

Figure 253

Crimped-On Leads, Figure 253

A high temperature double crimp connects the MGT (450°C) leads to solid nickel pins. This construction is recommended for applications with elevated temperatures. Due to the rigid nickel pins, this construction is not recommended in applications where movement or flexing is encountered, or if sharp bends are required adjacent to the heater exit

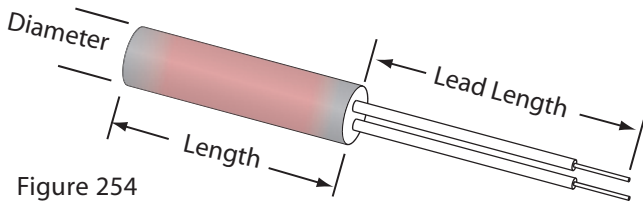


Figure 254

Swaged in Leads, Figure 254

High temperature MGT (450°C) wire is internally connected and swaged in place. This construction is recommended for applications in which the leads must be bent at the exit point from the heater and where mild flexing may be found. For applications with continuous or more severe movement, we would recommend metal braid or armor cable.

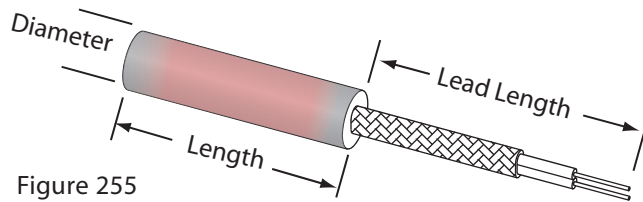


Figure 255

Stainless Steel Braid, Figure 255

High temperature MGT (450°C) wire is internally connected and swaged in place along with stainless steel braid. This construction offers protection against abrasion and sharp edges. This is a very strong construction which offers full length flexibility. This construction is recommended in applications with flexing and where the leads must pass through metal openings or routed along metal components.

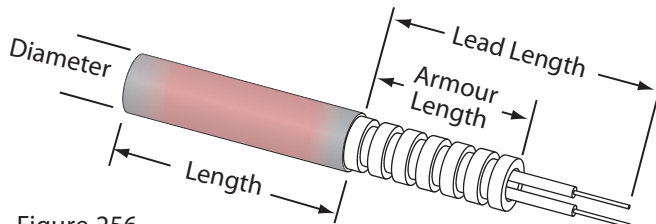


Figure 256

Stainless Steel Armoured Cable (Hose), Figure 256

High temperature MGT (450°C) wire is internally connected and swaged in place along with stainless steel hose. This construction is recommended for applications in which the leads are subjected to abrasion or run the risk of being pinched. This is the strongest lead protection available and works well in moving or flexing applications.

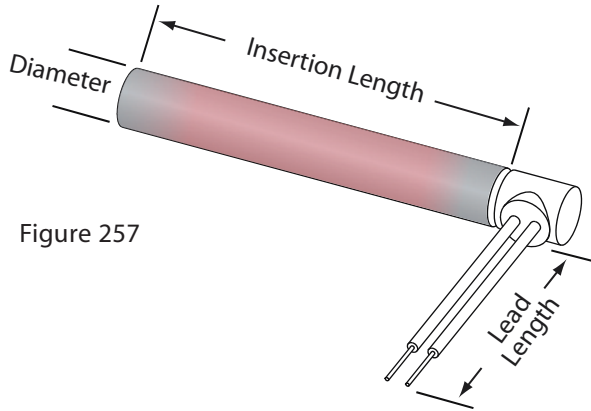


Figure 257

Right Angle Fibreglass Leads, Figure 257

High temperature MGT (450°C) leads exiting at right angle to the sheath. This construction offers a compact design where space is limited. This construction is not recommended where abrasion or flexing is present.

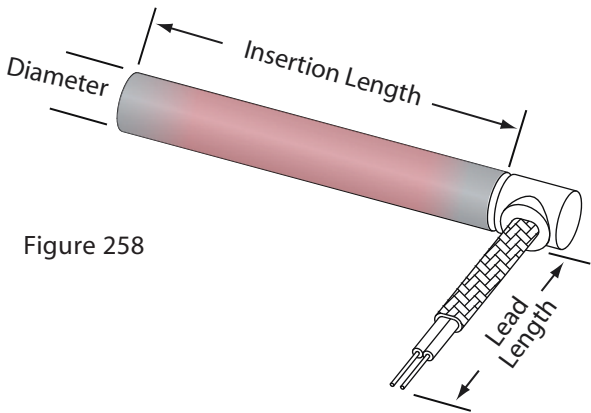


Figure 258

Right Angle Stainless Steel Braid, Figure 258

Stainless steel braid over high temperature MGT (450°C) wire exiting at right angle to the sheath. This construction is recommended in applications with flexing and where the leads must pass through metal openings or routed along metal components. This construction is desirable when space is limited and it is not feasible to bend standard leads.

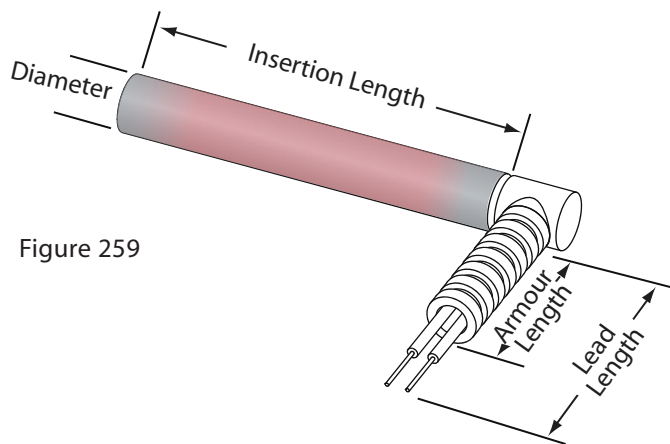


Figure 259

Right Angel Stainless Steel Armour (Hose), Figure 259

Stainless steel hose over high temperature MGT (450°C) wire exiting at right angle to the sheath. This is the strongest lead protection for use in applications where severe abrasion is present. These leads offer good flexibility and are good for moving or flexing applications.

Heater Diameter	Minimum Unheated Length
1/8"	Not Available
1/4"	1"
5/16"	1 1/2"
3/8"	1 1/2"
1/2"	1 1/2"
5/8"	1 9/16"
3/4"	1 7/8"
15/16"	1 7/8"
1"	1 7/8"

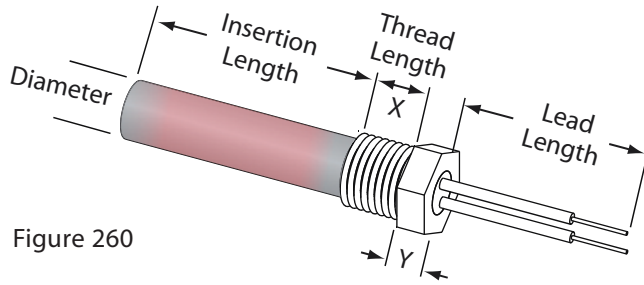


Figure 260

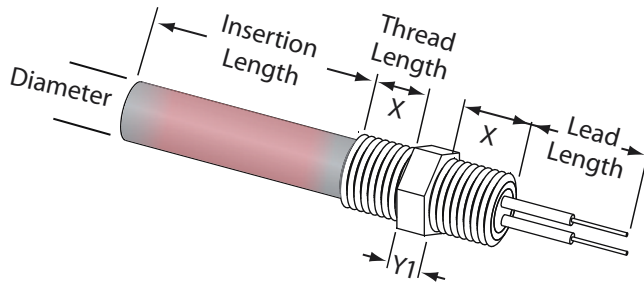


Figure 261

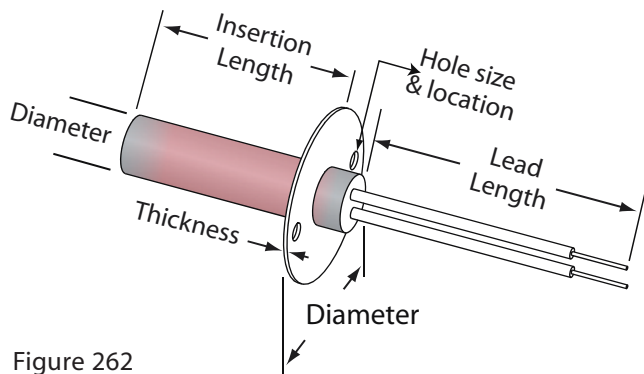


Figure 262

Single and Double Threaded Fittings, Figures 260 & 261

Single or double threaded fittings attached to sheath to allow for installation into threaded holes.

Fitting Materials - Brass, Steel and Stainless Steel

Leadwires - Fiberglass for high temperature applications
 - Teflon for moisture protection
 - Stainless Braid or Hose for flexing applications and abrasion protection

Terminal Boxes - General purpose and moisture resistant housings

Heater Diameter	NPT Size	X Dimension	Y Dimension	Y1 Dimension
1/4"	1/8-27	3/8"	3/16"	1/4"
3/8"	1/4-18	1/2"	3/16"	1/4"
1/2"	3/8-18	9/16"	1/4"	1/4"
5/8"	1/2-14	5/8"	1/4"	5/16"
3/4"	3/4-14	3/4"	1/4"	3/8"
7/8"	1-11 1/2	3/4"	1/4"	3/8"
1"	1-11 1/2	3/4"	1/4"	3/8"
1 1/4"	1 1/4-11 1/2	7/8"	5/16"	1/2"

Mounting Flanges, Figure 262

Mounting flanges are recommended for applications where vibration or movement may cause the heater to be dislodged from its hole. Stainless steel flanges are available in a variety of sizes and configurations. The standard flange is round and is supplied with two mounting holes. For heaters 5/8" diameter and under, the flange would be 1 1/2" in diameter. For larger diameter heaters the standard flange would be 2.00" in diameter.



Cartridge Heaters - other unique features

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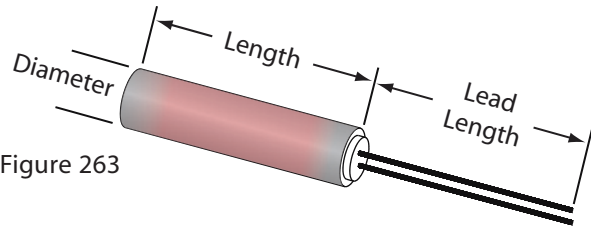


Figure 263

Teflon End Seal, Figure 263

A Teflon plug is swaged in place along with Teflon leads. This construction resists oil and water to 250°C/480°F. There is a minimum of a 1.00" unheated length at the lead end. Longer cold sections may be required if the watt density or operating temperature is high.

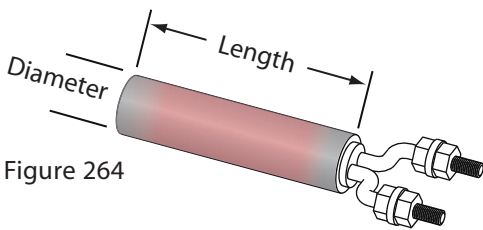


Figure 264

Screw Terminals, Figure 264

Threaded stud terminals are supplied complete with high temperature nuts and washers. Standard screw is #8-32. Available in 5/8", 3/4", 1", 16 mm and 20mm diameters heaters

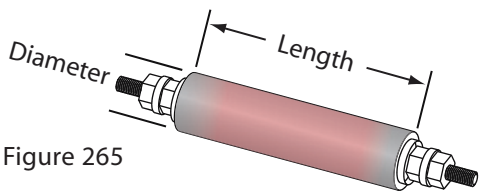


Figure 265

Double Ended Terminals, Figure 265 & 266

These terminations are ideal for applications where wiring from both ends is required. A minimum cold section of 1" is required for these leads.

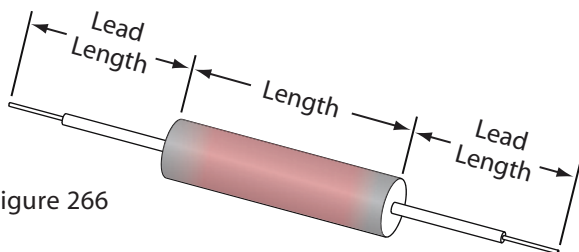


Figure 266

- Available Terminations -
- Solid nickel pins
 - Leadwires
 - Threaded studs

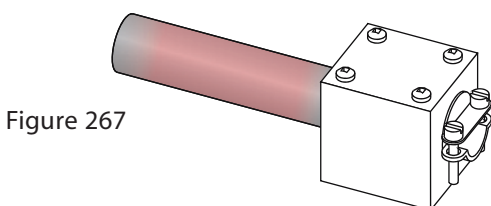


Figure 267

Terminal Boxes, Figure 267

Terminal boxes are permanently attached to the heater sheath to provide excellent protection in a variety of environments.

- Available Boxes -
- General purpose sheet metal
 - Moisture proof
 - Cast aluminum explosion resistant

Internal Thermocouples

Internal thermocouples are built into the heater assembly to monitor the internal or sheath temperatures. These are useful as high limit devices or in applications where space is at a premium. The power and sensor leads exit the sheath together and can be ordered with a variety of lead protections. Not all thermocouple configurations are available on smaller diameter heaters.

Type J and K calibrations are standard for the shown constructions.

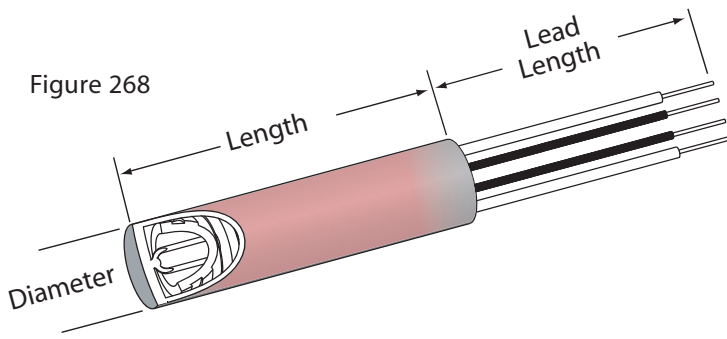


Figure 268

Grounded at Disc End, Figure 268

The thermocouple junction is grounded to the disc end of the heater. This construction is commonly used in hot runner applications. The disc end can be filled with silver solder and ground flat. This will ensure good contact when inserted into a flat end blind hole

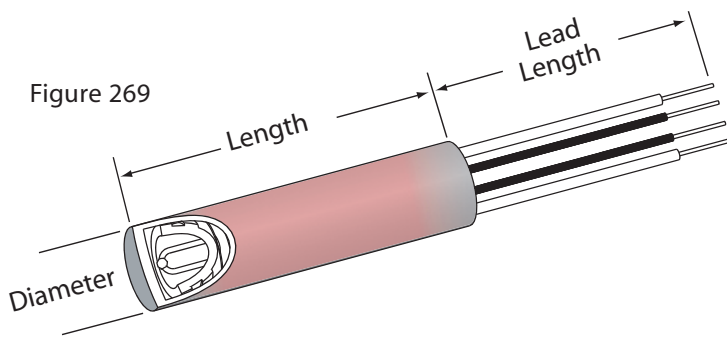


Figure 269

Ungrounded at Disc End, Figure 269

The thermocouple junction is ungrounded and is located just behind the disc end. This will give a reference temperature of the part being heated.

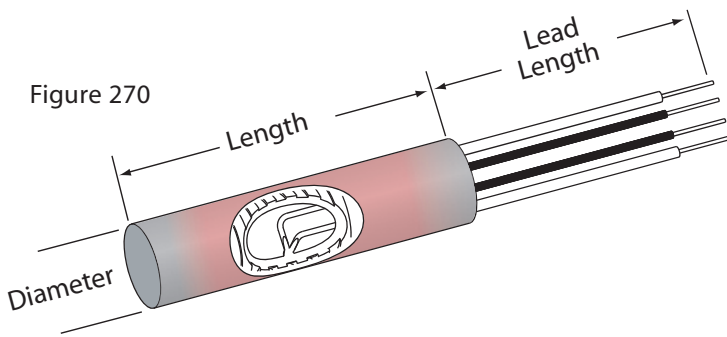


Figure 270

Grounded at Centre, Figure 270

The thermocouple junction is grounded to the sheath along the length of the heater. The standard location is at the center of the heater, but can be located anywhere along the length of the sheath. This construction will provide a quick response

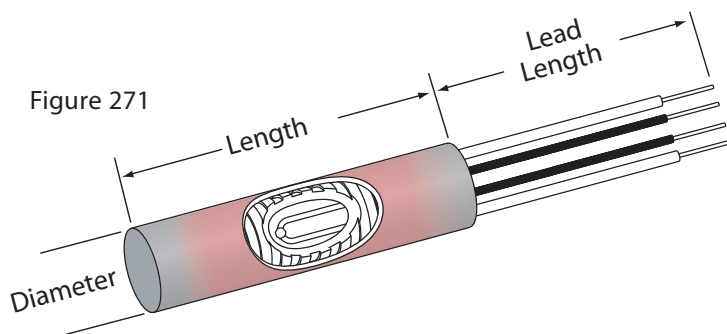


Figure 271

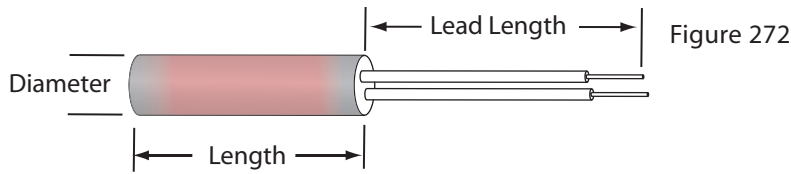
Ungrounded at Centre, Figure 271

The thermocouple junction is ungrounded and is centered in the diameter of the sheath. The standard location is at the center of the heater, but can be located anywhere along the length of the sheath. Typically used as a high limit in air or vacuum applications



Cartridge Heaters

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Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number	
1/8	1 1/2	30	120	76	CARC01J0001	1/4	2 1/2	250	120	157	CARE02J0037	
	1 1/2	60	120	154	CARC01J0002		2 1/2	250	240	157	CARE02J0038	
1/8	2	50	120	85	CARC02A0003	1/4	2 3/4	200	240	115	CARE02N0039	
	2	100	120	172	CARC02A0004		2 3/4	300	240	140	CARE02N0040	
1/4	1	80	120	136	CARE01A0005	1/4	3	125	120	72	CARE03A0041	
	1	100	120	127	CARE01A0006		3	125	240	64	CARE03A0042	
	1	100	120		CARE01A0007		3	200	240	102	CARE03A0043	
1/4	1 1/4	75	120	130	CARE01E0008	1/4	3	200	240	102	CARE03A0044	
	1 1/4	150	120	258	CARE01E0009		3	250	240	126	CARE03A0045	
	1 1/4	225	240	388	CARE01E0010		3	300	120	146	CARE03A0046	
1/4	1 1/2	30	120	34	CARE01J0011	1/4	4	100	120		CARE04A0048	
	1 1/2	100	120	130	CARE01J0012		4	200	120		CARE04A0049	
	1 1/2	100	240	130	CARE01J0013		4	200	240		CARE04A0050	
	1 1/2	125	120	140	CARE01J0014		4	300	120		CARE04A0051	
	1 1/2	150	120	170	CARE01J0015		4	300	120		CARE04A0052	
	1 1/2	200	120	258	CARE01J0016		4	300	240		CARE04A0053	
	1 1/2	200	240	258	CARE01J0017		1/4	4 1/2	350	240		CARE04J0054
1/4	1 3/4	150	120	155	CARE01N0018	1/4		5	200	240		CARE05A0055
	1 3/4	200	120	207	CARE01N0019			5	330	240		CARE05A0056
	1 3/4	200	240	207	CARE01N0020		5	400	120		CARE05A0057	
	1 3/4	300	240	310	CARE01N0021		5	400	240		CARE05A0058	
1/4	2	40	120	31	CARE02A0022	1/4	6	300	120		CARE06A0060	
	2	40	240	31	CARE02A0023		6	400	240		CARE06A0061	
	2	75	120	59	CARE02A0024	1/4	7	400	240		CARE07A0062	
	2	75	120	59	CARE02A0025		1/4	8	200	240		CARE08A0063
	2	125	120	105	CARE02A0026	8		300	120		CARE08A0064	
	2	125	240	105	CARE02A0027	8		400	240		CARE08A0065	
	2	150	120	127	CARE02A0028	1/4	10	600	240		CARE10A0066	
	2	150	120	127	CARE02A0029		1/4	11	600	240		CARE11A0067
	2	150	240	127	CARE02A0030			1/4	13	725	240	
	2	200	120	157	CARE02A0031							
	2	200	240	157	CARE02A0032							
	2	200	240	157	CARE02A0033							
	2	250	120	215	CARE02A0034							
	2	250	240	255	CARE02A0035							
	2	300	240	255	CARE02A0036							



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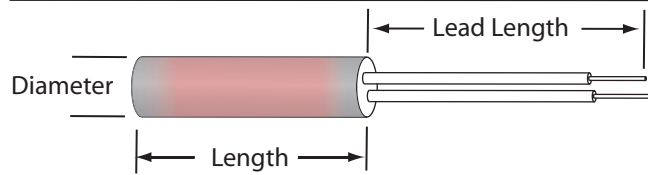
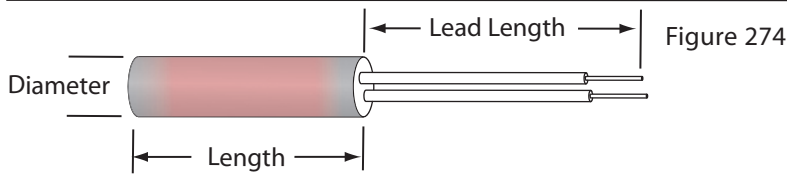


Figure 273

Dia.	Length	W	V	Watts /in ²	Catalogue Number
3/8	1	100	120	170	CARG01A0069
	1	150	120	256	CARG01A0070
	1	150	240	256	CARG01A0071
3/8	1 1/4	50	120	57	CARG01E0072
	1 1/4	80	120	108	CARG01E0073
	1 1/4	100	120	114	CARG01E0074
	1 1/4	125	120	141	CARG01E0075
	1 1/4	200	120	228	CARG01E0076
	1 1/4	200	240	228	CARG01E0077
3/8	1 3/8	150	120	146	CARG01G0078
3/8	1 7/16	100	120	91	CARG01H0079
	1 7/16	130	240	118	CARG01H0080
3/8	1 1/2	30	120	25	CARG01J0081
	1 1/2	50	120	42	CARG01J0082
	1 1/2	60	120	51	CARG01J0083
	1 1/2	75	120	64	CARG01J0084
	1 1/2	85	120	72	CARG01J0085
	1 1/2	100	240	86	CARG01J0086
	1 1/2	150	120	127	CARG01J0087
	1 1/2	150	240	127	CARG01J0088
	1 1/2	200	120	170	CARG01J0089
	1 1/2	200	240	170	CARG01J0090
	1 1/2	250	120	212	CARG01J0091
	1 1/2	250	240	212	CARG01J0092
	1 1/2	250	240	212	CARG01J0093
	3/8	1 3/4	125	120	86
1 3/4		150	240	102	CARG01N0095
1 3/4		175	120	120	CARG01N0096
1 3/4		200	240	136	CARG01N0097
1 3/4		200	240	136	CARG01N0098
1 3/4		250	120	163	CARG01N0099
1 3/4		250	240	163	CARG01N0100
1 3/4		250	240	163	CARG01N0101
3/8	2	50	120	28	CARG02A0102
	2	75	120	42	CARG02A0103
	2	100	120	57	CARG02A0104
	2	100	240	57	CARG02A0105
	2	150	120	85	CARG02A0106
	2	150	120	85	CARG02A0107

Dia.	Length	W	V	Watts /in ²	Catalogue Number
3/8	2	150	240	85	CARG02A0108
	2	165	240	94	CARG02A0109
	2	200	120	114	CARG02A0110
	2	200	240	114	CARG02A0111
	2	250	120	141	CARG02A0112
	2	250	240	141	CARG02A0113
	2	250	240	141	CARG02A0114
	2	300	120	170	CARG02A0115
	2	300	240	170	CARG02A0116
	2	400	120	226	CARG02A0117
	2	400	240	226	CARG02A0118
3/8	2 1/4	75	120	37	CARG02E0119
	2 1/4	125	120	62	CARG02E0120
	2 1/4	125	240	62	CARG02E0121
	2 1/4	250	120	121	CARG02E0122
3/8	2 1/4	250	240	121	CARG02E0123
	2 1/4	250	240	121	CARG02E0124
3/8	2 3/8	75	120	34	CARG02G0125
	2 3/8	165	120	75	CARG02G0126
	2 3/8	165	120	75	CARG02G0127
	2 3/8	165	240	75	CARG02G0128
	2 3/8	200	120	91	CARG02G0129
	2 3/8	200	240	91	CARG02G0130
	2 3/8	200	240	91	CARG02G0131
	2 3/8	250	120	113	CARG02G0132
	2 3/8	250	240	113	CARG02G0133
	2 3/8	300	120	136	CARG02G0134
2 3/8	300	240	136	CARG02G0135	
3/8	2 3/8	400	120	181	CARG02G0136
	2 1/2	100	120	42	CARG02J0137
	2 1/2	100	240	42	CARG02J0138
	2 1/2	250	240	141	CARG02J0139
	2 1/2	400	240	174	CARG02J0140
	2 1/2	500	120	215	CARG02J0141
	2 1/2	500	240	215	CARG02J0142
3/8	2 3/4	100	120	38	CARG02N0143
	2 3/4	200	120	76	CARG02N0144
	2 3/4	250	120	95	CARG02N0145
	2 3/4	275	240	104	CARG02N0146
	2 3/4	300	240	114	CARG02N0147
	2 3/4	500	240	190	CARG02N0148

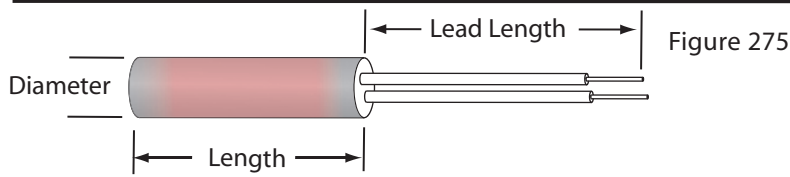


Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number		
3/8	3	100	120	34	CARG03A0149	4	4	250	120	61	CARG04A0191		
	3	100	120	34	CARG03A0150		4	250	240	61	CARG04A0192		
	3	100	240	34	CARG03A0151		4	300	120	76	CARG04A0193		
	3	150	120	51	CARG03A0152		4	300	240	76	CARG04A0194		
	3	150	240	51	CARG03A0153		4	400	120	97	CARG04A0195		
	3	200	120	68	CARG03A0154		4	400	120	97	CARG04A0196		
	3	200	240	68	CARG03A0155		4	400	240	97	CARG04A0197		
	3	225	240	76	CARG03A0156		4	450	240	109	CARG04A0198		
	3	250	120	106	CARG03A0157		4	500	120	121	CARG04A0199		
	3	250	240	86	CARG03A0158		4	500	240	121	CARG04A0200		
	3	260	240	110	CARG03A0159		4	600	240	146	CARG04A0201		
	3	300	120	102	CARG03A0160		3/8	4 1/4	400	240	91	CARG04E0202	
	3	300	120	102	CARG03A0161			4 1/2	4 1/2	300	120	65	CARG04J0203
	3	300	240	102	CARG03A0162				4 1/2	300	240	65	CARG04J0204
	3	300	240	127	CARG03A0163				4 1/2	400	120	85	CARG04J0205
3	400	120	136	CARG03A0164	4 1/2	400			240	85	CARG04J0206		
3	400	240	136	CARG03A0165	4 1/2	420			240	102	CARG04J0207		
3	450	240	153	CARG03A0166	4 1/2	500			120	106	CARG04J0208		
3	450	240	191	CARG03A0167	4 1/2	500		240	146	CARG04J0209			
3	500	120	170	CARG03A0168	4 3/4	4 3/4		300	120	60	CARG04N0210		
3/8	3	500	240	212		CARG03A0169		4 3/4	300	240	60	CARG04N0211	
	3	500	240	212		CARG03A0170		4 3/4	400	120	80	CARG04N0212	
	3	600	240	206		CARG03A0171		4 3/4	400	240	80	CARG04N0213	
3/8	3 1/2	120	120	34	CARG03J0172	4 3/4		500	240	98	CARG04N0214		
	3 1/2	250	240	71	CARG03J0173	3/8		5	150	120	29	CARG05A0215	
	3 1/2	300	120	85	CARG03J0174			5	150	240	29	CARG05A0216	
	3 1/2	300	240	85	CARG03J0175		5	200	120	38	CARG05A0217		
	3 1/2	320	240	90	CARG03J0176		5	300	120	57	CARG05A0218		
	3 1/2	350	120	92	CARG03J0177		5	300	240	57	CARG05A0219		
	3 1/2	350	240	92	CARG03J0178		5	400	120	75	CARG05A0220		
	3 1/2	400	240	113	CARG03J0179		5	470	240	90	CARG05A0221		
	3 1/2	500	120	142	CARG03J0180		5	500	120	95	CARG05A0222		
	3 1/2	500	240	142	CARG03J0181		5	500	240	95	CARG05A0223		
3/8	3 3/4	175	240	46	CARG03N0182		5	500	240	95	CARG05A0224		
	3 3/4	300	240	79	CARG03N0183	5	500	240	95	CARG05A0225			
	3 3/4	400	240	105	CARG03N0184	5	750	240	141	CARG05A0226			
	3 3/4	500	240	130	CARG03N0185	3/8	5 1/2	250	240	43	CARG05J0227		
3/8	4	125	120	30	CARG04A0186		5 1/2	300	240	51	CARG05J0228		
	4	125	240	30	CARG04A0187		5 1/2	600	240	102	CARG05J0229		
	4	150	120	36	CARG04A0188								
	4	150	240	36	CARG04A0189								
	4	200	120	49	CARG04A0190								



ASB Heating Elements Ltd.

Cartridge Heaters

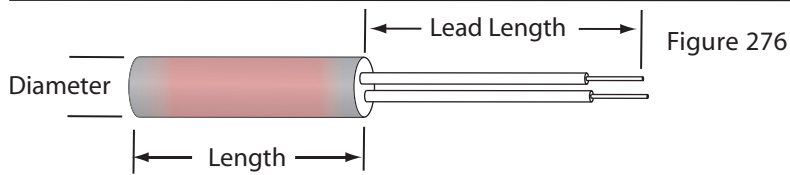


Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number		
3/8	5 3/4	400	240	65	CARG05N0230	3/8	8	300	120	34	CARG08A0265		
	5 3/4	500	240	81	CARG05N0231		8	300	240	34	CARG08A0266		
	5 3/4	600	120	97	CARG05N0232		8	300	240	34	CARG08A0267		
	5 3/4	600	240	97	CARG05N0233		8	500	120	57	CARG08A0268		
3/8	6	225	120	35	CARG06A0234		8	500	240	57	CARG08A0269		
	6	225	240	35	CARG06A0235		8	600	120	68	CARG08A0270		
	6	400	120	58	CARG06A0236		8	600	240	68	CARG08A0271		
	6	400	240	58	CARG06A0237		8	650	240	79	CARG08A0272		
	6	500	120	77	CARG06A0238		8	775	240	96	CARG08A0273		
	6	500	240	77	CARG06A0239		8	1000	240	113	CARG08A0274		
	6	500	240	77	CARG06A0240		3/8	9	500	240	50	CARG09A0275	
	6	500	240	77	CARG06A0241			9	885	240	94	CARG09A0276	
	6	575	240	85	CARG06A0242			9	1000	240	100	CARG09A0277	
	3/8	6	600	120	93		CARG06A0242	3/8	9 1/2	600	240	57	CARG09J0278
		6	600	240	93		CARG06A0243		9 1/2	1000	240	95	CARG09J0279
		6	600	240	93		CARG06A0244	3/8	10	600	120	54	CARG10A0280
6		600	240	93	CARG06A0245	10	600		240	54	CARG10A0281		
6		750	240	116	CARG06A0245	10	1000		240	90	CARG10A0282		
6		1000	240	165	CARG06A0246	3/8	12	500	240	37	CARG12A0283		
3/8		6 1/2	600	240	86		CARG06J0247	12	600	240	44	CARG12A0284	
		6 1/2	1000	240	142		CARG06J0248	12	1000	240	74	CARG12A0285	
3/8	6 3/4	300	240	41	CARG06N0249	3/8	12 3/4	1000	240	68	CARG12N0286		
	3/8	7	350	120	46		CARG07A0250	1/2	1 1/4	125	120	108	CARJ01E0287
		7	350	240	46		CARG07A0251		1 1/4	125	240	108	CARJ01E0288
		7	400	120	52	CARG07A0252	1 1/4		200	240	171	CARJ01E0289	
		7	450	240	60	CARG07A0253	1/2		1 1/2	150	120	96	CARJ01J0290
		7	500	240	65	CARG07A0254			1 1/2	150	240	96	CARJ01J0291
		7	500	240	65	CARG07A0254			1 1/2	200	120	128	CARJ01J0292
		7	600	240	80	CARG07A0255			1 1/2	200	240	128	CARJ01J0293
		7	675	240	95	CARG07A0256			1 1/2	250	240	159	CARJ01J0294
	7	1000	240	131	CARG07A0257	1/2	1 3/4	200	240	102	CARJ01N0295		
3/8	7 1/4	600	240	76	CARG07E0258		1 3/4	250	120	128	CARJ01N0296		
	7 1/2	300	240	36	CARG07J0259		1 3/4	300	240	154	CARJ01N0297		
3/8	7 1/2	600	120	73	CARG07J0260		1 3/4	400	240	205	CARJ01N0298		
	7 1/2	600	120	73	CARG07J0261								
	7 1/2	600	240	73	CARG07J0262								
	7 1/2	600	240	73	CARG07J0262								
	7 1/2	1000	240	122	CARG07J0263								
3/8	7 3/4	750	240	85	CARG07N0264								



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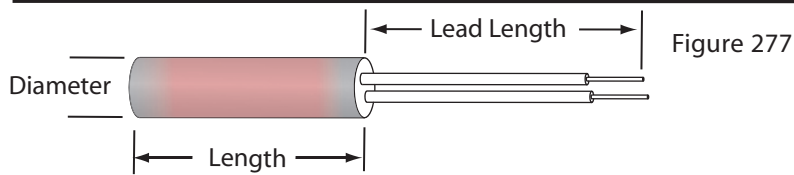


Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number		
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	2	200	120	85	CARJ02A0300		3	400	240	102	CARJ03A0340		
	2	200	240	85	CARJ02A0301		3	500	120	127	CARJ03A0341		
	2	250	120	106	CARJ02A0302		3	500	240	127	CARJ03A0342		
	2	250	240	106	CARJ02A0303		3	600	120	153	CARJ03A0343		
	2	300	120	128	CARJ02A0304		3	600	240	153	CARJ03A0344		
	2	300	240	128	CARJ02A0305		3	750	120	192	CARJ03A0345		
	2	400	120	170	CARJ02A0306		3	750	240	192	CARJ03A0346		
	2	400	240	170	CARJ02A0307								
	2	500	120	214	CARJ02A0308								
1/2	2 1/4	125	120	45	CARJ02E0309	1/2	3 1/2	250	120	53	CARJ03J0347		
	2 1/4	250	120	91	CARJ02E0310		3 1/2	250	240	53	CARJ03J0348		
	2 1/4	250	240	91	CARJ02E0311		3 1/2	350	240	75	CARJ03J0349		
	2 1/4	400	120	147	CARJ02E0312		3 1/2	420	240	97	CARJ03J0350		
	2 1/4	400	240	147	CARJ02E0313		3 1/2	500	120	106	CARJ03J0351		
						3 1/2	500	240	106	CARJ03J0352			
1/2	2 3/8	100	240	25	CARJ02G0314	1/2	3 3/4	250	120	49	CARJ03N0353		
	2 3/8	225	120	76	CARJ02G0315		3 3/4	500	120	98	CARJ03N0354		
	2 3/8	400	120	136	CARJ02G0316		3 3/4	500	240	98	CARJ03N0355		
	2 3/8	400	240	136	CARJ02G0317		3 3/4	1000	240	197	CARJ03N0356		
	2 3/8	475	120	161	CARJ02G0318								
	2 3/8	475	240	161	CARJ02G0319								
1/2	2 1/2	100	120	32	CARJ02J0320	1/2	4	150	120	27	CARJ04A0357		
	2 1/2	100	240	32	CARJ02J0321		4	150	240	27	CARJ04A0358		
	2 1/2	120	120	38	CARJ02J0322		4	250	120	45	CARJ04A0359		
	2 1/2	150	240	46	CARJ02J0323		4	250	240	45	CARJ04A0360		
	2 1/2	300	120	96	CARJ02J0324		4	300	120	56	CARJ04A0361		
	2 1/2	300	240	96	CARJ02J0325		4	300	240	56	CARJ04A0362		
	2 1/2	500	120	160	CARJ02J0326		4	400	120	73	CARJ04A0363		
	2 1/2	500	240	160	CARJ02J0327		4	400	240	73	CARJ04A0364		
							4	400	240	73	CARJ04A0365		
					4	490	240	90	CARJ04A0366				
1/2	2 3/4	250	120	71	CARJ02N0328	4	500	120	91	CARJ04A0367			
	2 3/4	400	120	114	CARJ02N0329	4	500	240	91	CARJ04A0368			
	2 3/4	400	240	114	CARJ02N0330	4	750	240	137	CARJ04A0369			
					4	1000	240	184	CARJ04A0370				
1/2	3	150	120	38	CARJ03A0331	1/2	4 1/2	300	240	48	CARJ04J0371		
	3	150	240	38	CARJ03A0332		4 1/2	350	120	56	CARJ04J0372		
	3	200	120	51	CARJ03A0333		4 1/2	500	240	80	CARJ04J0373		
	3	200	240	51	CARJ03A0334		4 1/2	750	240	119	CARJ04J0374		
	3	250	120	64	CARJ03A0335	1/2	4 3/4	200	240	30	CARJ04N0375		
	3	250	240	64	CARJ03A0336		4 3/4	300	240	44	CARJ04N0376		
	3	300	120	76	CARJ03A0337		4 3/4	500	240	75	CARJ04N0377		
	3	300	240	76	CARJ03A0338		4- 3/4	1000	240	148	CARJ04N0378		

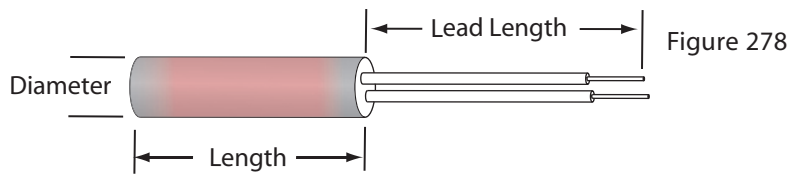


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Cartridge Heaters



Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number	
1/2	5	200	120	28	CARJ05A0379	1/2	6 3/4	500	120	51	CARJ06N0418	
	5	200	240	28	CARJ05A0380		6 3/4	500	240	51	CARJ06N0419	
	5	300	240	42	CARJ05A0381	1/2	7	350	240	34	CARJ07A0420	
	5	350	120	50	CARJ05A0382		7	500	120	49	CARJ07A0421	
	5	350	240	50	CARJ05A0383		7	500	240	49	CARJ07A0422	
	5	400	120	57	CARJ05A0384		7	600	240	59	CARJ07A0423	
	5	400	240	57	CARJ05A0385		7	900	240	95	CARJ07A0424	
	5	500	240	71	CARJ05A0386		7	1000	240	98	CARJ07A0425	
	5	625	240	99	CARJ05A0387	1/2	7 1/2	500	240	46	CARJ07J0426	
	5	750	240	107	CARJ05A0388		7 1/2	1000	240	91	CARJ07J0427	
	5	800	240	113	CARJ05A0389	1/2	7 3/4	1000	240	88	CARJ07N0428	
	5	1000	240	142	CARJ05A0390		7 3/4	1200	240	106	CARJ07N0429	
					7 3/4		1500	240	132	CARJ07N0430		
1/2	5 1/4	250	120	33	CARJ05E0391	1/2	8	300	120	25	CARJ08A0431	
	5 1/4	250	240	33	CARJ05E0392		8	300	240	25	CARJ08A0432	
1/2	5 1/2	500	120	65	CARJ05J0393		8	400	120	34	CARJ08A0433	
	5 1/2	500	240	65	CARJ05J0394		8	400	240	34	CARJ08A0434	
	5 1/2	700	240	89	CARJ05J0395	8	500	120	42	CARJ08A0435		
	5 1/2	750	240	96	CARJ05J0396	8	500	240	42	CARJ08A0436		
1/2	5 3/4	350	240	42	CARJ05N0397	8	600	240	51	CARJ08A0437		
	5 3/4	500	120	61	CARJ05N0398	8	800	240	68	CARJ08A0438		
	5 3/4	500	240	61	CARJ05N0399	8	1000	240	85	CARJ08A0439		
	5 3/4	1000	240	122	CARJ05N0400	8	1000	240	85	CARJ08A0440		
1/2	5 13/16	700	240	84	CARJ05P0401	8	1050	240	93	CARJ08A0441		
1/2	6	200	120	23	CARJ06A0402	8	1500	240	130	CARJ08A0442		
	6	300	120	35	CARJ06A0403	8	1500	240	130	CARJ08A0443		
	6	300	240	35	CARJ06A0404	8	2000	240	171	CARJ08A0444		
	6	350	240	40	CARJ06A0405	1/2	8 1/2	300	240	23	CARJ08J0445	
	6	500	120	58	CARJ06A0406		8 1/2	500	240	40	CARJ08J0446	
	6	500	240	58	CARJ06A0407		8 1/2	1000	240	85	CARJ08J0447	
	6	500	240	58	CARJ06A0408		8 1/2	1000	240	85	CARJ08J0448	
	6	700	240	82	CARJ06A0409		8 1/2	1100	240	93	CARJ08J0449	
	6	750	240	88	CARJ06A0410		1/2	8 3/4	1000	240	77	CARJ08N0450
	6	775	240	99	CARJ06A0411	1/2		9	500	240	37	CARJ09A0451
	6	1000	120	116	CARJ06A0412		9	900	240	70	CARJ09A0452	
	6	1000	240	116	CARJ06A0413		9	1000	240	75	CARJ09A0453	
	6	1000	240	116	CARJ06A0414		9	1200	240	98	CARJ09A0454	
	6	1200	240	140	CARJ06A0415		1/2	9 1/2	500	240	35	CARJ09J0455
	1/2	6 1/2	500	240		CARJ06J0416						
		6 1/2	1000	240		CARJ06J0417						



Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number
	9 1/2	1000	240	71	CARJ09J0456	5/8	1 1/2	250	120	126	CARL01J0488
						5/8	1 1/2	250	240	126	CARL01J0489
1/2	10	500	120	34	CARJ10A0457	5/8	2	200	120	68	CARL02A0490
	10	500	240	34	CARJ10A0458	5/8	2	200	240	68	CARL02A0491
	10	600	240	40	CARJ10A0459	5/8	2 3/8	280	120	81	CARL02G0492
	10	750	240	50	CARJ10A0460	5/8	2 3/8	280	120	81	CARL02G0493
	10	1000	240	67	CARJ10A0461	5/8	2 3/8	280	240	81	CARL02G0494
	10	1000	240	67	CARJ10A0462	5/8	2 3/8	350	120	102	CARL02G0495
	10	1500	240	101	CARJ10A0463	5/8	2 3/8	350	120	102	CARL02G0496
	10	1500	120	101	CARJ10A0464	5/8	2 1/2	150	120	41	CARL02J0497
	10	2000	240	134	CARJ10A0465	5/8	2 1/2	180	120	49	CARL02J0498
1/2	10 1/8	1000	120	74	CARJ10C0466	5/8	2 1/2	200	120	54	CARL02J0499
1/2	10 1/8	1400	240	94	CARJ10J0467	5/8	2 1/2	275	120		CARL02J1500
1/2	11	1000	240	61	CARJ11A0468	5/8	3	150	120	30	CARL03A0501
	11	1470	240	88	CARJ11A0469	5/8	3	250	120	51	CARL03A0502
	11	1500	240	91	CARJ11A0470	5/8	3	250	240	51	CARL03A0503
1/2	11 1/2	1525	240	94	CARJ11J0471	5/8	3	500	120	107	CARL03A0504
1/2	12	500	240	28	CARJ12A0472	5/8	3	500	240	107	CARL03A0505
	12	1000	240	55	CARJ12A0473	5/8	3	500	240	107	CARL03A0506
	12	1000	240	55	CARJ12A0474	5/8	3	750	240	154	CARL03A0507
	12	1000	240	55	CARJ12A0475	5/8	3 1/2	525	240	93	CARL03J0508
	12	1500	240	83	CARJ12A0476	5/8	3 3/4	240	120	39	CARL03N0509
	12	1500	240	83	CARJ12A0477	5/8	3 3/4	240	240	39	CARL03N0510
	12	2000	240	111	CARJ12A0478	5/8	3 3/4	525	120	86	CARL03N0511
1/2	12 1/2	1675	240	92	CARJ12J0479	5/8	3 3/4	525	120	86	CARL03N0512
1/2	14	1000	240	47	CARJ14A0480	5/8	3 3/4	525	240	86	CARL03N0513
	14	1700	240	83	CARJ14A0481	5/8	3 3/4	750	240	118	CARL03N0514
	14	2300	240	108	CARJ14A0482	5/8	4	250	120	38	CARL04A0515
1/2	15	2000	240	88	CARJ15A0483	5/8	4	250	240	38	CARL04A0516
1/2	16	900	240	37	CARJ16A0484	5/8	4	400	240	58	CARL04A0517
1/2	16 1/2	2200	240	90	CARJ16J0485	5/8	4	500	240	73	CARL04A0518
1/2	18	1700	240	62	CARJ18A0486	5/8	4	525	240	79	CARL04A0519
1/2	19 1/2	2875	240	99	CARJ19JA0487	5/8	4	600	240	88	CARL04A0520
						5/8	4	750	240	113	CARL04A0521
						5/8	4	1000	240	151	CARL04A0522
						5/8	4 1/2	700	120	92	CARL04J0523
						5/8	4 1/2	700	240	92	CARL04J0524



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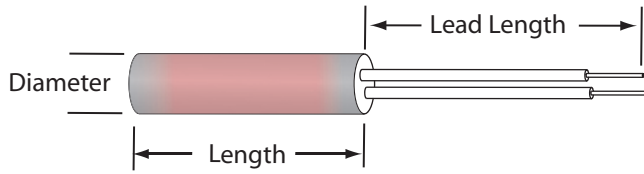
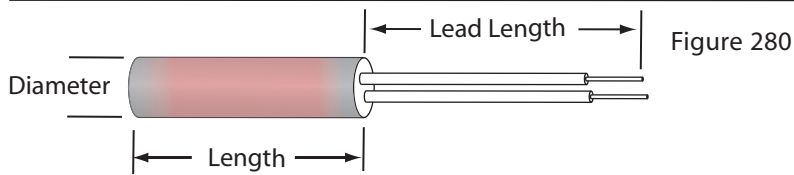


Figure 279

Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number		
5/8	4 3/4	250	240		CARL04N0525	8	8	1200	240	83	CARL08A0562		
	4 3/4	750	240	90	CARL04N0526			1500	240	102	CARL08A0563		
5/8	5	250	240	27	CARL05A0527	5/8	8 3/4	1700	240	105	CARL08N0564		
	5	300	240	35	CARL05A0528			5/8	9	550	240	33	CARL09A0565
	5	500	240	56	CARL05A0529					1000	240	64	CARL09A0566
	5	750	240	86	CARL05A0530					1700	240	103	CARL09A0567
	5	1000	240	112	CARL05A0531					5/8	10	500	240
5/8	5 3/8	800	120	86	CARL05G0532	600	240	33	CARL10A0569				
	5 3/8	800	240	86	CARL05G0533	650	120	35	CARL10A0570				
5/8	5 3/4	500	240	48	CARL05N0534	750	240	84	CARL10A0571				
	5 3/4	1000	240	97	CARL05N0535	1000	240	54	CARL10A0572				
	5 3/4	1500	240	146	CARL05N0536	1000	240	54	CARL10A0573				
5/8	6	300	240	28	CARL06A0537	1500	240	81	CARL10A0574				
	6	375	240	36	CARL06A0538	2000	240	108	CARL10A0575				
	6	500	240	47	CARL06A0539	5/8	11	1000	240	51	CARL11A0576		
	6	600	240	57	CARL06A0540			1500	240	74	CARL11A0577		
	6	750	240	71	CARL06A0541	5/8	12	500	240	22	CARL12A0578		
	6	1000	240	95	CARL06A0542			775	240	35	CARL12A0579		
	6	1000	240	95	CARL06A0543			1000	240	46	CARL12A0580		
	6	1500	240	139	CARL06A0544			1500	240	67	CARL12A0581		
6	1500	240	139	CARL06A0544	2000			240	89	CARL12A0582			
5/8	6 1/2	350	120	30	CARL06J0545	5/8	13	850	240	35	CARL13A0583		
	6 1/2	350	240	30	CARL06J0546			1500	240	59	CARL13A0584		
	6 1/2	500	240	43	CARL06J0547	5/8	14	900	240	34	CARL14A0585		
	6 1/2	600	240	52	CARL06J0548			1500	240	59	CARL14A0586		
	6 1/2	900	240	78	CARL06J0549			3700	240	138	CARL14A0587		
5/8	6 3/4	500	240	40	CARL06N0550	5/8	15	600	240	21	CARL15A0588		
	6 3/4	1000	240	81	CARL06N0551			975	240	35	CARL15A0589		
5/8	7	1000	240	85	CARL07A0552	5/8	15	2400	240	85	CARL15A0590		
	7	1500	240	117	CARL07A0553			4000	240	140	CARL15A0591		
5/8	7 3/4	400	240	28	CARL07N0554			5/8	16	1050	240	35	CARL16A0592
	7 3/4	500	240	35	CARL07N0555					4500	240	145	CARL16A0593
	7 3/4	1000	240	70	CARL07N0556	5/8	17	1000	240	32	CARL17A0594		
	7 3/4	1500	240	105	CARL07N0557			5/8	18	1500	240	43	CARL18A0595
5/8	8	500	240	35	CARL08A0558	2000	240			60	CARL18A0596		
	8	850	240	62	CARL08A0559								
	8	1000	240	69	CARL08A0560								
	8	1000	240	69	CARL08A0561								



Dia.	Length	W	V	Watts /in ²	Catalogue Number	Dia.	Length	W	V	Watts /in ²	Catalogue Number	
	18	4700	240	135	CARL18A0597		8	600	240	36	CARN08A0629	
5/8	20	1000	240	27	CARL20A0598		8	700	240	40	CARN08A0630	
	20	2500	240	66	CARL20A0599		8	1000	240	68	CARN08A0631	
	20	4700	240	122	CARL20A0600		8	1350	240	78	CARN08A0632	
	20	4700	240	122	CARL20A0600		8	2000	240	115	CARN08A0633	
5/8	22	1000	240	25	CARL22A0601	3/4	9	2000	240	101	CARN09A0634	
3/4	3	500	240	85	CARN03A0602	3/4	9 3/4	2000	240	92	CARN09N0635	
3/4	3 3/4	500	240	65	CARN03N0603	3/4	10	600	240	27	CARN10A0636	
	3 3/4	1000	240	131	CARN03N0604		10	800	240	36	CARN10A0637	
3/4	4	300	240	38	CARN04A0605		10	800	240	36	CARN10A0638	
	4	525	240	66	CARN04A0606		10	1000	240	46	CARN10A0639	
	4	525	240	66	CARN04A0607		10	1200	240	54	CARN10A0640	
	4	1000	240	122	CARN04A0608		10	2000	240	49	CARN10A0641	
3/4	4 1/2	350	120	42	CARN04J0609		3/4	11 3/4	1000	240	37	CARN11N0642
3/4	4 3/4	750	240	75	CARN04N0610			11 3/4	1500	240	56	CARN11N0643
	5	500	240	49	CARN05A0611	11 3/4		2000	240	75	CARN11N0644	
	5	500	240	49	CARN05A0612	3/4	12	600	240	46	CARN12A0645	
	5	700	240	68	CARN05A0613		12	800	240	54	CARN12A0646	
	5	1000	240	95	CARN05A0614		12	950	240	49	CARN12A0647	
3/4	5 3/4	1000	240	81	CARN05N0615		12	1500	240	56	CARN12A0648	
	5 3/4	1100	240	89	CARN05N0616		12	2000	240	75	CARN12A0649	
3/4	6	350	120	28	CARN06A0617	3/4	13	1000	240	34	CARN13A0650	
	6	350	240	28	CARN06A0618		3/4	14	1100	240	35	CARN14A0651
	6	500	240	39	CARN06A0619			14	1400	240	45	CARN14A0652
	6	750	240	59	CARN06A0620	14		2500	240	78	CARN14A0653	
	6	1100	240	87	CARN06A0621	3/4	14 3/4	1500	240	44	CARN14N0654	
	6	1500	240	115	CARN06A0622		3/4	16	1000	240	28	CARN16A0655
3/4	7	500	240	33	CARN07A0623	16		1250	240	35	CARN16A0656	
	7	1000	240	65	CARN07A0624	16		1500	240	44	CARN10A0657	
3/4	7 1/2	450	120	32	CARN07J0625	16		1800	240	49	CARN16A0658	
	7 3/4	1350	240	79	CARN07N0626	3/4	18	1450	240	35	CARN18A0659	
3/4	8	350	240	20	CARN08A0627		18	2000	240	49	CARN18A0660	
	8	500	240	28	CARN08A0628	3/4	20	2200	240	48	CARN20A0661	
3/4	24	1950	240	35	CARN24A0662		3/4	24	2750	240	50	CARN24A0663
	24	2750	240	50	CARN24A0663							