

§ Advanced Module Required

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
All	All	GMAW CV	STD CV		5	Pinch	10 – 45 V
		GMAW Power	Power Mode®		40	Pinch	0.1 – 11 kW
Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
Steel	0.030	GMAW CV	CV	CO ₂	93	Pinch	75 – 1200 ipm (1.91 – 30.48 m/min)
				Argon Mix	94		75 – 1200 ipm (1.91 – 30.48 m/min)
			Pulse	Argon Mix	95		UltimArc®
	0.035	GMAW CV	CV	CO ₂	10	Pinch	50 – 1200 ipm (1.27 – 30.48 m/min)
				Argon Mix	11		50 – 1010 ipm (1.27 – 25.65 m/min)
			Pulse	Argon Mix	12		60 – 1095 ipm (1.52 – 27.81 m/min)
		GMAW Pulse	RapidArc®	Argon Mix	13	UltimArc®	60 – 1200 ipm (1.52 – 30.48 m/min)
			Precision Pulse™	Argon Mix	411		100 – 600 ipm (2.54 – 15.24 m/min)
			Rapid X™(‡)	Argon Mix	272		75 – 1200 ipm (1.91 – 30.48 m/min)
		GMAW STT®	Synergic STT®(‡)	CO ₂	324	UltimArc®, Hot Start	100 – 225 ipm (2.54 – 5.72 m/min)
				Argon Mix	325		100 – 225 ipm (2.54 – 5.72 m/min)
			NonSynergic STT®(‡)	CO ₂	304		Peak, Background, Tailout, Hot Start
		Argon Mix	305	100 – 300 ipm (2.54 – 7.62 m/min)			
	0.040	GMAW CV	CV	CO ₂	138	Pinch	50 – 915 ipm (1.27 – 23.24 m/min)
				Argon Mix	139		50 – 880 ipm (1.27 – 22.35 m/min)
			Pulse	Argon Mix	140		60 – 835 ipm (1.52 – 21.21 m/min)
		GMAW Pulse	RapidArc®	Argon Mix	141	UltimArc®	60 – 1015 ipm (1.52 – 25.78 m/min)
			Precision Pulse™	Argon Mix	412		75 – 600 ipm (1.91 – 15.24 m/min)
			Rapid X™(‡)	Argon Mix	273		75 – 800 ipm (1.91 – 20.32 m/min)
		GMAW STT®	Synergic STT®(‡)	CO ₂	326	UltimArc®, Hot Start	90 – 225 ipm (2.29 – 5.72 m/min)
				Argon Mix	327		90 – 225 ipm (2.29 – 5.72 m/min)
			NonSynergic STT®(‡)	CO ₂	306		Peak, Background, Tailout, Hot Start
		Argon Mix	307	90 – 225 ipm (2.29 – 5.72 m/min)			
	0.045	GMAW CV	CV	CO ₂	20	Pinch	50 – 530 ipm (1.27 – 13.46 m/min)
				Argon Mix	21		50 – 490 ipm (1.27 – 12.45 m/min)
			Pulse	Argon Mix	22		50 – 585 ipm (1.27 – 14.86 m/min)
		GMAW Pulse	RapidArc®	Argon Mix	18	UltimArc®	75 – 680 ipm (1.91 – 17.27 m/min)
			Precision Pulse™	Argon Mix	413		75 – 600 ipm (1.91 – 15.24 m/min)
			Rapid X™(‡)	Argon Mix	274		100 – 680 ipm (2.54 – 17.27 m/min)
		GMAW STT®	Synergic STT®(‡)	CO ₂	328	UltimArc®, Hot Start	90 – 200 ipm (2.29 – 5.08 m/min)
				Argon Mix	329		90 – 200 ipm (2.29 – 5.08 m/min)
			NonSynergic STT®(‡)	CO ₂	308		Peak, Background, Tailout, Hot Start
		Argon Mix	309	90 – 225 ipm (2.29 – 5.72 m/min)			
	0.052	GMAW CV	CV	CO ₂	24	Pinch	50 – 435 ipm (1.27 – 11.05 m/min)
				Argon Mix	25		50 – 375 ipm (1.27 – 9.53 m/min)
			Pulse	Argon Mix	26		50 – 435 ipm (1.27 – 11.05 m/min)
GMAW Pulse		RapidArc®	Argon Mix	27	UltimArc®	60 – 455 ipm (1.52 – 11.56 m/min)	
		Precision Pulse™	Argon Mix	414		75 – 410 ipm (1.91 – 10.41 m/min)	
		Rapid X™(‡)	Argon Mix	275		75 – 405 ipm (1.91 – 10.29 m/min)	
GMAW STT®		Synergic STT®(‡)	CO ₂	330	UltimArc®, Hot Start	75 – 175 ipm (1.91 – 4.45 m/min)	
			Argon Mix	331		75 – 175 ipm (1.91 – 4.45 m/min)	
		NonSynergic STT®(‡)	CO ₂	310		Peak, Background, Tailout, Hot Start	90 – 150 ipm (2.29 – 3.81 m/min)
	Argon Mix	311	75 – 150 ipm (1.91 – 3.81 m/min)				
1/16	GMAW CV	CV	Argon Mix	107	Pinch	50 – 200 ipm (1.27 – 5.08 m/min)	
		Pulse	Argon Mix	108	UltimArc®	50 – 235 ipm (1.27 – 5.97 m/min)	
Metal Core	0.035	GMAW AC Pulse	Rapid Z™(§)	Argon Mix	472	UltimArc®	75 – 900 ipm (1.91 – 22.86 m/min)
	0.040	GMAW AC Pulse	Rapid Z™(§)	Argon Mix	473	UltimArc®	70 – 700 ipm (1.78 – 17.78 m/min)
	0.045	GMAW CV	CV	Argon Mix	81	Pinch	100 – 700 ipm (2.54 – 17.78 m/min)
			Pulse	Argon Mix	82	50 – 690 ipm (1.27 – 17.53 m/min)	
			GMAW Pulse	RapidArc®	Argon Mix	87	UltimArc®
		Rapid X™(‡)	Argon Mix	294	75 – 800 ipm (1.91 – 20.32 m/min)		
	0.052	GMAW CV	CV	Argon Mix	83	Pinch	50 – 460 ipm (1.27 – 11.68 m/min)
			Pulse	Argon Mix	84	50 – 445 ipm (1.27 – 11.3 m/min)	
			GMAW Pulse	RapidArc®	Argon Mix	88	UltimArc®
		Rapid X™(‡)	Argon Mix	295	60 – 495 ipm (1.52 – 12.57 m/min)		
	1/16	GMAW CV	CV	Argon Mix	85	Pinch	50 – 310 ipm (1.27 – 7.87 m/min)
			Pulse	Argon Mix	86	50 – 290 ipm (1.27 – 7.37 m/min)	
			GMAW Pulse	RapidArc®	Argon Mix	89	UltimArc®
		Rapid X™(‡)	Argon Mix	296	75 – 285 ipm (1.91 – 7.24 m/min)		
	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control
		GMAW CV	CV	Argon Mix	61	Pinch	100 – 1200 ipm (2.54 – 30.48 m/min)

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GMAW	Stainless	GMAW CV	CV	He Ar CO ₂	63	Pinch	100 — 1200 ipm	(2.54 — 30.48 m/min)	
									UltimArc®
GMAW	Stainless	0.030	GMAW Pulse	Pulse	He Ar CO ₂	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 ₂	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 ₂	33		75 — 1200 ipm	(1.91 — 30.48 m/min)	
				Pulse	He Ar CO ₂	34	UltimArc®	75 — 1200 ipm	(1.91 — 30.48 m/min)
				Argon Mix	36		60 — 1200 ipm	(1.52 — 30.48 m/min)	
	GMAW Pulse		Precision Pulse™	Argon Mix	421	UltimArc®	100 — 600 ipm	(2.54 — 15.24 m/min)	
			He Ar CO ₂	431		100 — 700 ipm	(2.54 — 17.78 m/min)		
			Rapid X™(‡)	Argon Mix	282	UltimArc®	100 — 800 ipm	(2.54 — 20.32 m/min)	
			GMAW STT®	Synergic STT®(‡)	Argon Mix	364	UltimArc®, Hot Start	100 — 300 ipm	(2.54 — 7.62 m/min)
	He Ar CO ₂	365			100 — 250 ipm	(2.54 — 6.35 m/min)			
	NonSynergic STT®(‡)	Argon Mix		344	Peak, Background, Tailout, Hot Start	100 — 300 ipm	(2.54 — 7.62 m/min)		
	He Ar CO ₂	345			100 — 300 ipm	(2.54 — 7.62 m/min)			
	0.040	GMAW STT®	Synergic STT®(‡)	Argon Mix	366	UltimArc®, Hot Start	100 — 300 ipm	(2.54 — 7.62 m/min)	
			He Ar CO ₂	367		100 — 250 ipm	(2.54 — 6.35 m/min)		
			NonSynergic STT®(‡)	Argon Mix	346	Peak, Background, Tailout, Hot Start	100 — 300 ipm	(2.54 — 7.62 m/min)	
			He Ar CO ₂	347		100 — 300 ipm	(2.54 — 7.62 m/min)		
	0.045	GMAW CV	CV	Argon Mix	41	Pinch	75 — 515 ipm	(1.91 — 13.08 m/min)	
			He Ar CO ₂	43		75 — 555 ipm	(1.91 — 14.1 m/min)		
			Pulse	He Ar CO ₂	44	UltimArc®	75 — 610 ipm	(1.91 — 15.49 m/min)	
			Argon Mix	46		50 — 515 ipm	(1.27 — 13.08 m/min)		
		GMAW Pulse	Precision Pulse™	Argon Mix	423	UltimArc®	50 — 400 ipm	(1.27 — 10.16 m/min)	
He Ar CO ₂			433		60 — 400 ipm	(1.52 — 10.16 m/min)			
Rapid X™(‡)			Argon Mix	284	UltimArc®	100 — 725 ipm	(2.54 — 18.42 m/min)		
GMAW STT®			Synergic STT®(‡)	Argon Mix	368	UltimArc®, Hot Start	90 — 200 ipm	(2.29 — 5.08 m/min)	
		He Ar CO ₂	369		90 — 200 ipm	(2.29 — 5.08 m/min)			
		NonSynergic STT®(‡)	Argon Mix	348	Peak, Background, Tailout, Hot Start	90 — 225 ipm	(2.29 — 5.72 m/min)		
		He Ar CO ₂	349		90 — 225 ipm	(2.29 — 5.72 m/min)			
1/16		GMAW CV	CV	Argon Mix	51	Pinch	50 — 230 ipm	(1.27 — 5.84 m/min)	
	GMAW Pulse	Pulse	Argon Mix	56	UltimArc®	50 — 270 ipm	(1.27 — 6.86 m/min)		
Stainless Metal Core EC4XX	0.045	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 — 665 ipm	(1.91 — 16.89 m/min)	
SiBr	0.035	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 — 1110 ipm	(2.03 — 28.19 m/min)	
	0.045	GMAW Pulse	Pulse	Argon	191	UltimArc®	50 — 555 ipm	(1.27 — 14.1 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 — 575 ipm	(1.91 — 14.61 m/min)	
NiFe-CI	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 — 555 ipm	(1.91 — 14.1 m/min)	
Ni-CI	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 — 400 ipm	(1.91 — 10.16 m/min)	

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	GMAW		Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
		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)	
			GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	150		125 — 800	ipm (3.18 — 20.32 m/min)	
			GMAW AC Pulse	AC Pulse (§)	Argon	98	Frequency	125 — 800	ipm (3.18 — 20.32 m/min)	
			GMAW AC Pulse	AC Pulse (§)	Argon	391	UltimArc®	125 — 700	ipm (3.18 — 17.78 m/min)	
	Aluminum 4XXX	3/64	GMAW CV	CV	Argon	71	Pinch	125 — 590	ipm (3.18 — 14.99 m/min)	
			GMAW Pulse	Pulse	Argon	72	UltimArc®	85 — 600	ipm (2.16 — 15.24 m/min)	
			GMAW Pulse	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)	
			GMAW AC Pulse	AC Pulse (§)	Argon	393	UltimArc®	100 — 500	ipm (2.54 — 12.7 m/min)	
	Aluminum 4XXX	1/16	GMAW CV	CV	Argon	73	Pinch	75 — 340	ipm (1.91 — 8.64 m/min)	
			GMAW Pulse	Pulse	Argon	74	UltimArc®	75 — 350	ipm (1.91 — 8.89 m/min)	
			GMAW Pulse	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)	
			GMAW AC Pulse	AC Pulse (§)	Argon	394	UltimArc®	100 — 400	ipm (2.54 — 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)	
			GMAW Pulse	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)	
			GMAW AC Pulse	AC Pulse (§)	Argon	396	UltimArc®	125 — 800	ipm (3.18 — 20.32 m/min)	
	Aluminum 5XXX	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)	
			GMAW Pulse	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)	
			GMAW AC Pulse	AC Pulse (§)	Argon	398	UltimArc®	85 — 600	ipm (2.16 — 15.24 m/min)	
	Aluminum 5XXX	1/16	GMAW CV	CV	Argon	77	Pinch	125 — 470	ipm (3.18 — 11.94 m/min)	
			GMAW Pulse	Pulse	Argon	78	UltimArc®	100 — 460	ipm (2.54 — 11.68 m/min)	
			GMAW Pulse	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)	
			GMAW AC Pulse	AC Pulse (§)	Argon	399	UltimArc®	100 — 400	ipm (2.54 — 10.16 m/min)	
	FCAW		Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Flux Core	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 — 45	V	
			FCAW-G	Gas Shield CV		7	Pinch	10 — 45	V	
	Cored Wire	0.045	FCAW-G	CV	CO ₂	90	Pinch	175 — 600	ipm (4.45 — 15.24 m/min)	
			FCAW-G	CV	Argon Mix	91		175 — 600	ipm (4.45 — 15.24 m/min)	
		0.052	FCAW-G	CV	CO ₂	187	Pinch	150 — 500	ipm (3.81 — 12.7 m/min)	
			FCAW-G	CV	Argon Mix	188		150 — 500	ipm (3.81 — 12.7 m/min)	
		1/16	FCAW-G	CV	CO ₂	189	Pinch	125 — 400	ipm (3.18 — 10.16 m/min)	
			FCAW-G	CV	Argon Mix	190		125 — 375	ipm (3.18 — 9.53 m/min)	
	SMAW		Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA	SMAW Soft	SMAW Soft	NA	1	Arc Force, Hot Start	15 — 350	A	
			DCEP SMAW	SMAW Crisp	NA	2	Arc Force, Hot Start	15 — 350	A	
			SMAW Pipe	SMAW Pipe	NA	4	Arc Force	50 — 250	A	
			DCEN SMAW	SMAW DC- (§)	NA	379	Arc Force, Hot Start	15 — 350	A	
			AC SMAW	AC SMAW (§)	NA	374	Arc Force, Hot Start, Frequency	15 — 350	A	
	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 — 350	A	
				Touch Start TIG Pulse	Ar / He	8	Frequency, Background, Hot Start	5 — 350	A	
				HF TIG(⊖)	Ar / He	375	Hot Start	5 — 350	A	
				HF TIG Pulse (⊖)	Ar / He	376	Frequency, Background, Hot Start	5 — 350	A	
			AC GTAW	Touch Start AC TIG (§)	Ar / He	377	AC Frequency, AC Balance, DC Offset, Hot Start	10 — 350	A	
				HF Start AC TIG (§)	Ar / He	378	AC Frequency, AC Balance, DC Offset, Hot Start	10 — 350	A	

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CAG	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA	CAG	Arc Gouge	Compressed Air	9		60 - 350 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
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 — 655 ipm	(2.54 — 16.64 m/min)
			Sync Pulse Trail	Argon Mix	405	UltimArc®	100 — 655 ipm	(2.54 — 16.64 m/min)
			HotWire Pulse Trail	Argon Mix	462		75 — 610 ipm	(1.91 — 15.49 m/min)
0.052		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 — 435 ipm	(2.54 — 11.05 m/min)
			Sync Pulse Trail	Argon Mix	407	UltimArc®	100 — 435 ipm	(2.54 — 11.05 m/min)
			HotWire Pulse Trail	Argon Mix	463		50 — 445 ipm	(1.27 — 11.3 m/min)