

§ Advanced Module Required

‡ STT® or Advanced Module Required

Δ Tandem Controller Required

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 module rating, or feeder configuration

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
								All
All	All	GMAW CV	STD CV		5	Pinch	10 - 45 V	
		GMAW Power	Power Mode®		40	Pinch	0.1 - 23 kW	
GMAW	Steel	0.030	GMAW CV	CV	CO <sub>2</sub>	93	Pinch	75 - 1200 ipm
				Argon Mix	94	75 - 1200 ipm		
		GMAW Pulse	Pulse	Argon Mix	95	UltimArc®	65 - 1200 ipm	
		0.035	GMAW CV	CV	CO <sub>2</sub>	10	Pinch	50 - 1200 ipm
				Argon Mix	11	50 - 1200 ipm		
			GMAW Pulse	Pulse	Argon Mix	12	UltimArc®	60 - 1200 ipm
				RapidArc®	Argon Mix	13		60 - 1200 ipm
				Precision Pulse™	Argon Mix	411		100 - 600 ipm
			Rapid X™(‡)	Argon Mix	272	75 - 1200 ipm		
		GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	324	UltimArc®, Hot Start	100 - 225 ipm	
			Argon Mix	325	100 - 225 ipm			
		NonSynergic STT®(‡)	CO <sub>2</sub>	304	Peak, Background, Tailout, Hot Start	100 - 300 ipm		
	Argon Mix	305	100 - 300 ipm					
	0.040	GMAW CV	CV	CO <sub>2</sub>	138	Pinch	50 - 1200 ipm	
			Argon Mix	139	50 - 1200 ipm			
		GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 - 1200 ipm	
			RapidArc®	Argon Mix	141		60 - 1200 ipm	
			Precision Pulse™	Argon Mix	412		75 - 600 ipm	
			Rapid X™(‡)	Argon Mix	273		75 - 800 ipm	
		GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	326	UltimArc®, Hot Start	90 - 225 ipm	
	Argon Mix		327	90 - 225 ipm				
	NonSynergic STT®(‡)	CO <sub>2</sub>	306	Peak, Background, Tailout, Hot Start	90 - 225 ipm			
	Argon Mix	307	90 - 225 ipm					
	0.045	GMAW CV	CV	CO <sub>2</sub>	20	Pinch	50 - 800 ipm	
			Argon Mix	21	50 - 800 ipm			
		GMAW Pulse	Pulse	Argon Mix	22	UltimArc®	50 - 800 ipm	
			RapidArc®	Argon Mix	18		75 - 800 ipm	
			Precision Pulse™	Argon Mix	413		75 - 600 ipm	
			Rapid X™(‡)	Argon Mix	274		100 - 800 ipm	
		GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	328	UltimArc®, Hot Start	90 - 200 ipm	
Argon Mix	329		90 - 200 ipm					
NonSynergic STT®(‡)	CO <sub>2</sub>	308	Peak, Background, Tailout, Hot Start	90 - 225 ipm				
Argon Mix	309	90 - 225 ipm						
0.052	GMAW CV	CV	CO <sub>2</sub>	24	Pinch	50 - 750 ipm		
		Argon Mix	25	50 - 700 ipm				
	GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 700 ipm		
		RapidArc®	Argon Mix	27		60 - 750 ipm		
		Precision Pulse™	Argon Mix	414		75 - 500 ipm		
		Rapid X™(‡)	Argon Mix	275		75 - 600 ipm		
	GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	330	UltimArc®, Hot Start	75 - 175 ipm		
Argon Mix		331	75 - 175 ipm					
NonSynergic STT®(‡)	CO <sub>2</sub>	310	Peak, Background, Tailout, Hot Start	90 - 150 ipm				
Argon Mix	311	75 - 150 ipm						
1/16	GMAW CV	CV	Argon Mix	107	Pinch	50 - 450 ipm		
	GMAW Pulse	Pulse	Argon Mix	108	UltimArc®	50 - 500 ipm		

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<b>GMAW</b>	<b>Stainless</b>	0.030	GMAW CV	CV	Argon Mix	<b>61</b>	Pinch	100 - 1200 ipm					
					He Ar CO <sub>2</sub>	<b>63</b>		100 - 1200 ipm					
			GMAW Pulse	Pulse	He Ar CO <sub>2</sub>	<b>64</b>	UltimArc®	90 - 1200 ipm					
					Argon Mix	<b>66</b>		80 - 1200 ipm					
					Precision Pulse™	Argon Mix		<b>420</b>	UltimArc®	100 - 800 ipm			
						He Ar CO <sub>2</sub>		<b>430</b>		100 - 800 ipm			
		0.035	GMAW CV	CV	Argon Mix	<b>31</b>	Pinch	75 - 1200 ipm					
					He Ar CO <sub>2</sub>	<b>33</b>		75 - 1200 ipm					
					Pulse	He Ar CO <sub>2</sub>		<b>34</b>	UltimArc®	75 - 1200 ipm			
						Argon Mix		<b>36</b>		60 - 1200 ipm			
			GMAW Pulse	Precision Pulse™	Argon Mix	<b>421</b>	UltimArc®	100 - 600 ipm					
					He Ar CO <sub>2</sub>	<b>431</b>		100 - 700 ipm					
					Rapid X™(‡)	Argon Mix		<b>282</b>	UltimArc®	100 - 800 ipm			
	GMAW STT®	Synergic STT®(‡)	Argon Mix	<b>364</b>	UltimArc®, Hot Start	100 - 300 ipm							
			He Ar CO <sub>2</sub>	<b>365</b>		100 - 250 ipm							
		NonSynergic STT®(‡)	Argon Mix	<b>344</b>	Peak, Background, Tailout, Hot Start	100 - 300 ipm							
			He Ar CO <sub>2</sub>	<b>345</b>		100 - 300 ipm							
	0.040	GMAW STT®	Synergic STT®(‡)	Argon Mix	<b>366</b>	UltimArc®, Hot Start	100 - 300 ipm						
				He Ar CO <sub>2</sub>	<b>367</b>		100 - 250 ipm						
			NonSynergic STT®(‡)	Argon Mix	<b>346</b>	Peak, Background, Tailout, Hot Start	100 - 300 ipm						
				He Ar CO <sub>2</sub>	<b>347</b>		100 - 300 ipm						
	0.045	GMAW CV	CV	Argon Mix	<b>41</b>	Pinch	75 - 800 ipm						
				He Ar CO <sub>2</sub>	<b>43</b>		75 - 800 ipm						
				GMAW Pulse	Pulse		He Ar CO <sub>2</sub>	<b>44</b>	UltimArc®	75 - 800 ipm			
							Argon Mix	<b>46</b>		50 - 800 ipm			
							Precision Pulse™	Argon Mix		<b>423</b>	UltimArc®	50 - 400 ipm	
								He Ar CO <sub>2</sub>		<b>433</b>		60 - 400 ipm	
GMAW STT®		Rapid X™(‡)	Argon Mix	<b>284</b>	UltimArc®	100 - 800 ipm							
			Synergic STT®(‡)	Argon Mix		<b>368</b>	UltimArc®, Hot Start	90 - 200 ipm					
				He Ar CO <sub>2</sub>		<b>369</b>		90 - 200 ipm					
			NonSynergic STT®(‡)	Argon Mix		<b>348</b>	Peak, Background, Tailout, Hot Start	90 - 225 ipm					
				He Ar CO <sub>2</sub>		<b>349</b>		90 - 225 ipm					
			1/16	GMAW CV		CV	Argon Mix	<b>51</b>	Pinch	50 - 515 ipm			
GMAW Pulse	Pulse	Argon Mix		<b>56</b>	UltimArc®	50 - 635 ipm							
<b>Metal Core</b>	0.035	GMAW AC Pulse	Rapid Z™(§)	Argon Mix	<b>472</b>	UltimArc®	75 - 900 ipm						
				Argon Mix	<b>473</b>		70 - 700 ipm						
	0.045	GMAW CV	CV	Argon Mix	<b>81</b>	Pinch	100 - 700 ipm						
				Argon Mix	<b>82</b>		UltimArc®	50 - 700 ipm					
				GMAW Pulse	RapidArc®			Argon Mix	<b>87</b>	UltimArc®	75 - 800 ipm		
								Argon Mix	<b>294</b>		75 - 800 ipm		
								Rapid X™(‡)	Argon Mix		<b>83</b>	Pinch	50 - 600 ipm
	0.052	GMAW Pulse	RapidArc®	Argon Mix	<b>84</b>	UltimArc®		50 - 600 ipm					
				Argon Mix	<b>88</b>		60 - 800 ipm						
				Rapid X™(‡)	Argon Mix		<b>295</b>	UltimArc®	60 - 650 ipm				
	1/16	GMAW CV	CV	Argon Mix	<b>85</b>	Pinch	50 - 450 ipm						
				Argon Mix	<b>86</b>		UltimArc®	50 - 450 ipm					
GMAW Pulse				RapidArc®	Argon Mix			<b>89</b>	UltimArc®	60 - 450 ipm			
					Argon Mix			<b>296</b>		75 - 450 ipm			

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	<b>GMAW</b>	<b>Aluminum 4XXX</b>	0.035	GMAW CV	CV	Argon	<b>148</b>	Pinch
GMAW Pulse				Pulse	Argon	<b>149</b>	UltimArc®	125 - 800 ipm
				CC Pulse	Argon	<b>150</b>		125 - 800 ipm
GMAW Pulse on Pulse®				Pulse on Pulse®	Argon	<b>98</b>	Frequency	125 - 800 ipm
GMAW AC Pulse			AC Pulse (§)	Argon	<b>391</b>	UltimArc®	125 - 700 ipm	
3/64			GMAW CV	CV	Argon	<b>71</b>	Pinch	125 - 700 ipm
			GMAW Pulse	Pulse	Argon	<b>72</b>	UltimArc®	85 - 600 ipm
				CC Pulse	Argon	<b>69</b>		85 - 600 ipm
			GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	<b>99</b>	Frequency	85 - 500 ipm
GMAW AC Pulse			AC Pulse (§)	Argon	<b>393</b>	UltimArc®	100 - 500 ipm	
1/16			GMAW CV	CV	Argon	<b>73</b>	Pinch	75 - 375 ipm
			GMAW Pulse	Pulse	Argon	<b>74</b>	UltimArc®	75 - 350 ipm
		CC Pulse		Argon	<b>79</b>	75 - 350 ipm		
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	<b>100</b>	Frequency	80 - 400 ipm	
GMAW AC Pulse		AC Pulse (§)	Argon	<b>394</b>	UltimArc®	100 - 400 ipm		
<b>Aluminum 5XXX</b>		0.035	GMAW CV	CV	Argon	<b>151</b>	Pinch	175 - 750 ipm
			GMAW Pulse	Pulse	Argon	<b>152</b>	UltimArc®	150 - 800 ipm
				CC Pulse	Argon	<b>153</b>		150 - 800 ipm
			GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	<b>101</b>	Frequency	140 - 800 ipm
		GMAW AC Pulse	AC Pulse (§)	Argon	<b>396</b>	UltimArc®	125 - 800 ipm	
		3/64	GMAW CV	CV	Argon	<b>75</b>	Pinch	125 - 750 ipm
			GMAW Pulse	Pulse	Argon	<b>76</b>	UltimArc®	85 - 700 ipm
				CC Pulse	Argon	<b>70</b>		85 - 700 ipm
			GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	<b>102</b>	Frequency	100 - 600 ipm
		GMAW AC Pulse	AC Pulse (§)	Argon	<b>398</b>	UltimArc®	85 - 600 ipm	
		1/16	GMAW CV	CV	Argon	<b>77</b>	Pinch	125 - 500 ipm
			GMAW Pulse	Pulse	Argon	<b>78</b>	UltimArc®	100 - 500 ipm
				CC Pulse	Argon	<b>80</b>		100 - 450 ipm
	GMAW Pulse on Pulse®		Pulse on Pulse®	Argon	<b>103</b>	Frequency	75 - 350 ipm	
	GMAW AC Pulse	AC Pulse (§)	Argon	<b>399</b>	UltimArc®	100 - 400 ipm		
	<b>SiBr</b>	0.035	GMAW Pulse	Pulse	Argon	<b>192</b>	UltimArc®	80 - 1200 ipm
0.045		GMAW Pulse	Pulse	Argon	<b>191</b>	UltimArc®	50 - 600 ipm	
<b>Cu</b>	0.035	GMAW Pulse	Pulse	Argon Helium	<b>198</b>	UltimArc®	100 - 700 ipm	
	0.045	GMAW Pulse	Pulse	Argon Helium	<b>196</b>	UltimArc®	75 - 500 ipm	
<b>NiCr</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	<b>501</b>	UltimArc®	75 - 800 ipm	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	<b>503</b>	UltimArc®	75 - 600 ipm	
<b>NiCu</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	<b>507</b>	UltimArc®	75 - 800 ipm	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	<b>509</b>	UltimArc®	75 - 600 ipm	
<b>NiFe-CI</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	<b>513</b>	UltimArc®	75 - 800 ipm	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	<b>515</b>	UltimArc®	75 - 600 ipm	
<b>Ni-1</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	<b>519</b>	UltimArc®	75 - 800 ipm	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	<b>521</b>	UltimArc®	75 - 600 ipm	
<b>Ni-CI</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	<b>525</b>	UltimArc®	75 - 800 ipm	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	<b>527</b>	UltimArc®	75 - 500 ipm	

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FCAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Flux Core	All		FCAW-S	STD CV	NA	<b>6</b>	Pinch
FCAW-G				STD CV		<b>7</b>	Pinch	10 - 45 V
0.045			FCAW-G	CV	CO <sub>2</sub>	<b>90</b>	Pinch	175 - 600 ipm
					Argon Mix	<b>91</b>		175 - 600 ipm
0.052			FCAW-G	CV	CO <sub>2</sub>	<b>187</b>	Pinch	150 - 500 ipm
					Argon Mix	<b>188</b>		150 - 500 ipm
1/16			FCAW-G	CV	CO <sub>2</sub>	<b>189</b>	Pinch	125 - 400 ipm
					Argon Mix	<b>190</b>		125 - 400 ipm

SMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA		DCEP SMAW	SMAW Soft	NA	<b>1</b>	Arc Force, Hot Start
SMAW Crisp					NA	<b>2</b>	Arc Force, Hot Start	15 - 555 A
SMAW Pipe					NA	<b>4</b>	Arc Force	50 - 250 A
DCEN SMAW				SMAW DC- (§)	NA	<b>379</b>	Arc Force, Hot Start	15 - 350 A
AC SMAW				AC SMAW (§)	NA	<b>374</b>	Arc Force, Hot Start, Frequency	15 - 350 A

GTAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA		DCEN GTAW	GTAW Touch Start	Argon	<b>3</b>	Hot Start
GTAW-P					Argon	<b>8</b>	Hot Start, Frequency, Background	5 - 555 A
GTAW HF (§)					Argon	<b>375</b>	Hot Start	5 - 450 A
GTAW-P HF (§)					Argon	<b>376</b>	Hot Start, Frequency, Background	5 - 450 A
AC GTAW				Touch Start AC GTAW (§)	Argon	<b>377</b>	Hot Start, Frequency, Balance, Offset	10 - 350 A
				HF Start AC GTAW (§)	Argon	<b>378</b>	Hot Start, Frequency, Balance, Offset	10 - 350 A

CAG	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA	NA	CAG	CAG	Compressed Air	<b>9</b>		

GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Steel	0.035	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	<b>400</b>	UltimArc®	100 - 1000 ipm
Sync Pulse Trail				Argon Mix	<b>401</b>	100 - 800 ipm		
HotWire Pulse Trail				Argon Mix	<b>460</b>	80 - 900 ipm		
0.040		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	<b>402</b>	UltimArc®	150 - 800 ipm	
			Sync Pulse Trail	Argon Mix	<b>403</b>		150 - 800 ipm	
			HotWire Pulse Trail	Argon Mix	<b>461</b>		80 - 800 ipm	
0.045		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	<b>404</b>	UltimArc®	100 - 700 ipm	
			Sync Pulse Trail	Argon Mix	<b>405</b>		100 - 700 ipm	
			HotWire Pulse Trail	Argon Mix	<b>462</b>		75 - 800 ipm	
0.052		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	<b>406</b>	UltimArc®	100 - 800 ipm	
			Sync Pulse Trail	Argon Mix	<b>407</b>		100 - 800 ipm	
			HotWire Pulse Trail	Argon Mix	<b>463</b>		50 - 800 ipm	