

§ Advanced Module Required

⊖ External HF Starter Required

* Range is limited by power source rating, module rating, or feeder configuration

‡ STT® or Advanced Module Required

△ Tandem Controller Required

	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	All	All		GMAW CV	STD CV		5	Pinch
			GMAW Power	Power Mode®		40	Pinch	0.1 — 23 kW
GMAW	Steel	0.8 mm	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)
					Argon Mix	410		100 — 600 ipm (2.54 — 15.24 m/min)
			GMAW Pulse	Precision Pulse™	Argon Mix	138	Pinch	50 — 1200 ipm (1.27 — 30.48 m/min)
					Argon Mix	139		50 — 1200 ipm (1.27 — 30.48 m/min)
		0.9 mm	GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 — 1200 ipm (1.52 — 30.48 m/min)
					Argon Mix	141		60 — 1200 ipm (1.52 — 30.48 m/min)
			GMAW Pulse	Precision Pulse™	Argon Mix	411	UltimArc®	100 — 600 ipm (2.54 — 15.24 m/min)
					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)
		GMAW STT®	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)	
		1.0 mm	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®	75 — 1200 ipm (1.91 — 30.48 m/min)
					Argon Mix	13		60 — 1200 ipm (1.52 — 30.48 m/min)
					Argon Mix	412		75 — 600 ipm (1.91 — 15.24 m/min)
					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)	
	GMAW STT®		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)	
	1.2 mm	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®	60 — 800 ipm (1.52 — 20.32 m/min)
					Argon Mix	18		60 — 800 ipm (1.52 — 20.32 m/min)
					Argon Mix	413		75 — 600 ipm (1.91 — 15.24 m/min)
					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)	
GMAW STT®		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)		
1.32 mm	GMAW CV	CV	Argon Mix	540	Pinch	50 — 550 ipm (1.27 — 13.97 m/min)		
	GMAW Pulse	Low Fume Pulse(‡)	Argon Mix	544	UltimArc®	50 — 600 ipm (1.27 — 15.24 m/min)		
1.4 mm	GMAW CV	CV	CO ₂	24	Pinch	50 — 640 ipm (1.27 — 16.26 m/min)		
			Argon Mix	25		50 — 550 ipm (1.27 — 13.97 m/min)		
	GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 — 580 ipm (1.27 — 14.73 m/min)		
			Argon Mix	27		60 — 615 ipm (1.52 — 15.62 m/min)		
			Argon Mix	275		75 — 600 ipm (1.91 — 15.24 m/min)		
			Argon Mix	553		50 — 600 ipm (1.27 — 15.24 m/min)		
1.6 mm	GMAW CV	CV	Argon Mix	107	Pinch	50 — 350 ipm (1.27 — 8.89 m/min)		
	GMAW Pulse	Pulse	Argon Mix	108	UltimArc®	50 — 400 ipm (1.27 — 10.16 m/min)		
Metal Core	0.9mm	GMAW Rapid Z™	Rapid Z™(§)	Argon Mix	472	UltimArc®	75 — 900 ipm (1.91 — 22.86 m/min)	
	1.0mm	GMAW Rapid Z™	Rapid Z™(§)	Argon Mix	473	UltimArc®	70 — 700 ipm (1.78 — 17.78 m/min)	
	1.2 mm	GMAW CV	CV	Argon Mix	81	Pinch	50 — 700 ipm (1.27 — 17.78 m/min)	
				Argon Mix	82		50 — 700 ipm (1.27 — 17.78 m/min)	
	1.4 mm	GMAW Pulse	Pulse	Argon Mix	294	UltimArc®	75 — 700 ipm (1.91 — 17.78 m/min)	
				Argon Mix	84		50 — 600 ipm (1.27 — 15.24 m/min)	
	1.6 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	295	UltimArc®	60 — 650 ipm (1.52 — 16.51 m/min)	
				Argon Mix	85		50 — 450 ipm (1.27 — 11.43 m/min)	
1.6 mm	GMAW Pulse	Pulse	Argon Mix	86	UltimArc®	50 — 450 ipm (1.27 — 11.43 m/min)		
			Argon Mix	296		75 — 450 ipm (1.91 — 11.43 m/min)		

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GMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	Stainless	0.8 mm	GMAW CV	CV		Argon Mix	61	Pinch
Ar He CO ₂						63	100 — 1200 ipm (2.54 — 30.48 m/min)	
GMAW Pulse			Pulse		Ar He CO ₂	64	UltimArc®	100 — 1200 ipm (2.54 — 30.48 m/min)
					Argon Mix	66		100 — 1200 ipm (2.54 — 30.48 m/min)
0.9 mm		GMAW CV	CV		Argon Mix	29	Pinch	75 — 1200 ipm (1.91 — 30.48 m/min)
					Ar He CO ₂	30		60 — 1200 ipm (1.52 — 30.48 m/min)
		GMAW Pulse	Pulse		Argon Mix	421	UltimArc®	100 — 600 ipm (2.54 — 15.24 m/min)
					Argon Mix	421		100 — 600 ipm (2.54 — 15.24 m/min)
		GMAW STT®	Synergic STT®(‡)		Argon Mix	364	UltimArc®, Hot Start	100 — 300 ipm (2.54 — 7.62 m/min)
					Ar He CO ₂	365		100 — 250 ipm (2.54 — 6.35 m/min)
GMAW STT®		NonSynergic STT®(‡)		Argon Mix	344	Peak, Background, Tailout, Hot Start	100 — 300 ipm (2.54 — 7.62 m/min)	
				Ar He CO ₂	345		100 — 300 ipm (2.54 — 7.62 m/min)	
1.0 mm		GMAW CV	CV		Argon Mix	31	Pinch	75 — 1200 ipm (1.91 — 30.48 m/min)
					Ar He CO ₂	33		75 — 1000 ipm (1.91 — 25.4 m/min)
		GMAW Pulse	Pulse		Ar He CO ₂	34	UltimArc®	60 — 1200 ipm (1.52 — 30.48 m/min)
					Argon Mix	36		60 — 1200 ipm (1.52 — 30.48 m/min)
					Argon Mix	422		60 — 600 ipm (1.52 — 15.24 m/min)
					Argon Mix	283		100 — 800 ipm (2.54 — 20.32 m/min)
	GMAW STT®	Synergic STT®(‡)		Argon Mix	366	UltimArc®, Hot Start	100 — 300 ipm (2.54 — 7.62 m/min)	
				Ar He CO ₂	367		100 — 250 ipm (2.54 — 6.35 m/min)	
				Argon Mix	346		Peak, Background, Tailout, Hot Start	100 — 300 ipm (2.54 — 7.62 m/min)
				Ar He CO ₂	347			100 — 300 ipm (2.54 — 7.62 m/min)
1.2 mm	GMAW CV	CV		Argon Mix	41	Pinch	75 — 700 ipm (1.91 — 17.78 m/min)	
				Ar He CO ₂	43		75 — 700 ipm (1.91 — 17.78 m/min)	
	GMAW Pulse	Pulse		Ar He CO ₂	44	UltimArc®	50 — 700 ipm (1.27 — 17.78 m/min)	
				Argon Mix	46		50 — 800 ipm (1.27 — 20.32 m/min)	
				Argon Mix	423		50 — 400 ipm (1.27 — 10.16 m/min)	
				Argon Mix	284		100 — 800 ipm (2.54 — 20.32 m/min)	
	GMAW STT®	Synergic STT®(‡)		Argon Mix	368	UltimArc®, Hot Start	90 — 200 ipm (2.29 — 5.08 m/min)	
				Ar He CO ₂	369		90 — 200 ipm (2.29 — 5.08 m/min)	
Argon Mix				348	Peak, Background, Tailout, Hot Start		90 — 225 ipm (2.29 — 5.72 m/min)	
Ar He CO ₂				349			90 — 225 ipm (2.29 — 5.72 m/min)	
1.6 mm	GMAW CV	CV		Argon Mix	51	Pinch	50 — 480 ipm (1.27 — 12.19 m/min)	
	GMAW Pulse	Pulse		Argon Mix	56	UltimArc®	50 — 505 ipm (1.27 — 12.83 m/min)	
Stainless Metal Core ECXXX		1.2 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 — 800 ipm (1.91 — 20.32 m/min)
SiBr	1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 — 1000 ipm (2.03 — 25.4 m/min)	
	1.2mm	GMAW STT®	Synergic STT®(‡)	Argon	336	UltimArc®, Hot Start	120 — 350 ipm (3.05 — 8.89 m/min)	
Cu	1.0mm	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	75 — 500 ipm (1.91 — 12.7 m/min)	
	1.2mm	GMAW Pulse	Pulse	Argon Helium	196	UltimArc®	75 — 500 ipm (1.91 — 12.7 m/min)	
NiCr	1.0mm	GMAW Pulse	Pulse	Ar He	502	UltimArc®	75 — 800 ipm (1.91 — 20.32 m/min)	
	1.2mm	GMAW Pulse	Pulse	Ar He	504	UltimArc®	75 — 600 ipm (1.91 — 15.24 m/min)	

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*			
	GMAW	Aluminum (AISI)	1.0 mm	GMAW CV	CV	Argon	148	Pinch	125 — 800 ipm (3.18 — 20.32 m/min)		
GMAW Pulse				Pulse	Argon	149	UltimArc®	125 — 800 ipm (3.18 — 20.32 m/min)			
				CC Pulse	Argon	150	UltimArc®	125 — 800 ipm (3.18 — 20.32 m/min)			
GMAW Pulse on Pulse*				Pulse on Pulse*	Argon	98	Frequency	100 — 500 ipm (2.54 — 12.7 m/min)			
			GMAW AC Pulse	AC Pulse (§)	Argon	392	UltimArc®	125 — 700 ipm (3.18 — 17.78 m/min)			
1.2 mm			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	UltimArc®	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)			
1.6 mm			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	UltimArc®	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 (AIMg)		1.0 mm	GMAW CV	CV	Argon	151	Pinch	175 — 750 ipm (4.45 — 19.05 m/min)			
			GMAW Pulse	Pulse	Argon	152	UltimArc®	125 — 700 ipm (3.18 — 17.78 m/min)			
				CC Pulse	Argon	153	UltimArc®	125 — 700 ipm (3.18 — 17.78 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	397	UltimArc®	100 — 800 ipm (2.54 — 20.32 m/min)			
		1.2 mm	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	UltimArc®	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)			
		1.6 mm	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	UltimArc®	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	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		1.2 mm	FCAW-G	CV	CO ₂	90	Pinch	175 — 600 ipm (4.45 — 15.24 m/min)			
					Argon Mix	91	Pinch	175 — 600 ipm (4.45 — 15.24 m/min)			
		1.4 mm	FCAW-G	CV	CO ₂	187	Pinch	150 — 500 ipm (3.81 — 12.7 m/min)			
					Argon Mix	188	Pinch	150 — 500 ipm (3.81 — 12.7 m/min)			
1.6 mm		FCAW-G	CV	CO ₂	189	Pinch	125 — 400 ipm (3.18 — 10.16 m/min)				
				Argon Mix	190	Pinch	125 — 400 ipm (3.18 — 10.16 m/min)				
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 GTAW	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			
HF TIG Pulse (⊖)	Ar / He	376					Frequency, Background Hot Start	5 — 450 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			
	CAG	NA				NA	CAG	Arc Gouge	Compressed Air	9	60 — 555 A

Weld Set Reference: Z194524
Power Wave® R450/S500 (SI units)



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GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	Steel	1.0 mm	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	402	UltimArc®, Phase Angle	150 — 800 ipm
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)
1.2 mm		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)
1.4 mm		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 — 600 ipm	(2.54 — 15.24 m/min)
			Sync Pulse Trail	Argon Mix	407	UltimArc®	100 — 600 ipm	(2.54 — 15.24 m/min)
			HotWire Pulse Trail	Argon Mix	463		50 — 800 ipm	(1.27 — 20.32 m/min)

GMAW-HyperFill	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Steel	0.9mm	GMAW	Hyperfill		Argon Mix	601	
1.0mm		GMAW	Hyperfill		Argon Mix	602		100 — 480 ipm (2.54 — 12.19 m/min)