

§ Advanced Module Required

‡ STT® or Advanced Module Required

Δ Tandem Controller 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 - 23	kW
Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)			
GMAW	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)		
			GMAW Pulse	Pulse	Argon Mix	95	UltimArc®	65 - 1200	ipm (1.65 - 30.48 m/min)	
		0.035	GMAW CV	CV	CO ₂	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)	
				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	100 - 300	ipm (2.54 - 7.62 m/min)	
			Argon Mix	305	100 - 300	ipm (2.54 - 7.62 m/min)				
		GMAW AC STT®	Synergic AC STT®(§)	CO ₂	380	Balance, UltimArc®	50 - 200	ipm (1.27 - 5.08 m/min)		
				Argon Mix	381		50 - 200	ipm (1.27 - 5.08 m/min)		
		0.040	GMAW CV	CV	CO ₂	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)	
				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	90 - 225	ipm (2.29 - 5.72 m/min)	
					Argon Mix	307		90 - 225	ipm (2.29 - 5.72 m/min)	
		GMAW AC STT®	Synergic AC STT®(§)	CO ₂	382	Balance, UltimArc®	45 - 185	ipm (1.14 - 4.7 m/min)		
				Argon Mix	383		45 - 185	ipm (1.14 - 4.7 m/min)		
		0.045	GMAW CV	CV	CO ₂	20	Pinch	50 - 800	ipm (1.27 - 20.32 m/min)	
				Argon Mix	21	50 - 800		ipm (1.27 - 20.32 m/min)		
			GMAW Pulse	Pulse	Argon Mix	22	UltimArc®	50 - 800	ipm (1.27 - 20.32 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)	
				Rapid X™(‡)	Argon Mix	274		100 - 800	ipm (2.54 - 20.32 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	90 - 225	ipm (2.29 - 5.72 m/min)	
					Argon Mix	309		90 - 225	ipm (2.29 - 5.72 m/min)	
		GMAW AC STT®	Synergic AC STT®(§)	CO ₂	384	Balance, UltimArc®	40 - 170	ipm (1.02 - 4.32 m/min)		
				Argon Mix	385		40 - 170	ipm (1.02 - 4.32 m/min)		
		0.052	GMAW CV	CV	CO ₂	24	Pinch	50 - 750	ipm (1.27 - 19.05 m/min)	
				Argon Mix	25	50 - 700		ipm (1.27 - 17.78 m/min)		
			GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 700	ipm (1.27 - 17.78 m/min)	
				RapidArc®	Argon Mix	27		60 - 750	ipm (1.52 - 19.05 m/min)	
				Precision Pulse™	Argon Mix	414		75 - 500	ipm (1.91 - 12.7 m/min)	
				Rapid X™(‡)	Argon Mix	275		75 - 600	ipm (1.91 - 15.24 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 - 450	ipm (1.27 - 11.43 m/min)			
		GMAW Pulse	Pulse	Argon Mix		108	UltimArc®	50 - 500	ipm (1.27 - 12.7 m/min)	

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)			
GMAW	Stainless	0.030	GMAW CV	CV	Argon Mix	61	Pinch	100 - 1200 ipm (2.54 - 30.48 m/min)			
					He Ar CO ₂	63		100 - 1200 ipm (2.54 - 30.48 m/min)			
			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)			
					GMAW Pulse	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 STT®	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™(‡)	282		UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)		
					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)								
	0.040	GMAW STT®	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)				
				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)		
	0.045	GMAW CV	CV	Argon Mix	41	Pinch	75 - 800 ipm (1.91 - 20.32 m/min)				
				He Ar CO ₂	43		75 - 800 ipm (1.91 - 20.32 m/min)				
				GMAW Pulse	Pulse		He Ar CO ₂	44	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
							Argon Mix	46		50 - 800 ipm (1.27 - 20.32 m/min)	
				GMAW STT®	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™(‡)	284			UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)				
		1/16	GMAW STT®	NonSynergic 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)			
Synergic 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)					
GMAW CV	CV				Argon Mix	51		Pinch	50 - 515 ipm (1.27 - 13.08 m/min)		
GMAW Pulse	Pulse	Argon Mix	56	UltimArc®	50 - 635 ipm (1.27 - 16.13 m/min)						
Metal Core	EC4XX	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)			
					Argon Mix	82		UltimArc®	50 - 700 ipm (1.27 - 17.78 m/min)		
					Argon Mix	87			75 - 800 ipm (1.91 - 20.32 m/min)		
		0.052	GMAW Pulse	RapidArc®	Argon Mix	294	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)			
					Argon Mix	83		Pinch	50 - 600 ipm (1.27 - 15.24 m/min)		
					Argon Mix	84			UltimArc®	50 - 600 ipm (1.27 - 15.24 m/min)	
					Argon Mix	88				60 - 800 ipm (1.52 - 20.32 m/min)	
		1/16	GMAW Pulse	Rapid X™(‡)	Argon Mix	295	UltimArc®		60 - 650 ipm (1.52 - 16.51 m/min)		
					Argon Mix	85		Pinch	50 - 450 ipm (1.27 - 11.43 m/min)		
					Argon Mix	86			UltimArc®	50 - 450 ipm (1.27 - 11.43 m/min)	
Argon Mix	89				60 - 450 ipm (1.52 - 11.43 m/min)						
Argon Mix	296	75 - 450 ipm (1.91 - 11.43 m/min)									
0.045	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)					

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	GMAW	Aluminum 4XXX	0.035	GMAW CV	CV	Argon	148	Pinch	150 - 750
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)
			GMAW AC Pulse	AC Pulse (§)	Argon	391	UltimArc®	125 - 700	ipm (3.18 - 17.78 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)
			GMAW AC Pulse	AC Pulse (§)	Argon	393	UltimArc®	100 - 500	ipm (2.54 - 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)	
		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)
				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)
		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)
			GMAW AC Pulse	AC Pulse (§)	Argon	398	UltimArc®	85 - 600	ipm (2.16 - 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)	
		GMAW AC Pulse	AC Pulse (§)	Argon	399	UltimArc®	100 - 400	ipm (2.54 - 10.16 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)	
	1/16	GMAW Pulse	Pulse	Ar/ Ar He	505	UltimArc®	75 - 350	ipm (1.91 - 8.89 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)	
	1/16	GMAW Pulse	Pulse	Ar/ Ar He	511	UltimArc®	50 - 350	ipm (1.27 - 8.89 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 - 600	ipm (1.91 - 15.24 m/min)	
	1/16	GMAW Pulse	Pulse	Ar/ Ar He	523	UltimArc®	50 - 300	ipm (1.27 - 7.62 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 - 500	ipm (1.91 - 12.7 m/min)	
FCAW	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)
					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)
					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)
					Argon Mix	190		125 - 400	ipm (3.18 - 10.16 m/min)

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
SMAW	NA	NA	DCEP SMAW	Soft	NA	1	Arc Force, Hot Start	15 - 555 A
				Crisp	NA	2	Arc Force, Hot Start	15 - 555 A
				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	NA	NA	DCEN GTAW	Touch Start TIG	Ar / He	3	Hot Start	5 - 555 A
				Touch Start TIG Pulse	Ar / He	8	Frequency, Background, Hot Start	5 - 555 A
				HF TIG (§)	Ar / He	375	Hot Start	5 - 450 A
			AC GTAW	HF TIG Pulse (§)	Ar / He	376	Frequency, Background, Hot Start	5 - 450 A
				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
CAG	NA	NA	CAG	Arc Gouge	Compressed Air	9		60 - 555 A
GMAW-Tandem	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 - 800 ipm (1.91 - 20.32 m/min)
		0.052	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 - 800 ipm (2.54 - 20.32 m/min)
				Sync Pulse Trail	Argon Mix	407	UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)
				HotWire Pulse Trail	Argon Mix	463		50 - 800 ipm (1.27 - 20.32 m/min)