

§ 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	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	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)	
			Precision Pulse™	Argon Mix	410		100 - 600 ipm (2.54 - 15.24 m/min)	
		0.9 mm	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	411		100 - 600 ipm (2.54 - 15.24 m/min)	
			Rapid X™(‡)	Argon Mix	272		75 - 800 ipm (1.91 - 20.32 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)		
	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)	
			RapidArc®	Argon Mix	13		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)		
	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)	
			RapidArc®	Argon Mix	18		60 - 800 ipm (1.52 - 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)			
1.4 mm	GMAW CV	CV	CO ₂	24	Pinch	50 - 640 ipm (1.27 - 16.26 m/min)		
			Argon Mix	25		50 - 55 ipm (1.27 - 1.4 m/min)		
	GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 580 ipm (1.27 - 14.73 m/min)		
		RapidArc®	Argon Mix	27		60 - 615 ipm (1.52 - 15.62 m/min)		
		Precision Pulse™	Argon Mix	275		75 - 600 ipm (1.91 - 15.24 m/min)		
		Rapid X™(‡)	Argon Mix	275		75 - 600 ipm (1.91 - 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)	
		GMAW Pulse	Pulse	Argon Mix	82	UltimArc®	50 - 700 ipm (1.27 - 17.78 m/min)	
		Rapid X™(‡)	Argon Mix	294	75 - 800 ipm (1.91 - 20.32 m/min)			
	1.4 mm	GMAW Pulse	Pulse	Argon Mix	84	UltimArc®	50 - 600 ipm (1.27 - 15.24 m/min)	
			Rapid X™(‡)	Argon Mix	295		60 - 495 ipm (1.52 - 12.57 m/min)	
	1.6 mm	GMAW CV	CV	Argon Mix	85	Pinch	50 - 450 ipm (1.27 - 11.43 m/min)	
		GMAW Pulse	Pulse	Argon Mix	86	UltimArc®	50 - 450 ipm (1.27 - 11.43 m/min)	
		Rapid X™(‡)	Argon Mix	296	75 - 450 ipm (1.91 - 11.43 m/min)			
Stainless Metal Core EC4XX	1.2 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 - 800 ipm (1.91 - 20.32 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	100 - 1200 ipm (2.54 - 30.48 m/min)	
					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)	
					Argon Mix	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)	
				Precision Pulse™		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)	
				Precision Pulse™		Argon Mix		422	60 - 600 ipm (1.52 - 15.24 m/min)
				Rapid X™(‡)		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)	
			GMAW STT®	NonSynergic STT®(‡)		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)	
				Precision Pulse™		Argon Mix		423	50 - 400 ipm (1.27 - 10.16 m/min)
				Rapid X™(‡)		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)	
GMAW STT®			NonSynergic STT®(‡)		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)		
Aluminum (AlSi)	1.0 mm	GMAW CV	CV		Argon	148	Pinch	125 - 800 ipm (3.18 - 20.32 m/min)	
					Argon	149		125 - 800 ipm (3.18 - 20.32 m/min)	
		GMAW Pulse	Pulse		Argon	150	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	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)	
					Argon	72		85 - 600 ipm (2.16 - 15.24 m/min)	
		GMAW Pulse	Pulse		Argon	69	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)		
	1.6 mm	GMAW CV	CV		Argon	73	Pinch	75 - 375 ipm (1.91 - 9.53 m/min)	
					Argon	74		75 - 350 ipm (1.91 - 8.89 m/min)	
		GMAW Pulse	Pulse		Argon	79	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 (AlMg)	1.0 mm	GMAW CV	CV		Argon	151	Pinch	175 - 750 ipm (4.45 - 19.05 m/min)
						Argon	152		125 - 700 ipm (3.18 - 17.78 m/min)
GMAW Pulse			Pulse		Argon	153	UltimArc®	125 - 700 ipm (3.18 - 17.78 m/min)	
				CC Pulse		Argon		153	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®	125 - 800 ipm (3.18 - 20.32 m/min)		
1.2 mm		GMAW CV	CV		Argon	75	Pinch	125 - 750 ipm (3.18 - 19.05 m/min)	
					Argon	76		85 - 700 ipm (2.16 - 17.78 m/min)	
		GMAW Pulse	Pulse		Argon	70	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)		
1.6 mm		GMAW CV	CV		Argon	77	Pinch	125 - 500 ipm (3.18 - 12.7 m/min)	
				Argon	78	100 - 500 ipm (2.54 - 12.7 m/min)			
	GMAW Pulse	Pulse		Argon	80	UltimArc®	100 - 450 ipm (2.54 - 11.43 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)			

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GMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	SIBr		1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®
1.2mm			GMAW Pulse	Pulse	Argon	191	UltimArc®	50 - 600 ipm (1.27 - 15.24 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)

FCAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	Flux Core		All	FCAW-S	Self Shield CV	NA	6	Pinch
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)
						91		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)
						188		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)		
				190		125 - 400 ipm (3.18 - 10.16 m/min)		

SMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	NA	NA	NA	DCEP SMAW	Soft	NA	1	Arc Force, Hot Start
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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	NA	NA	NA	DCEN GTAW	Touch Start GTAW	Ar / He	3	Hot Start
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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Range*
	NA	NA	CAG	Arc Gouge	Compressed Air	9		

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
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)	