

§ 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 <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)	
			Precision Pulse™		Argon Mix	410		100 - 600	ipm (2.54 - 15.24 m/min)	
	0.9 mm	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	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 <sub>2</sub>	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 <sub>2</sub>	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)
	1.0 mm	GMAW AC STT®	Synergic AC STT®(‡)			CO <sub>2</sub>	380	Balance, UltimArc®	50 - 200	ipm (1.27 - 5.08 m/min)
						Argon Mix	381		50 - 200	ipm (1.27 - 5.08 m/min)
		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®	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 <sub>2</sub>	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 <sub>2</sub>	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)	
	1.2 mm	GMAW AC STT®	Synergic AC STT®(‡)			CO <sub>2</sub>	382	Balance, UltimArc®	45 - 185	ipm (1.14 - 4.7 m/min)
						Argon Mix	383		45 - 185	ipm (1.14 - 4.7 m/min)
		GMAW CV	CV			CO <sub>2</sub>	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 <sub>2</sub>	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 <sub>2</sub>	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)		
1.4 mm	GMAW AC STT®	Synergic AC STT®(‡)			CO <sub>2</sub>	384	Balance, UltimArc®	40 - 170	ipm (1.02 - 4.32 m/min)	
					Argon Mix	385		40 - 170	ipm (1.02 - 4.32 m/min)	
	GMAW CV	CV			CO <sub>2</sub>	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)	
1.6 mm		Precision Pulse™			Argon Mix	414		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)
	1.4 mm		Rapid X™(‡)			Argon Mix	294		75 - 800	ipm (1.91 - 20.32 m/min)
		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)	
Stainless Metal Core EC4XX	1.2 mm		Rapid X™(‡)		Argon Mix	290	UltimArc®	75 - 800	ipm (1.91 - 20.32 m/min)	
		GMAW Pulse								

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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 <sub>2</sub>	63	100 - 1200 ipm (2.54 - 30.48 m/min)	
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	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 <sub>2</sub>	30	60 - 1200 ipm (1.52 - 30.48 m/min)	
		GMAW Pulse	Pulse	Argon Mix	30	UltimArc®	100 - 600 ipm (2.54 - 15.24 m/min)			
							Precision Pulse™	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 <sub>2</sub>	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 <sub>2</sub>	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 <sub>2</sub>	33	75 - 1000 ipm (1.91 - 25.4 m/min)	
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	34	UltimArc®	60 - 1200 ipm (1.52 - 30.48 m/min)			
							Argon Mix	36	60 - 1200 ipm (1.52 - 30.48 m/min)	
		GMAW Pulse	Precision Pulse™	Argon Mix	422	UltimArc®	60 - 600 ipm (1.52 - 15.24 m/min)			
							Rapid X™(‡)	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 <sub>2</sub>	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 <sub>2</sub>	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 <sub>2</sub>	43	75 - 700 ipm (1.91 - 17.78 m/min)	
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	44	UltimArc®	50 - 700 ipm (1.27 - 17.78 m/min)			
							Argon Mix	46	50 - 800 ipm (1.27 - 20.32 m/min)	
		GMAW Pulse	Precision Pulse™	Argon Mix	423	UltimArc®	50 - 400 ipm (1.27 - 10.16 m/min)			
							Rapid X™(‡)	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 <sub>2</sub>	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 <sub>2</sub>	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)				
						Ar He CO <sub>2</sub>	56	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	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	72	UltimArc®	85 - 600 ipm (2.16 - 15.24 m/min)			
							CC Pulse	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	74	UltimArc®	75 - 350 ipm (1.91 - 8.89 m/min)			
							CC Pulse	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	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	76	UltimArc®	85 - 700 ipm (2.16 - 17.78 m/min)			
							CC Pulse	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	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	1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®
1.2mm		1.2mm	GMAW Pulse	Pulse	Argon	191	UltimArc®	50 - 600 ipm (1.27 - 15.24 m/min)
Cu	1.0mm	1.0mm	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	75 - 500 ipm (1.91 - 12.7 m/min)
	1.2mm	1.2mm	GMAW Pulse	Pulse	Argon Helium	196	UltimArc®	75 - 500 ipm (1.91 - 12.7 m/min)
NiCr	1.0mm	1.0mm	GMAW Pulse	Pulse	Ar He	502	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)
	1.2mm	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 <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)
	1.4 mm		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)
1.6 mm		FCAW-G	CV	CO <sub>2</sub>	189	Pinch	125 - 400 ipm (3.18 - 10.16 m/min)	
				Argon Mix	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)