP"

EXAMPLE:	One number plus		1 or 2 Letters		1 or 2 Letters	
	3ARR3*	A	3B	3		
	Basic Type	FORM	GROUP	Non-Positional		

Cross Reference Information

WR/RBM NO.	MARS NO.	WR/RBM NO.	MARS NO.	
90-1	19002	90-25	19006	2. Locate in the following table the Relay GROUP and select the corresponding MARS Replacement Relay from the kit.
90-2	19009	90-26	19008	
90-3	19004	90-27	19005	19002 MARS 63 replaces Relay GROUPS 2J; 2K; 2L; 2M; 5N; 7J; 7K; 7L; 7M; 7N; 8L; 8M; 8N
90-4	19003	90-40	19004	19003 MARS 64 replaces Relay GROUPS 3A; 3B; 3AV; 3AU; 4A; 4B; 6A; 6B; 6AV; 10A; 10B; 10AU; 10AV
90-5	19006	90-41	19008	19004 MARS 65 replaces Relay GROUPS 3P; 3R; 3AP; 5P; 5R; 5S; 5T; 22S
90-6	19006	90-63	19002	19005 MARS 66 replaces Relay GROUPS 3U; 3V; 3AT; 6U; 6V; 6W
90-7	19004	90-64	19003	19006 MARS 67 replaces Relay GROUPS 3C; 3D; 3AA; 4C; 4D; 4BK; 6C; 6D; 6AA; 10C; 10D; 26A; 26B; 26C; 26D
90-8	19003	90-65	19004	19007 MARS 68 replaces Relay GROUPS 3E; 3F; 3AB; 3AC; 4E; 4F; 4G; 6E; 6F; 6G; 10H; 10AB; 10AC; 26E; 26F; 26G; 26H; 27E; 27F; 27G
90-9	19007	90-66	19005	19008 MARS 69 replaces Relay GROUPS 3S; 3T; 10S; 10T; 25S; 25T; 10AS
90-10	19008	90-67	19006	19009 MARS 70 replaces Relay GROUPS 5B; 5C; 5D; 5AA; 8B; 8C; 8D
90-11	19003	90-68	19007	19010 MARS 71 replaces Relay GROUPS 6TV; 6TW; 10V
90-12	19007	90-69	19001	3. Install relay in accordance with instructions in MARS Replacement Kit
90-13	19005			
90-14	19003	TECUM. NO.	MARS NO.	
90-15	19006	82777	19002	
90-16	19007	82778	19004	
90-17	19002	82779	19008	
90-18	19008	82781	19010	
90-19	19006	82783	19003	
90-20	19007	82784	19009	
90-21	19002	82785	19006	
90-22	19003	82787	19007	
90-23	19007			
90-24	19008			

MARS Potential Relays

MARS Universal Replacement

The MARS refrigeration potential relay service kit has become an industry standard since its introduction over fifty years ago. Its long-term reliability and easy replacement have been the key to its success. The wide calibration ranges and the universal bracket make the MARS potential relay service kit a must on every service truck.

Features:

- Genuine MARS relays replace thousands of O.E.M. models
- Non-positional
- Wide range of selectivity
- QC-6 Kit included with each relay to convert screw-on to push-on
- Instructions and wiring diagram included in each relay
- Universal break-off bracket on each relay. Simply snap-off parts not needed
- The six most popular relays available in a service kit—19001 MARS 6 PAK—complete cross reference guide included in each kit
- UL and CSA listings available

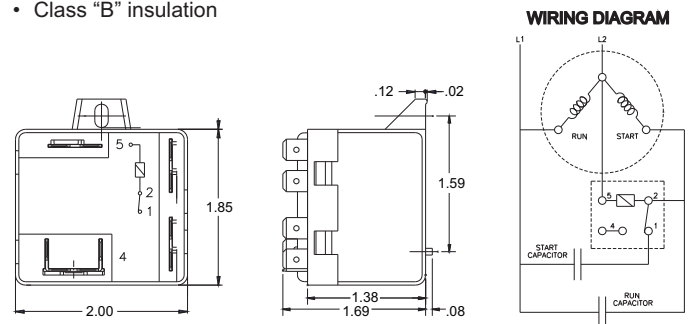


MARS HVAC Potential Relays

MARS series relays are manufactured for the HVAC industry. These relays meet all requirements for original equipment relays.

Features:

- 50/60 Hz
- cULus
- Contact rating 35 amp, 400 VAC
- Operating position tab up
- Instructions and wiring diagram included in each relay
- Class "B" insulation

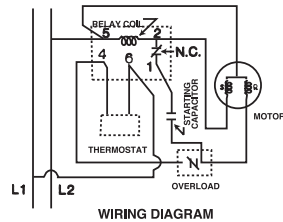
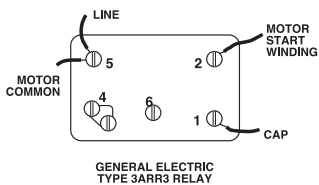


Calibration Specifications

MARS NO.	MARS MODEL NO	CONTINUOUS COIL VOLTAGE	PICK-UP VOLTAGE	DROP-OUT VOLTAGE
19163	MARS 163	168	140-153	20-45
19164	MARS 164	420	242-272	60-121
19165	MARS 165	332	171-184	40-90
19166	MARS 166	420	204-233	60-121
19167	MARS 167	420	300-328	60-121
19168	MARS 168	502	314-342	60-135
19169	MARS 169	332	180-193	40-90
19170	MARS 170	253	285-305	35-77
19171	MARS 171	420	204-233	60-121

Note: If used on 50 Hz, the PU will be about 13% lower

COMPONENTS



Calibration Specifications

MARS NO.	MARS MODEL NO.	CONTINUOUS COIL VOLTAGE	PICK-UP		DROP-OUT
			MIN.	MAX	
19001	MARS 6 PAK	—	—	—	—
19002	MARS 63	170	139	153	55
19003	MARS 64	395	260	275	120
19004	MARS 65	332	168	182	90
19005	MARS 66	395	215	225	120
19006	MARS 67	420	295	315	125
19007	MARS 68	502	325	345	135
19008*	MARS 69	336	180	195	105
19009*	MARS 70	253	285	305	77
19010*	MARS 71	420	212	232	121
93001	QC-6				

MARS H-10 Pro Universal Refrigerant Leak Detector

The MARS H-10 Pro combines and enhances all the features of the previous H-10 Series models into one full featured unit. The H-10 Pro Refrigerant Leak Detector continues to be the universal standard for checking halogen-based refrigerant leaks in residential and commercial applications. With automatic auto zero balance control it's unique sensor calibration system will pinpoint small, medium and large leaks. The instrument uses a tried-and-true positive ion emission heated diode with audible and visual leak rate indicators. It is the most sensitive and accurate leak detector to detect all CFC, HFC, and HCFC non-flammable refrigerants. The unit is mounted in a durable carry case which houses the 4.5 foot probe with built in filter, carrying strap, wall adapter and operating instructions.



Features:

- Enhanced sensitivity detects all halogen-based, non-flammable CFC, HFC and HCFC refrigerants including: R12, R22, R134a, R404a, R410a, R502, R507 and many others
- Improved sensor responsiveness with ultra-sensitive detection
- Dual power sources include rechargeable battery or external DC powered (wall adapter included)
- Selectable sensitivity to pinpoint small, medium or large leaks
- Unique visual sensor calibration system (with included reference leak bottle)
- Rugged enclosure with shoulder strap included
- Manual or automatic zero modes
- Headphone port allows for optional headset use in high-noise environments

Specifications:

Nominal Leak Range: 0.006 oz/yr (stationary) | 0.1 oz/yr (moving probe per SAE J2791)

Power Supply: 12 VDC - internal rechargeable sealed lead acid battery; 100-240 VAC wall adapter/universal battery charger to charge or run continuously

Reference Leak: Approx. 0.006 oz/yr (stationary) | 0.1 oz/yr (moving probe per SAE J2791), 1 year life (typical)

Ambient Operating Temp: 32°F to 104°F (0°C to 40°C)

Battery Life: 3 hours (typically)

Warm Up Time: Approx. 2 min.

Response Time: 1 second

Gases Detected: All CFC, HFC and HCFC non-flammable refrigerants

Detection Principle: Positive Ion Emission Heated Diode

Probe Length: 4.5 feet

Dimensions: 10.5"L x 8.3"W x 5.4" H

NOTE: sensors are consumed in normal operation. It is good practice to have a spare sensor available at all times.

MARS NO.	CATALOG NO.	DESCRIPTION
25301	H-10 Pro	Universal Refrigerant Leak Detector, Wall adapter or Battery Powered

Renewal Parts

MARS stocks genuine renewal parts for MARS, GE, and Bacharach H-10 Series Leak Detectors.



Renewal Parts For H-10 Professional, H-10N, H-10G, and H-10B

MARS NO.	CATALOG NO.	DESCRIPTION	H-10 PRO/PM	H-10N	H-10G	H-10B
25310	M1101UD	Maintenance kit (100 filters, 3 rubber probe tips)	✓	✓	✓	✓
25315	H10N04	Plug-in sensor element	✓	✓	✓	✓
25308	M1101UV	Standard Probe assembly	✓	✓	✓	✓
25314	M1101UU	Probe tip - clear plastic	✓	✓	✓	✓
25309	E7076DX	Rubber tip for probe	✓	✓	✓	
25322	B9017MM	Metal probe extension, 14" long	✓	✓	✓	✓
25325	M1101AH	Battery charger - 120-240 VAC	✓			
25320	B9017LC	Battery charger (included with 25331)		✓		
25333	M1101VS	Cigarette lighter adapter	✓	✓		
25319	M1101HV	Power cord			✓	✓
25323	M1101UC	Super tune up kit; sensor, leak vial, 100 filters 3 flow balls and 3 rubber probe tips	✓	✓	✓	✓
25326	M1101AD	Battery for H-10 Pro	✓			
25321	K9344AH	Reference Leak Assembly	✓	✓	✓	✓
25346	3015-0880	Probe Assembly w/LED Indicator	✓	✓	✓	✓

MARS Solid State Motor Starting Devices & Solid State Timers

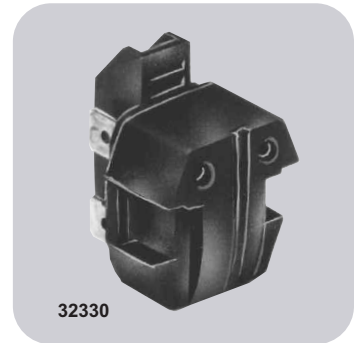
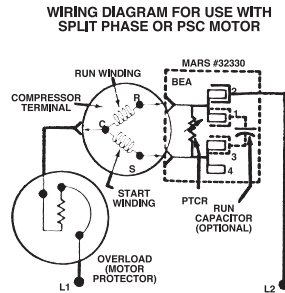
MARS Solid State Motor Starting Relay for Refrigerators and Freezers

MARS 32330 is a solid state PTC motor starting relay that mounts directly to any 3-pin fuse connector. One model replaces thousands of current relays used on 1/12 HP to 1/3 HP compressors.

Features:

- Replaces Tecumseh Relays SSR2 and SSR3 for push-on applications.
- Non-positional
- One model for 1/12 HP to 1/3 HP, 120 volt
- UL and CSA listings available

MARS NO.	HORSEPOWER	VOLTAGE
32330	1/12 - 1/3	120



MARS Solid State Timers Delay On Make

The MARS 32391 is the top-selling timer in the industry. Its reliability has been proven in the field by knowledgeable contractors.

The MARS 32391 will not be fooled by the thermostat anticipator.

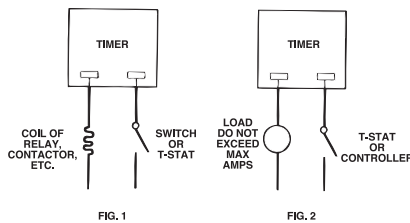
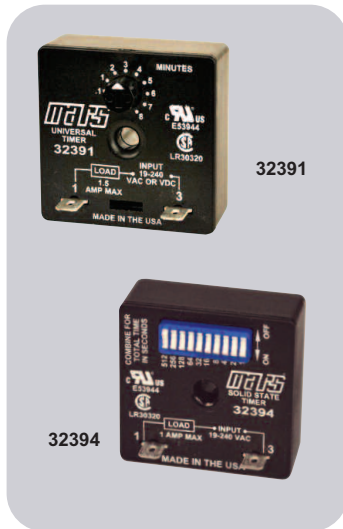
Heavy duty MARS timers are offered for higher current applications.

Features:

- Easy two-wire installation
- Proven reliability, all solid state
- .25 in. quick connect terminals
- Mounts in any position
- Compact size
- High accuracy
- Totally enclosed and encapsulated for proper heat dissipation

Specifications:

- .040 amps min. latch current



MARS NO.	TYPE DELAY	TIME DELAY RANGE	TYPE OF ADJUSTMENT	INPUT VOLTAGE	HZ	MAX AMPS.	VOLTAGE DROP	CONN. DIA.
32391	on make	6 sec...8 min.	dial	19...240VAC	50/60	1	2.5 at 1 amp.	1
32394	on make	1 sec...1023 sec.	slide switch adjustable in 1 second increments	19...144VAC	50/60	1	2.5 at 1 amp.	1

Heavy Duty

32399	on make	10...1000 sec.	dial	230 VAC	50/60	10	5 at 10 amp.	1 or 2
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Mars Solid State Timers Delay On Break

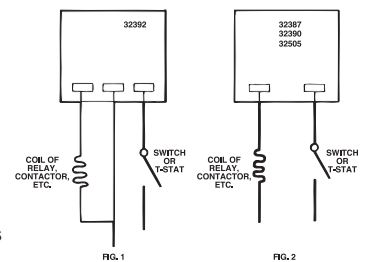
MARS solid state delay on break timers are designed to prevent short cycling of air conditioning, refrigeration and heat pump compressors. Upon application of power the load is energized. When the thermostat opens, or if there is a momentary loss of power, the load is de-energized and the delay period begins. The compressor will not start again during the delay period.

MARS number 32392 is a versatile three wire timer that features adjustable timing and can be used with any voltage from 19 thru 240 VAC, 50 or 60 Hz.

The MARS 32390 and the new 32505 are the most simple and economic ways to stop short cycling on 24 VAC controlled systems. Both devices are fixed 5 minute delay on break timers.

Features:

- 1 to 3 second random re-start
- Models for two-wire or three-wire connection
- Dial adjustable
- Compact size
- Mounts in any position
- .25 in. quick connect terminals
- Proven reliability
- MARS delay-on-break timers are not load sensitive
- MARS 32505 features two wire leads



Adjustable

MARS NO.	TYPE DELAY	TIME DELAY RANGE	TYPE OF ADJUSTMENT	INPUT VOLTAGE	HZ	MAX AMPS.	VOLTAGE DROP	CONN. DIA.
32392	on break	6 sec...5 min.	dial	19...240VAC	50/60	1	2.5 at 1 amp.	1

Fixed Delay

32390	on break	5 min.	none	24 VAC	50/60	1	2.5 at 1 amp.	1
32505	on break	5 min.	none	20-30 VAC	50/60	1	3 at 1 amp.	1

MARS Solid State Timers

The MARS Delay on Make Timer is designed to delay energization and prevent short cycling. This one unit covers all operating voltages and time delays. The compact timer mounts in any position and features easy two wire installation. UL recognized.

The MARS Delay on Break Timer, dial adjustable is designed to prevent short cycling of air conditioning and heat pump compressors. The compact timers mount in any position and are UL recognized.

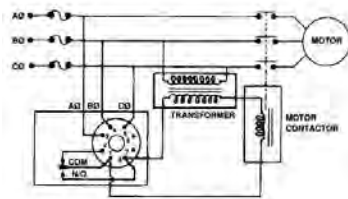


MARS NO.	REPLACES	VOLTAGE	DELAY TYPE	TIME DELAY RANGE	TYPE OF ADJUSTMENT
32091	ICM 105	19-240	On make	6 sec. - 10 min.	Dial
32001	ICM 203	19-240	On break	6 sec. - 10 min.	Dial adj. 2 terminal

MARS Phase Reversal Protector

Features:

- Disconnects the motor pilot circuit on loss of one or more phases or when the voltage imbalance between any of the two phases exceeds 7%
- Re-energizes the pilot circuit only when all 3 phases are present and the voltage imbalance is less than 7%
- 208-277VAC, 50-60Hz
- Contact Rating: NO/NC (type "C") 5A/240V, 10A/120V
- 1/4" male spade terminals
- Compact design: 2.35" x 2.425" x 1.1"



Phase Reversal Protector

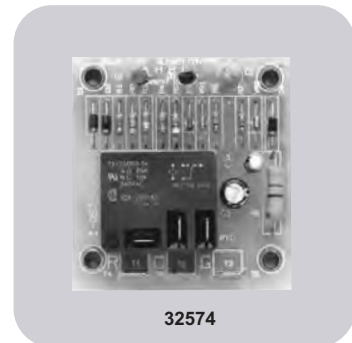
MARS NO.	NOMINAL VOLTAGE	INPUT VOLTAGE	SPDT RELAY CONTACTS AMP RATING
32532	240 VAC	175-255 VAC	10 amps res.
32534	480 VAC	380-500 VAC	8 amps res
93057*	8 Pin Octal Base, 35mm Din Rail or Surface Mount		

* Base not included

Fan Time Delay Module

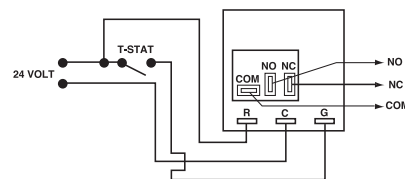
The MAHBC fan time delay module is a replacement for the direct motor control used by leading OEMs in high efficiency residential central air conditioning systems. The purpose of the control is to keep the blower motor running for 60 seconds after the thermostat has been satisfied. The result is an increase in residual cooling from the indoor coil without running the condensing unit, and thus, higher energy efficiency.

The MAHBC is ideal for retrofit where improved efficiency is desirable.



Features:

- Wide ambient temperature operating range -40°F to 175°F
- 1/4" male quick connect terminals
- Easy surface mount with four #6 screws
- UL and CSA recognized



Cross Reference

OEM	PART NO.
BARD	8201-056
RHEEM	42-22515-01
SNYDER GENERAL	0001395336

MARS NO.	MARS MODEL	VOLTAGE	OUTPUT 120V	OUTPUT 240V	TIME DELAY	ACTION
32574	MAHBC	24VAC	1 HP	2 HP	60 SEC.	SPDT

MARS Bypass Timer

MARS 32395 is an adjustable, multi-voltage bypass timer that allows the temporary bypass of a control or device during start-up. At the end of the delay period the control is returned to the circuit.

Eliminate nuisance trips!

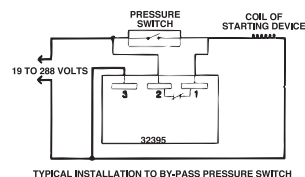


FIG. 1

Low pressure switch bypass application.

FIGURE 1
LOAD IS BYPASSED ON RETURNS TO CIRCUIT AFTER DELAY PERIOD.

MARS NO.	TYPE DELAY	TIME DELAY RANGE	TYPE OF ADJ.	INPUT VOLTAGE	HZ	MAX AMPS	VOLTAGE DROP	CONN. DIAGRAM
32395	by-pass	6 sec...8 min.	dial	19...240VAC	50/60	1	2 at 1 amp.	1

Compressor Anti-Short Cycle Timer with Low Voltage Brownout Protection

Delay on break.

OEM replacement timers for Lennox, Rheem, Ruud, Trane, Heil Quaker, Keep Rite, Mc Quay, Snyder General and others.

Features:

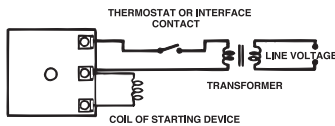
- Lockout delay prevents rapid cycling compensated resistor type wall thermostats
- Single hole mounting (.25 inch diameter)
- Non-positional
- Brownout protection prevents startup when voltage is below normal conditions
- Reduces nuisance service calls due to short cycling
- Delay on Break Lockout delay starts with opening of thermostat or loss of power
- .25 in. quick-connect terminals
- Eliminates relay chatter due to thermostat bounce
- Small size 2.00 x 2.00 x .75 in.
- UL and CSA listings available



Operation:

On initial closure of the thermostat, the compressor relay energizes immediately. When the thermostat opens, a lockout condition and a time delay is initiated. During this lockout time delay period, the compressor cannot be energized.

Brownout protection prevents energizing of the compressor when the line voltage is below normal conditions.



With Integral Brownout Protection

MARS NO.	MODEL NO.	OPERATING VOLTAGE (NOMINAL)	TIME DELAY (MIN.) ± 2%	MARS NO.
32381	TA24A3	24 VAC	3	1.5
32382	TA24A5	24 VAC	5	1.5

MARS Fan Delay/Post Purge Timers

These MARS solid state timers provide for convenient control of a variety of functions.

MARS number 32393 is a fixed 2 minute, 24V off-delay timer that allows the fan to continue to operate after the thermostat is satisfied to purge the ducts of conditioned air.

MARS number 32378 is versatile, high amp timers which, depending on installation (see connection diagrams 2 and 3), will perform either on-delay or off-delay functions. On-delay is especially useful for controlling unloader valves. Off-delay can be used for fan off-delay, pump down systems or post purge applications. The off-delay may also serve an anti-bounce function as a pump flutter bypass switch.

Features:

- Wide selection of models
- Easy installation
- Compact size
- Mounts in any position
- Totally solid state
- High accuracy

Specifications:

- 100 milliamps minimum latch current

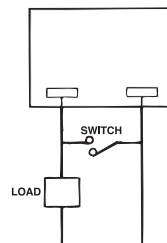
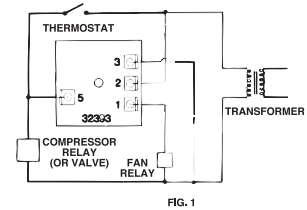


FIG. 2
POST PURGE

With the switch closed, the load is energized. when the switch opens, the load remains energized and the time delay begins. at the end of the delay period the load is de-energized.

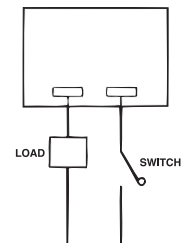


FIG. 3
INTERVAL - ON

When the switch closes, the time delay begins. at the end of the delay period, the load is de-energized.

MARS NO.	TYPE DELAY	TIME DELAY RANGE	TYPE OF ADJ.	INPUT VOLTAGE	HZ	MAX AMPS	VOLTAGE DROP	CONN. DIAGRAM
32393	off delay	2 min. fixed	—	24 VAC	50/60	1	2 at 1 amp.	1
32378	off delay/interval	6 sec... 10 min.	dial	120 VAC	50/60	10	2.1 at 10 amp.	2 or 3

MARS Universal Replacements for Refrigeration and Air Conditioning

30 MARS motor protectors solve the serviceman's most annoying problem—finding suitable replacements for motor overload protectors.

Features:

- Used in refrigeration, room air conditioners, heating, appliances, and electric motors
- Each overload has six-inch leads and two wire nuts for simple installation
- UL and CSA listings available



Application Survey By Horsepower*

MARS NO.	HORSEPOWER															
	110/115								208/240V							
	1/20	1/12	1/8	1/6	1/5	1/4	1/3	1/2	1/12	1/8	1/6	1/5	1/4	1/3	1/2	1
35009			■	■	■										■	■
35010			■	■	■	■									■	■
35011				■	■	■									■	■
35012				■	■	■									■	■
35014					■	■									■	
35015					■	■	■								■	
35016					■	■	■								■	
35017						■	■									■
35018						■	■	■								■
35019							■	■								
35020																

3/4" A/C Overloads

MARS NO.	TEMPERATURE CODE
35101	MRA-3763-529
35105	MRP-00-AIU-529

*Motor protectors cannot be replaced by horsepower, amperage, or nameplate data alone. Refer to cross reference information for proper replacement of original equipment motor protectors by part number.

On-Winding Overheat Protection

Klixon SL-11 kits are mounted on the windings of general purpose motors and hermetically sealed compressors. They supplement conventional current overload relays in magnetic starters providing modern total protection for most older motors in use today.



Features:

- Allow motors to perform at full-load capacity but will protect against dangerous running overloads
- Protect against blocked ventilation, high ambient temperatures, single phasing
- Each kit contains three matched motor-winding thermostats
- When starter overloads operate, the SL-11 will protect against re-starting at unsafe winding temperatures.
- These motor winding thermostats do not replace overloads in the starter
- UL & CSA listed

Installation:

SL-11 thermostats are tied in place on the end turns of appropriate winding bundles, one to each phase or buried in the windings during motor rewind. They are connected in series between the starter coil and its power supply.

Selection:

- Pick thermostat temperature to operate at the mid-point between the "maximum normal running" temperature and the "maximum allowed running temperature."
- Subtract the gradient temperature (outlined in the chart below) from the mid-point to obtain the operating temperature of the thermostat.

Epoxy-Sealed Thermostats For General Purpose Motors - Normally Closed

MARS NO.	KLIXON KIT NO	KLIXON CAT. NO	OPERATING TEMPERATURE
37075	SL-11-75	9700K51-146	75°C
37090	SL-11-90	9700K21-146	90°C
37100	SL-11-100	9700K26-146	100°C
37110	SL-11-110	9700K36-146	110°C
37120	SL-11-120	9700K01-146	120°C
37130	SL-11-130	9700K11-146	130°C
37135	SL-11-135	9700K06-146	135°C
37140	SL-11-140	9700K66-146	140°C
37145	SL-11-145	9700K76-146	145°C
37150	SL-11-150	9700K46-146	150°C

Three thermostats per package

Typical Gradients	Thermostat Location		Maximum Contact Rating Amps				
	Motor Type	Tied On End Turns	Buried In End Turns	Klixon #	24V	115V	230V
Open Type		30°C	15°C	9700K	18	18	12
Totally Enclosed		25°C	10°C				
Fan Cooled		20°C	5°C				
Totally Enclosed Non-Ventilated							

Commercial Refrigeration Thermostats

Refrigeration Cases and Coils

MARS has selected the most popular Klixon disc-type thermostats found in commercial refrigeration. These controls cover a wide assortment of applications including supermarket cases and walk-in, reach-in, and beverage coolers.

Features:

- Used on refrigeration cases, coils, with many other commercial applications
- Long lead wires supplied to satisfy most requirements
- Used by Hussman, Friedrich, Larkin, Schaefer, etc.
- 1 inch discs fully encapsulated for trouble-free use
- Mounts directly on coil tube or surface for maximum temperature response
- UL and CSA listings available
- 25 resistive amps maximum

ELECTRICAL RATING			
		TERM. 1-3	TERM. 1-2
Full load amps	120V	13	5.8
	240V	10	2.9
Locked rotor amps	120V	60	34.8
	240V	45	17.4
Pilot Duty	120/240V	125	125
Resistive amps	120/240V	25	25
	277V	15	15

Tube Mounting

MARS NO.	KLIXON NO.	O.E.M.	O.E.M. PART NO.	SWITCH ACTION	OPERATING TEMPERATURES F°		TUBE MT. IN	LEADS IN
					OPEN	CLOSE		
33405	20420D24-106-63	Bally	—	D	70	20	5/8	18
33415	20420D24-399-350	—	—	D	65	20	5/8	20
33420	20428F1-4-676	Friedrich	606-038-00	F	35	55	3/8	20
33425	20420L15-913-302	—	794-824-00	L	40	25	5/8	11
33430	20420D1-166-336	—	—	D	50	35	1/2	18
33435	20420L28-229-89	Hussman	P211-119696	L	20	5	3/4	40
33440	20420F32-381-533	—	—	F	20	30	3/4	48
33455	20420F19-63-294	Schaefer	C10872-19	F	20	60	5/8	36
33460	20420L19-202-274	—	C10872-6	L	35	5	5/8	54
33470	20420L15-376-218	—	125211	L	50	30	5/8	36
33475	20420L15-722-218	Tyler Ref.	146291	L	40	20	5/8	36
33480	20420L15-767-257	—	146739	L	80	50	5/8	90

Surface Mounting

MARS NO.	KLIXON NO.	O.E.M.	O.E.M. PART NO.	SWITCH ACTION	OPERATING TEMPERATURES F°		LEADS IN
					OPEN	CLOSE	
33017	20425L153-B22-B54	Heatcraft	5708L	L	75	40	18 w/ quick connects
33025	20425D56-520-B10	Heatcraft	5709L	D	55	35	18 w/ quick connects

1D=SPDT, no. 1 is common (white) - no label, no. 2 either opens or closes temp. rise - red label, no. 3 is opposite of no. 2 - blue label F= close on temperature rise, SPST L= open on temperature rise, SPST 2

KLIXON



Change-Over Switches for Fan-Coil Systems

The MARS Series 390 change-over switches are used for summer-winter change-over of electric thermo-stats in hydronic heating - cooling fan-coil units.

Features:

- Color coded leads allow easy installation
- SL-8 thermostat is enclosed in sealed case for trouble-free operation
- Snap-acting disc type, insures accurate temperature repeatability
- Can be mounted in any position
- UL and CSA listings available

Installation:

The SL-8 change-over switch is located on the main run of the supply line where it can quickly sense the maximum temperature of the hot or cold water passing through. If the SL-8 switch is exposed to surrounding temperatures, thermal insulation should be wrapped around the switch case to maintain desired thermal response.

Specifications:

Pipe size: 5/8 in O.D.

Leads: 12 in. color coded

Switch Action: SPDT

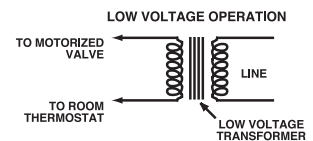
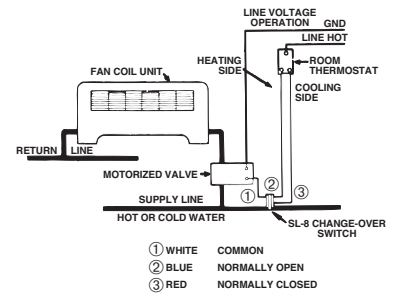
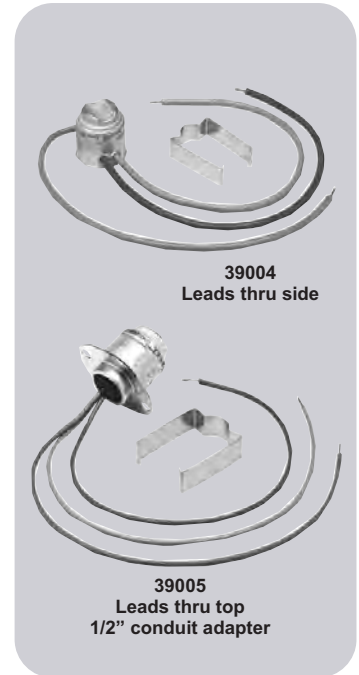
Temperature: 88°F (31°C)—terminals 1 & 2 close, 1 & 3 open
73°F (23°C)—terminals 1 & 3 close, 1 & 2 open

Mounting: mounting clip supplied with each kit

Electrical: terminals 1 & 3 25 amp at 120/240 VAC

Terminals 1 & 2 10 amp at 120 VAC, 5 amp at 240 VAC

KLIXON



Honeywell No.	MARS No.	White Rodgers No.	MARS No.
L6076A	39004	752-1	39004
L6076B	39005	752-2	39005

MARS NO.	KLIXON KIT NO.	KLIXON NO.	DESCRIPTION
39004	SL8-5	20425D27-160-356	leads thru side of cup
39005	SL8-5A	20425D69-160-287	leads thru top of cup with 1/2" conduit adapter

For Defrost Termination

MARS Series 330 defrost controls are designed to replace many defrost thermostats. The leads are of sufficient length for the connection to be made at the same location as was the control removed. The connection should be insulated in a manner similar to that on the original equipment.

The selection of the proper thermostat can be made by matching the temperature code of the thermostat removed to the code on the MARS Thermostat.



33008

Features:

- Refrigerators, A/C units, & heat pumps, dehumidifiers, icemakers or any place where a fixed temperature control is required in a wet or dirty environment.
- Thermostats have 32" leads.

Temp. Code	Use MARS No.	Temp. Code	Use MARS No.	Temp. Code	Use MARS No.
L40-3.0	33008	L58-4.3	33011	L65-4.0	33012
L42-2.0		L60-2.0		L67-4.2	
L45-3.0		L60-2.5		L70-4.0	
L45-3.0		L60-3.0		L75-5.0	
L55-1.5	33010	L60-3.5	33020	L80-3.0	33020
L55-2.0		L60-4.0		L80-4.0	
L55-2.5		L60-4.5		L80-4.5	
L55-3.0				L80-5.0	
L55-3.5					
L55-4.0					

MARS NO.	TEMP. CODE	OPENING TEMP. F°	CLOSING TEMP F°
33008	L45	45	25
33010	L55	55	35
33011	L60	60	40
33012	L70	70	50
33020	L80	80	60

VOLTS	INDUCTIVE	
	F.L.A.	L.R.A.
120	5.8	25
240	2.9	70

MARS Freeze Stat

The MARS 33101 is designed to help stop flood back to compressor crankcases caused by low ambient temperatures.

Features:

- Simple to install
- Refrigerators, freezers, A/C, food dispensing equipment
- For use with 1" pipe, 1/2' radius
- 24" leads



33101

MARS NO.	OPENING TEMP. F°	CLOSING TEMP F°
33101	34	45

Fixed Setting Pressure Controls

Low pressure controls.

Specifications:

- Contacts rated at 6 amps, 24-240 volts
- 18" leads

Features:

- Tamper proof construction
- Direct mounting on tubing
- UL & CSA recognized



43341

The 4 - Series Klixon Pressure Switches. This newest set of designs delivers the reliability and performance that has made Klixon the most trusted name in the electromechanical sensor business. The 4 - Series line of pressure switches covers many new R410A applications along with traditional pressure setting switches.

Klixon Brand, UL and CUL, Compact size, light weight for direct mounting, Factory Set, Hermetically Sealed Sensor.

5.8 FLA - 34.8 LRA @ 120 VAC, 2.9 FLA - 15.0 LRA @ 240 VAC, 100,000 Cycle Life at Rated Current.

Low Pressure Cut-Out - Open on Pressure Drop, Automatic Reset Normally Open

4 SERIES MARS NO.	3 SERIES MARS NO.	OPENING PRESSURE	RESET PRESSURE	NOTES
43341	33329	5	20	1/4" Female Flare S.A.E. Mounting
43342		5	30	1/4" Female Flare S.A.E. Mounting
43343	33330	10	25	1/4" Female Flare S.A.E. Mounting
43344	33333	15	35	1/4" Female Flare S.A.E. Mounting
43371		15	40	1/4" Copper Clad SS Tube, 90 degree elbow w/36" leads
43345		20	45	1/4" Female Flare S.A.E. Mounting
43372		22	50	1/4" Copper Clad SS Tube w/38" leads
43373		25	40	Gold Contacts 1/4" Female Flare w/36" leads
43346	33362	25	50	1/4" Female Flare S.A.E. Mounting
43347	33336	25	65	1/4" Female Flare S.A.E. Mounting
43348	33363	25	80	1/4" Female Flare S.A.E. Mounting
43349		35	60	1/4" Female Flare S.A.E. Mounting
43350	33364	40	80	1/4" Female Flare S.A.E. Mounting
43351		45	60	1/4" Female Flare S.A.E. Mounting
43352	33339	50	90	1/4" Female Flare S.A.E. Mounting
43374		50	95	1/4" Copper Clad SS Tube w/36" leads
43353	33342	75	100	1/4" Female Flare S.A.E. Mounting
43375		90	120	1/4" Female Flare, w/18" leads
43354		150	225	1/4" Female Flare S.A.E. Mounting
43355		170	250	1/4" Female Flare S.A.E. Mounting
43361		165	215	1/4" Female Flare S.A.E. Mounting w/Quick Connects
43362		200	240	1/4" Female Flare S.A.E. Mounting w/Quick Connects, SPDT

Fixed Setting Pressure Controls High Pressure Cut-Outs

MARS offers the most complete line of high pressure cut-outs available.

Specifications:

- Contacts rated at 6 amps, 24-240 volts
- 1/4" female flare S.A.E. mounting
- 18" leads

Features:

- Tamper proof construction
- Direct mounting on tubing
- UL & CSA recognized



The 4 - Series Klixon Pressure Switches. This newest set of designs delivers the reliability and performance that has made Klixon the most trusted name in the electromechanical sensor business. The 4 - Series line of pressure switches covers many new R410A applications along with traditional pressure setting switches.

Klixon Brand, UL and CUL, Compact size, light weight for direct mounting, Factory Set, Hermetically Sealed Sensor.

5.8 FLA - 34.8 LRA @ 120 VAC, 2.9 FLA - 15.0 LRA @ 240 VAC, 100,000 Cycle Life at Rated Current.

High Pressure Cut-Out - Open on Pressure Rise, Automatic Reset, Normally Closed

4 SERIES MARS NO.	3 SERIES MARS NO.	OPENING PRESSURE	RESET PRESSURE	NOTES
43337	33353	200	150	1/4" Female Flare S.A.E. Mounting
43321		225	150	1/4" Female Flare S.A.E. Mounting
43322	33354	250	150	1/4" Female Flare S.A.E. Mounting
43324	33310	275	195	1/4" Female Flare S.A.E. Mounting
43325	33355	300	200	1/4" Female Flare S.A.E. Mounting
43326	33313	325	225	1/4" Female Flare S.A.E. Mounting
43320	33316	350	245	1/4" Female Flare S.A.E. Mounting
43327	33356	350	250	1/4" Female Flare S.A.E. Mounting
43328	33319	375	275	1/4" Female Flare S.A.E. Mounting
43329	33357	400	200	1/4" Female Flare S.A.E. Mounting
43330	33322	400	280	1/4" Female Flare S.A.E. Mounting
43340	33370	400	300	1/4" Female Flare S.A.E. Mounting w/24" leads (1 stripped, 1 w/1/4" female flag QC)
43331	33358	400	300	1/4" Female Flare S.A.E. Mounting w/24" leads (1 stripped, 1 w/1/4" female flag QC)
43311		410	290	1/4" Female Flare S.A.E. Mounting
43332	33325	425	300	1/4" Female Flare S.A.E. Mounting
43333		425	325	1/4" Female Flare S.A.E. Mounting
43334	33359	450	250	1/4" Female Flare S.A.E. Mounting
43365		590	418	1/4" Female Flare w/snubber
43335	33361	600	475	1/4" Female Flare S.A.E. Mounting
43366		610	420	1/4" Copper Clad SS Tube, 90 degree elbow w/snubber
43376		610	420	1/4" Copper Clad SS Tube w/snubber
43339	33369	630	480	1/4" Female Flare S.A.E. Mounting
43367		650	450	1/4" Copper Clad SS Tube w/snubber

Condenser Fan Cycling Switches

Fan cycling switches provide refrigeration and air conditioning from low ambient conditions.

Specifications:

- Contacts rated at 6 amps, 24-240 volts
- 1/4" female flare S.A.E. mounting
- 18" leads

Features:

- Tamper proof construction
- Direct mounting on tubing
- UL & CSA recognized



Fan Cycling - Close on Pressure Rise

4 SERIES MARS NO.	3 SERIES MARS NO.	OPENING PRESSURE	RESET PRESSURE	NOTES
43301		75	120	1/4" Female Flare S.A.E. Mounting
43302		110	170	1/4" Female Flare S.A.E. Mounting
43303	33340	125	265	1/4" Female Flare S.A.E. Mounting
43304		150	225	1/4" Female Flare S.A.E. Mounting
43305		190	275	1/4" Female Flare S.A.E. Mounting
43370		180	240	1/4" Female Flare, S.A.E. Mounting
43306	33341	210	275	1/4" Female Flare S.A.E. Mounting
43307		300	400	1/4" Female Flare S.A.E. Mounting

Manual Reset - High Pressure Cut Out Open on Pressure Rise



4 SERIES MARS NO.	3 SERIES MARS NO.	OPENING PRESSURE	RESET PRESSURE	NOTES
43312		375	Manual	1/4" Female Flare S.A.E. Mounting
43313	33365	410	Manual	1/4" Female Flare S.A.E. Mounting
43314	33350	415	Manual	Capillary Tube
43315	33352	440	Manual	Capillary Tube
43316		475	Manual	1/4" Female Flare S.A.E. Mounting
43368		590	Manual	1/4" Female Flare w/snubber
43369		610	Manual	1/4" Female Flare w/snubber

Heat Pump Defrost Thermostats

MARS heat pump defrost thermostats are designed for direct replacement of most existing controls of this type. The temperature settings and tubing sizes have been carefully selected from the most popular OEM settings. Each MARS thermostat comes complete with extra long 54 inch leads, mounting clamp, and installation instructions for fast and simple field installation.

Features:

- Four controls cover most requirements
- Tapered mounting edge for maximum heat transfer
- Extra long 54 inch leads for simple wiring
- Individually boxed with mounting clamp and instructions
- UL & CUL listed



33490

Electrical Ratings:

Cycles X1000	Volts	FLA	LRA	Resistive Amps	VA
100	120VAC	5.8	34.8	10	125
100	240VAC	2.9	17.4	10	125
30	120VAC	10.0	40.0	-	-
30	240VAC	10.0	40.0	-	-
100	30VDC	-	-	1	-

MARS NO.	OPERATING TEMPERATURES F°		TUBE MOUNTING IN	LEADS IN
	OPEN	CLOSE		
33490	80	30	3/8	54
33492	80	30	1/2	54
33494	65	30	3/8	54
33496	65	30	1/2	54

MARS Heat Pump Defrost Timer

MARS Heat Pump Defrost Timer replaces General Electric and Paragon timers on heat pumps with time initiated and time or temperature terminated defrost systems.

The MARS Heat Pump Timer features a defrost interval adjustment that allows selection of either 90 minutes or 45 minutes between defrost periods.

The MARS Heat Pump Defrost Timer will replace Paragon timers used by Carrier, Bryant, and other OEMs with the addition of a mounting bracket.

Features:

- Adjustable 90 or 45 minute defrost interval
- Replaces GE directly
- Replaces Paragon with bracket
- Telechron S1 motor
- 50/60 Hertz
- UL and CSA listings available



34790

Specifications:

- Time Delays:** Digital interval delay duration: jumper selectable as 45 or 90 min. D faults to 45 min. if jumper wire is not connected.
- Defrost Delay Duration:** 10 min. or terminated upon the defrost thermostat opening
- Defrost Window Delay Duration:** 50 seconds
- Operating Voltage:** 240 VAC +10% - 25%
- Output:** relay/contactor output Type - solid state Form - SPDT N.O. Rating - .50 amp steady state
- Protection:** 25% or greater shutdown
- Surface Mount:** With two #6 screws .25 inch male quick connect terminal
- Operating Temp:** -40°C to +85°C
- Humidity:** 95% relative

MARS NO.	DEFROST INTERVAL	DEFROST TIMING PERIOD	DEFROST INITIATION	SWITCHING
34790	90 or 45	10	50 Sec.	SPST N.O.

TUTCO™ Compressor Heaters for A/C and Refrigeration

Features:

- Corrosion resistant exterior
- High temperature silicone rubber element and insulated leads
- 30" leads
- Wattage for each model matches compressor requirements
- Completely moisture proof
- Installs quickly and easily
- Nominal power consumption
- UL & CSA Listed



Application Reference Chart for TUTCO™ Compressor Heaters

Manufacturer	Model	MARS No.
Aspera	H	32605-32608
Aspera	J	32609-32611
Bendix/Westinghouse	A	32613-32616
Bendix/Westinghouse	C, D	32601-32604
Bendix/Westinghouse	E	32605-32608
Bristol/Sundstrand	H10A, H21A, H2EA, H22A	32605-32608
Bristol/Sundstrand	H10B, H20B, H21B, H22B	32613-32616
Bristol/Sundstrand	H10G, H20G, H21G, H22GN2NG-144	32617-32620
Carrier	6A25, 26, 28, 29, 6A35, 38, 45, 48	32605-32608
Carrier	6A88	32617-32620
Carrier/Carlisle	6R	32625-32626
Carlisle	W (70-88)	32601-32604
Copeland	BR	32633-32635
Copeland	CR	32605-32608
Copeland	JR	32629-32630
Copeland	RR, SR	32613-32616
Copeland	VR	32621-32624
Copeland	Y	32601-32604
Fedders/Chrysler	3009	32617-32620
Fedders/Chrysler	2870908	32631
Hitachi	1500FH4-H	32617-32620
Hitachi	305FH2-HE, 402FH2-HE, 505FH2-HE	32613-32616
Hitachi	753FH3-H, 1001FH4-H	32601-32604
Sanyo	CR15F, CR20F, CR33F	32631
Tecumseh	AB, AW	32613, 32616
Tecumseh	AH	32605-32608
Tecumseh	AJ	32609-32611
Tecumseh	AK	32629-32630
Tecumseh	B, C, CL, AG, AV	32601-32604
Tecumseh	FE, FB	32617-32620
Trane	D4340/7669	32609-32611
Trane	D4340/7670	32621-32624
Trane	D4350/689, D4359/690	32605-32608
Westinghouse	CD072, CD090	32605-32608
Westinghouse	CD072, CD090	32621-32624

MARS NO.	DESCRIPTION	VOLTS	WATTS	INCHES		SHAPE
				MIN.	MAX.	
32601	CH-100	240		30 3/16	37	
32602	CH-100-1	208	50	30 3/16	37	OVL
32604	CH-100-3	480		30 3/16	37	
32605	CH-101	240		27 7/16	34 1/4	
32608	CH-101-3	480	54	27 7/16	34 1/4	OVL
32609	CH-102	240		25 3/4	32 9/16	
32610	CH-102-1	208	60	25 3/4	32 9/16	OVL
32611	CH-102-2	120		25 3/4	32 9/16	
32613	CH-103	240		24 3/4	31 9/16	
32616	CH-103-3	480	45	24 3/4	31 9/16	OVL
32617	CH-104	240		41 1/2	48 5/16	
32618	CH-104-1	208		41 1/2	48 5/16	
32619	CH-104-2	120	75	41 1/2	48 5/16	RND
32620	CH-104-3	480		41 1/2	48 5/16	
32621	CH-105	240		32 1/2	39 5/16	
32622	CH-105-1	208	50	32 1/2	39 5/16	RND
32624	CH-105-3	480		32 1/2	39 5/16	
32625	CH-115	240		30 3/16	37	
32626	CH-115-2	120	40	30 3/16	37	RND
32629	CH-135	240		20 5/16	27 1/8	
32630	CH-135-2	120	45	20 5/16	27 1/8	OVL
32631	CH-197	240	25	13 3/4	20 9/16	RND
32633	CH-202	240		33 3/4	36 3/4	
32634	CH-202-2	120	70	33 3/4	36 3/4	RND
32635	CH-202-3	480		33 3/4	36 3/4	

Direct Replacement Crankcase Heaters for Copeland

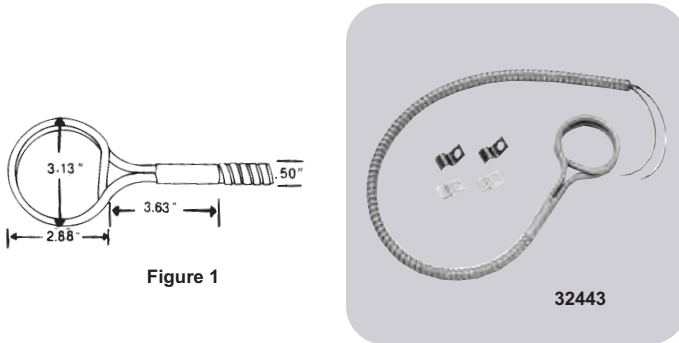


Figure 1

32443

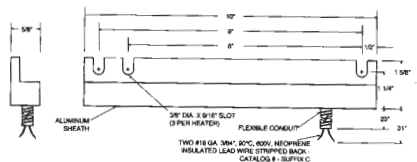
K&H Series Crankcase Heaters

MARS NO.	COPELAND NO.	WATTS	VOLTS	FIGURE	COMPRESSOR MODEL
32443	9980118-06(018-0028-02)	50	240	1	K & H

Universal Replacement Crankcase Heaters for Copeland



32490



MARS NO.	COPELAND NO.	WATTS	VOLTS	HEATER LENGTH IN.	CAN REPLACE	ACCESSORIES
32490	018-0034-00	65	120	10	4R,6R,6T,9R,9T,9W,E, MW3A,3R,LA,MR,NR,EA, ER,LW,MD	2 bolts
32491	018-0034-01	65	240	10	4R,6R,6T,9R,9T,9W,E,MW 3A,3R,LA,MR,NR,EA, ER,LW,MD	2 bolts
32492	018-0034-02	65	480	10	E,9R,9W,MW,3A,3R,LA,M, NR,EA,ER,LW,MD	2 bolts

Direct Replacement Crankcase Heaters for Copeland

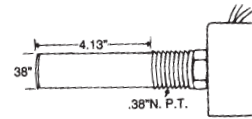


Figure 1

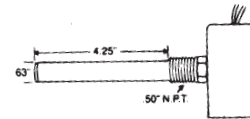


Figure 2

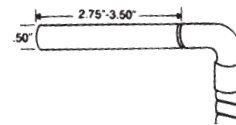
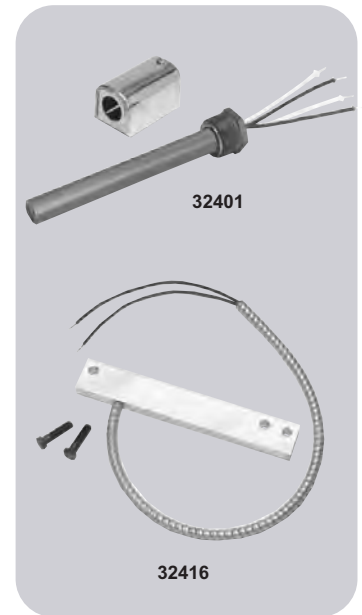


Figure 3



32401

32416

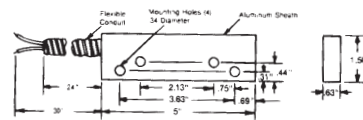


Figure 4

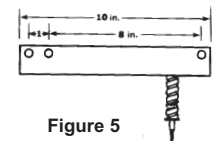


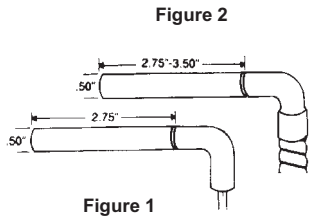
Figure 5

Crankcase Heaters for Copeland

NOTE: All heaters requiring clips or brackets are packaged with the appropriate clips or brackets required.

MARS NO.	COPELAND NO.	WATTS	VOLTS	HEATER LENGTH IN.	FIGURE	COMPRESSOR MODEL	ACCESSORIES
32401	518-0001-01	65	480	4.13	1	3D, 9D, 9R	-
32403	518-0001-02	65	240	4.13	1	3D,9D,9R	-
32408	518-0002-01	100	480	4.25	2	4R, 6R, 6T, 4D, 6D	-
32409	518-0002-02	100	240	4.25	2	4R,6R,6T,4D,6D	-
32410	518-0002-03	100	120	4.25	2	4R, 6R, 6T, 4D, 6D	-
32416	518-0009-01	65	240	10.00	5	E,9R,9W,MW,3A, 3R,LA,MR,NR	2 bolts
32431	018-0021-04	200	120	3.50	4	6RJ, 4RV, 4RR	2 bolts
32432	018-0021-05	200	240	3.50	3	6RJ,4RJ,4RR	2 bolts
32437	018-0023-01	50	240	5.00	5	K & H	2 bolts
32439	018-0023-00	50	120	5.00	4	K & H	2 bolts

Direct Replacement Crankcase Heaters for Carrier



Crankcase Heaters for Carrier

MARS NO.	CARRIER NO.	WATTS	VOLTS	HEATER LENGTH IN.	LEAD LENGTH IN.	FIGURE	COMPRESSOR MODEL
32452	HT36DL172	125	120	2.75	25	2	
32456	HT36ES363	75	120	2.75	36.5	1	AB:AC:AD:38AA
32460	HT36NS377	75	120	2.75	88	2	EB:30EA:30HH: 30HJ:48DD:50DD
32462	HT36NS477	75	230	2.75	88	2	6D:06D
32464	HT36FS474	75	240	2.75	52	2	EM:6D:06D
32466	HT36XS575	75	240	2.75	36	1	
32468	HT36FL463	125	240	2.75	49	2	
32472	HT36FL379	125	120	2.75	60	2	EM:06DM: 306B:50EQ
32474	HT36FL479	125	240	2.75	68	2	EM:06DM: 30HR:30HS

One-On-One™ Crankcase Heaters

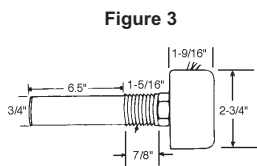
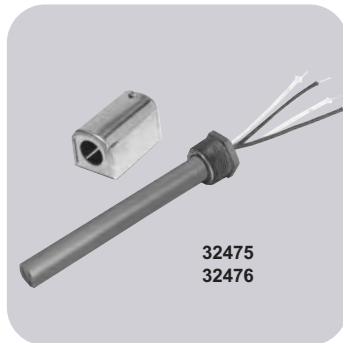
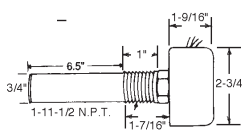


Figure 4



MARS NO.	OEM	OEM NO.	WATTS	VOLTS	LENGTH	DIA.	FIGURE
32475	Trane	661A-16093-12-4-C	100	115/230	6 1/2"	3/4"	4
32476	Trane	661A-13881-12-4-C	75	115/230	6 1/2"	3/4"	3
32478	Trane	X13140729-01	140	115/230	11"	3/4"	4

PTCR Crankcase Heaters

MARS solid state crankcase heater is a PTCR self regulating device which performs in a similar manner to a heater and thermostat combination. Unlike conventional resistance heater and thermostat combinations which provide only fully on or fully off operation, MARS solid state crankcase heater emits heat in proportion to the compressor requirements.

As compressor temperature decreases, current flow through the heater increases causing it to heat up. When the compressor is warm and additional heat is not required, current flow decreases. Only enough electricity is consumed to maintain the correct temperature. MARS solid state crankcase heaters are self adjusting to voltage variations.

Application:

MARS 32342 is for use on heaterless compressors to help correct refrigerant migration or as a preventative maintenance precaution. It will replace belly-band heaters on compressors up to 5 HP, 120 and 240 VAC. MARS 32342 attaches to the compressor using high temperature, pressure sensitive aluminum foil. If more heat is required, a second 32342 may be wired in parallel and applied to the opposite side of the compressor.

Features:

- Total solid state reliability
- Self regulating
- 32342—fast, easy installation
- UL E49372, SA5202
- CSA LR46861, LR80111



MARS NO.	TYPE	WATTS	VOLTS
32342	Heater with self-stick foil	35 - 45	600 Max

Self Regulating Crankcase Heaters

MARS self-regulating crankcase heaters are designed for use with refrigeration compressors up to 5HP and 40 inches in circumference. These heating cables provide peak heat during cold periods and reduced heat when the air temperature rises and should not be used in non-hazardous areas.

- Cold length: 30"
- Heat cable length: 50"



MARS NO.	TYPE	WATTS	VOLTS
70970	Self Regulating	32W @ 50°F • 60W @ 0°F	120
70971	Self Regulating	32W @ 50°F • 60W @ 0°F	240

Replacement Coil Kits and Accessories for Electric Heat

MARS Replacement coil kits for electric heat let you repair strip heaters quickly and economically. Each kit contains one close wound, stretch to length, resistance coil with welded terminal bolts; two each male and female ceramic terminal insulators; two each .375 and .450 inch standard ceramic bushings; two each .375 and .450 inch extra long ceramic bushings; necessary nuts, washers, and installation instructions.



Select the right MARS kit from the chart below and order one kit for each circuit to be repaired. Thermal fuse links are rated 22 amp resistor, 15 amp inducer at 120 and 240 VAC.

Features:

- Welded terminal bolts for low resistance and long life
- Close wound coil, stretch to fit many applications
- Complete with bushings, insulators and hardware

MARS NO.	WATTAGE AT				STRETCHED LENGTH			
	240V	208V	480V	277V	INCHES		METERS	
					MIN	MAX	MIN	MAX
34602	5000	3750	—	—	44.62	127.48	1.13	3.24
34604	—	—	5000	—	61.78	176.53	1.57	4.48
34606	—	—	—	5000	59.44	169.82	1.51	4.31
34608	3500	2625	—	—	50.75	145.00	1.29	3.68
34610	—	—	3500	—	42.27	120.76	1.07	3.07
34614	2000	1500	—	—	25.90	74.01	0.66	1.88
34616	2500	1875	—	—	30.89	88.26	0.78	2.24
34620	—	—	—	2500	27.61	78.87	0.70	2.00
34622	1500	1125	—	—	17.04	48.69	0.43	1.24
34624	4500	3375	—	—	42.33	120.95	1.07	3.07
34626	—	—	4500	—	46.05	131.98	1.17	3.35
34630	—	—	2000	—	32.00	108.00	0.81	2.74
34652	6600	4950	—	—	70.56	201.59	1.79	5.12
34654	—	—	6600	—	65.39	186.71	1.66	4.74
34656	6000	4500	—	—	54.43	155.50	1.38	3.95
34658	—	—	6000	—	71.88	205.38	1.83	5.22
34660 ⁽¹⁾	5000	3756	—	—	25.00	70.00	—	—

(1) Larger diameter coil - 5/8"

Thermal Fuse Links*



MARS NO.	°F	°C	DESCRIPTION
34700	204	95.56	Fuse Link
34702	283	139.45	Fuse Link
34704	333	167.22	Fuse Link
34706	300	148.89	Fuse Link
34708	300	148.89	Fuse Link—Round Ceramic Base
34710	227	108.33	Fuse Link—Oblong Ceramic Base
34712	300	148.89	Fuse Link—Oblong Ceramic Base

*10 per pack

Replacement Coil Economy Kits



MARS NO.	DESCRIPTION
34600	5000 Watt @ 240 V; includes coil, insulators & hardware
34601	5000 Watt @ 240 V; includes 300° fuse link, coil, insulators & hardware

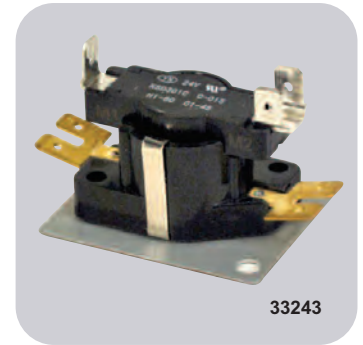
Electric Heat Sequencers

A new simple method for selecting and replacing electric heat sequencers with only five basic controls. Replace sequencers in almost any existing system.

Sequencer selection:

- A. Determine the number of circuits to be switched. (Electrical rating of auxiliary switch same as main switch.) When more than one (1) sequencer is required the sequencers are to be wired in series with the last switch in each sequencer energizing the control circuit of the next sequencer.
- B. Select from the chart the sequencers needed for the number of circuits to be switched. These sequencers may be wired in series to allow sequencing of virtually any number of heating elements and fans.

If the sequencers control the fan/blower circuit, the first switch (M1-M2) of each sequencer must always control the fan. This provides a fan interlock to insure that the fan will remain on until all elements are de-energized.

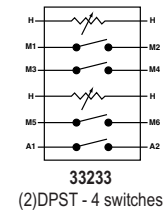
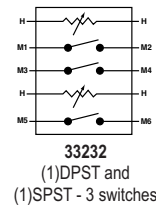
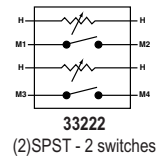
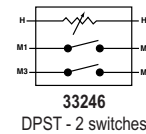
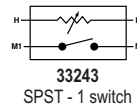


33243

Features:

- Solid State dependability
- Replaces Honeywell and White-Rodgers
- Ambient rated from 20°F to 160°F
- Used on both separate blower and element and combination blower and element systems
- Total 24 volt control
- Standard double quick-connect terminals for combination fan and element systems
- Full-load-rated auxiliary contacts
- 7.2 KW combination fan and element rated contacts (23A resistive, 7A motor load)
- Non-positional
- Voltage and ambient self compensating positive temperature coefficient (PTC) heater elements
- Individually packaged with wiring diagrams for up to seven element furnaces.
- UL and CSA listing available

Schematic



Contact Rating Chart

VAC	RES AMPS	FLA	LRA	PILOT DUTY VA
120	30	23	84	672
240	30	23	60	960
277	23	23	42	775
480	12.5	5	10	400

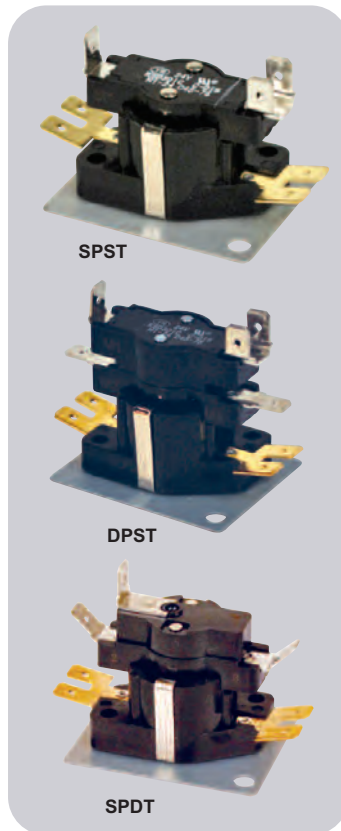
NO. OF SWITCHES	MARS NO.	REPLACES KLIXON NO.	SWITCH SEQUENCE		SWITCH TIMING: MIN-MAX IN SECONDS								
			FIRST ON LAST OFF	LAST ON FIRST OFF	SWITCH NO.1 TERMINALS M1 / M2		SWITCH NO.2 TERMINALS M3 / M4		SWITCH NO.3 TERMINALS M5 / M6		SWITCH NO.4 (2) TERMINALS A1 / A2		
1	33243	6000AOM	(1)		1-60	1-45							
2	33246	6000EOM	(1)		1-60	1-45	1-60	1-45					
2	33222	51172-22	No. 1	No. 2	1-24	45-75	30-70	1-40					
3	33232	51172-32	No. 1, No. 2	No. 3	1-24	45-75	1-24	45-75	30-70	1-40			
4	33233	51172-33	No. 1, No. 2	No. 3, No. 4	1-24	45-75	1-24	45-75	30-70	1-40	30-70	1-40	

Thermal Time Delay Relays Sequencers

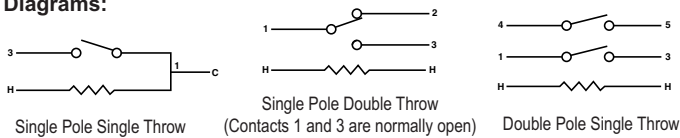
These time delay relays are used for a variety of applications in heating and air conditioning. They operate by means of a solid state PTC (positive temperature coefficient) device which heats up as current passes through it from the control circuit. This heat causes a positive, snap-acting disc to make or break the necessary contacts.

Features:

- Shock & vibration resistant internal snap action automatic reset switch mechanism assures positive make/break action
- Non-positional
- Wide selection for any application
- Voltage and ambient compensated
- UL and CSA listed
- Used for electric heat, air conditioning, heat pumps, gas & oil furnaces, unit heaters and commercial refrigeration



Diagrams:



MARS NO.	REPLACES KLIXON NO.	SWITCH TYPE	CONTROL VOLTAGE	DELAY (SEC.)	
				ON	OFF
33215	G0-18		24	1-60	1-45
33217	G4-9		240	20-70	20-80
33241	AOM		24	1-24	45-75
33242	AOM	SPST N.O.	24	30-75	1-40
33243	AOM		24	1-60	1-45
33244	EOM		24	1-24	45-75
33245	EOM	DPST N.O.	24	30-75	1-40
33246	EOM		24	1-60	1-45
33247	COM-21	SPDT 1 & 3 N.O.	24	1-24	15-75
33255	E4	DPST N.O.	120	30-110	15-65
33256	E4		120	20-70	20-80
33265	E4	DPST N.O.	240	30-110	15-65
33266	E4		240	20-70	20-80
33267	C4M-13	SPDT 1 & 3 N.O.	240	20-70	20-80

Electric Heat Sequencers

The MARS heat sequencers are used in a variety of applications, including electric furnaces, baseboard heaters, heat pump blower control and heating element control. The sequencers stage electric heat to prevent circuit overload. These units operate by means of a PTC (positive temperature coefficient). The PTC is self current limiting, ensuring stable switching action over a wide range of voltages.

Features:

- Solid state dependability
- Replaces Honeywell, White Rodgers, and Klixon
- 12.5A to 25A contact ratings
- Quick connect terminals
- Various mounting positions
- Shock & vibration resistant
- Ambient rated from -50°F to 165°F
- Full-load rated auxiliary contacts



Single Load Contact Ratings

VAC	RESISTIVE (NON-INDUCTIVE)		MOTOR RATINGS (INDUCTIVE)		
	WATTS	AMPS	FULL LOAD	LOCKED ROTOR	PILOT DUTY
120	3000	25	10A	60A	125VA
240	6000	25	5A	30A	125VA
480	6000	12.5	3A	18A	480VA

Combined Load Ratings: 30A @ 240VAC - Total: 23A non-inductive + 7FLA / 42LRA inductive
Life at rated current: 10,000 cycles

MARS NO.	TIM.	SW.	M1-M2	M3-M4	M5-M6	M7-M8	M9-M10	M1-M2	M3-M4	M5-M6	M7-M8	M9-M10
33841	1	1	1-20	-	-	-	-	40-110	-	-	-	-
33842	1	1	-	-	30-90	-	-	-	-	1-30	-	-
33844 ⁽¹⁾	1	2	1-20	1-20	-	-	-	40-110	1-110	-	-	-
33845	1	2	-	-	30-90	30-90	-	-	-	1-30	1-30	-
33832 ⁽¹⁾	2	3	1-110	1-110	1-110	-	-	1-110	1-110	1-110	-	-
33833 ⁽¹⁾	2	4	1-110	1-110	1-110	1-110	-	1-110	1-110	1-110	1-110	-
33848 ⁽¹⁾⁽²⁾	4	5	1-160	1-160	1-160	1-110	1-160	1-160	1-160	1-160	1-160	1-160

(1) M1-M2 and M3-M4 are always first switches to turn ON and to turn OFF. All other switches are random ON and random OFF

(2) #33848 - switch contacts designated F1-F2 instead of M1-M2

■ These contacts switch simultaneously

ON TIME - Elapsed time to make contacts after heater is energized (Min. to Max.)

OFF TIME - Elapsed time to make contacts after heater is de-energized (Min. to Max.)

OFF Timings determined after PTC heater has been electrified for a total of 5 minutes.

Heating Applications

MARS Series 390 thermostats are designed for quick on-the-job replacements. One thermostat, when used in conjunction with only one listed, can solve almost any mounting problems you encounter.

Our thermostats have been carefully selected to cover the widest temperature ranges with the fewest models.

Features:

- Each 3/4" thermostat has an integral oval flange to match the most commonly used mounting option
- Widest range of replacements in the industry
- UL and CSA listings available

Electrical Rating

		Terminals	Terminals*
FL Amps	120v	1-3	1-2
	240v	10	5.8
Res. Amps	120v	5	2.9
	240/277v	25	10
	240/277v	25	5
Pilot Duty	120/240/277v	125va	125va

*For Spdt Thermostats

Fan Switches - Close On Temperature Rise

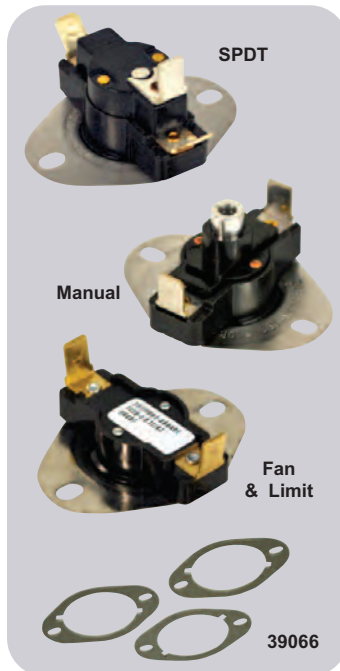
MARS NO.	KLIXON TEMP. CODE	TEMPERATURE °F	
		OPEN	CLOSE
39006	F110-2	90	110
39007	F120-2	100	120
39008	F130-2	110	130
39009	F140-2	120	140
39010	F150-2	130	150
39011	F160-2	140	160
39015	F210-2	190	210

Manual Reset Limit Switches - Open On Temperature Rise

MARS NO.	REPLACES KLIXON TEMP. CODE	TEMPERATURE °F
		OPEN °F
39099	MR125	125
39037	MR140	140
39038	MR150	150
39039	MR160	160
39095	MR170	170
39096	MR180	180
39097	MR190	190
39098	MR200	200
39040	MR210	210
39041	MR220	220
39042	MR240	240
39043	MR300	300

Mounting Flanges - 3 Per Package

MARS NO.	DESC.	TYPE OF MOUNTING	SWITCH DIA.
39066	small oval flat	flush	3/4"



Limit Switches - Open On Temperature Rise

MARS NO.	KLIXON TEMP. CODE	TEMPERATURE °F	
		CLOSE	OPEN
39086	L125-2	105	125
39087	L130-4	90	130
39018	L140-4	100	140
39019	L150-4	110	150
39020	L160-4	120	160
39021	L170-4	130	170
39022	L180-4	140	180
39023	L190-4	150	190
39024	L200-4	160	200
39025	L210-4	170	210
39026	L220-4	180	220
39027	L230-4	190	230
39028	L240-4	200	240
39029	L250-4	210	250
39030	L270-4	230	270
39031	L300-4	260	300
39032	L325-4	285	325
39033	L350-4	310	350

Single Pole Double Throw Switches

MARS NO.	KLIXON TEMP. CODE	TEMPERATURE °F	
		1-2 OPEN	1-2 CLOSE
39078	D140-2	120	140
39045	D150-2	130	150
39046	D160-2	140	160
39081	D170-2	150	170
39082	D205-4	165	205

Adjustable Fan or Limit Thermostats

MARS adjustable fan or limit thermostats let you reduce inventory and still have on hand the most popular thermostat ratings.

MARS adjustable thermostats are easily set for the desired temperature by turning the indicator dial built into the control. Each MARS adjustable thermostat features integral 2 hole oval mounting flanges.



Features:

- Easy dial adjustment
- Six controls cover most requirements
- Integral oval flange
- UL and CSA listings available

MARS NO.	TYPE	RANGE °F	DIFF. °F	SWITCHING ACTION
39205	Fan	90-130	20	Close on rise
39210	Fan	140-180	20	Close on rise
39220	Limit	135-175	40	Open on rise
39225	Limit	175-215	40	Open on rise
39230	Limit	210-250	40	Open on rise
39235	Limit	250-290	40	Open on rise

Cross Reference Information

GEM NO.	MARS NO.	WHITE-RODGERS NO.	MARS NO.	MARS 2	MARS NO.
AT 012	39220	3F05-1	39205	35205	39205
AT 013	39225	3F05-2	39210	35220	39220
AT 014	39230	3L05-1	39220	35225	39225
AT 015	39235	3L05-2	39225	35230	39230
AT 021	39205	3L05-3	39230	35235	39235
AT 022	39210				

Electric Heat High Limit Thermostats

MARS electric heat high limit thermostats are designed for easy accurate replacement of OEM thermostats on electric furnaces. Temperature ratings and differentials have been carefully selected for safe operation.

MARS electric heat high limit thermostats feature an exposed matte finish disc for fast response. Easy matching of OEM mountings using the integral round flange or accessory oval flange.



Features:

- Exposed matte finish disc for fast response
- Oval mounting flange supplied to match many popular mounts
- Twelve models replace most popular OEM thermostats
- Individually bagged with instructions
- UL and CSA listings available

MARS NO.	TEMPERATURE °F		
	OPEN	CLOSE	DIFFERENTIAL
39310	110	90	20
39312	120	100	20
39314	130	100	30
39316	140	100	40
39318	145	105	40
39320	150	110	40
39322	155	115	40
39324	160	120	40
39326	170	130	40
39328	180	140	40
39330	190	150	40
39332	200	160	40

Pro-Series Heating Service Kit

MARS has selected the most popular fan and limit switches used in heating applications. Each switch has an integral small oval flange to duplicate the most popular mounting. UL and CSA listings available.



MARS NO.	SWITCH TYPE	KLIKON TEMP. CODE	TEMPERATURE °F		TEMPERATURE °C	
			CLOSE	OPEN	CLOSE	OPEN
39008	Fan	F130-2	130	110	54	43
39009	Fan	F140-2	140	120	60	49
39010	Fan	F150-2	150	130	66	54
39011	Fan	F160-2	160	140	71	60
39022	Limit	L180-4	140	180	60	82
39023	Limit	L190-4	150	190	66	88
39024	Limit	L200-4	160	200	71	93

Home Laundry Applications

MARS has carefully selected the most popular multi-purpose thermostats for home laundry and drier equipment. MARS Operating Limit Thermostats range from 125°F to 180°F and have narrow differentials (20°F).



Features:

- UL and CSA listings available.

Operating Limit Thermostats — Open On Temperature Rise

MARS NO.	KLIKON TEMP. CODE	TEMP °F-OPEN	TEMP. °F-CLOSE
39086	L125-2	125	105
39055	L130-2	130	110
39051	L150-2	150	130
39048	L180-2	180	160

Cross Reference Information

WR NO.	MARS REPLACEMENT	WR NO.	MARS REPLACEMENT	WR NO.	MARS REPLACEMENT
3F01-110	39006	3L01-120	39086	3L02-160	39039
3F01-120	39007	3L01-130	39087	3L02-170	39095
3F01-130	39008	3L01-140	39018	3L02-180	39096
3F01-140	39009	3L01-180	39022	3L02-190	39097
3F01-150	39010	3L01-190	39023	3L02-200	39098
3F01-160	39011	3L01-200	39024		
3F01-180	39112	3L01-230	39027	3L03-140	39078
3F01-200	39113	3L01-250	39029	3L03-190	39147
3F01-350	39017	3L01-300	39031	3L03-325	39093
		3L01-350	39033		
		3L01-550	39036		

MARS Thermocouples

MARS universal replacement thermocouples are fully equipped with fittings and necessary hardware for quick and easy installation.

Each kit is packaged on a display card for easy identification.

Features:

- High temperature stainless steel element for long life and dependable operation
- Fully equipped with fittings and necessary hardware for quick and easy installation
- Individually display packaged for protection and easy identification



MARS NO.	MODEL NO.	LENGTH INCHES
72218	TC-18P	18
72224	TC-24P	24
72230	TC-30P	30
72236	TC-36P	36
72248	TC-48P	48

Hot Surface Igniters

MARS Universal Silicon Nitride Igniter

MARS Universal Silicon Nitride Igniter is designed to replace over 100 silicon nitride igniter applications. The universal bracket kit is used in a simple series of combinations for a quick and easy installation. Extremely low iron content makes the MARS Universal Silicon Nitride Igniter very durable and reliable. Low energy consumption makes it perfect for any 120 VAC application.

Features:

- Gas fired forced air furnaces and boilers
- Easy to install
- Universal bracket fits most furnaces
- Fits over 100 applications

Specifications:

- Input voltage 120vac
- Time to ignition temperature: 16 seconds
- CSA certified
- Steady current 1.3 amps (± 0.3 amps @ 120v)



MARS NO.	DESCRIPTION
68040	Universal SiN Round Silicone Nitride Igniter

Gas Furnace Igniters

- Compatible with 17, 34, and 45 second warm-up modules
- Full 115/120 volt rated (no step down module required for silicon nitride)
- Wire nuts or OEM plugs and mounting hardware included
- New laminated pictorial cross reference and contractor tri-folds available

Flat silicon carbide: The most economical solution.

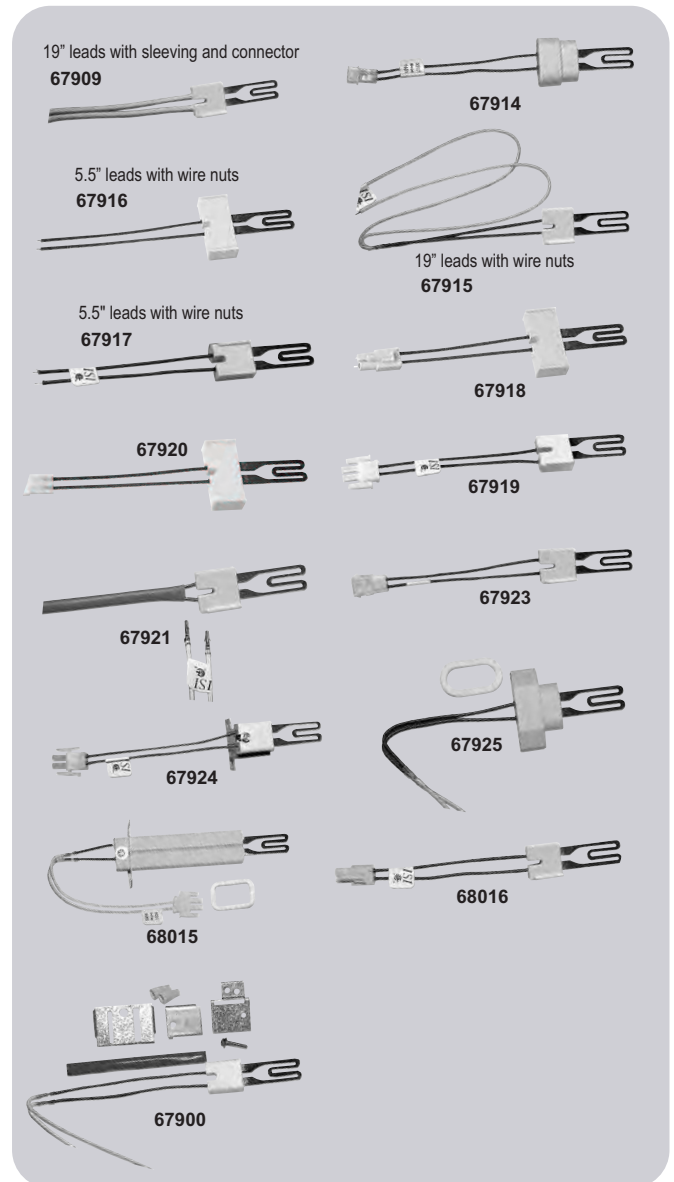
Silicon nitride: The newest technology is virtually indestructible.

Direct Replacements

FLAT SILICON CARBIDE	INDUSTRY RECOGNIZED REFERENCE
67914	41-401
67915	41-402
67916	41-403
68017	41-404
67917	41-405
67925	41-406
67918	41-407
67919	41-408
67920	41-409
68016	41-410
68013	41-411
68014	41-412/41-414
67915	41-238/41-242
68015	Rheem 62-22669-92
67909	Coleman 1474-051P / 052P
67921	Lennox 33J37
67924	Goodman B1401015 / B1401018S
67923	York 025-32625-000

Universal

FLAT SILICON CARBIDE	SILICON NITRIDE	SUPCO	WHITE-RODGERS
67900	N/A	SIG1100	
N/A	68040	SSN2000	21D64-2



*Cannot be sold in Canada