

§ 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	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	0.8 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 - 1075 ipm (1.27 - 27.31 m/min)				
			GMAW Pulse	Pulse	Argon Mix		140	UltimArc®	60 - 1005 ipm (1.52 - 25.53 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 - 775 ipm (1.27 - 19.69 m/min)		
			Argon Mix	11	50 - 610 ipm (1.27 - 15.49 m/min)				
			GMAW Pulse	Pulse	Argon Mix		12	UltimArc®	75 - 590 ipm (1.91 - 14.99 m/min)
				RapidArc®	Argon Mix		13		60 - 825 ipm (1.52 - 20.96 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 - 540 ipm (1.27 - 13.72 m/min)		
			Argon Mix	21	50 - 440 ipm (1.27 - 11.18 m/min)				
			GMAW Pulse	Pulse	Argon Mix		22	UltimArc®	60 - 475 ipm (1.52 - 12.07 m/min)
				RapidArc®	Argon Mix		18		60 - 605 ipm (1.52 - 15.37 m/min)
Precision Pulse™		Argon Mix	413	75 - 600 ipm (1.91 - 15.24 m/min)					
		Rapid X™(‡)	Argon Mix	274	100 - 690 ipm (2.54 - 17.53 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 - 310 ipm (1.27 - 7.87 m/min)			
		Argon Mix	25	50 - 290 ipm (1.27 - 7.37 m/min)					
	GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 300 ipm (1.27 - 7.62 m/min)			
		RapidArc®	Argon Mix	27		60 - 335 ipm (1.52 - 8.51 m/min)			
Rapid X™(‡)	Argon Mix	275	75 - 395 ipm (1.91 - 10.03 m/min)						
	1.6 mm	GMAW CV	CV	Argon Mix	107	Pinch	50 - 225 ipm (1.27 - 5.72 m/min)		
GMAW Pulse		Pulse	Argon Mix	108	UltimArc®	50 - 255 ipm (1.27 - 6.48 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 - 555 ipm (1.27 - 14.1 m/min)		
		GMAW Pulse	Pulse	Argon Mix	82	UltimArc®	50 - 530 ipm (1.27 - 13.46 m/min)		
	Rapid X™(‡)		Argon Mix	294	75 - 700 ipm (1.91 - 17.78 m/min)				
	1.4 mm	GMAW Pulse	Pulse	Argon Mix	84	UltimArc®	50 - 335 ipm (1.27 - 8.51 m/min)		
			Rapid X™(‡)	Argon Mix	295		60 - 420 ipm (1.52 - 10.67 m/min)		
	1.6 mm	GMAW CV	CV	Argon Mix	85	Pinch	50 - 310 ipm (1.27 - 7.87 m/min)		
GMAW Pulse		Pulse	Argon Mix	86	UltimArc®	50 - 360 ipm (1.27 - 9.14 m/min)			
Rapid X™(‡)	Argon Mix	296	75 - 360 ipm (1.91 - 9.14 m/min)						
Stainless Metal Core EC4XX	1.2 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 - 665 ipm (1.91 - 16.89 m/min)		

§ 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

	GMAW		Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Stainless	0.8 mm	GMAW CV	CV	Argon Mix	61	Pinch	100 - 1120	ipm	(2.54 - 28.45 m/min)
Ar He CO ₂								63	100 - 1200	ipm
GMAW Pulse			Pulse	Argon Mix	64	UltimArc®	100 - 1200	ipm	(2.54 - 30.48 m/min)	
							Argon Mix	66	100 - 1200	ipm
0.9 mm			GMAW CV	CV	Argon Mix	29	Pinch	75 - 1200	ipm	(1.91 - 30.48 m/min)
								Argon Mix	30	60 - 1110
			GMAW Pulse	Pulse	Argon Mix	421	UltimArc®	100 - 600	ipm	(2.54 - 15.24 m/min)
								Argon Mix	364	100 - 300
			GMAW STT®	Synergic STT®(‡)	Ar He CO ₂	365	UltimArc®, Hot Start	100 - 250	ipm	(2.54 - 6.35 m/min)
								Argon Mix	344	100 - 300
GMAW STT®			NonSynergic STT®(‡)	Ar He CO ₂	345	Peak, Background, Tailout, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)	
							100 - 300	ipm	(2.54 - 7.62 m/min)	
1.0 mm		GMAW CV	CV	Argon Mix	31	Pinch	75 - 920	ipm	(1.91 - 23.37 m/min)	
							Ar He CO ₂	33	75 - 710	ipm
			GMAW Pulse	Pulse	Argon Mix	34	UltimArc®	60 - 835	ipm	(1.52 - 21.21 m/min)
								Argon Mix	36	60 - 910
		GMAW Pulse	Precision Pulse™	Argon Mix	422	UltimArc®	60 - 600	ipm	(1.52 - 15.24 m/min)	
							Argon Mix	283	100 - 800	ipm
		GMAW STT®	Synergic STT®(‡)	Ar He CO ₂	366	UltimArc®, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)	
							Argon Mix	367	100 - 250	ipm
		GMAW STT®	NonSynergic STT®(‡)	Ar He CO ₂	346	Peak, Background, Tailout, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)	
							100 - 300	ipm	(2.54 - 7.62 m/min)	
		1.2 mm	GMAW CV	CV	Argon Mix	41	Pinch	75 - 460	ipm	(1.91 - 11.68 m/min)
								Ar He CO ₂	43	75 - 435
GMAW Pulse				Pulse	Argon Mix	44	UltimArc®	50 - 450	ipm	(1.27 - 11.43 m/min)
								Argon Mix	46	50 - 560
GMAW Pulse			Precision Pulse™	Argon Mix	423	UltimArc®	50 - 400	ipm	(1.27 - 10.16 m/min)	
							Argon Mix	284	100 - 780	ipm
GMAW STT®	Synergic STT®(‡)		Ar He CO ₂	368	UltimArc®, Hot Start	90 - 200	ipm	(2.29 - 5.08 m/min)		
						Argon Mix	369	90 - 200	ipm	(2.29 - 5.08 m/min)
GMAW STT®	NonSynergic STT®(‡)	Ar He CO ₂	348	Peak, Background, Tailout, Hot Start	90 - 225	ipm	(2.29 - 5.72 m/min)			
					90 - 225	ipm	(2.29 - 5.72 m/min)			
1.6 mm	GMAW CV	CV	Argon Mix	51	Pinch	50 - 215	ipm	(1.27 - 5.46 m/min)		
						Argon Mix	56	50 - 235	ipm	(1.27 - 5.97 m/min)
SiBr	1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 - 775	ipm	(2.03 - 19.69 m/min)	
							1.2mm	GMAW Pulse	Pulse	Argon
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
NiCr	1.0mm	GMAW Pulse	Pulse	Ar/ Ar He	502	UltimArc®	75 - 800	ipm	(1.91 - 20.32 m/min)	
							1.2mm	GMAW Pulse	Pulse	Ar/ Ar He
Aluminum (AISI)	1.0 mm	GMAW CV	CV	Argon	148	Pinch	125 - 800	ipm	(3.18 - 20.32 m/min)	
							Argon	149	125 - 800	ipm
		GMAW Pulse	Pulse	Argon	150	UltimArc®	125 - 800	ipm	(3.18 - 20.32 m/min)	
							Argon	98	100 - 500	ipm
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	392	UltimArc®	125 - 700	ipm	(3.18 - 17.78 m/min)	
							AC Pulse (\$)	71	125 - 590	ipm
		1.2 mm	GMAW CV	CV	Argon	71	Pinch	125 - 590	ipm	(3.18 - 14.99 m/min)
								Argon	72	85 - 600
	GMAW Pulse		Pulse	Argon	69	UltimArc®	85 - 600	ipm	(2.16 - 15.24 m/min)	
							Argon	99	85 - 500	ipm
	GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	393	UltimArc®	100 - 500	ipm	(2.54 - 12.7 m/min)		
						AC Pulse (\$)	73	100 - 500	ipm	(2.54 - 12.7 m/min)
	1.6 mm	GMAW CV	CV	Argon	73	Pinch	75 - 340	ipm	(1.91 - 8.64 m/min)	
							Argon	74	75 - 350	ipm
		GMAW Pulse	Pulse	Argon	79	UltimArc®	75 - 350	ipm	(1.91 - 8.89 m/min)	
							Argon	100	80 - 400	ipm
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	394	UltimArc®	100 - 400	ipm	(2.54 - 10.16 m/min)	
							AC Pulse (\$)	79	75 - 350	ipm

§ Advanced Module Required

○ External HF Starter Required

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

‡ STT® or Advanced Module Required

Δ Tandem Controller Required

GMAW	Aluminum (AlMg)	Size	Procedure		Gas Type	Mode #	Arc Control	Max. Range (*)	
			Waveform	Waveform					
	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		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		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 - 470 ipm (3.18 - 11.94 m/min)
				GMAW Pulse	Pulse	Argon	78	UltimArc®	100 - 460 ipm (2.54 - 11.68 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)	

FCAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Flux Core							
	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		175 - 600 ipm (4.45 - 15.24 m/min)
			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)
			FCAW-G	CV	CO ₂	189	Pinch	125 - 390 ipm (3.18 - 9.91 m/min)
					Argon Mix	190		125 - 360 ipm (3.18 - 9.14 m/min)

SMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA							
	NA	NA	DCEP SMAW	SMAW Soft	NA	1	Arc Force, Hot Start	15 - 350 A
				SMAW Crisp	NA	2	Arc Force, Hot Start	15 - 350 A
				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	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 (Θ)	Ar / He	375	Hot Start	5 - 350 A
				HF TIG Pulse (Θ)	Ar / He	376	Frequency, Background, Hot Start	5 - 350 A
				Auto TIG	Ar / He	490		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

CAG	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA							
	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							
	1.0 mm		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)
				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)
	1.4 mm		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 - 455 ipm (2.54 - 11.56 m/min)
				Sync Pulse Trail	Argon Mix	407	UltimArc®	100 - 455 ipm (2.54 - 11.56 m/min)
				HotWire Pulse Trail	Argon Mix	463		50 - 445 ipm (1.27 - 11.3 m/min)