

⊖ External HF Starter Required

Δ Tandem Controller Required

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
							V	ipm
All	All	GMAW CV	STD CV		5	Pinch	10 — 45	V
		GMAW Power	Power Mode®		40	Pinch	0.1 — 40	kW
Steel	0.030	GMAW CV	CV	CO <sub>2</sub>	93	Pinch	75 — 1200	ipm (1.91 — 30.48 m/min)
			Argon Mix	94	75 — 1200		ipm (1.91 — 30.48 m/min)	
		GMAW Pulse	Pulse	Argon Mix	95	UltimArc®	65 — 1200	ipm (1.65 — 30.48 m/min)
	0.035	GMAW CV	CV	CO <sub>2</sub>	10	Pinch	50 — 1200	ipm (1.27 — 30.48 m/min)
			Argon Mix	11	50 — 1200		ipm (1.27 — 30.48 m/min)	
		GMAW Pulse	Pulse	Argon Mix	12	UltimArc®	60 — 1200	ipm (1.52 — 30.48 m/min)
			RapidArc®	Argon Mix	13		60 — 1200	ipm (1.52 — 30.48 m/min)
			Precision Pulse™	Argon Mix	411		100 — 600	ipm (2.54 — 15.24 m/min)
	0.040	GMAW CV	CV	CO <sub>2</sub>	138	Pinch	50 — 1200	ipm (1.27 — 30.48 m/min)
			Argon Mix	139	50 — 1200		ipm (1.27 — 30.48 m/min)	
		GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 — 1200	ipm (1.52 — 30.48 m/min)
			RapidArc®	Argon Mix	141		60 — 1200	ipm (1.52 — 30.48 m/min)
			Precision Pulse™	Argon Mix	412		75 — 600	ipm (1.91 — 15.24 m/min)
	0.045	GMAW CV	CV	CO <sub>2</sub>	20	Pinch	50 — 735	ipm (1.27 — 18.67 m/min)
			Argon Mix	21	50 — 655		ipm (1.27 — 16.64 m/min)	
		GMAW Pulse	Pulse	Argon Mix	22	UltimArc®	50 — 760	ipm (1.27 — 19.3 m/min)
			RapidArc®	Argon Mix	18		75 — 800	ipm (1.91 — 20.32 m/min)
			Precision Pulse™	Argon Mix	413		75 — 600	ipm (1.91 — 15.24 m/min)
	0.052	GMAW CV	CV	CO <sub>2</sub>	24	Pinch	50 — 600	ipm (1.27 — 15.24 m/min)
			Argon Mix	25	50 — 480		ipm (1.27 — 12.19 m/min)	
		GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 — 575	ipm (1.27 — 14.61 m/min)
			RapidArc®	Argon Mix	27		60 — 635	ipm (1.52 — 16.13 m/min)
			Precision Pulse™	Argon Mix	414		75 — 500	ipm (1.91 — 12.7 m/min)
	1/16	GMAW CV	CV	Argon Mix	107	Pinch	50 — 700	ipm (1.27 — 17.78 m/min)
GMAW Pulse		Pulse	Argon Mix	108	UltimArc®	50 — 315	ipm (1.27 — 8 m/min)	
Stainless	0.030	GMAW CV	CV	Argon Mix	61	Pinch	100 — 1200	ipm (2.54 — 30.48 m/min)
			He Ar CO <sub>2</sub>	63	100 — 1200		ipm (2.54 — 30.48 m/min)	
		GMAW Pulse	Pulse	He Ar CO <sub>2</sub>	64	UltimArc®	90 — 1200	ipm (2.29 — 30.48 m/min)
			Argon Mix	66	80 — 1200		ipm (2.03 — 30.48 m/min)	
			Precision Pulse™	Argon Mix	420	UltimArc®	100 — 800	ipm (2.54 — 20.32 m/min)
			He Ar CO <sub>2</sub>	430	100 — 800		ipm (2.54 — 20.32 m/min)	
	0.035	GMAW CV	CV	Argon Mix	31	Pinch	75 — 1200	ipm (1.91 — 30.48 m/min)
			He Ar CO <sub>2</sub>	33	75 — 1200		ipm (1.91 — 30.48 m/min)	
		GMAW Pulse	Pulse	He Ar CO <sub>2</sub>	34	UltimArc®	75 — 1200	ipm (1.91 — 30.48 m/min)
			Argon Mix	36	60 — 1200		ipm (1.52 — 30.48 m/min)	
			Precision Pulse™	Argon Mix	421	UltimArc®	100 — 600	ipm (2.54 — 15.24 m/min)
			He Ar CO <sub>2</sub>	431	100 — 700		ipm (2.54 — 17.78 m/min)	
	0.045	GMAW CV	CV	Argon Mix	41	Pinch	75 — 730	ipm (1.91 — 18.54 m/min)
			He Ar CO <sub>2</sub>	43	75 — 685		ipm (1.91 — 17.4 m/min)	
		GMAW Pulse	Pulse	He Ar CO <sub>2</sub>	44	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)
			Argon Mix	46	50 — 705		ipm (1.27 — 17.91 m/min)	
		Precision Pulse™	Argon Mix	423	UltimArc®	50 — 400	ipm (1.27 — 10.16 m/min)	
		He Ar CO <sub>2</sub>	433	60 — 400		ipm (1.52 — 10.16 m/min)		
1/16	GMAW CV	CV	Argon Mix	51	Pinch	50 — 310	ipm (1.27 — 7.87 m/min)	
	GMAW Pulse	Pulse	Argon Mix	56	UltimArc®	50 — 345	ipm (1.27 — 8.76 m/min)	
Metal Core	0.045	GMAW CV	CV	Argon Mix	81	Pinch	100 — 700	ipm (2.54 — 17.78 m/min)
		GMAW Pulse	Pulse	Argon Mix	82	UltimArc®	50 — 700	ipm (1.27 — 17.78 m/min)
			RapidArc®	Argon Mix	87		75 — 800	ipm (1.91 — 20.32 m/min)
	0.052	GMAW CV	CV	Argon Mix	83	Pinch	50 — 600	ipm (1.27 — 15.24 m/min)
		GMAW Pulse	Pulse	Argon Mix	84	UltimArc®	50 — 570	ipm (1.27 — 14.48 m/min)
			RapidArc®	Argon Mix	88		60 — 575	ipm (1.52 — 14.61 m/min)
	1/16	GMAW CV	CV	Argon Mix	85	Pinch	50 — 415	ipm (1.27 — 10.54 m/min)
		GMAW Pulse	Pulse	Argon Mix	86	UltimArc®	50 — 365	ipm (1.27 — 9.27 m/min)
RapidArc®	Argon Mix		89	60 — 425	ipm (1.52 — 10.8 m/min)			

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			Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)		
	Type	Size								
<b>GMAW</b>	Aluminum 4XXX	0.035	GMAW CV	CV	Argon	148	Pinch	150 — 750	ipm (3.81 — 19.05 m/min)	
			GMAW Pulse	Pulse	Argon	149	UltimArc®	125 — 800	ipm (3.18 — 20.32 m/min)	
				CC Pulse	Argon	150		125 — 800	ipm (3.18 — 20.32 m/min)	
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	98	Frequency	125 — 800	ipm (3.18 — 20.32 m/min)		
		3/64	GMAW CV	CV	Argon	71	Pinch	125 — 700	ipm (3.18 — 17.78 m/min)	
				GMAW Pulse	Pulse	Argon	72	UltimArc®	85 — 600	ipm (2.16 — 15.24 m/min)
					CC Pulse	Argon	69		85 — 600	ipm (2.16 — 15.24 m/min)
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	99	Frequency	85 — 500	ipm (2.16 — 12.7 m/min)		
		1/16	GMAW CV	CV	Argon	73	Pinch	75 — 375	ipm (1.91 — 9.53 m/min)	
	GMAW Pulse			Pulse	Argon	74	UltimArc®	75 — 350	ipm (1.91 — 8.89 m/min)	
				CC Pulse	Argon	79		75 — 350	ipm (1.91 — 8.89 m/min)	
	GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	100	Frequency	80 — 400	ipm (2.03 — 10.16 m/min)			
	Aluminum 5XXX	0.035	GMAW CV	CV	Argon	151	Pinch	175 — 750	ipm (4.45 — 19.05 m/min)	
			GMAW Pulse	Pulse	Argon	152	UltimArc®	150 — 800	ipm (3.81 — 20.32 m/min)	
				CC Pulse	Argon	153		150 — 800	ipm (3.81 — 20.32 m/min)	
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	101	Frequency	140 — 800	ipm (3.56 — 20.32 m/min)		
		3/64	GMAW CV	CV	Argon	75	Pinch	125 — 750	ipm (3.18 — 19.05 m/min)	
				GMAW Pulse	Pulse	Argon	76	UltimArc®	85 — 700	ipm (2.16 — 17.78 m/min)
					CC Pulse	Argon	70		85 — 700	ipm (2.16 — 17.78 m/min)
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	102	Frequency	100 — 600	ipm (2.54 — 15.24 m/min)		
		1/16	GMAW CV	CV	Argon	77	Pinch	125 — 500	ipm (3.18 — 12.7 m/min)	
				GMAW Pulse	Pulse	Argon	78	UltimArc®	100 — 500	ipm (2.54 — 12.7 m/min)
					CC Pulse	Argon	80		100 — 450	ipm (2.54 — 11.43 m/min)
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	103	Frequency	75 — 350	ipm (1.91 — 8.89 m/min)		
	SiBr	0.035	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 — 1200	ipm (2.03 — 30.48 m/min)	
		0.045	GMAW Pulse	Pulse	Argon	191	UltimArc®	50 — 600	ipm (1.27 — 15.24 m/min)	
	Cu	0.035	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	100 — 700	ipm (2.54 — 17.78 m/min)	
		0.045	GMAW Pulse	Pulse	Argon Helium	196	UltimArc®	75 — 500	ipm (1.91 — 12.7 m/min)	
	NiCr	0.035	GMAW Pulse	Pulse	Ar/ Ar He	501	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)	
		0.045	GMAW Pulse	Pulse	Ar/ Ar He	503	UltimArc®	75 — 600	ipm (1.91 — 15.24 m/min)	
NiCu	0.035	GMAW Pulse	Pulse	Ar/ Ar He	507	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)		
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	509	UltimArc®	75 — 600	ipm (1.91 — 15.24 m/min)		
NiFe-Cl	0.035	GMAW Pulse	Pulse	Ar/ Ar He	513	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)		
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	515	UltimArc®	75 — 600	ipm (1.91 — 15.24 m/min)		
Ni-1	0.035	GMAW Pulse	Pulse	Ar/ Ar He	519	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)		
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	521	UltimArc®	75 — 600	ipm (1.91 — 15.24 m/min)		
Ni-Cl	0.035	GMAW Pulse	Pulse	Ar/ Ar He	525	UltimArc®	75 — 800	ipm (1.91 — 20.32 m/min)		
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	527	UltimArc®	75 — 500	ipm (1.91 — 12.7 m/min)		
<b>FCAW</b>	Flux Core	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 — 45	V	
			FCAW-G	Gas Shield CV	NA	7	Pinch	10 — 45	V	
	Cored Wire	0.045	FCAW-G	CV	CO <sub>2</sub>	90	Pinch	175 — 600	ipm (4.45 — 15.24 m/min)	
					Argon Mix	91		175 — 600	ipm (4.45 — 15.24 m/min)	
		0.052	FCAW-G	CV	CO <sub>2</sub>	187	Pinch	150 — 500	ipm (3.81 — 12.7 m/min)	
					Argon Mix	188		150 — 500	ipm (3.81 — 12.7 m/min)	
					CO <sub>2</sub>	189		125 — 400	ipm (3.18 — 10.16 m/min)	
Argon Mix	190	125 — 400	ipm (3.18 — 10.16 m/min)							
<b>SMAW</b>	NA	NA	DCEP SMAW	SMAW Soft	NA	1	Arc Force, Hot Start	15 — 415	A	
				SMAW Crisp	NA	2	Arc Force, Hot Start	15 — 415	A	
				SMAW Pipe	NA	4	Arc Force	50 — 250	A	
<b>CAG</b>	NA	NA	CAG	Arc Gouge	Compressed Air	9		60 — 415	A	

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GTAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA	DCEN GTAW	Touch Start TIG	Ar / He	3	Hot Start	5 — 415 A
		Touch Start TIG Pulse		Ar / He	8	Frequency, Background, Hot Start	5 — 415 A	
		HF TIG(⊖)		Ar / He	375	Hot Start	5 — 415 A	
		HF TIG Pulse(⊖)		Ar / He	376	Frequency, Background, Hot Start	5 — 415 A	

GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Steel	0.035	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	400	UltimArc®, Phase Angle	100 — 1000 ipm (2.54 — 25.4 m/min)
Sync Pulse Trail				Argon Mix	401	UltimArc®	100 — 800 ipm (2.54 — 20.32 m/min)	
HotWire Pulse Trail				Argon Mix	460		80 — 900 ipm (2.03 — 22.86 m/min)	
0.040		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	402	UltimArc®, Phase Angle	150 — 800 ipm (3.81 — 20.32 m/min)	
			Sync Pulse Trail	Argon Mix	403	UltimArc®	150 — 800 ipm (3.81 — 20.32 m/min)	
			HotWire Pulse Trail	Argon Mix	461		80 — 800 ipm (2.03 — 20.32 m/min)	
0.045		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	404	UltimArc®, Phase Angle	100 — 700 ipm (2.54 — 17.78 m/min)	
			Sync Pulse Trail	Argon Mix	405	UltimArc®	100 — 700 ipm (2.54 — 17.78 m/min)	
			HotWire Pulse Trail	Argon Mix	462		75 — 780 ipm (1.91 — 19.81 m/min)	
0.052		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 — 575 ipm (2.54 — 14.61 m/min)	
			Sync Pulse Trail	Argon Mix	407	UltimArc®	100 — 575 ipm (2.54 — 14.61 m/min)	
			HotWire Pulse Trail	Argon Mix	463		50 — 575 ipm (1.27 — 14.61 m/min)	