AIR CARBON ARC GOUGING DATA

The air carbon arc process is flexible, efficient, and cost effective on practically any metal; carbon steel, stainless steel and other ferrous alloys; gray, malleable and ductile cast iron; aluminum; nickel; copper alloys and other nonferrous metals. Single-phase machines with low open-circuit voltage may not work for air carbon arc gouging (CAC-A). However, any three-phase welding power source of sufficient capacity may be used for air carbon arc gouging. The arc voltage used in air carbon arc gouging and cutting ranges from a low of 35 to a high of 56 volts; thus the open-circuit voltage should be at least 60 volts. The actual arc voltage is governed by arc length and the type of gouging. For most applications CAC-A is used with DCEP (reverse polarity). The electrode should extend at most 7 inches from the gouging torch with the air jet between the electrode and workpiece.
A minimum extension of 2" should be used to prevent damage to the torch parts. Normal compressed air pressures for CAC-A range between 80 psi and 100 psi at the torch; higher pressures may be used, but they don't remove metal more efficiently. Use 60 psi (413.7 kPa) with the light-duty manual torch. The air hose supplying air to the torch body should have an inside diameter of at least 3/8" (6.4 mm).

SUGGESTED CURRENT RANGES FOR COMMONLY USED ELECTRODE TYPES AND SIZES

Electrode Diameter		DC Electrode With DCEP		AC Electrode WIth AC		AC Electrode With DCEN	
in.	mm	Minimum Amps	Maximum Amps	Minimum Amps	Maximum Amps	Minimum Amps	Maximum Amps
1/8	3.2	60	90	-	-	-	-
5/32	4.0	90	150	-	-	-	-
3/16	4.8	200	250	200	250	150	180
1/4	6.4	300	400	300	400	200	250
5/16	7.9	350	450	-	-	-	-
3/8	9.5	450	600	350	450	300	400
1/2	12.7	800	1000	-	-	-	-
5/8	15.9	1000	1250	-	-	-	-
3/4	19.1	1250	1600	-	-	-	-
1	25.4	1600	2200	-	-	-	-

RECOMMENDED MINIMUM AIR REQUIREMENTS

					Recommended Compressor Rating					
	(1) AIr Pressure		Air Consumption		Intermittent Use		Continuous Use		ASME Receiver Size	
Type of Torch	psi	kPa	cfm	L/min	hp	kW	hp	kW	gal	litres
Light Duty (2)	40	280	8	227	.5	0.4	1.5	1.1	60	227
General Duty (2)	80	550	25	708	5.0	3.7	7.5	5.6	80	303
Multipurpose (3)	80	550	33	934	7.5	5.6	10	7.5	80	303
Automatic (4)	60	414	46	1303			15	11.2	80	303

1. Pressure while torch is in operation.
2. Accommodates flat electrodes.
3. Generally considered a foundry torch.
4. Requires some kind of mechanical manipulation.

PERMISSIBLE NOISE EXPOSURE

Ear protection is recommended when noise from the air carbon arc process exceeds permissible levels as listed in OSHA 1910.95

Duration Per Day	Sound Level DBA (in hours) Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/4 or less	115