



Alpha Astra Series

Industrial Three-Phase UPS 5 to 3600kVA

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THE ASTRA INDUSTRIAL AC & DC POWER SYSTEMS ARE ENGINEERED TO SUPPLY CLEAN CONTINUOUS POWER IN CONDITIONS RANGING FROM EVERYDAY POWER FLUCTUATIONS TO CATASTROPHIC POWER FAILURE.

Systems are designed with state of the art IGBT technology and ergonomics, providing a complete AC and DC power backup system. True online double conversion Uninterruptible Power Supplies (UPS) provide high power quality and reliability. The LCD monitoring panel provides all necessary information on an easy to understand front mimic panel.

Ideal applications for Alpha Industrial Power systems include thermal power plants, petrochemical plants, steel-works, naval civil applications, naval military applications, off-shore platforms, energy control, civil installations and railway infrastructure.

Astra Series Custom Product Applications

- › Switching rectifier and battery charger for railways application (Mobile)
- › Inverter for railways application (Mobile)
- › Voltages regulator for civil lighting applications (Tunnel, Road Lights)

Industry Project

- › Complete UPS designed for semi-custom applications
- › Manual battery recharge
- › Adaptable to all input voltages
- › High power rectifier to recharge long backup batteries
- › Double input frequency (50 and 60Hz)
- › Parallelable up to 6 units
- › Special battery intermediate voltages (48 / 110 / 220Vdc)
- › Compatible with most common industry communications standards
- › Automatic battery recharge (IU-DIN41733, I1 I2 U)
- › Easy access for maintenance and service

RCN - Rectifier Battery Charger

- › Power range: 120 / 240Vdc 65 to 1100A
- › Adaptable to all input voltages
- › Full digital control
- › Frequency (50 and 60Hz) self adapting
- › Open code software: system engineering adapts the basic C code to the application through a user friendly interface
- › Adaptable to all output voltages and currents
- › Automatic battery recharge (UI-DIN41733, I1 I2 U, U1 U2 I)
- › Manual battery recharge

IMN/ITN - Single and Three Phase Inverters

- › Power range: 5 to 3600kVA
- › Adaptable to all output AC standard voltages
- › Full digital control
- › Parallelable up to 6 units
- › Open code software: system engineering adapts the basic C code to the application through a user friendly interface
- › LCD Front Panel + RS232 + Free Contact Interface
- › (no programming skills required)
- › Compatible with the main communication standards
- › Adaptable to all input DC standard voltages
- › Compliant to the main industrial standards



RCN Rectifier



Astra Series IMN 1 Phase



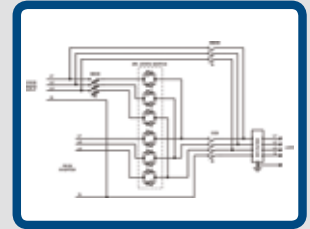
Astra Series ITN 3 Phase

RCN 120 and 240Vdc - Size (A)	65	125	225	350
Electrical				
Input Voltage:	380/400/415Vac, ±15%, 3Wires (other voltage on request)			
Input Frequency:	50+60Hz, ±5Hz			
Input Short Circuit Current (@ 400Vac, IEC Standard):	≤10kA rms (others on request)			
120Vdc Max Input Power Consumption @ Vin=400V, Load 100%:	12.8kVA	24.6kVA	44.3kVA	68.9kVA
240Vdc Max Input Power Consumption @ Vin=400V, Load 100%:	25.6kVA	49.2kVA	88.6kVA	138kVA
Max Input Power Distortion @ Nominal Load (THD%):	≤27%, ≤12% with 12 pulses bridge with electronic sharing (on request) or with input THD filter (on request)			
Input Power Factor (With nominal voltage, 100% load):	≥0.75 (without manual charge)			
120Vdc Nominal Output Voltage:	120Vdc (110+125)			
240Vdc Nominal Output Voltage:	240Vdc (220+240)			
Output Voltage (Vac):				
Floating	2.2+2.3 V/Cell for lead battery (adjustable), 1.4+1.5 V/Cell for NiCad battery (adjustable)			
Boost	2.4+2.45 V/Cell for lead battery (adjustable), 1.5+1.6 V/Cell for NiCad battery (adjustable)			
Equalizing	Up to 2.7 V/Cell for lead battery, up to 1.7 V/Cell for NiCad battery (manual charge)			
	Forced boost push button (on request), Thermal compensation for sealed lead battery (on request)			
Output Ripple:	≤2%rms (1%rms on request)			
Overload Capability:	110% for 20min / 120% for 10sec			
Battery Recharging System:	DIN 41773 IU with ammetric discrimination for vented lead acid and NiCad battery			
Heat Dissipation @ Nominal Load and Voltage (120Vdc):	0.6kW, 34BTU/min	1.13kW, 64BTU/min	2.03kW, 116BTU/min	3.15kW, 180BTU/min
Heat Dissipation @ Nominal Load and Voltage (240Vdc):	1.2kW, 68BTU/min	2.25kW, 128BTU/min	4.06kW, 231BTU/min	6.3kW, 359BTU/min
Parallelability:	Units decoupled by diodes with natural load sharing (on request)			

RCN 120 and 240Vdc - Size (A)	65	125	225	350
120Vdc Efficiency:				
25%, 50%	≥68, ≥83	≥69, ≥84	≥70, ≥84	≥70, ≥85
75%, 100%	≥88, ≥93	≥89, ≥93	≥90, ≥93	≥90, ≥93
240Vdc Efficiency:				
25%, 50%	≥68, ≥83	≥69, ≥84	≥70, ≥85	≥72, ≥86
75%, 100%	≥88, ≥93	≥89, ≥93	≥90, ≥94	≥91, ≥94
Cable Wiring:	Insulation 450/750V Uo/U, 70 to 160°C, CEI 20-22, IEC 332.1 (450/750V Uo/U, 90 to 250°C, CEI 20-22, CEI 20-38, IEC 332.2 on request) Flat cables for low voltage signals between PCBs are used			
Environmental Data				
Acoustic Noise Level:	<60dBA (according EN 50091)		<62dBA (according EN 50091)	
EMI:	EN50091-2 (CE Label) Restricted			
Operating Temperature:	-10 to 40°C / 14 to 104°F			
Storage Temperature:	-20 to 70°C / -4 to 158°F			
Relative Humidity:	<95% non-condensing			
Ventilation:	Forced for rectifier bridge (redundant on request)			
Altitude (mt. above sea level):	<2000 (derating -0.05% / mt)			
Mechanical Data				
Protection Degree (IEC529):	IP 20 (other on request)			
Painting Color and Type:	RAL 7035 (Gray), ≥60µm, 40 gloss (others on request)			
Dimensions 120Vdc H x W x D (in/mm):	70.9 x 24.2 x 23.8 / 1800 x 615 x 605			82.7x242x 31.7/2100x 615x805
Weight 120Vdc (lb/kg):	903.9 / 410	1124.4 / 510	1234.6 / 560	1763.7 / 800
Dimensions 240Vdc H x W x D (in/mm):	70.9 x 24.2 x 24.2 / 1800 x 615 x 615		82.7x242x 31.7/2100x 615x805	82.7x321x 31.7/2100x 815x805
Weight 240Vdc (lb/kg):	1036.2 / 470	1366.9 / 620	1521.2 / 690	1984.2 / 900
Input/Output Cable Connection:	Bottom side (top side on request)			
Transport:	Base provided: for forklift handling (lifting belts and load balancing hooks - on request)			
Transport Mechanical Stress:	EN50091-1 Restricted			
Installation (in/mm):	7.9 / 200 from wall (less on request), 11.8 / 300 from ceiling, air inlet from the front, air outlet from the top and rear sides			
Accessibility:	Front and rear (not rear access - on request with cabinet extension)			



Maximizes reliability index mean time between failures using common electronics cards



Thyristor-based static switch with redundant supply



Parallelable up to four units with microprocessor load sharing control

ITN 120Vdc - Power (kVA)		10	20	30	60	100	150
Electrical							
Input Voltage:		120Vdc nominal value, min to max range 95 to 170					
Nominal Output Power (P.F. 0.8, P.F. 1):		10kVA 8kW	20kVA 16kW	30kVA 24kW	60kVA 48kW	100kVA 80kW	150kVA 120kW
Nominal Output Voltage:		380/400/415Vac (adjustable $\pm 5\%$) 3PH + N 4 wires (208 or 440 on request)					
Nominal Output Current (P.F.1, P.F. 0.8):		11.6A, 14.5A	23.2A, 29A	34.7A, 43.3A	70A, 87A	116A, 145A	174A, 217A
Output Harmonic Distorsion (THD):		<3% linear load, <6% non linear load (75% N.P. and CF 3:1)					
Overload Capability (PF=0.8):	Inverter	110% Pn for 2h, 125% Pn for 10', 150% In for 10', 200% In for 100ms					
	Bypass	150% Pn continuous duty, 200% Pn for 10', 2000% Pn for 1 cycle					
Short Circuit Protection:	Bypass Protection	By fuses					
	Current Inverter Limitation	200% In for the first 100ms (AC current limit for distribution fuses intervention) 125% In for 5 s (according with EN50091-3)					
Output Frequency:		Nominal 50/60Hz (selectable), inverter sync with mains ± 2 Hz (selectable)					
Voltage Static Stability:		$\pm 2\%$					
Dynamic Stability:	50%	$\pm 5\%$ with recovery @ $\pm 2\%$ within 2 cycles					
	100%	$\pm 8\%$ ($\pm 5\%$ on request) with recovery @ $\pm 2\%$ within 3 cycles					
Efficiency:	25%, 50%	$\geq 81, \geq 83$	$\geq 82, \geq 84$	$\geq 82, \geq 86$	$\geq 83, \geq 86$	$\geq 83, \geq 86$	$\geq 83, \geq 86$
	75%, 100%	$\geq 85, \geq 85$	$\geq 85, \geq 86$	$\geq 87, \geq 87$	$\geq 87, \geq 87$	$\geq 87, \geq 87$	$\geq 87, \geq 87$
Heat Dissipation @ Nominal Load and Voltage:		1.41kW, 80BTU/ min	2.60kW, 148BTU/ min	3.59kW, 204BTU/ min	7.17kW, 408BTU/ min	11.9kW, 680BTU/ min	17.9kW, 1020BTU/ min
Hot Stand-by:		2 units max					
Parallelability:		Up to 6 units with electronic sharing					
Automatic Static Bypass:		Electronic Thyristor Switch					
Bypass Range Accepted For Commutation:							
	Voltage	Nominal output voltage $\pm 10\%$ (others on request)					
	Frequency	Nominal output frequency ± 2 Hz (adjustable)					
Transfer:		Sensing and transfer time \leq Cycle, Commutation time 500 μ s					
Retransfer:		0 s (controlled), automatic or manual (selectable), block on mains after 6 commutations in 120sec					

ITN 120Vdc - Power (kVA)		10	20	30	60	100	150
Manual Bypass:		With electronic security and without interruption					
Cable Wiring:		450/750V Uo/U, 70 to 160°C, CEI 20-22, IEC 332.1 (450/750V Uo/U, 90 to 250°C, CEI 20-22, IEC 332.2 on request) Flat cables for low voltage signals between PCBs are used					
Environmental Data							
Acoustic Noise Level:		<62dBA (according EN50091)	<65dBA (according EN 50091)				
EMI:		EN50091-2 (CE Label) Restricted					
Operating Temperature:		-10 to 40°C / 14 to 104°F (for T <0°C data can not be readable due to freezing of LCD)					
Storage Temperature:		-20 to 70°C / -4 to 158°F					
Relative Humidity:		<95% non-condensing					
Ventilation:		Forced (forced redundant on request)					
Altitude (mt. above sea level):		<1000					
Power Derating For Altitude:		>1000 mt (a.s.l.) 0.05% /mt					
Mechanical Data							
Protection Degree (IEC529):		IP 20 (other on request)					
Painting Color and Type:		RAL 7035 (Gray), $\geq 60\mu$ m, 40 gloss (others on request)					
Dimensions H x W x D (in/mm):		70.9 x 24.2 x 23.8 / 1800 x 615 x 605	82.7 x 24.2 x 31.7 / 2100 x 615 x 805		82.7 x 36 x 2100 x 915 x 805	82.7 x 63 x 2100 x 1600 x 805	82.7 x 70.9 x 35.6 / 2100 x 1800 x 905
		749.6 / 340	925.9 / 420	1058.2 / 480	1333.8 / 605	2028.3 / 920	2381 / 1080
Input/Output Cable Connection:		Bottom side (top side on request)					
Transport:		Base provided: for forklift handling (for lifting belts and load balancing hooks - on request)					
Transport Mechanical Stress:		EN50091-1 Restricted					
Installation (in/mm):		7.9 / 200 from wall (less on request), 11.8 / 300 from ceiling, air inlet from the front, air outlet from the top and rear					
Accessibility:		Front and rear (not rear access - on request with cabinet extension)					

IMN 120Vdc/115Vac/230Vac - Power (kVA)		10	20	30	60
Electrical					
Input Voltage:		120Vdc nominal value, min to max range 95 to 170			
Nominal Output Power (P.F. 0.8, P.F. 1):		10kVA, 8kW	20kVA, 16kW	30kVA, 24kW	60kVA, 48kW
Nominal Output Voltage:		115/120Vac (adjustable $\pm 5\%$) 1PH, 2 wires			
Nominal Output Current (P.F.1, P.F. 0.8):		69.6A, 87A	139A, 174A	208A, 260A	417A, 521A
Output Harmonic Distorsion (THD):		<3% linear load, <6% non linear load (75% N.P. and CF 3:1)			
Overload Capability (PF=0.8):	Inverter	110% Pn for 2h, 125% Pn for 10', 150% In for 10', 200% In for 100ms			
	Bypass	150% Pn continuous duty, 200% Pn for 10', 2000% Pn for 1 cycle			
Short Circuit Protection:	Bypass Protection	By fuses			
	Current Inverter Limitation	200% In for the first 100ms (AC current limit for distribution fuses intervention) 125% In for 4.8 s (according with EN50091-3)			
Output Frequency:		Nominal 50/60Hz (selectable), inverter sync with mains ± 2 Hz (selectable)			
Voltage Static Stability:		$\pm 1.5\%$			
Dynamic Stability:	50%	$\pm 5\%$ with recovery @ $\pm 2\%$ within 2 cycles			
	100%	$\pm 8\%$ ($\pm 5\%$ on request) with recovery @ $\pm 2\%$ within 2 cycles			
Efficiency:	25%, 50%	$\geq 75, \geq 79$	$\geq 76, \geq 80$	$\geq 80, \geq 82$	$\geq 80, \geq 82$
	75%, 100%	$\geq 82, \geq 83$	$\geq 82, \geq 84$	$\geq 83, \geq 85$	$\geq 86, \geq 87$
Heat Dissipation @ Nominal Load and Voltage:		1.63kW, 92.7BTU/min	3.05kW, 173BTU/min	4.23kW, 240BTU/min	7.17kW, 408BTU/min
Hot Stand-by:		2 units max			
Parallelability:		Up to 6 units with electronic sharing			
Automatic Static Bypass:		Electronic Thyristor Switch			
Bypass Range Accepted For Commutation:					
	Voltage	Nominal output voltage $\pm 10\%$ (others on request)			
	Frequency	Nominal output frequency ± 2 Hz (adjustable)			
Transfer:		Sensing and transfer time \leq Cycle, Commutation time 500 μ s			
Retransfer:		0 s (controlled), automatic or manual (selectable), block on mains after 6 commutations in 120sec			
Manual Bypass:		With electronic security and without interruption			
Cable Wiring:		450/750V Uo/U, 70 to 160°C, CEI 20-22, IEC 332.1 (450/750V Uo/U, 90 to 250°C, CEI 20-22, CEI 20-38, IEC 332.2 on request) Flat cables for low voltage signals between PCBs are used			
Environmental Data					
Acoustic Noise Level:		<62dBA (according EN 50091)	<65dBA (according EN 50091)		
EMI:		EN50091-2 (CE Label) Restricted			
Operating Temperature:		-10 to 40°C / 14 to 104°F (for T <0°C data can not be readable due to freezing of LCD)			
Storage Temperature:		-20 to 70°C / -4 to 158°F			
Relative Humidity:		<95% non-condensing			
Ventilation:		Forced (forced redundant on request)			
Altitude (mt. above sea level):		<1000			
Power Derating For Altitude:		>1000 mt (a.s.l.) 0.05% /mt			
Mechanical Data					
Protection Degree (IEC529):		IP 20 (other on request)			
Painting Color and Type:		RAL 7035 (Gray), $\geq 60\mu$ m, 40 gloss (others on request)			
Dimensions H x W x D (in/mm):		70.9 x 24.2 x 23.8 / 1800 x 615 x 605	82.7 x 32.1 x 31.7 / 2100 x 815 x 805	82.7 x 36 x 35.6 / 2100 x 915 x 905	
Weight (lb/kg):		727.5 / 330	925.9 / 420	1102.3 / 500	1477.1 / 670
Input/Output Cable Connection:		Bottom side (top side on request)			
Transport:		Base provided: for forklift handling (for lifting belts and load balancing hooks -on request)			
Transport Mechanical Stress:		EN50091-1 Restricted			
Installation (in/mm):		7.9 / 200 from wall (less on request), 11.8 / 300 from ceiling, air inlet from the front, air outlet from the top and rear			
Accessibility:		Front and rear (not rear access - on request with cabinet extension)			

IMN 240Vdc/115Vac/230Vac - Power (kVA)		10	20	60	115
Electrical					
Input Voltage:		240Vdc nominal value, min to max range 190 to 330			
Nominal Output Power (P.F. 0.8, P.F. 1):		10kVA, 8kW	20kVA, 16kW	60kVA, 48kW	115kVA, 92kW
Nominal Output Voltage:		115/120Vac (adjustable $\pm 5\%$) 1PH, 2 wires			
Nominal Output Current (P.F.1, P.F. 0.8):		69.6A, 87A	139A, 174A	417A, 521A	800A, 1000A
Output Harmonic Distorsion (THD):		<3% linear load, <6% non linear load (75% N.P. and CF 3:1)			
Overload Capability (PF=0.8):	Inverter	110% Pn for 2h, 125% Pn for 10', 150% In for 10', 200% In for 100ms			
	Bypass	150% Pn continuous duty, 200% Pn for 10', 2000% Pn for 1 cycle			
Short Circuit Protection:	Bypass Protection	By fuses			
	Current Inverter Limitation	200% In for the first 100ms (AC current limit for distribution fuses intervention) 125% In for 4.8 s (according with EN50091-3)			
Output Frequency:		Nominal 50/60Hz (selectable), inverter sync with mains ± 2 Hz (selectable)			
Voltage Static Stability:		$\pm 1.5\%$			
Dynamic Stability:	50%	$\pm 5\%$ with recovery @ $\pm 2\%$ within 2 cycles			
	100%	$\pm 8\%$ ($\pm 5\%$ on request) with recovery @ $\pm 2\%$ within 2 cycles			
Efficiency:	25%, 50%	$\geq 80, \geq 81$	$\geq 80, \geq 81$	$\geq 82, \geq 84$	$\geq 83, \geq 85$
	75%, 100%	$\geq 82, \geq 84$	$\geq 83, \geq 85$	$\geq 86, \geq 88$	$\geq 87, \geq 89$
Heat Dissipation @ Nominal Load and Voltage:		1.4kW, 79.6BTU/min	2.8kW, 159BTU/min	6.5kW, 370BTU/min	11.4kW, 648BTU/min
Hot Stand-by:		2 units max			
Parallelability:		Up to 6 units with electronic sharing			
Automatic Static Bypass:		Electronic Thyristor Switch			
Bypass Range Accepted For Commutation:					
	Voltage	Nominal output voltage $\pm 10\%$ (others on request)			
	Frequency	Nominal output frequency ± 2 Hz (adjustable)			
Transfer:		Sensing and transfer time \leq Cycle, Commutation time 500 μ s			
Retransfer:		0 s (controlled), automatic or manual (selectable), block on mains after 6 commutations in 120sec			
Manual Bypass:		With electronic security and without interruption			
Cable Wiring:		450/750V Uo/U, 70 to 160°C, CEI 20-22, IEC 332.1 (450/750V Uo/U, 90 to 250°C, CEI 20-22, CEI 20-38, IEC 332.2 on request) Flat cables for low voltage signals between PCBs are used			
Environmental Data					
Acoustic Noise Level:		<62dBA (according EN 50091)	<65dBA (according EN 50091)		
EMI:		EN50091-2 (CE Label) Restricted			
Operating Temperature:		-10 to 40°C / 14 to 104°F (for T <0°C data can not be readable due to freezing of LCD)			
Storage Temperature:		-20 to 70°C / -4 to 158°F			
Relative Humidity:		<95% non-condensing			
Ventilation:		Forced (forced redundant on request)			
Altitude (mt. above sea level):		<1000			
Power Derating For Altitude:		>1000 mt (a.s.l.) 0.05% /mt			
Mechanical Data					
Protection Degree (IEC529):		IP 20 (other on request)			
Painting Color and Type:		RAL 7035 (Gray), $\geq 60\mu$ m, 40 gloss (others on request)			
Dimensions H x W x D (in/mm):		70.9 x 24.2 x 23.8 / 1800 x 615 x 605	82.7 x 32.1 x 31.7 / 2100 x 815 x 805	82.7 x 36 x 35.6 / 2100 x 915 x 905	
Weight (lb/kg):		771.6 / 350	903.9 / 410	1322.8 / 600	1719.6 / 780
Input/Output Cable Connection:		Bottom side (top side on request)			
Transport:		Base provided: for forklift handling (for lifting belts and load balancing hooks - on request)			
Transport Mechanical Stress:		EN50091-1 Restricted			
Installation (in/mm):		7.9 / 200 from wall (less on request), 11.8 / 300 from ceiling, air inlet from the front, air outlet from the top and rear			
Accessibility:		Front and rear (not rear access - on request with cabinet extension)			



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