

§ 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 - 11 kW	
Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
Steel	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 - 1075 ipm (1.27 - 27.31 m/min)			
		GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 - 1075 ipm (1.52 - 27.31 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)	
	1.0 mm	GMAW CV	CV	CO <sub>2</sub>	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 <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)	
	1.2 mm	GMAW CV	CV	CO <sub>2</sub>	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 <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)		
1.4 mm	GMAW CV	CV	CO <sub>2</sub>	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)					
1.6 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	275	75 - 395 ipm (1.91 - 10.03 m/min)			
		GMAW CV	CV	Argon Mix	107	Pinch	50 - 225 ipm (1.27 - 5.72 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)	
			Pulse	Argon Mix	82		50 - 530 ipm (1.27 - 13.46 m/min)	
	1.4 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	294	UltimArc®	75 - 700 ipm (1.91 - 17.78 m/min)	
			Pulse	Argon Mix	84		50 - 335 ipm (1.27 - 8.51 m/min)	
	1.6 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	295	UltimArc®	60 - 420 ipm (1.52 - 10.67 m/min)	
			CV	Argon Mix	85		Pinch	50 - 310 ipm (1.27 - 7.87 m/min)
	Stainless Metal Core EC4XX	1.2 mm	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)	

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
							Current (A)	Speed (m/min)
GMAW	0.8 mm	GMAW CV	CV	Argon Mix	61	Pinch	100 - 1120	ipm (2.54 - 28.45 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 - 1110	ipm (1.52 - 28.19 m/min)
		GMAW Pulse	Pulse	Argon Mix	421	UltimArc®	100 - 600	ipm (2.54 - 15.24 m/min)
				Ar He CO <sub>2</sub>	364		100 - 300	ipm (2.54 - 7.62 m/min)
		GMAW STT®	Synergic STT®(‡)	Argon Mix	365	UltimArc®, Hot Start	100 - 250	ipm (2.54 - 6.35 m/min)
				Ar He CO <sub>2</sub>	344		100 - 300	ipm (2.54 - 7.62 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 - 920	ipm (1.91 - 23.37 m/min)
				Ar He CO <sub>2</sub>	33		75 - 710	ipm (1.91 - 18.03 m/min)
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	34	UltimArc®	60 - 835	ipm (1.52 - 21.21 m/min)
				Argon Mix	36		60 - 910	ipm (1.52 - 23.11 m/min)
		GMAW Pulse	Precision Pulse™	Argon Mix	422	UltimArc®	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 <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 - 460	ipm (1.91 - 11.68 m/min)
				Ar He CO <sub>2</sub>	43		75 - 435	ipm (1.91 - 11.05 m/min)
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	44	UltimArc®	50 - 450	ipm (1.27 - 11.43 m/min)
				Argon Mix	46		50 - 560	ipm (1.27 - 14.22 m/min)
		GMAW Pulse	Precision Pulse™	Argon Mix	423	UltimArc®	50 - 400	ipm (1.27 - 10.16 m/min)
				Argon Mix	284		100 - 780	ipm (2.54 - 19.81 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 - 215	ipm (1.27 - 5.46 m/min)	
	GMAW Pulse	Pulse	Argon Mix	56	UltimArc®	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	191	UltimArc®	50 - 555	ipm (1.27 - 14.1 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/ Ar He	502	UltimArc®	75 - 800	ipm (1.91 - 20.32 m/min)
	1.2mm	GMAW Pulse	Pulse	Ar/ Ar He	504	UltimArc®	75 - 600	ipm (1.91 - 15.24 m/min)

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
							Current (A)	Speed (m/min)
GMAW	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)
				Argon	98		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)	
			Argon	71		125 - 590	ipm (3.18 - 14.99 m/min)	
	1.2 mm	GMAW CV	CV	Argon	71	Pinch	125 - 590	ipm (3.18 - 14.99 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)
				Argon	99		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)	
			Argon	73		75 - 340	ipm (1.91 - 8.64 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 (1.91 - 8.89 m/min)
GMAW Pulse		Pulse	Argon	79	UltimArc®	75 - 350	ipm (1.91 - 8.89 m/min)	
			Argon	100		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)		
		Argon	394		100 - 400	ipm (2.54 - 10.16 m/min)		

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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)	
			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)
			GMAW CV	CV	Argon	75	Pinch	125 - 750 ipm	(3.18 - 19.05 m/min)
	1.2 mm	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)	
			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)
1.6 mm	GMAW Pulse	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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	Flux Core								
	All	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 - 45 V	
			FCAW-G	Gas Shield CV	NA	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 - 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 (§)	Ar / He	375	Hot Start	5 - 350 A	
				HF TIG (§)	Ar / He	376	Frequency, Background, Hot Start	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)		
			1.2 mm	GMAW Tandem (Δ)	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)		