BLUE STAR
Power Systems Inc.

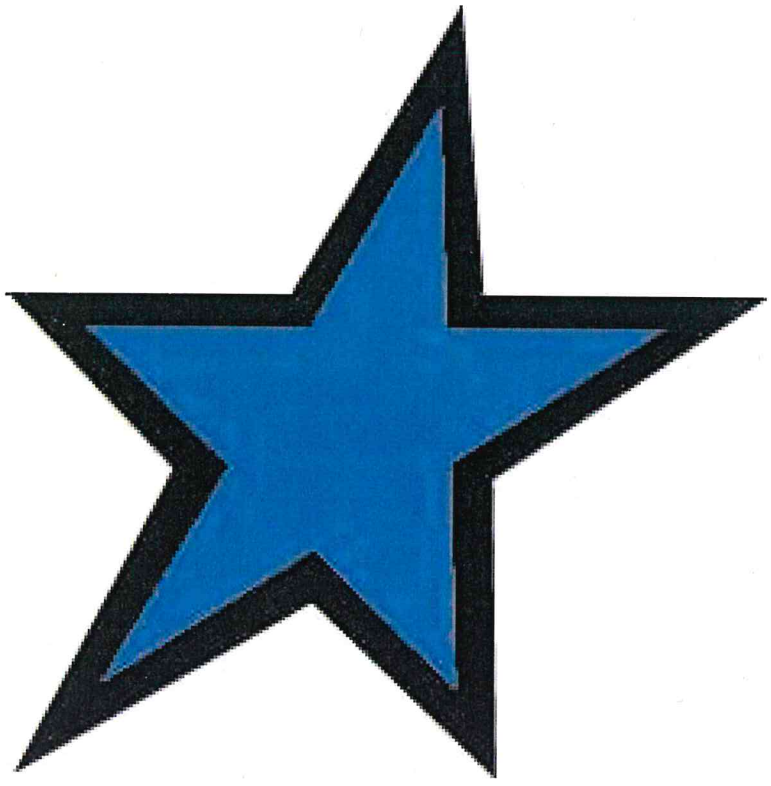
Submittal

12/14/2023

Project Title	County of Fresno
Quote Number:	0096230-4
Model:	VD150-02FT4

Approved : _____

By Antoine Grayson 12/14/2023



Blue Star Power Systems Inc.
Taylor Wallace
2250 Carlson Drive
North Mankato MN 56003
Office: 507 345 1776
Cell: 507 317 9278
Email: taylor.wallace@bluestarps.com

BLUE STAR
Power Systems Inc.

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Power Systems Inc.

Sales Quote

Quote Date:	**8/10/2023 1:15:15 PM**
Quote Number:	**0096230-4**
Project Title:	**County of Fresno**
Prepared for	**Blue Star Power Systems Inc.**

Distributed by:

Unit Model	**VD150-02FT4**	**Standby / Prime**	**Emergency Stationary Standby**
kWe Rating	**150 kWe**	**UL 2200 Listed**	**Yes**
Fuel	**Diesel**	**CSA Approved**	**Yes**
EPA	**Tier 4 Final**	**Paint Color**	**White**

Engine Model:	Volvo TAD871VE 150kW Standby Power Rating at 1800 RPM Governor - Electronic Isochronous
Voltage:	208/120V 3 Phase 60 Hz 0.8 PF
Gen Model:	Stamford UCI274G 12 Lead Wired 208V 3 Phase Low Wye 105°C Rise Over 40°C Ambient
Voltage Regulator:	Stamford MX321 Automatic Voltage Regulator with PMG Excitation
Generator Space Heater:	Generator Anti-Condensation Heater 90W 120VAC Wired to Terminal
Control Panel:	Blue Star DCP7310 Microprocessor Based Gen-Set Controller Mounted Facing Left from Generator End (Unless Specified Otherwise) Standard Features: Low Oil Pressure, High Coolant Temp, Overspeed, Overcrank Shutdowns Emergency Stop Pushbutton, Audible Alarm Buzzer with Silencing Switch
Control Panel Options:	
Unit Color:	White
Enclosure:	OPU (Open Power Unit - No Enclosure) Formed Steel Base with Mounting and Lifting Holes Includes Vibration Mounts to Isolate Unit from Base Rail
Cooling:	Unit Mounted Radiator (50°C Ambient) with Duct Flange
Oil Drain Extension:	Plumbed to Bulkhead Fitting in Base
Mainline Breaker:	500 Amp 3 Pole 600 Volt Breaker Mounted & Wired in a NEMA 1 Enclosure
Jacket Water Heater:	Engine Block Heater 2500W 240VAC Rated for -20°F Heater Installed with Isolation Valves and Wired to Terminal
Air Cleaner:	Dry Single Stage
Air Restrictor Indicator:	Installed in Air Filtration System
Silencer:	SCR Catalyst / Silencer Mounted to Engine
Battery:	24 Volt System with Rack and Cables
Battery Charger:	DSE 24 Volt 10 Amp Mounted and Wired to Terminal
Fuel Tank:	24 Hour / 375 Gallon UL 142 Listed Sub-Base Fuel Tank with Stub-up Area Double Wall Construction with Secondary Containment Standard Includes: Supply & Return Connections, Fuel Level Gauge, Fuel Leak Switch and Fill & Vent Plumbing
Factory Test:	Standard Commercial Testing Includes: Verification of Alarm Shutdowns, Voltage Settings, Block Loading to Rated kWe and PF
Owner's Manual:	Print Copy (Qty 1) **Standard**

Warranty: 2 Year / 2000 Hour Limited

Notes: ADD - Dual Stage filter

Additional Options (Not Included in Price):

Payment Terms: Due Upon Receipt

Delivery Schedule: 40 Weeks (Contingent on component availability)

Terms & Conditions

- This quote is valid for a period of 15 days.
- This proposal is our interpretation of your requirement. It includes only the items listed on this quotation. Should there be other requirements or specifications, we will re-quote accordingly.
- Units are shipped wet to include lube oil and 50/50 water and antifreeze mix unless otherwise noted in this quotation.
- All extended piping, wiring, or other than listed above is performed by “others”.
- Seller is not quoting, offloading, job site startup, personnel instructions, field testing, or unit installation.
- Quoted prices include normal testing, packaging, and instructional literature.
- It is the distributor/purchaser and end user’s responsibility to ensure that this equipment is operated in accordance with all applicable local, state, and federal laws and regulations governing the use and operation of this equipment.

Distributor Terms & Conditions

BLUE STAR
Power Systems Inc.

Diesel Product Line

208-600 Volt

VD150-02FT4

60 Hz / 1800 RPM

150 kWe / 150 kWe

Standby / Prime

Ratings

	240V	208V	240V	480V	600V
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Generator Model	UCDI274J1	UCI274G	UCI274G	UCI274F	UCI274F
Connection	12 LEAD DD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	4 LEAD WYE
Standby kWe	150	150	150	150	150
AMPS	625	521	452	226	181
Temp Rise	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C
Prime kWe	150	150	150	150	150
AMPS	625	521	452	226	181
Temp Rise	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C	105˚C / 40˚C

Standard Equipment

Engine

- Radiator Cooled Unit Mounted (55˚C)
- Radiator Duct Flange (OPU Only)
- Blower Fan & Fan Drive
- Starter & Alternator
- Oil Pump & Filter
- Oil Drain Extension w/Valve
- Governor - Electronic Isochronous
- 24V Battery System & Cables
- Air Cleaner (Dry Single Stage)
- SRC Catalyst / Silencer Mounted
- Flexible Fuel Connector
- EPA Certified Tier 4 Final

Generator

- Brushless Single Bearing
- Automatic Voltage Regulator
- ± 1% Voltage Regulation
- 4 Pole, Rotating Field
- 105˚C Standby Temperature Rise
- 105˚C Prime Temperature Rise
- 100% of Rated Load - One Step
- 5% Maximum Harmonic Content
- NEMA MG 1, IEEE and ANSI Standards Compliance for Temperature Rise

Additional

- Single Source Supplier
- UL 2200 & cUL Listed
- CSA Certified
- Seismic Certified to IBC 2021
- NFPA 110 / CSA C282 Compliant
- Microprocessor Based Digital Control Panel Mounted in NEMA 12 Enclosure
- Base - Formed Steel
- Main Line Circuit Breaker Mounted & Wired
- Battery Charger 24V 5 Amp
- Jacket Water Heater -20˚F 2500W 240V w/Isolation Valves
- Vibration Isolation Mounts
- 2 Year / 2000 Hour Standby Warranty
- 1 Year / 1500 Hour Prime Warranty
- Standard Colors - White / Gray

Application Data

Engine

Manufacturer:	Volvo Penta	Displacement - Cu. In. (lit):	470 (7.70)
Model:	TAD871VE	Bore - in. (cm) x Stroke - in. (cm):	4.33 (11.0) x 5.31 (13.5)
Type:	4-Cycle	Compression Ratio:	17.5:1
Aspiration:	Turbo Charged, CAC	Rated RPM:	1800
Cylinder Arrangement:	6 Cylinder Inline	Max HP Stby (kWm):	252 (185)

Exhaust System	Standby	Prime
Gas Temp. (Stack): °F (°C)	709 (376)	709 (376)
Gas Volume at Stack Temp: CFM (m³/min)	886 (25.1)	886 (25.1)
Maximum Allowable Exhaust Restriction: in. H_2O (kPa)	24.0 (6.00)	24.0 (6.00)
Cooling System		
Ambient Capacity of Radiator: °F (°C)	131 (55.0)	131 (55.0)
Maximum Allowable Static Pressure on Rad. Exhaust: in. H_2O (kPa)	0.50 (0.12)	0.50 (0.12)
Water Pump Flow Rate: GPM (lit/min)	102 (386)	102 (386)
Heat Rejection to Coolant: BTUM (kW)	6,995 (122)	6,995 (122)
Heat Rejection to CAC: BTUM (kW)	1,666 (29.3)	1,666 (29.3)
Heat Radiated to Ambient: BTUM (kW)	2,135 (37.4)	2,135 (37.4)
Air Requirements		
Aspirating: CFM (m³/min)	445 (12.6)	445 (12.6)
Air Flow Required for Rad. Cooled Unit: CFM (m³/min)	16,961 (480)	16,961 (480)
Air Flow Required for Heat Exchanger/Rem. Rad. CFM (m³/min)	Consult Factory For Remote Cooled Applications	
Fuel Consumption		
At 100% of Power Rating: gal/hr (lit/hr)	10.6 (40.0)	10.6 (40.0)
At 75% of Power Rating: gal/hr (lit/hr)	8.50 (32.0)	8.50 (32.0)
At 50% of Power Rating: gal/hr (lit/hr)	6.08 (23.0)	6.08 (23.0)
DEF Consumption (% of fuel consumption)	± 7.00%	± 7.00%
Fluids Capacity		
Total Oil System: gal (lit)	7.13 (27.0)	7.13 (27.0)
Engine Jacket Water Capacity: gal (lit)	4.50 (17.0)	4.50 (17.0)
System Coolant Capacity: gal (lit)	13.5 (51.1)	13.5 (51.1)
DEF Tank Capacity: gal (lit)	18.5 (70.0)	18.5 (70.0)

Deration Factors: Rated Power is available up to 4,921 Ft (1500m) at ambient temperatures to 122°F (50°C).
Consult factory for site conditions above these parameters.

Diesel Product Line

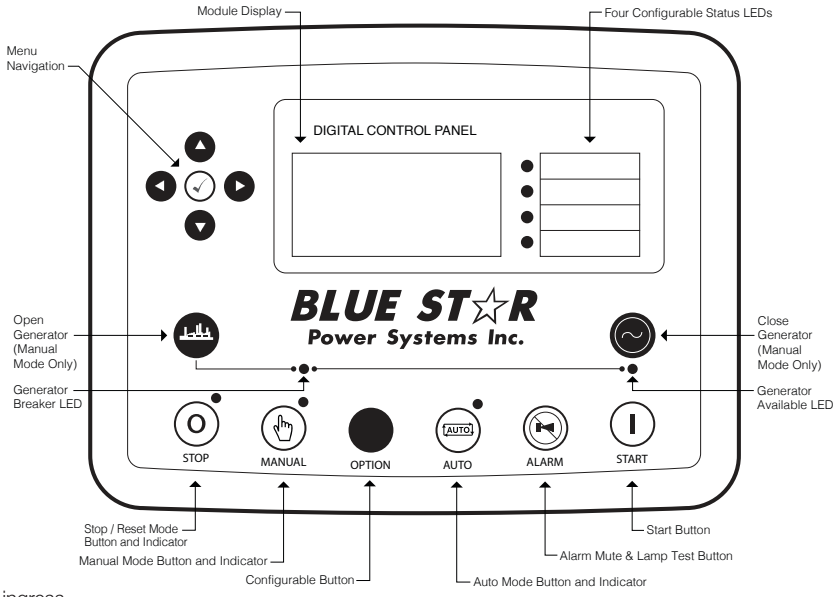
150 kWe / 150 kWe

BLUE STAR Power Systems Inc.

DCP7310 Control Panel

Standard Features

- Digital Metering
- Engine Parameters
- Generator Protection Functions
- Engine Protection
- CAN Bus (J1939) ECU Communications
- Windows-Based Software
- Multilingual Capability
- Remote Communications to DSE2548 Remote Annunciator
- 8 Programmable Contact Inputs
- 10 Contact Outputs
- RS485 Communicator Interface
- cULus Listed, CE Approved
- Event Recording
- IP 65 rating (with supplied gasket) offers increased resistance to water ingress
- NFPA 110 Level 1 Compatible

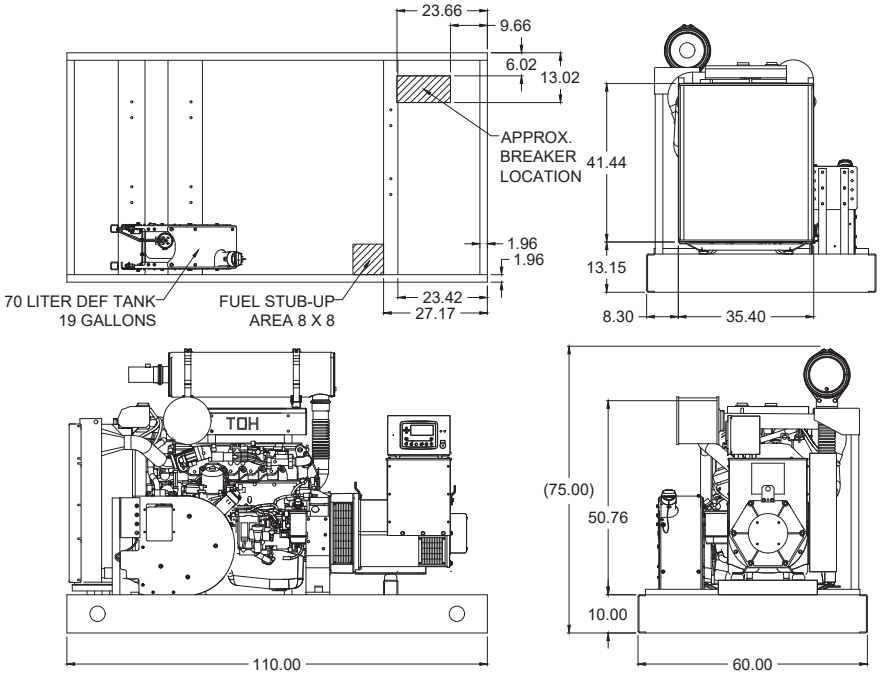


Weights / Dimensions / Sound Data

	L x W x H	Weight lbs
~~OPU~~	~~110 x 60 x 75 in~~	~~4,525~~
~~Level 1~~	~~134 x 60 x 82 in~~	~~5,450~~
~~Level 2~~	~~134 x 60 x 82 in~~	~~5,500~~
~~Level 3~~	~~174 x 60 x 82 in~~	~~5,775~~

Please allow 6-12 inches for height of exhaust stack.

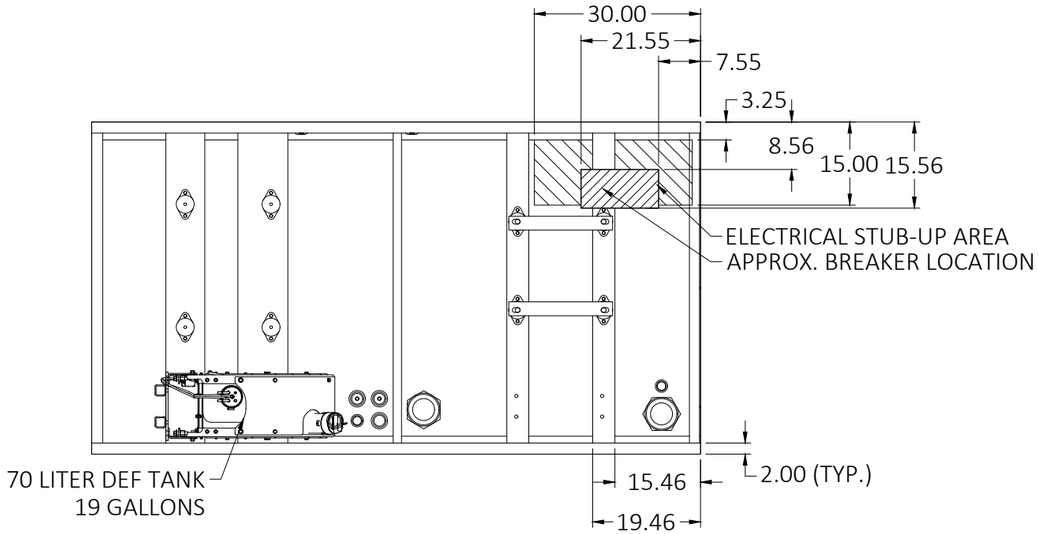
	No Load	Full Load
OPU	79 dBA	82 dBA
Level 1	75 dBA	78 dBA
Level 2	71 dBA	74 dBA
Level 3	67 dBA	69 dBA

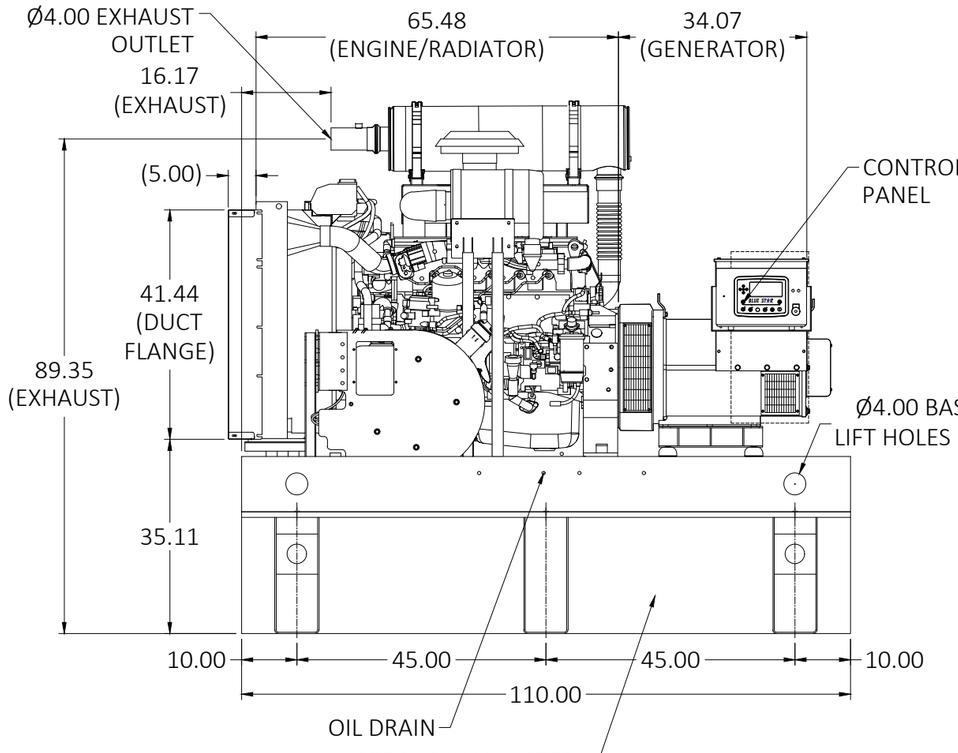


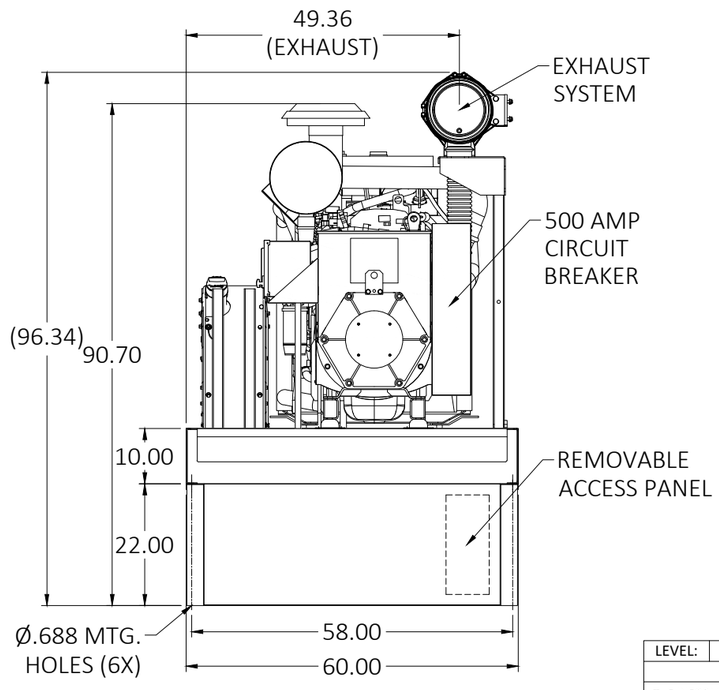
DRAWING:	VD150-02FT4-202-01

APPROXIMATE SHIP WEIGHT:
6,000 LBS.

PRELIMINARY DRAWING
ALL DIMENSIONS MAY CHANGE
DURING SUBMITTAL PROCESS.
DRAWING IS NOT CERTIFIED
BY BLUE STAR POWER SYSTEMS





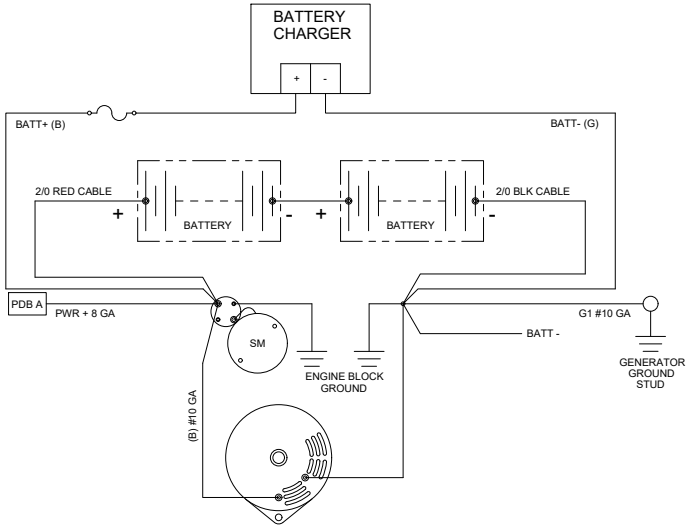


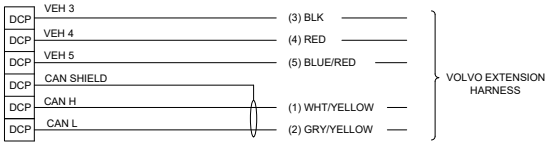
NOTES:
1. BREAKER DIMENSIONS ARE APPROXIMATE
2. DUCT FLANGE WIDTH 35.40"
3. FUEL SUPPLY: 3/8" FUEL RETURN: 3/8"
4. UNIT OFFSET 4.00" TOWARDS RIGHT SIDE
5. (XX.XX) DIMENSIONS ARE FOR REFERENCE ONLY

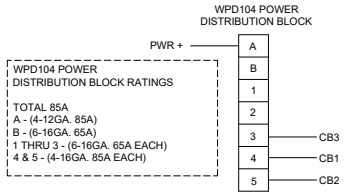
LEVEL:	DESCRIPTION:	DATE:	BY:
	REVISIONS:		

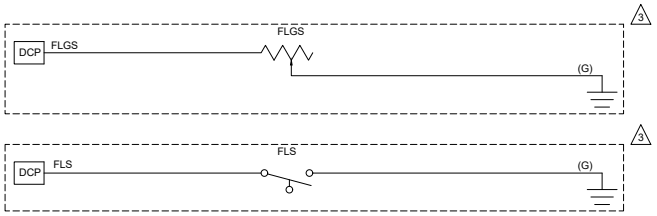
DRAWN BY: RPS	BLUE STAR Power Systems Inc.		
DATE: 09/11/2023	2250 CARLSON DRIVE, NORTH MANKATO, MINNESOTA 56003 | 1 507 345 1776		
ENGINE: TAD871VE	BASE: 27985	TANK: 21824(3-0427)	
GENERATOR: UCI274G	HSG: NONE	SIZE: B	SCALE: NONE | SHEET: 1 OF 1

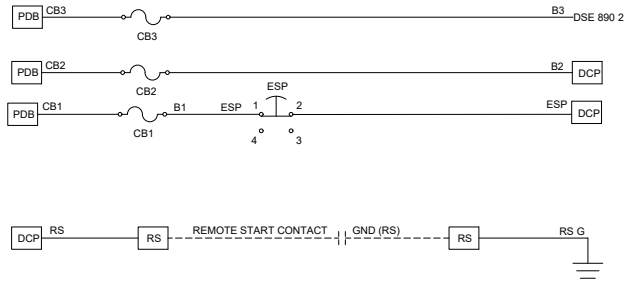
DRAWING: VD-DC-00029

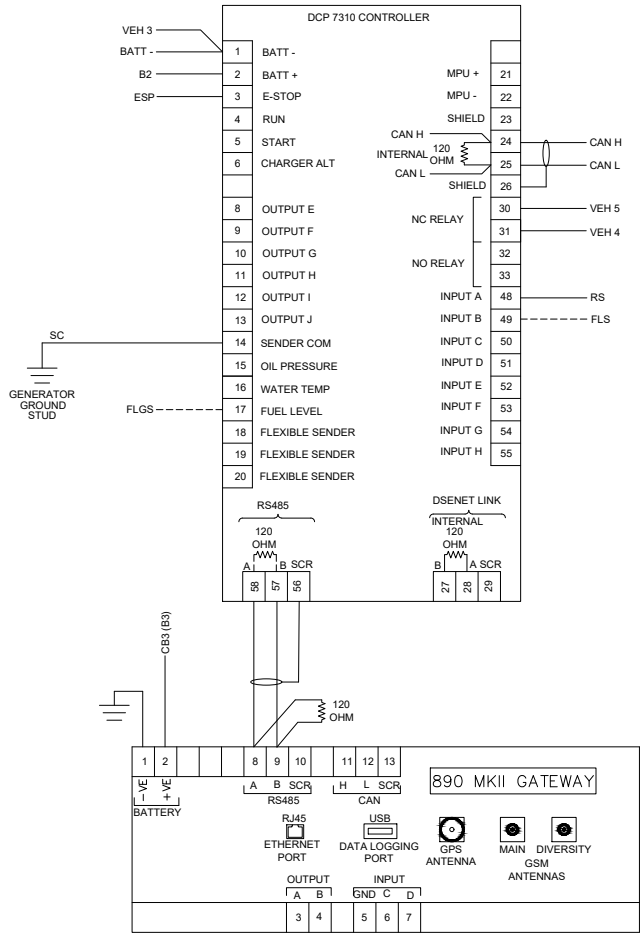












LEGEND:

CB1 - CIRCUIT BREAKER #1 (10A)
CB2 - CIRCUIT BREAKER #2 (15A)
CB3 - CIRCUIT BREAKER #3 (5A)
ESP - EMERGENCY STOP PUSHBUTTON
FLGS - FUEL LEVEL GAUGE SENDER
FLS - FUEL LEAK SWITCH
PDB - POWER DISTRIBUTION BLOCK
RS - REMOTE START
SC - SENDER COMMON
SM - STARTER MOTOR
VEH - VOLVO EXTENSION HARNESS

NOTES:
1. DASHED LINES (- - -) ARE CUSTOMER CONNECT OR OPTIONAL
2. ALL WIRES TO BE #16 GA UNLESS NOTED OTHERWISE
3. INSTALL WITH FUEL TANK (SEE DIMENSIONAL DRAWING) OR WHEN NOTED

LEVEL:	DESCRIPTION:	DATE:	BY:
	REVISIONS:		

DRAWN BY: MJK
DATE: 8-2-22

BLUE STAR Power Systems Inc.
2250 CARLSON DRIVE, NORTH MANKATO, MINNESOTA 56003 | 1 507 345 1776

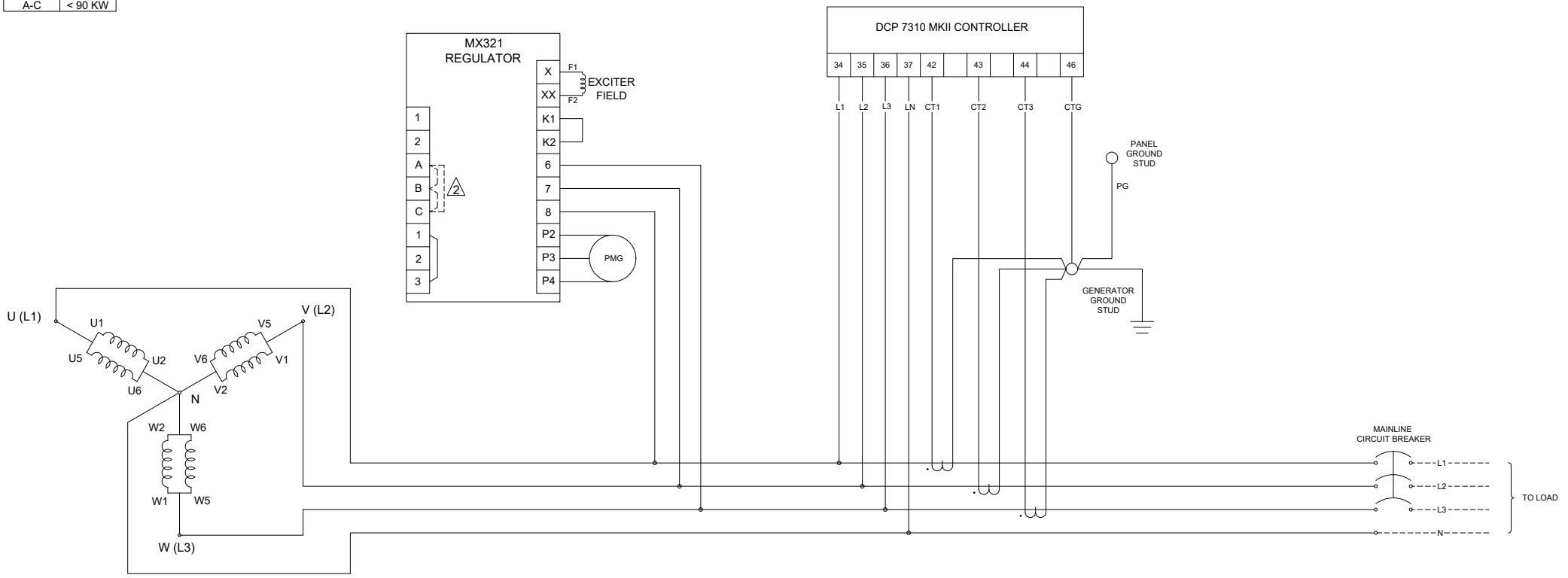
DC ELECTRICAL DIAGRAM

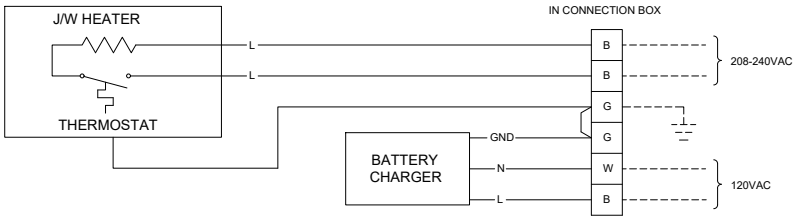
ENGINE:	FUEL:	SIZE:	
VOLVO T4	DIESEL	B	SCALE: NONE SHEET: 1 OF 1

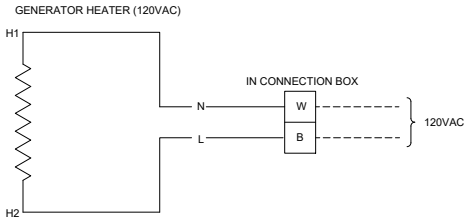
PIN PLACEMENT	
LINK	POWER
A-B	> 550 KW
B-C	90-550 KW
A-C	< 90 KW

2

DRAWING: SDE-AC-00632







NOTES:
1. DASHED LINES (– – – –) ARE CUSTOMER CONNECT OR OPTIONAL
2. SEE CHART FOR PIN PLACEMENT

LEVEL:	DESCRIPTION:	DATE:	BY:
	REVISIONS:		

DRAWN BY: AJP
DATE: 09-12-23

BLUE STAR Power Systems Inc.
2250 CARLSON DRIVE, NORTH MANKATO, MINNESOTA 56003 | 1 507 345 1776

208V 3P AC ELECTRICAL DIAGRAM

AVR:	GENERATOR:	SIZE:	
MX321	STAMFORD	B	SCALE: NONE SHEET: 1 OF 1

Important

This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.

Requirements marked with ⚠ are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.

Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalities as described in the Clean Air Act.

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel

Number of cylinders			6
Displacement, total		liters in^3	7,70 470
Firing order			1-4-2-6-3-5
Bore		mm in	110 4,33
Stroke		mm in	135 5,31
Compression ratio			17.5:1
Wet weight (Not including after treatment system)	Engine only	kg lb	737 1625
	Power pac	kg lb	947 2088

Performance				**rpm**	**1500**	**1800**	**2000**	**2200**
ICFN Power 185 kW		without fan		kW hp	181 246	185 252	185 252	185 252
		with fan 650 mm pull		kW hp	172 234	169 230	166 225	161 219
Torque at:		ICFN Power 185 kW		Nm lbf ft	1150 848	982 724	884 652	803 592
Max torque at engine speed	ICFN Power		1200 rpm	Nm lbf ft	1160 856			
Power tolerance				%	±3			
Mean piston speed				m/s ft/sec	6,8 22,1	8,1 26,6	9,0 29,5	9,9 32,5
Effective mean pressure at:		ICFN Power 185 kW		MPa psi	1,88 273	1,60 232	1,44 209	1,31 190
Total mass moment of inertia, J (mR^2) (not including flywheel)				kgm^2 $lbft^2$	0,398 9,4			
Friction Power				kW hp	17 23	23 31	29 39	35 48
Derating see Technical Diagrams								

Engine brake performance (only engines with engine brake)		rpm	1500	2200	2500	2800
Brake power:	without fan	kW	70	121	145	170
		hp	95	165	197	231
Brake torque:	without fan	Nm	448	524	555	580
		lbf ft	330	386	409	428
Engine speed range for engine brake activation:		rpm	900-2800			
Min engine speed with engine brake still active:		rpm	900			
Min oil temperature for engine brake activation:		°C	55			

Cold start performance

*Cold start limit temperature	without starting aid	°C °F	-15 5	
	with manifold heater 4 kW	°C °F	-30 -22	
	with manifold heater 4 kW and block heater	°C °F	-35 -31	
*Specify oil quality	Above -15°C; 15W40 Above -25°C; 10W30 Below -25°C; 5W30			
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
	Volvo	1,5		

* See also general section in the sales guide

Lubrication system

Lubricating oil consumption (average)			Vol%	0,05
Oil system capacity including filters			liter US gal	27 7,13
Oil pan capacity:		Max	liter US gal	24 6,34
		Min	liter US gal	19 5,02
Oil change intervals/specifications	VDS4		h	500
			h	
Engine angularity limits:	front up		°	40
	front down		°	45
	side tilt		°	40
Oil pressure at rated power			kPa psi	425 62

Lubrication system

Lubrication oil temperature in sump:	max	°C °F	125 257
Oil filtration efficiency (in accordance with ISO 4548-12)	97%	µ	36
	50%	µ	14

Fuel system		rpm	1500	1800	2000	2200
Urea consumption (vol% of diesel consumption)		vol%	6%			
Fuel to conform to			EU EN590 US D975, 1-D and 2-D (Max 15ppm sulphur and 7% FAME)			
System supply flow at max. speed		liter/h US gal/h	122 32,2			
Fuel supply line max. restriction (Measured at fuel inlet connection)		kPa psi	25 3,6			
Fuel supply line max. pressure, during engine stand still (meassured at fuel inlet connection)		kPa psi	20 2,9			
System return flow at max. speed		liter/h US gal/h	60,0 15,9			
Fuel return line max. restriction (Measured at fuel return connection)		kPa psi	15 2,2			
Max. allowable inlet fuel temp (Measured at fuel inlet connection)		°C °F	80 176			
Prefilter / Water separator filtration efficiency	99%	µ	30			
Main fuel filter filtration efficiency (in accordance with ISO 19438)	98%	µ	5			
	96%	µ	4			
Governor type/make, standard			Volvo/ EMS 2.3			
Injection pump type/make			Denso HP4			

Intake and exhaust system		Inlet air temp	rpm	1500	1800	2000	2200
Charge air consumption at: (+25°C and 100kPa)	ICFN Power 185 kW	25°C	m³/min	11,6	12,6	14,4	15,2
		77°F	cfm	410	445	509	537
⚠ **See front page for important information** Max allowable air intake restriction including piping			kPa psi	6 0,9			
Heat rejection to exhaust at:	ICFN Power 185 kW		kW BTU/min	90 5135	99 5653	108,6 6176	118,7 6750
Exhaust gas temperature after turbine at:	ICFN Power 185 kW		°C °F	371 700	376 709	362 684	374 705
⚠ **See front page for important information** Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 102 mm			kPa psi	15 2,2	17 2,5	20 2,9	22 3,2
⚠ **See front page for important information** Max allowable temperature drop between turbine and SCR muffler inlet.			Δ°C Δ°F	15 27			
SCR muffler pressure drop (at exhaust gas flow and exhaust temp given)			kPa psi	10 1,5	11 1,6	13 1,9	14 2,0
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	ICFN Power 185 kW		m³/min cfm	23,4 826	25,1 886	27,3 964	28,9 1021

Cooling system			rpm	1500	1800	2000	2200
Heat rejection radiation from engine at:		ICFN Power 185 kW	kW	5	5	4,8	5,2
			BTU/min	307	290	273	296
Heat rejection to coolant at:		ICFN Power 185 kW	kW	116	123	124	133
			BTU/min	6585	6995	7040	7581
Radiator cooling system type				Closed circuit			
Standard radiator core area		ICFN Power 185 kW	m²	0,6			
			foot²	6,46			
Fan diameter	650 mm	ICFN Power 185 kW	mm	650			
			in	25,59			
Fan power consumption	650 mm pull		kW	9,3	15,8	19,3	23,9
			hp	13	21	26	33
Fan drive ratio	fan Ø650			1.4:1			
Coolant capacity:	engine		liter	17			
			US gal	4,5			
	engine + standard radiator, hoses and expansion tank		liter	51			
			US gal	13,5			
Coolant pump			drive/ratio	belt/1,40:1			
Coolant flow with standard system			l/s	5,4	6,5	7,2	8,0
			US gal/s	1,4	1,7	1,9	2,1
Minimum coolant flow			l/s				6,0
			US gal/s				1,6
Maximum outer circuit restriction incl. piping			kPa	40,0			
			psi	5,8			
Thermostat:		start to open	°C	85			
			°F	185			
		fully open	°C	95			
			°F	203			
Maximum static pressure head (expansion tank height + pressure cap setting)			kPa	85			
			psi	12,3			
Minimum static pressure head (expansion tank height + pressure cap setting)			kPa	75			
			psi	10,9			
Standard pressure cap setting			kPa	75			
			psi	10,9			
Maximum top tank temperature			°C	107			
			°F	225			
Recommended Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still are functioning			liter	2			
			US gal	0,5			

Charge air cooler system		**rpm**	**1500**	**1800**	**2000**	**2200**
Heat rejection to charge air cooler	ICFN Power 185 kW	kW	29,8	29,3	33,8	35,5
		BTU/min	1695	1666	1922	2019
Charge air mass flow	ICFN Power 185 kW	kg/s	0,229	0,249	0,285	0,3
Charge air inlet temp.	ICFN Power 185 kW	°C	178	166	168	167
(Charge air temp after turbo compressor)		°F	352	331	334	333
⚠ **See front page for important information** Max allowable Charge air outlet temp.		°C	49	49	50	50
(Charge air temp after charge air cooler)		°F	120	120	122	122
⚠ **See front page for important information** Maximum pressure drop over charge air cooler incl. piping		kPa	7	9	11	12
		psi	1,02	1,31	1,60	1,74
Charge air pressure		kPa	203	182	180	174
(After charge air cooler)		psi	29,44	26,40	26,11	25,24
Standard charge air cooler core area		m²	0,5			
		foot²	5,38			

Cooling performance: 0,6 m² radiator and 650mm fan, pull

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

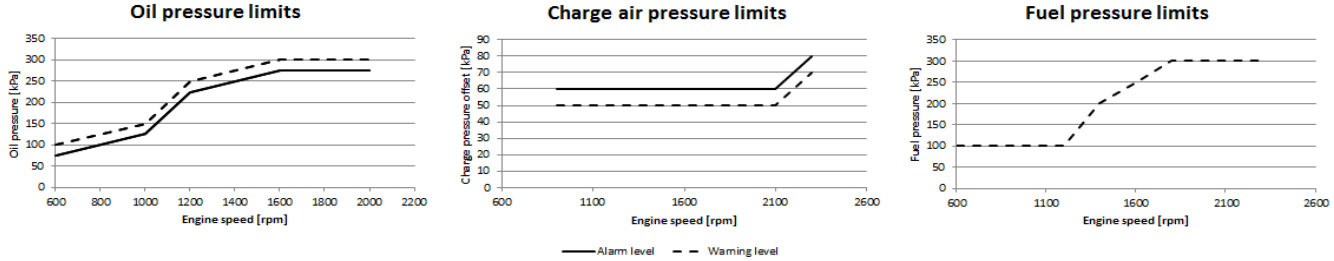
				ICFN Power 185 kW			
Engine speed	Engine power	Air on temp		Air flow		External restriction	
rpm	kW hp	°C	°F	m^3/s	ft^3/s	Pa	psi
1500	181	62	143	7,4	261,3	0	
	246	61	141	7,2	254,3	100	0,015
		58	137	6,7	236,6	200	0,029
		54	130	6,1	215,4	300	0,044
2200	185	63	146	9,4	332,0	0	
	252	63	145	9,3	328,4	100	0,015
		62	144	9	317,8	200	0,029
		61	141	8,6	303,7	300	0,044

Engine management system

Functionality	Alternatives			Default setting
Governor mode	Droop	Isochronous		Isochronous
Governor droop	10	125	Nm/rpm	
Governor response	Adjustable PI constants			
Idle speed	600	800	rpm	600
Stop function				Replaced by "Ignition of stop engine"
Preheating function	Ignition	Request	Request + temp	If preheat is available, preheat will be active at ignition on if temp low or demanded by driver.
Lamp test				No lamp test, not used any longer
Ignition of stop engine	Yes	No		No

Engine sensors and switch settings		Unit	Alarm level: Setting range		Engine protection: Level	Engine protection: Action. Default/Alternative
Oil temp		°C		125	125	Derate/Shut down
Oil pressure	Low idle	kPa		75,0	75	Shut down.
	Rated speed	kPa		275	275	Shut down.
Oil level				Low level		
Coolant temp		°C		107	107	Derate/Shut down
Coolant level			See cooling system	On	Low level	Derate/Shut down
Fuel feed pressure	Low idle	kPa		100		
	Rated speed			300		
Water in fuel				Alarm when closed		
EGR temp		°C		210	210	Derate/Shut down
Air filter pressure drop				5kPa		
Altitude, above sea		m			700	Automatic derating, see section derating
Charge air temp		°C		85	85	Derate/Shut down
Charge air pressure		kPa		Alarm map value	Alarm map value	Derate/Shut down
SCR temp		°C		515	515	Derate

Parameter	Warning	Alarm	Derated 0% to engine protection map	Derated 100% to engine protection map	Forced idle after 5 sec	Forced shut down after 0 sec
Coolant temp	102°C	107°C	107°C	112°C		
Oil temp	120°C	125°C	125°C	130°C		
Low oil pressure	Warning map value	Alarm map value				Alarm map value
High charge air temp	80°C	85°C	85°C	90°C		
High charge air pressure	Warning map value	Alarm map value		Alarm map value		
EGR temp	200°C	210°C	210°C	220°C		



Electrical system

Voltage and type				24V
Alternator:	make			MELCO
	output	A		110/130
	tacho output	Hz/alternator rev.		
	drive ratio			
Starter motor:	make			MELCO
	type			85P50/90P55
	output		kW	5 / 5.5
			hp	6.8 / 7.5
Number of teeth on:	flywheel			137
	starter motor			10 / 12 teeth
Inlet manifold heater (at 20 V)			kW	4
Power relay for the manifold heater			A	200

Conditions:	**Temperature**	**°C**		**25**	**0**	**-15**
(5 mΩ main circuit resistance@ 20°C)	**Battery**	**Ah / CCA**		**140/800**	**140/800**	**140/800**
Crank speed		rpm		185	160	120
Crank current		A		220	300	470
Starter input power during crank		kW		4,91	5,90	6,94
Battery power during crank		kW		5,15	6,31	7,50
Min battery @ 0°C		Ah / CCA				

Power take off		**rpm**	**1400**	**1800**	**2000**	**2200**
Front end in line with crank shaft max:*	0.02 kgm^2	Nm	1064,0	743,0	740	833
Flywheel		lbf ft	785	548	546	614
SAE 2, STD 10" & 11,5 ", 1.303 kgm2	0.03 kgm^2	Nm	1030,0	706,0	697	786
		lbf ft	760	521	514	580
	0.04 kgm^2	Nm	996,0	663,0	654	729
		lbf ft	735	489	482	538
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	45,0	57,9	64,3	70,7
		hp	61	79	87	96
	max down	kW	45,0	58,0	64,3	70,7
		hp	61	79	87	96
	max right	kW	21,1	27,2	30,2	33,2
		hp	29	37	41	45
Maximum power on Rear PTO on top of flywheel housing(REPTO):*		kW	75			
		hp	102			
Speed ratio direction of rotation viewed from flywheel side			1:1 Counter clockwise			
Maximum torque on PTO at compressor position:*		Nm	200			
		lbf ft	148			
Speed ratio direction of rotation viewed from flywheel side			1.026:1 Counter clockwise			
Timing gear at hydraulic pump PTO max:*		Nm	80			
		lbf ft	59			
Speed ratio direction of rotation viewed from flywheel side			1.3:1 Clockwise			
Max allowed bending moment in flywheel housing	SAE2	Nm	4600			
		lbf ft	3393			
Max. rear main bearing load		N	4250			
		lbf	955,4			

**** Maximum allowed torque at individual PTO´s.***
If more then one PTO output is used simultaniusly, calculations needs to be performed to determine available maximum. Available torque depends on application inertia.

Performance	Power (kW)	Rpm
ICFN Power	185	2200

Sensors Alarm	Signal	Range	Alarm switch	Alarm Level	Derating level	Condition/Delay	Derating
Boost pressure	0,5-4,5 V	50 - 500 kPa	N/A	Alarm map value	Warning map value		Yes 100% of Eng_prot_map
Boost temperaure	50-0 kΩ	-40° - 130 °C	N/A	85°C	85°C		See soft derate 3
Coolant level switch	Digital		Alarm when closed	Low	Low		Yes 100% of Eng_prot_map
Coolant temperature	50-0 kΩ	-40° - 140 °C	N/A	107°C	107°C		See soft derate 1
Engine Speed Cam	Frequency	0-4000 rpm	N/A	Lost sign			
Engine Speed Crank	Frequency	0-4000 rpm	N/A	Lost sign			
EGR gas temp	0-0.8 kΩ	-40 - 850°C	N/A	210°C	210°C		See soft derate 4
Oil level sensor			N/A	Low level	N/A		
Oil temperature	50-0 kΩ	-40° - 140 °C	N/A	125°C	125°C		See soft derate 2
Water In fuel switch	Digital		Alarm when closed	Water in Fuel			

Sensors Alarm	Signal	Range	rpm Map					Condition	Derating
Fuel pressure	0,5-4,5 V	0-700 kPa	**0 rpm**	**600 rpm**	**1000 rpm**	**1800 rpm**	**1900 rpm**		
Warning Level			0	100	100	300	300		
Alarm Level			N/A	N/A	N/A	N/A	N/A		
Oil pressure	0,5-4,5 V	0-700 kPa	**550 rpm**	**600 rpm**	**1000 rpm**	**1200 rpm**	**1600 rpm**		
Warning Level			-50	100	150	250	300		
Alarm Level			-75	75	125	225	275		Engine shutdown

Remarks

1) Soft derate Coolant temp	**Speed / °C**	**107°C**	**109.5°C**	**112°C**	
Remaining torque in %	600	100%	88%	77%	
	1500	100%	80%	61%	
	2200	100%	88%	76%	

Derate map R2			
°C	**107**	**109,5**	**112**
%	0	50	100

2) Soft derate Oil temp	**Speed / °C**	**125°C**	**127.5°C**	**130°C**	
Remaining torque in %	600	100%	88%	77%	
	1500	100%	80%	61%	
	2200	100%	88%	76%	

Derate map R2			
°C	**125**	**127,5**	**130**
%	0	50	100

3)Soft derate Boost Temp	**Speed / °C**	**85°C**	**87.5°C**	**90°C**	
Remaining torque in %	600	100%	88%	77%	
	1500	100%	80%	61%	
	2200	100%	88%	76%	

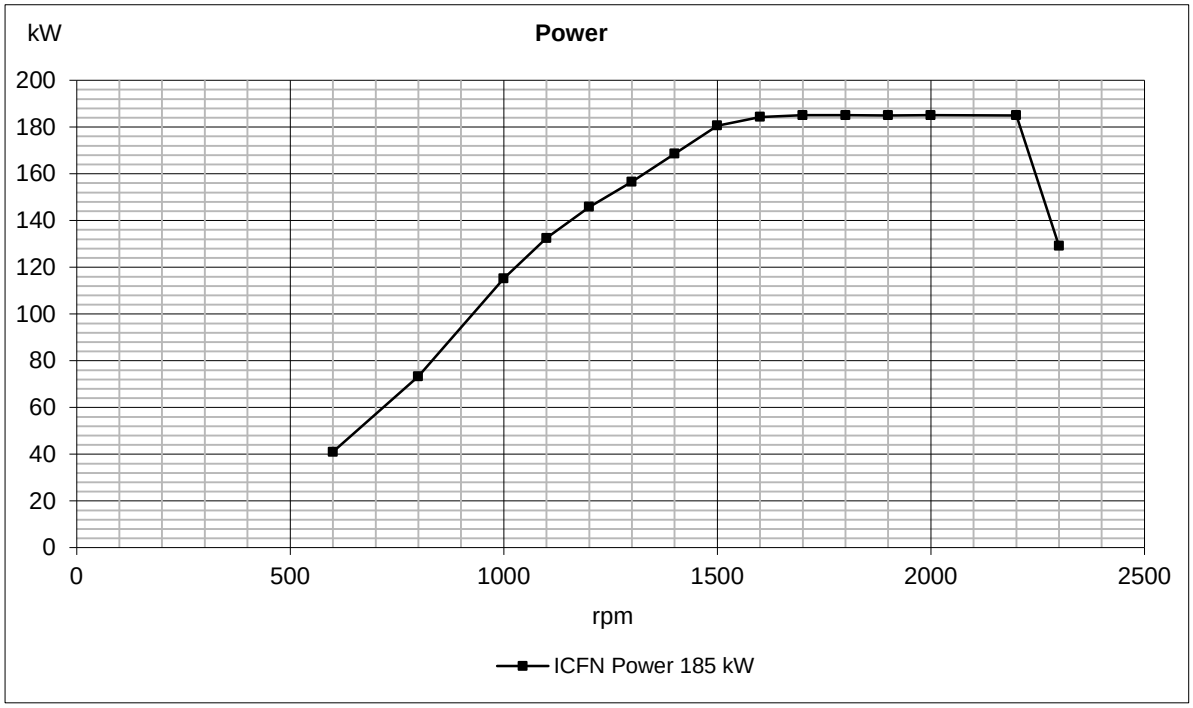
Derate map R2			
°C	**85**	**87,5**	**90**
%	0	50	100

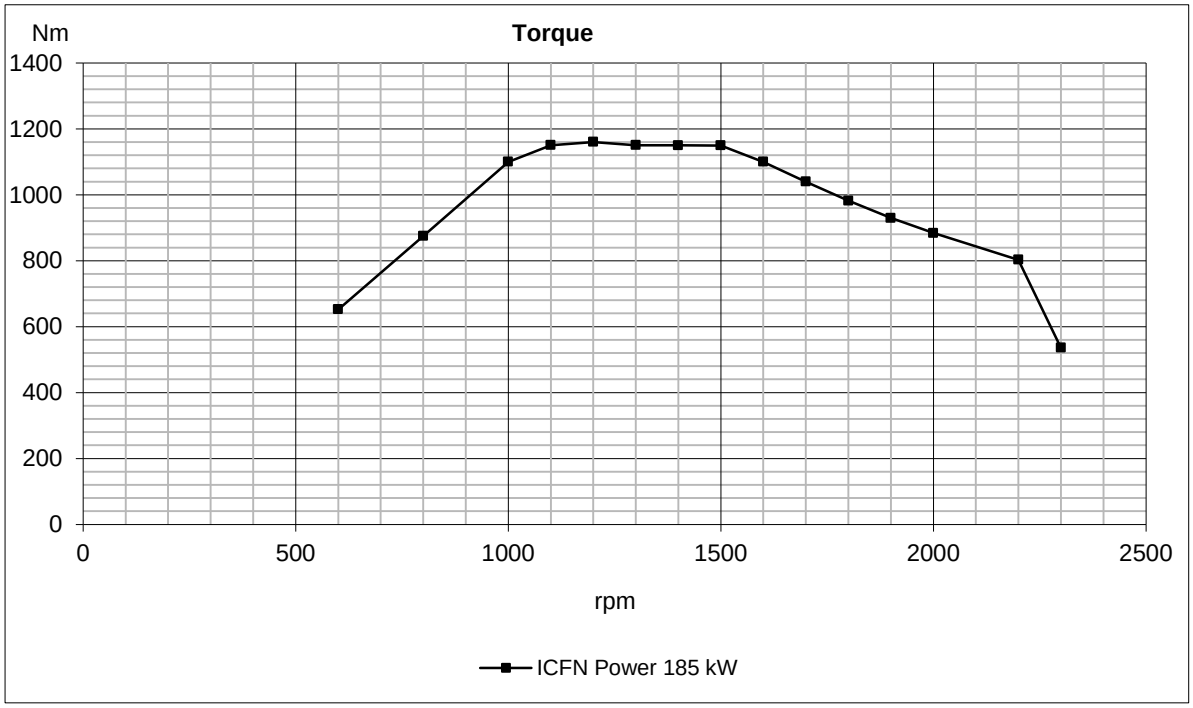
4)Soft derate EGR temp	**Speed / °C**	**210°C**	**215°C**	**220°C**	
Remaining torque in %	600	100%	88%	77%	
	1200	100%	80%	61%	
	1800	100%	88%	76%	

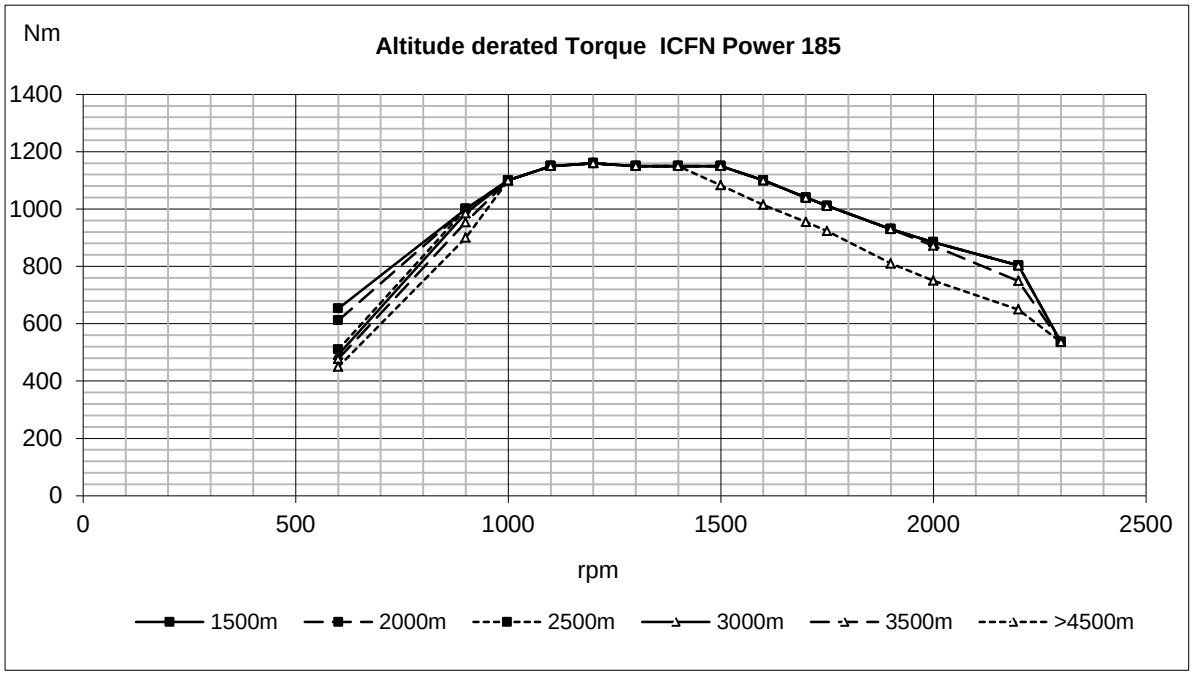
Derate map R2					
°C	**210**	**215**	**220**		
%	0	50	100		

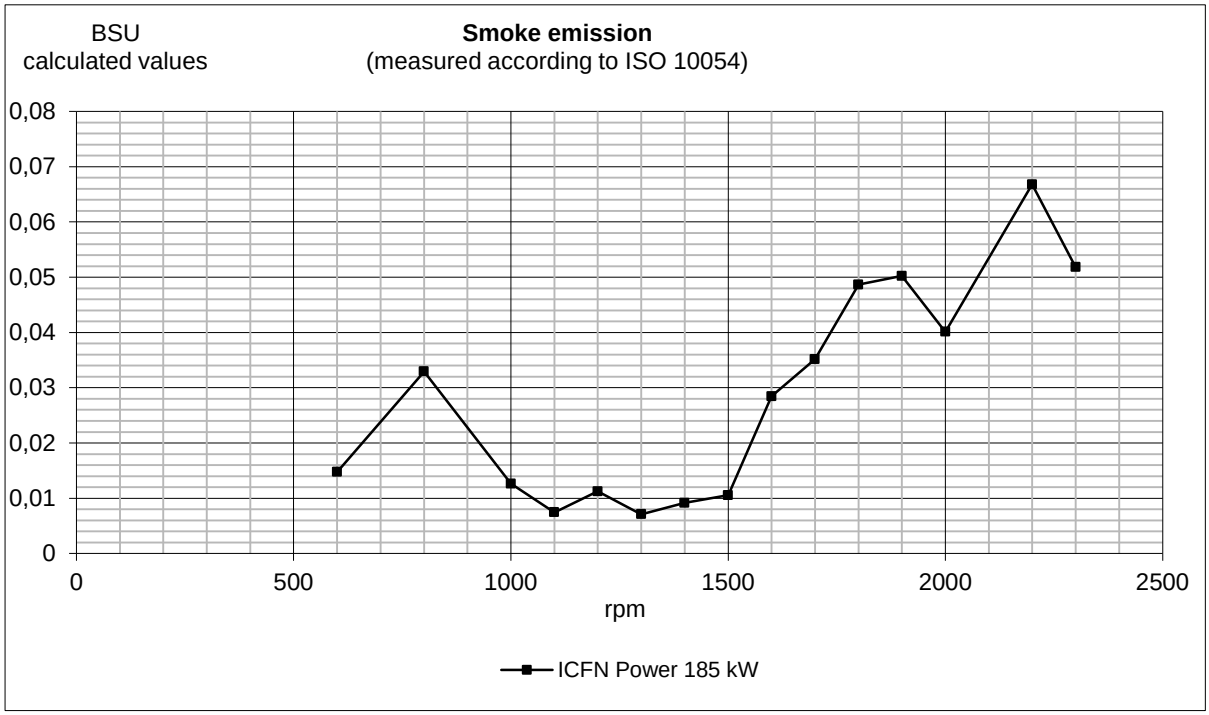
Max Torque High Map R2												
	600	700	900	1000	1100	1200	1300	1400	1450	1500	1600	[rpm]
	653	750	1000	1100	1150	1160	1150	1150	1150	1150	1100	[Nm]
	1700	1750	1900	2000	2100	2200	2300	2400	2500			[rpm]
	1040	1011	930	884	842	803	536	268	0			[Nm]

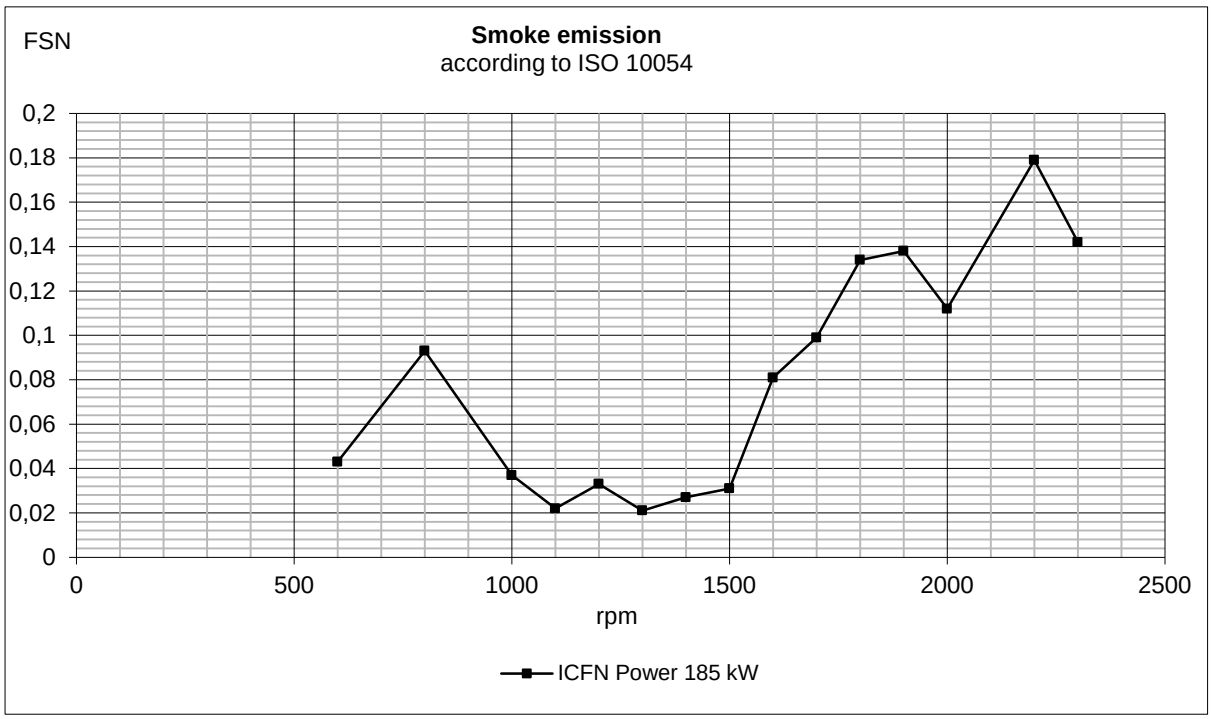
Max Torque Engine Protection Map R2													
	600	800	900	1000	1100	1200	1600	1700	1900	2000	2100	2200	[rpm]
	500	545	580	620	660	700	700	685	655	640	625	610	[Nm]

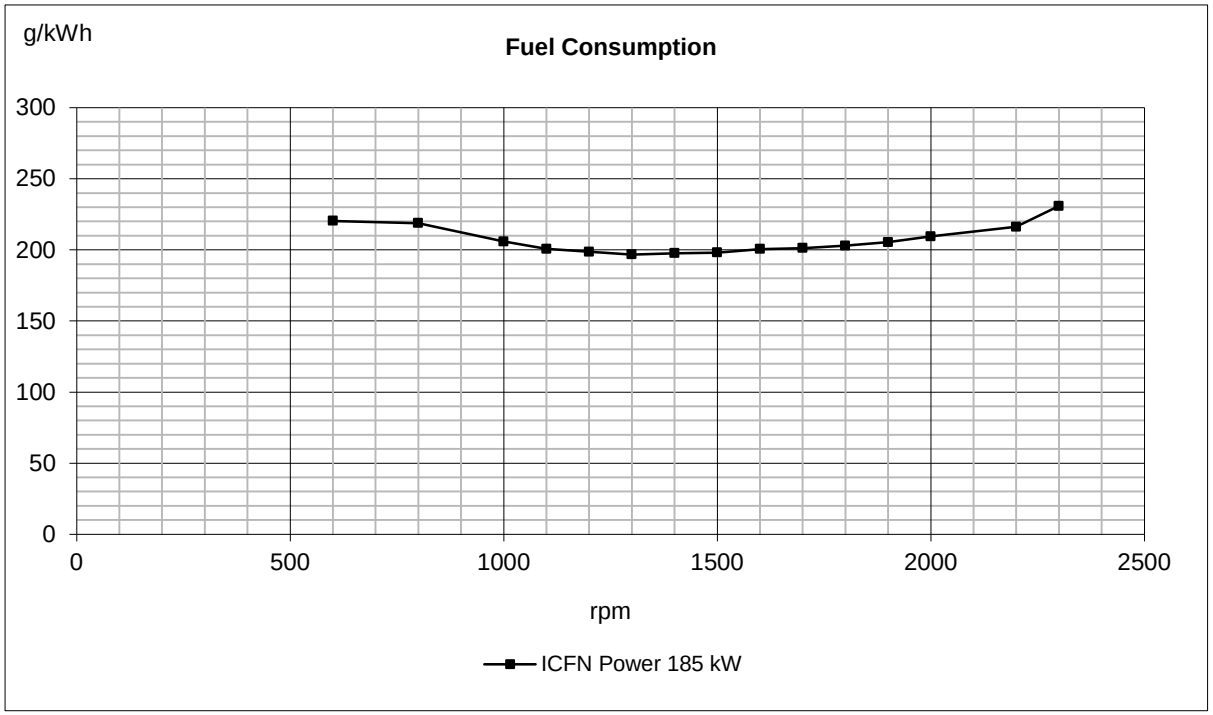

kW
Power
200
180
160
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW

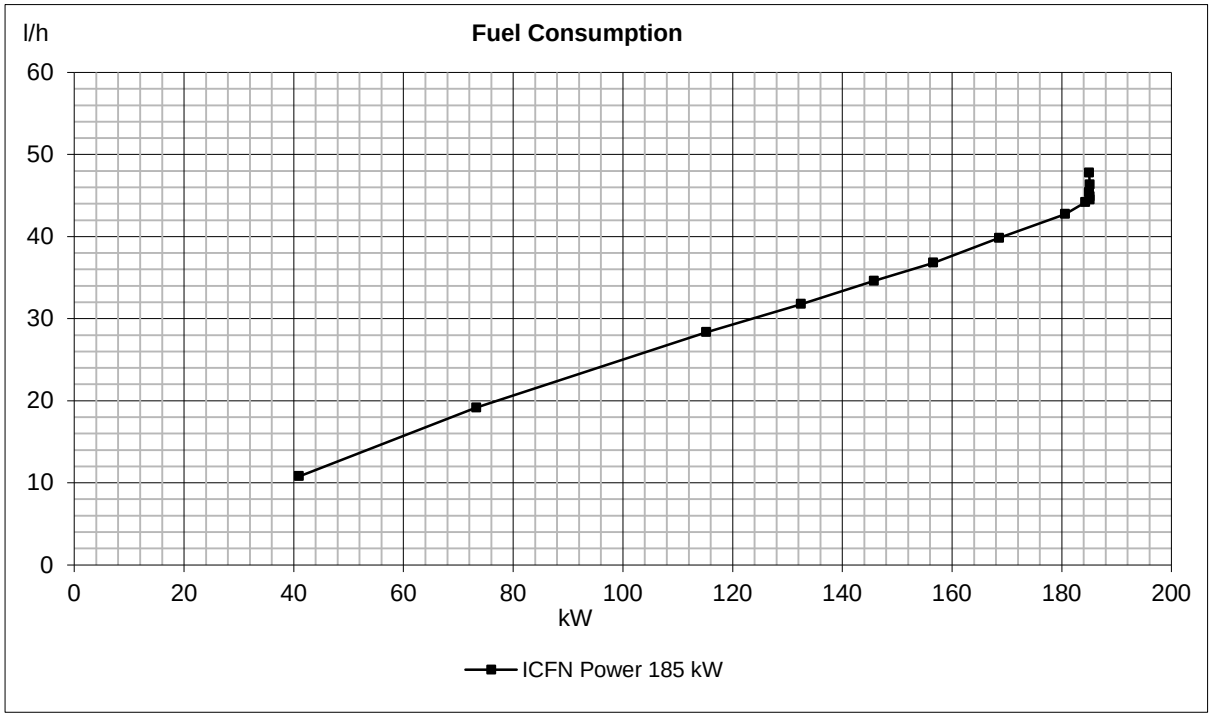

Nm
Torque
1400
1200
1000
800
600
400
200
0
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW

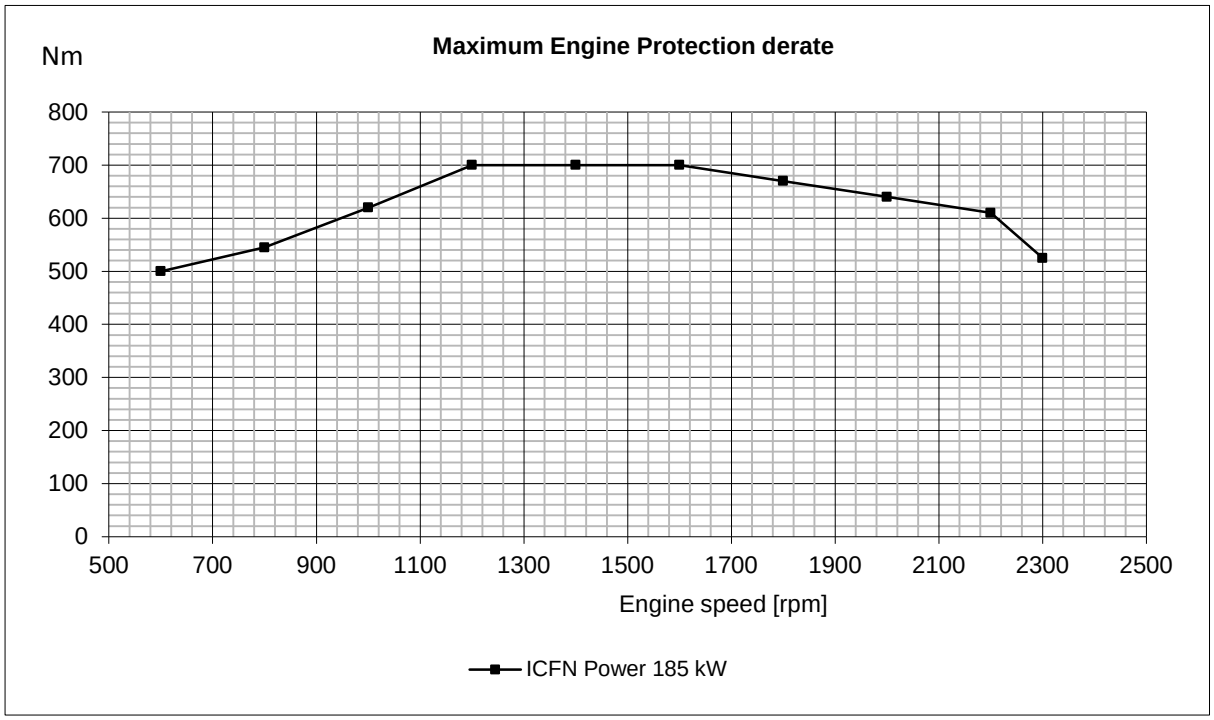

Nm
Altitude derated Torque ICFN Power 185
1400
1200
1000
800
600
400
200
0
0
500
1000
1500
2000
2500
rpm
1500m
2000m
2500m
3000m
3500m
>4500m

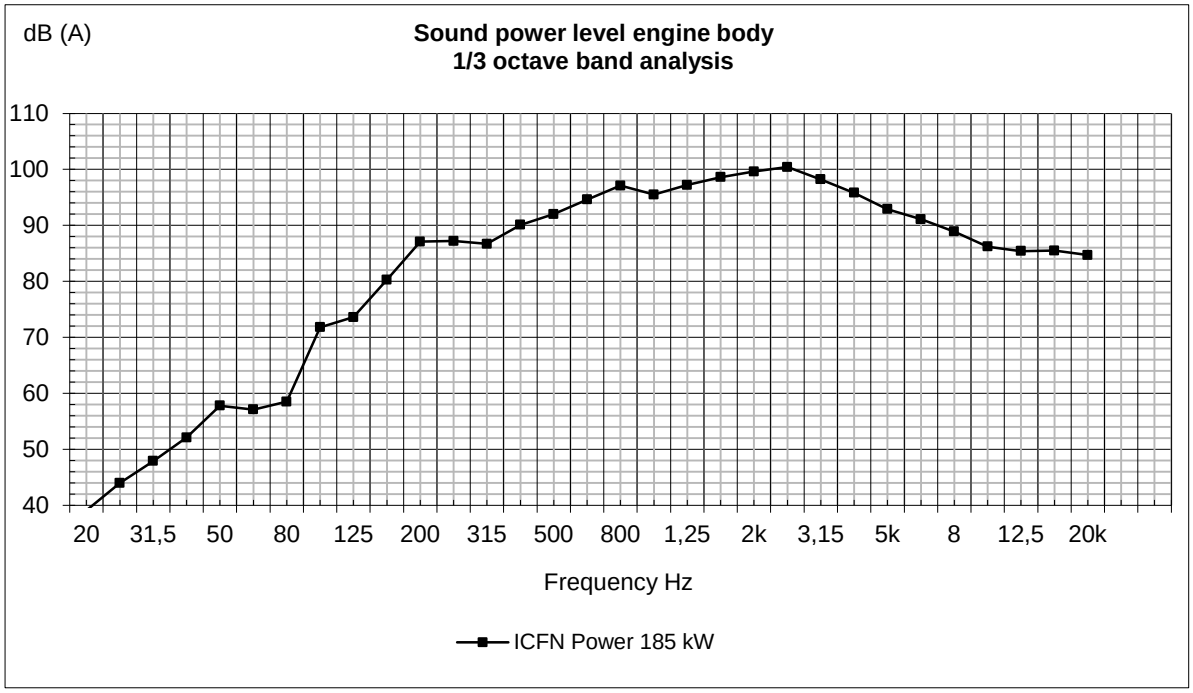

BSU
calculated values
Smoke emission
(measured according to ISO 10054)
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW

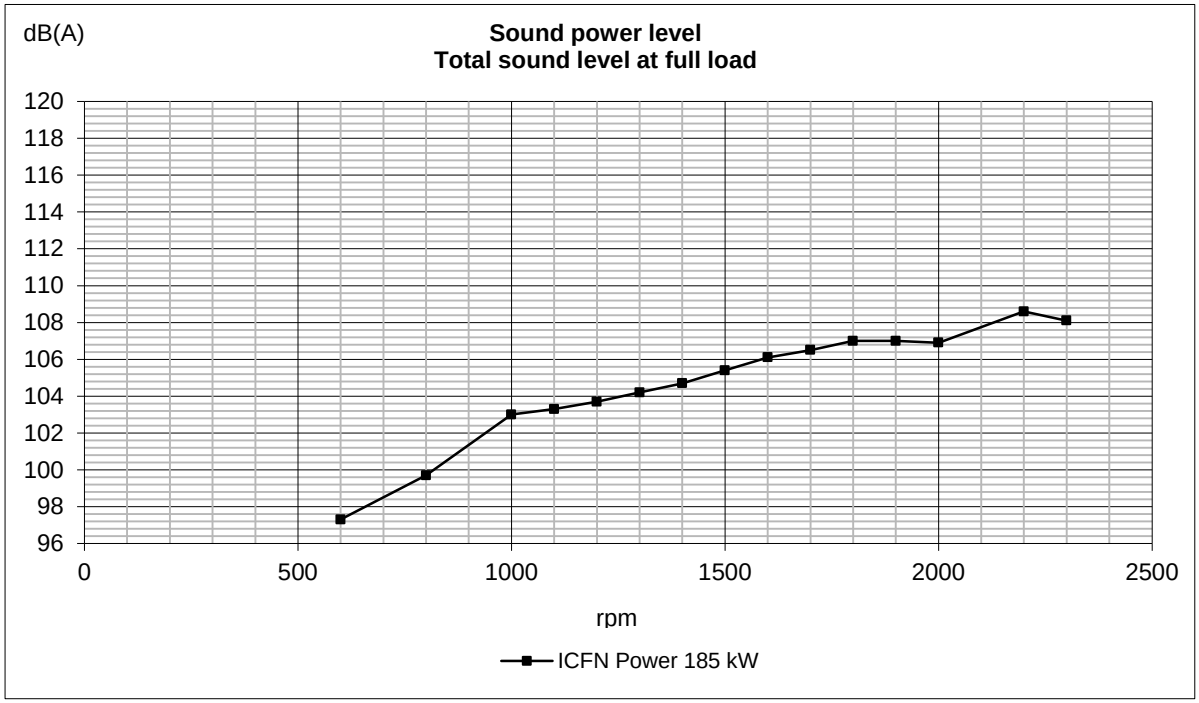

FSN
Smoke emission
according to ISO 10054
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW

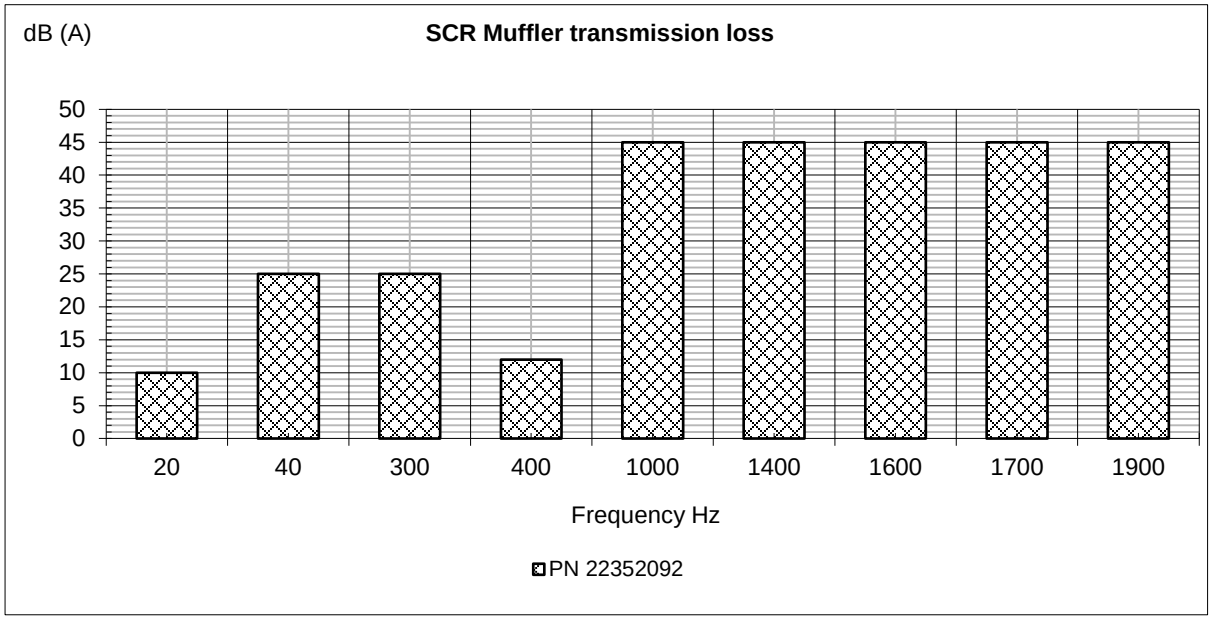

g/kWh
Fuel Consumption
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW

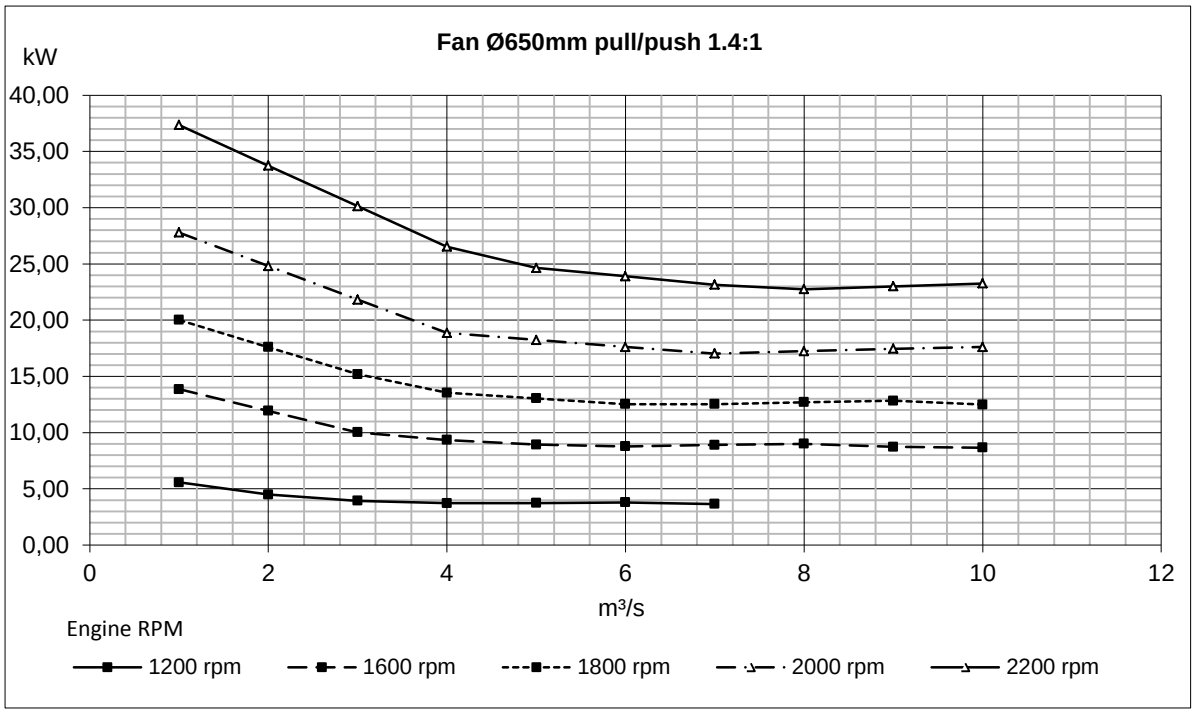

l/h
Fuel Consumption
60
50
40
30
20
10
0
0
20
40
60
80
100
120
140
160
180
200
kW
ICFN Power 185 kW

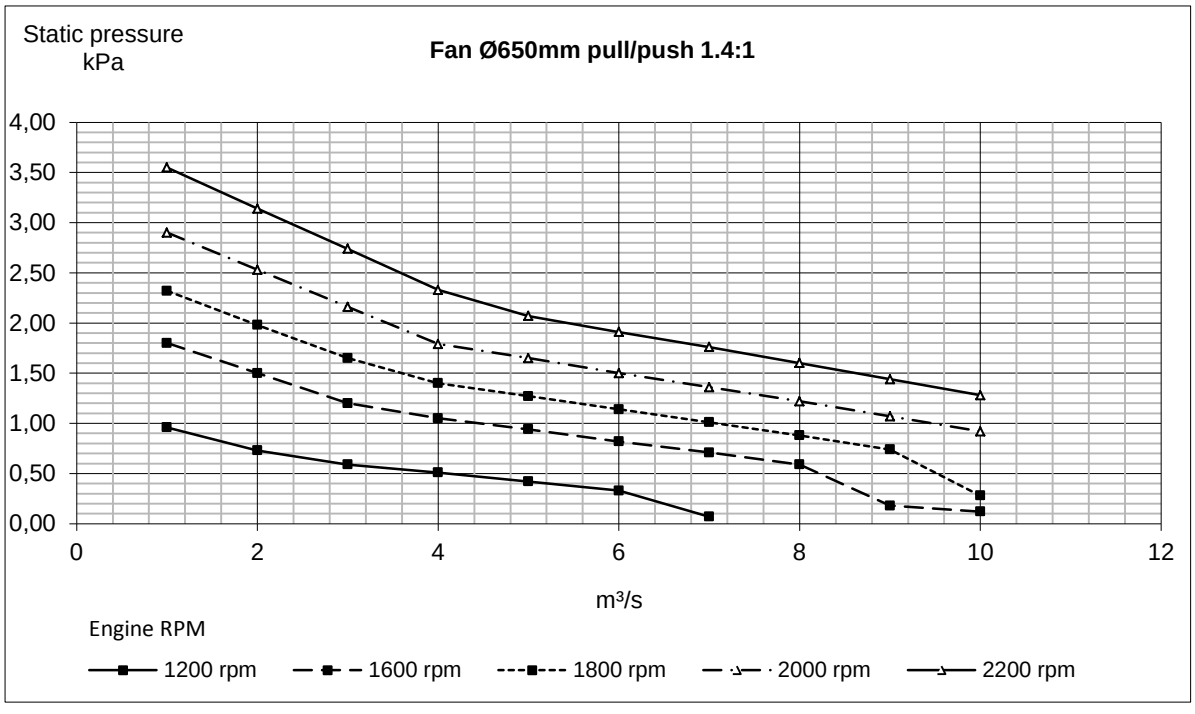

Maximum Engine Protection derate
Nm
800
700
600
500
400
300
200
100
0
500
700
900
1100
1300
1500
1700
1900
2100
2300
2500
Engine speed [rpm]
ICFN Power 185 kW

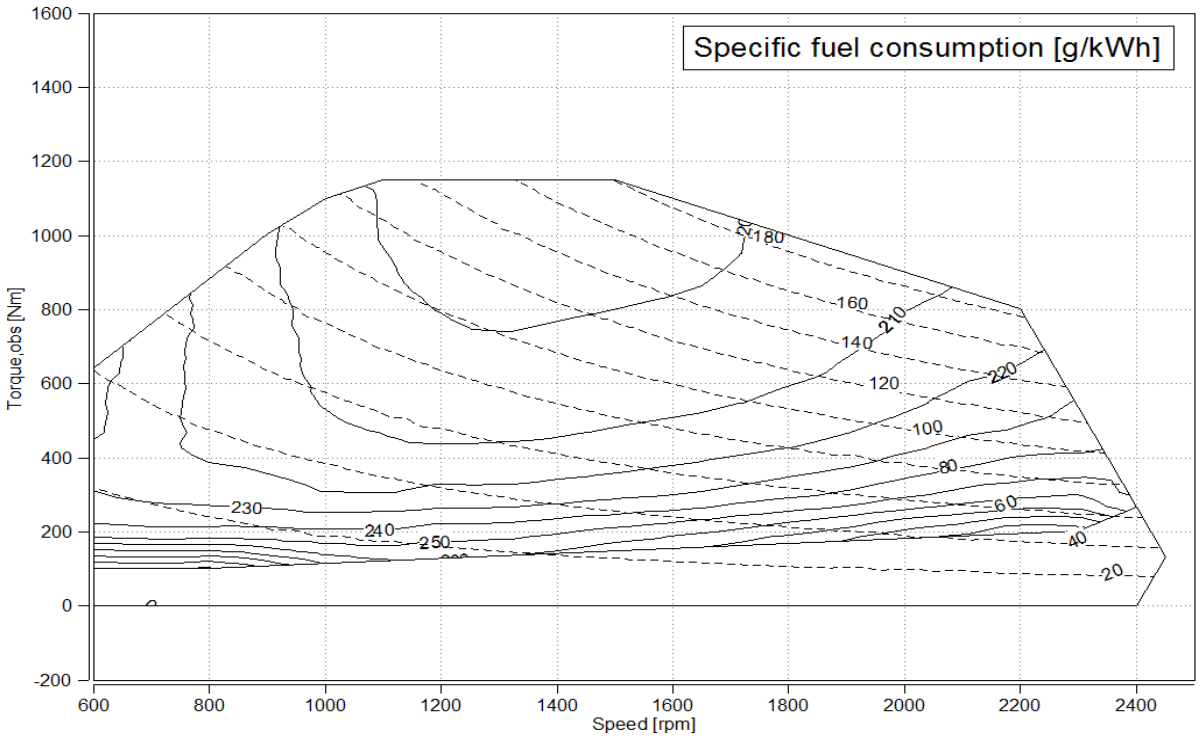

dB (A)
Sound power level engine body
1/3 octave band analysis
110
100
90
80
70
60
50
40
20
31,5
50
80
125
200
315
500
800
1,25
2k
3,15
5k
8
12,5
20k
Frequency Hz
ICFN Power 185 kW

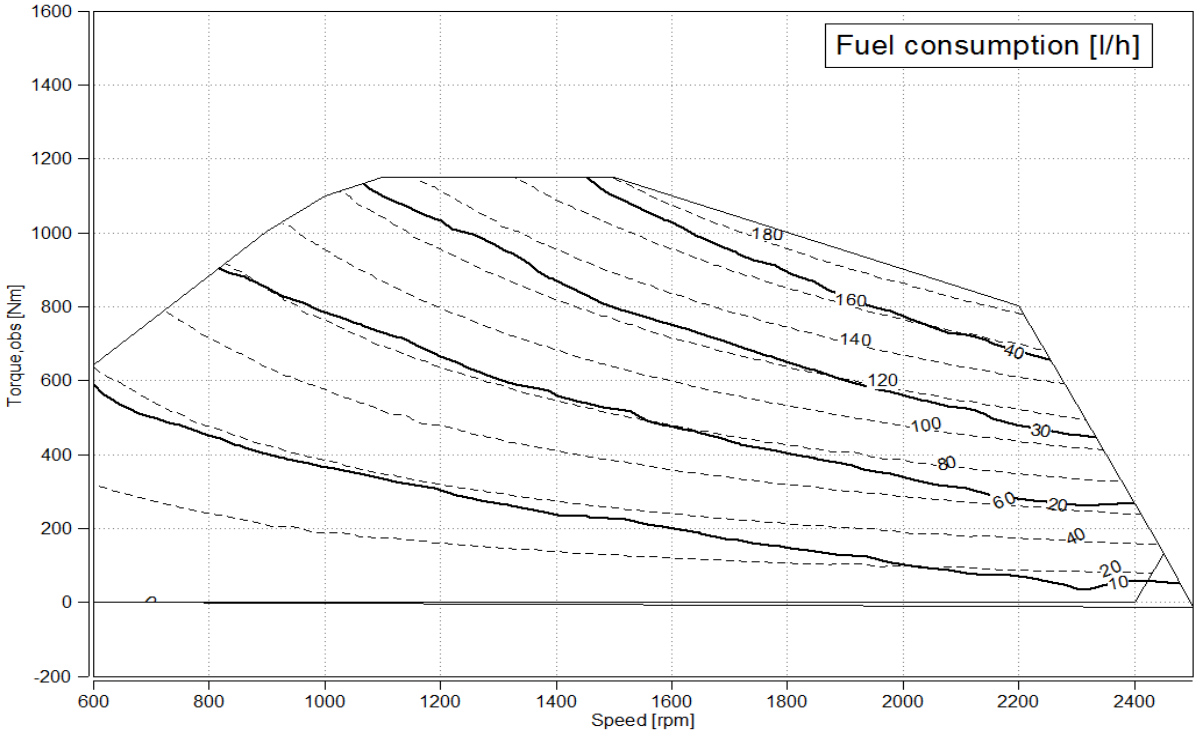

dB(A)
Sound power level
Total sound level at full load
120
118
116
114
112
110
108
106
104
102
100
98
96
0
500
1000
1500
2000
2500
rpm
ICFN Power 185 kW


dB (A)
SCR Muffler transmission loss
50
45
40
35
30
25
20
15
10
5
0
20
40
300
400
1000
1400
1600
1700
1900
Frequency Hz
PN 22352092


Fan Ø650mm pull/push 1.4:1
kW
40,00
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
0
2
4
6
8
10
12
m³/s
Engine RPM
1200 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm


Static pressure
kPa
Fan Ø650mm pull/push 1.4:1
4,00
3,50
3,00
2,50
2,00
1,50
1,00
0,50
0,00
0
2
4
6
8
10
12
m³/s
Engine RPM
1200 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm


Specific fuel consumption [g/kWh]
Torque,obs [Nm]
Speed [rpm]
1600
1400
1200
1000
800
600
400
200
0
-200
600
800
1000
1200
1400
1600
1800
2000
2200
2400
180
160
210
140
220
120
100
80
230
60
240
40
250
20


Fuel consumption [l/h]
Torque,obs [Nm]
Speed [rpm]
1600
1400
1200
1000
800
600
400
200
0
-200
600
800
1000
1200
1400
1600
1800
2000
2200
2400
180
160
140
40
120
30
100
80
20
60
40
20
10

Industrial Alternators

BLUE STAR Power Systems Inc.

Blue Star Power Systems, Inc. utilizes the highest quality alternators available. Our industrial alternators provide consistent performance, quality design, and great durability required for long life and versatility. Alternators used by Blue Star Power Systems, Inc. are UL and CSA Listed, which guarantees that each one meets the rigorous demands of industrial power generation and will provide safe and effective service for the life of the alternator. Blue Star Power Systems, Inc. alternators range from 20 kWe through 2000 kWe.

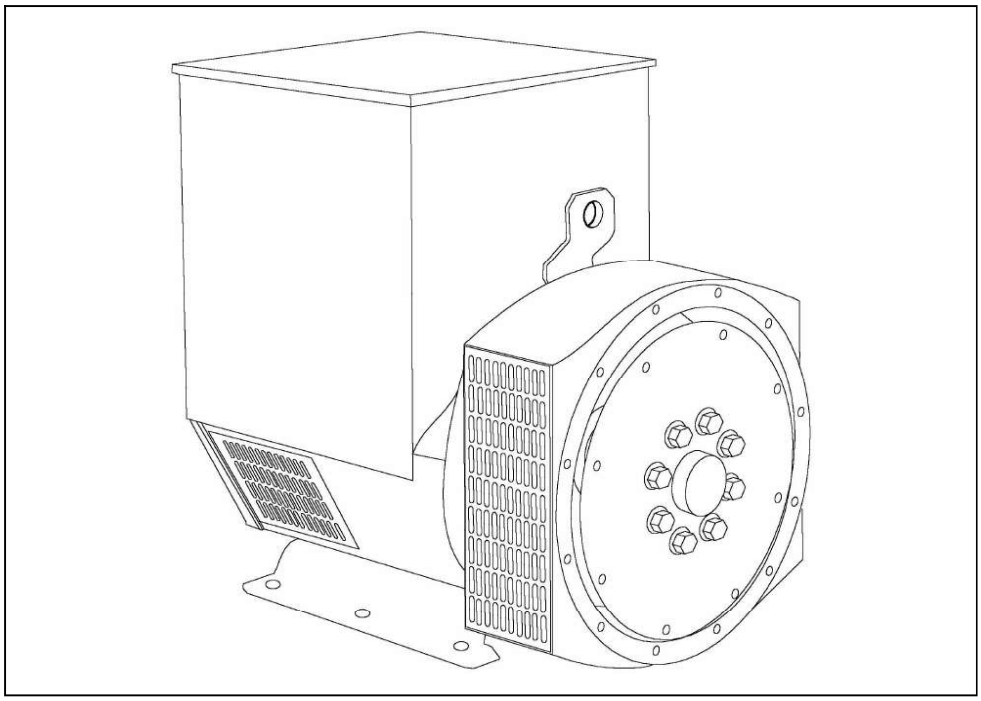
Standard Features

- **Enhanced Ventilation**
  Created by a high-efficiency fan that optimizes internal airflow patterns, maximizes heat transfer, and minimizes hot spot differentials for extended winding life.
- **Fully Guarded**
  For operator safety and alternator protection. No rotating or electrically energized parts are exposed. All openings are covered by louvers or screens.
- **Large Conduit Box**
  Provides ample space for easy connections and allows load line access from all sides, top, or bottom.
- **Design Specs and Agency Approvals**
  All Blue Star Power Systems, Inc. alternators are UL and CSA Listed (unless specified otherwise) and meet NEMA MG1-32, BS5000, CSA C22.2, IEC 34 and VDE 0530 requirements.
- **Class H Insulation System**
  Utilizes an unsaturated polyester varnish for optimal insulation life and superior moisture protection.
- **Optimized Windings**
  Provide low reactances and exceptional motor starting capability. The stator windings utilize a 2/3 pitch to minimize harmonic distortion and facilitate parallel operation.
- **Permanent Magnet Generator (optional)**
  Ensures 300% short circuit current during fault conditions and provides the regulator with input power isolated from load distortion.
- **Heavy-Duty Bearing**
  Resists contamination and gives a life expectancy up to 40,000 hours.
- **Automatic Voltage Regulator**
  Provides accurate 1% regulation, under-speed protection, stability adjustment to optimize transient performance, and EMI filtering to commercial standards. Fully encapsulated for rugged durability in virtually any environment.

STAMFORD®

UCI274G - Winding 311

Technical Data Sheet



SPECIFICATIONS & OPTIONS

STANDARDS

Stamford industrial generators meet the requirements of BS EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359.
Other standards and certifications can be considered on request.

VOLTAGE REGULATORS

SX460 AVR - STANDARD

With this self excited control system the main stator supplies power via the Automatic Voltage Regulator (AVR) to the exciter stator. The high efficiency semiconductors of the AVR ensure positive build-up from initial low levels of residual voltage.
The exciter rotor output is fed to the main rotor through a three phase full wave bridge rectifier. This rectifier is protected by a surge suppressor against surges caused, for example, by short circuit.

AS440 AVR

With this self-excited system the main stator provides power via the AVR to the exciter stator. The high efficiency semi-conductors of the AVR ensure positive build-up from initial low levels of residual voltage.
The exciter rotor output is fed to the main rotor through a three-phase full-wave bridge rectifier. The rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out-of-phase paralleling.
The AS440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

MX341 AVR

This sophisticated AVR is incorporated into the Stamford Permanent Magnet Generator (PMG) control system.
The PMG provides power via the AVR to the main exciter, giving a source of constant excitation power independent of generator output. The main exciter output is then fed to the main rotor, through a full wave bridge, protected by a surge suppressor. The AVR has in-built protection against sustained over-excitation, caused by internal or external faults. This de-excites the machine after a minimum of 5 seconds.
An engine relief load acceptance feature can enable full load to be applied to the generator in a single step.
If three-phase sensing is required with the PMG system the MX321 AVR must be used.
We recommend three-phase sensing for applications with greatly unbalanced or highly non-linear loads.

MX321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three-phase rms sensing, for improved regulation and performance.
Over voltage protection is built-in and short circuit current level adjustments is an optional facility.

WINDINGS & ELECTRICAL PERFORMANCE

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th …) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

TERMINALS & TERMINAL BOX

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers' wiring and gland arrangements. It has removable panels for easy access.

SHAFT & KEYS

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation.
Two bearing generators are balanced with a half key.

INSULATION/IMPREGNATION

The insulation system is class 'H'.
All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

QUALITY ASSURANCE

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

The stated voltage regulation may not be maintained in the presence of certain radio transmitted signals. Any change in performance will fall within the limits of Criteria 'B' of EN 61000-6-2:2001. At no time will the steady-state voltage regulation exceed 2%.

DE RATES

All values tabulated on page 8 are subject to the following reductions

5% when air inlet filters are fitted.
3% for every 500 metres by which the operating altitude exceeds 1000 metres above mean sea level.
3% for every 5°C by which the operational ambient temperature exceeds 40°C.
Note: Requirement for operating in an ambient exceeding 60°C must be referred to the factory.

NB Continuous development of our products entitles us to change specification details without notice, therefore they must not be regarded as binding.

Front cover drawing typical of product range.

WINDING 311

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.		
A.V.R.	MX321	MX341	
VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)		

CONTROL SYSTEM	SELF EXCITED		
A.V.R.	SX460	AS440	
VOLTAGE REGULATION	± 1.0 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT		

INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.0199 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.69 Ohms at 22°C							
EXCITER STATOR RESISTANCE	20 Ohms at 22°C							
EXCITER ROTOR RESISTANCE	0.091 Ohms PER PHASE AT 22°C							
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. refer to factory for others							
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6315-2RS (ISO)							
BEARING NON-DRIVE END	BALL. 6310-2RS (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	580 kg				598 kg			
WEIGHT WOUND STATOR	225 kg				225 kg			
WEIGHT WOUND ROTOR	210.35 kg				199.39 kg			
WR² INERTIA	1.7674 kgm^2				1.7169 kgm^2			
SHIPPING WEIGHTS in a crate	613 kg				630 kg			
PACKING CRATE SIZE	123 x 67 x 103 (cm)				123 x 67 x 103 (cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.514 m³/sec 1090 cfm				0.617 m³/sec 1308 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA BASE RATING FOR REACTANCE VALUES	182	182	182	N/A	205	218	218	231
Xd DIR. AXIS SYNCHRONOUS	2.15	1.94	1.80	-	2.43	2.31	2.11	2.06
X'd DIR. AXIS TRANSIENT	0.19	0.17	0.16	-	0.21	0.20	0.18	0.18
X"d DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	-	0.15	0.14	0.13	0.12
Xq QUAD. AXIS REACTANCE	1.29	1.16	1.08	-	1.47	1.40	1.28	1.24
X"q QUAD. AXIS SUBTRANSIENT	0.18	0.16	0.15	-	0.18	0.17	0.16	0.15
X_L LEAKAGE REACTANCE	0.08	0.07	0.07	-	0.09	0.08	0.08	0.07
X_2 NEGATIVE SEQUENCE	0.13	0.12	0.11	-	0.16	0.15	0.13	0.13
X_0 ZERO SEQUENCE	0.08	0.07	0.07	-	0.10	0.09	0.08	0.08
REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED							
T'd TRANSIENT TIME CONST.	0.038 s							
T"d SUB-TRANSTIME CONST.	0.012 s							
T'do O.C. FIELD TIME CONST.	1 s							
Ta ARMATURE TIME CONST.	0.01 s							
SHORT CIRCUIT RATIO	1/Xd							

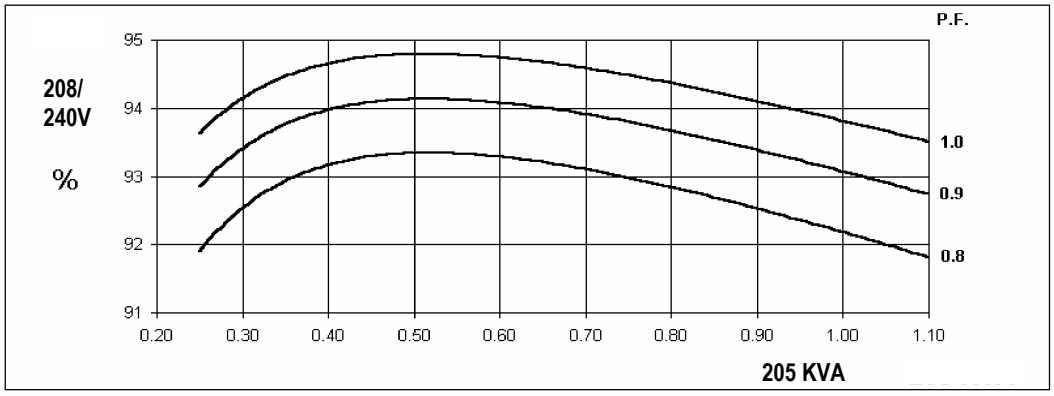
60 Hz

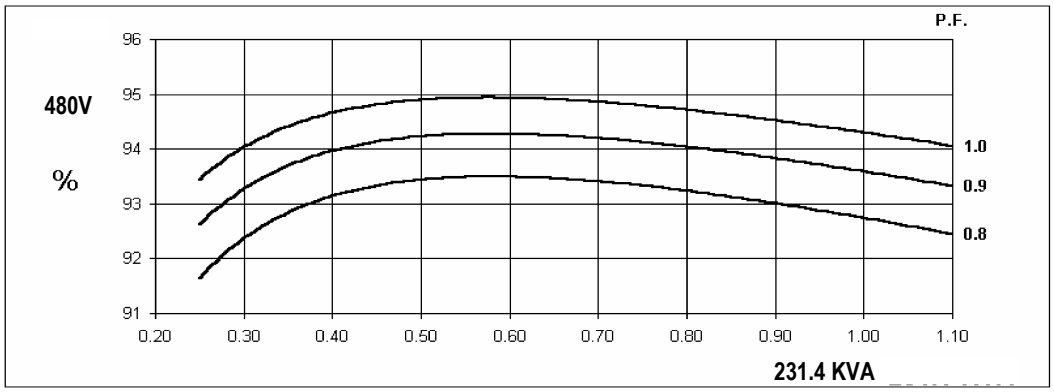
UCI274G

Winding 311

STAMFORD

THREE PHASE EFFICIENCY CURVES

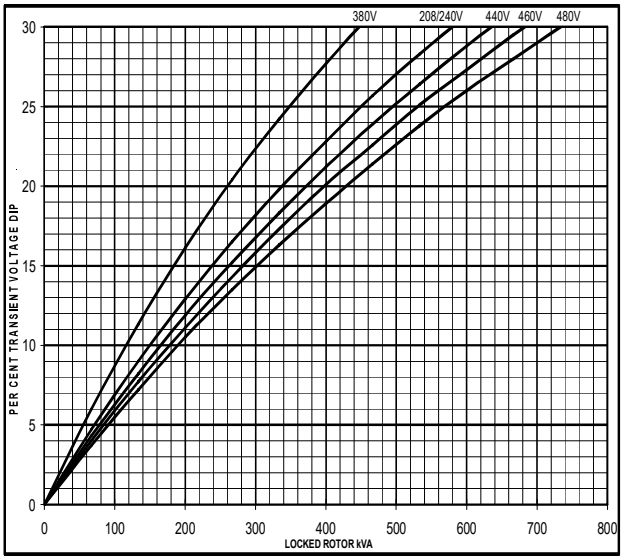




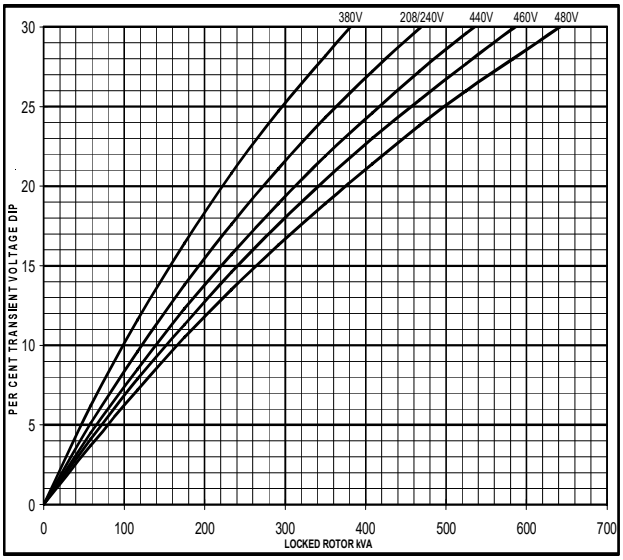
Locked Rotor Motor Starting Curve

60 Hz

MX

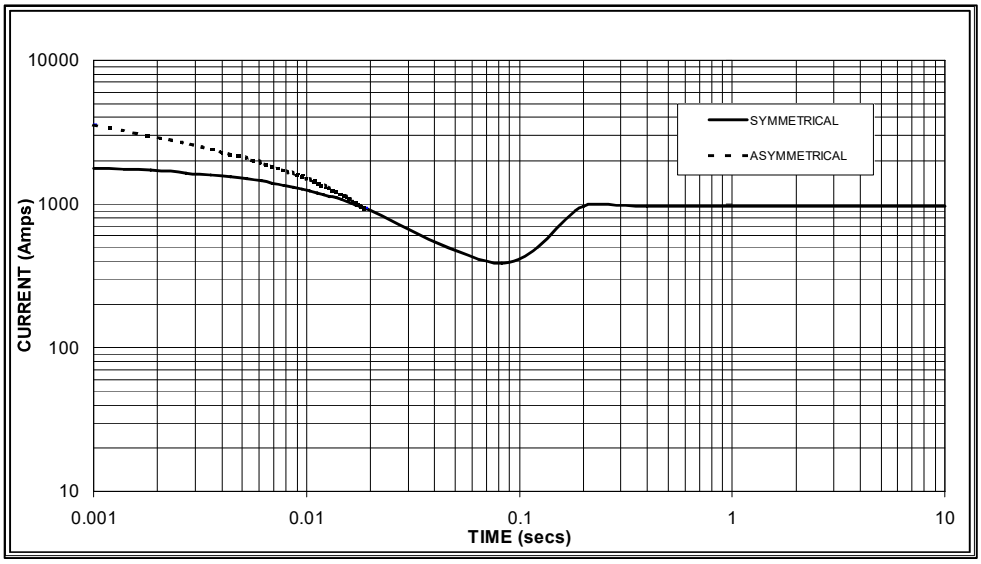


SX



Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

60 Hz



Sustained Short Circuit = 970 Amps

Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.07	440v	X 1.06
415v	X 1.12	460v	X 1.12
		480v	X 1.17

The sustained current value is constant irrespective of voltage level

Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :
Parallel Star = Curve current value X 2
Series Delta = Curve current value X 1.732

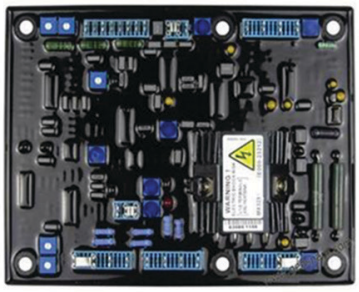
RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	192.8	199.0	199.0	212.2	205.0	218.5	218.5	231.4	213.0	228.8	228.8	250.0	218.5	234.0	234.0	253.3
	kW	154.2	159.2	159.2	169.8	164.0	174.8	174.8	185.1	170.4	183.0	183.0	200.0	174.8	187.2	187.2	202.6
	Efficiency (%)	92.4	92.7	92.9	93.0	92.2	92.4	92.7	92.7	92.0	92.2	92.5	92.5	91.9	92.1	92.4	92.5
	kW Input	166.9	171.7	171.4	182.5	177.9	189.2	188.6	199.7	185.2	198.5	197.9	216.2	190.2	203.3	202.6	219.1

MX321 Voltage Regulator

BLUE STAR Power Systems Inc.

MX321 is a three phase sensed Automatic Voltage Regulator and forms part of the excitation system for a brush-less generator. Excitation power is derived from a three-phase permanent magnet generator (PMG), to isolate the AVR control circuits from the effects of nonlinear loads and to reduce radio frequency interference on the generator terminals. Sustained generator short circuit current is another feature of the PMG system.



Voltage Adjustment

The screwdriver adjustable potentiometer adjusts the generator output voltage. Adjustment clockwise increases the generator output voltage.

When using a remote voltage adjust rheostat, remove the jumper wire across terminals 1 and 2 and install a 1k ohm 1 watt rheostat. This will give ±10% voltage variation from the nominal.

Stability Adjustment

The AVR includes a stability or damping circuit to provide good steady state and transient performance of the generator.

A jumper link selector is provided to optimize the response of the stability circuit to various size generators. The link should be positioned as shown in the diagram according to the kW rating of the generator.

The correct setting of the Stability adjustment can be found by running the generator at no load and slowly turning the stability control anti-clockwise until the generator voltage starts to become unstable.

The optimum or critically damped position is slightly clockwise from this point (i.e. where the machine volts are stable but close to the unstable region).

Under Frequency Roll Off (UFRO) Adjustment

The AVR incorporates an underspeed protection circuit which gives a volts/Hz characteristic when the generator speed falls below a presettable threshold known as the “knee” point.

The red Light Emitting Diode (LED) gives indication that the UFRO circuit is operating.

The UFRO adjustment is preset and sealed and only requires the selection of 50 or 60Hz and 4 pole or 6 pole, using the jumper link as shown in the diagram.

For optimum setting, the LED should illuminate as the frequency falls just below nominal, i.e. 47Hz on a 50Hz system or 57Hz on a 60Hz system.

Specifications

Sensing Input	
Voltage	190 to 264VAC max, 1 or 3 phase
Frequency	50 to 60 Hz Nominal
Power Input (PMG)	
Voltage	170 to 220VAC, 3 phase
Current	3A
Frequency	100 to120 Hz Nominal
Output	
Voltage	max 120VDC
Current	Continuous 3.7A Intermittent 6A for 10 secs
Resistance	15 ohms Minimum
Regulation +/- 0.5% RMS	
Thermal Drift 0.02% per 1ºC change in AVR ambient	
Soft Start Ramp Time 0.4 - 4 seconds	
Typical System Response	
AVR Response	10 ms
Field Current to 90%	80 ms
Machine Volts to 97%	300 ms
External Voltage Adjustment +/-10% with 1k ohm 1 watt trimmer	
Under Frequency Protection	
Set Point	95% Hz
Slope	100 to 300% down to 30 Hz
Max. Dwell	20% volts/S Recovery
Unit Power Dissipation 18 watts Maximum	
Analog Input	
Maximum Input	+/- 5VDC
Sensitivity	1V for 5% Generator Volts (Adjustable)
Input Resistance	1k ohm
Quadrature Droop Input 10 ohms Burden	
Max. Sensitivity	0.22A for 5% Droop 0PF
Max. Input:	0.33A
Current Limit Input 10 ohms burden	
Sensitivity Range	0.5 to 1A
Over Voltage Detection Input 10 ohms Burden	
Set Point	300V Time Delay: 1 sec (Fixed)
CB Trip Coil Volts	10 to 30VDC
CB Trip Coil Resistance	20 to 60 ohms
Time Delay	1 second (Fixed)
Over Excitation Protection	
Set Point	75VDC
Time Delay	8 to 15 seconds (Fixed)

DCP7310 Control Panel

BLUE STAR Power Systems Inc.

The DCP7310 is an Auto Start Control Module suitable for a wide variety of single, diesel or gas, generator set applications. The 7310 provides generator set control, transfer switch control, metering, monitoring & protection.

Key Benefits

- Real-time clock provides accurate event logging
- Multiple date and time scheduler
- Set maintenance periods can be configured to maintain engine performance
- Can be integrated into building management systems (BMS) using MODBUS
- Increased input and output expansion capability via DSENet®
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- PLC functionality
- Data logging to assist with fault finding and diagnosis
- cULus Listed

Advanced Features

- 4-Line back-lit LCD text display
- Five key menu navigation
- Front panel editing with PIN protection
- Customizable status screens
- Power save mode
- 8 Configurable inputs
- 6 Configurable DC outputs
- 2 configurable volt-free relay outputs
- Flexible sensor inputs
- Configurable timers and alarms
- 3 configurable maintenance alarms
- Multiple date and time scheduler
- Configurable event log (250 events)
- CAN engine support through FT4
- Integral PLC editor
- Easy access diagnostic page
- CAN and Magnetic Pick-up/Alt. inputs
- Fuel usage monitor and low fuel alarms
- Charge alternator failure alarm
- Load monitoring (kW, frequency, voltage)
- Support for 0V to 10V & 4mA to 20mA sensors
- LED and LCD alarm indication
- Power monitoring (kWh, kVAr, kVAh, kVArh)
- Load switching (load shedding and dummy load outputs)
- Unbalanced load protection
- USB connectivity
- Backed up real time clock
- Fully configurable via DSE Configuration Suite PC software
- Remote SCADA monitoring via DSE Configuration Suite PC software
- User selectable simultaneous RS232, RS485
- Configurable MODBUS pages
- MODBUS RTU & TCP support
- Advanced SMS messaging (additional external modem required)
- Additional display screens to enhance with modem diagnostics
- Idle control for starting
- DSENet® expansion compatible

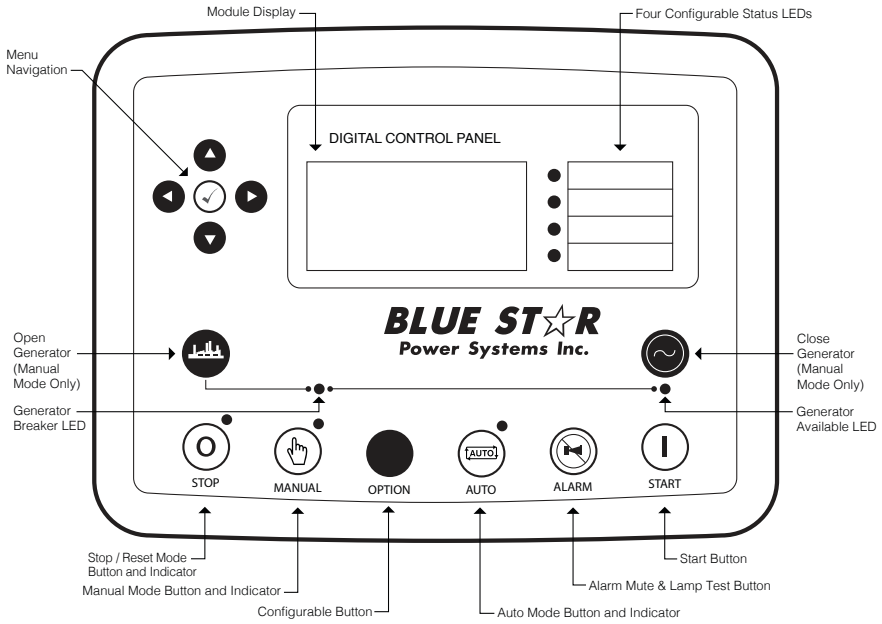
Specifications

DC Supply	
Continuous Voltage Rating	8V to 35V Continuous
Cranking Dropouts: Able to survive 0V for 100mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries.	
Maximum Operating Current	510mA at 12V, 240mA at 24V
Maximum Standby Current	330mA at 12V, 160mA at 24V
Charge Fail/Excitation Range	0V to 35V
Outputs	
Output A (Fuel)	15ADC at Supply Voltage
Output B (Start)	15ADC at Supply Voltage
Outputs C & D (Volt free)	8A at 250VAC
Aux Outputs E to J	2ADC at Supply Voltage
Generator	
Voltage Range (L-L)	26V to 719VAC
Voltage Range (L-N)	15V to 415VAC
Frequency Range	3.5 Hz to 75 Hz
Bus	
Voltage Range	15V to 415VAC (L-N)
Frequency Range	3.5 Hz to 75 Hz
Magnetic Pickup	
Voltage Range	+/- 0.5V to 70V
Frequency Range	10,000 Hz (max)
Display	
LCD Heated Display	-40°F to 158°F

DCP7310 Control Panel

Front Panel LED Indicators:

- Manual: Indicates controller is in the MANUAL mode
- Stop: Indicates controller is in the STOP mode
- Auto: Indicates unit is in the AUTO mode
- Generator Available: Indicates when the generator is available to take load
- Generator Breaker: Indicates system is supplying current to a connected load
- Four Configurable Status LEDs: Configurable via DSE Configuration Suite PC software



Standard Engine Protection Functions

Pre-Alarms (Warnings)

- Low Oil Pressure
- High Coolant Temperature
- Low Coolant Temperature
- Battery Overcharge (High Voltage)
- Weak Battery (Low Voltage)
- Low Load
- Def Level
- Battery Charger Failure
- Engine Sender Unit Failure
- Engine kWe Overload
- Maintenance Interval Timer
- Low Fuel Level
- Fuel Leak Detect

Alarms (Shutdowns)

- Low Oil Pressure
- High Coolant Temperature
- Overspeed
- Overcrank
- Fuel Sender Failure
- Def Level

All alarms and pre-alarms can be configured via the DSE Configuration Suite PC software or the front panel.

Optional Features

- Generator Protection - 27(2), 32, 40Q, 51(2), 59(2), 81O, 81U
- Enhanced Generator Protection - 51 and 47
- Selection of Integrating Reset or Instantaneous Reset Characteristics for Overcurrent Protection
- Ethernet and 4G (GSM) remote monitoring and communications via DSE WebNet Software
- Automatic Transfer Switch Control
- Remote Emergency Stop
- Multilingual Capability
- High Fuel Level Pre-Alarm
- Critical Low Fuel Level Alarm
- Analog Meters

Generator Protection

- Undervoltage (27)
- Overvoltage (59)
- Underfrequency (81U)
- Overfrequency (81O)
- Overcurrent (51)
- Reverse Power (32)
- Loss of Excitation (400)
- Phase Imbalance (47)

All generator protection features are programmable as alarms or pre-alarms.

DCP7310 Control Panel

BLUE STAR Power Systems Inc.

DRP2510 Remote Display Panel

The DRP2510 is a display module designed to work with the DCP7310 Auto Start. Up to three display modules can be connected to one host control module, and can be positioned up to a maximum distance of 3,280 (1km) away. All remote displays connected to the same system, will show the same information at any one time, while the host controller is able to display different information. The modules are simple to operate, and feature the same user-friendly, menu layout as the host module. All communications and configuration are done via the host module only. The remote devices simply mirror the configuration of the host module, making the system quick and easy to install.

DSE2548 DSENET® Remote Annunciator

The DSE2548 is an LED expansion module that can be used with all DSENet® compatible control modules. The module has been designed to display a maximum of height individual LED indications up to a maximum distance of 3,280 (1km). The DSE2548 is presented in a vertical enclosure. It includes an alarm sounder that is triggered when the host controller detects an alarm condition. The alarm can be muted directly from the DSE2548 using the front push button. The DSE2548 includes individual LEDs for each channel and a 'Power On' LED that flashes when the link with the host controller is lost.

DSE890 MKII DSEWebNet® Gateway 4G (GSM/Ethernet) Remote Communications Interface

The DSE890 MKII 4G gateway is used in conjunction with supported DSE controllers to provide remote monitoring and communications data via the DSEWebNet® software. The DSE890 MKII gateway communicates with a maximum of five connected DSE controllers, monitoring their instrumentation and operating states. The DSEWebNet® software is accessed using an internet browser or mobile app connection. Users are able to perform multiple tasks including: monitoring equipment, clearing alarm conditions and starting/stopping equipment at the click of a button.

DSE2157 DSENET® Output Expansion Module

The DSE2157 is an output relay expansion module for use with DSENet® compatible control modules. The DSE2157 has been designed to extend a host module's output capabilities. A maximum of 10 DSE2157's can be connected to an individual module at any one time. All outputs are configurable via the host controller. The additional output capabilities of the DSE2157 give OEMs the flexibility to meet increasingly complex industry specifications.

DSE2130 DSENET® Input Expansion Module

The DSE2130 is an input expansion module for use with DSENet® compatible control modules. The additional input capabilities of the DSE2130 give OEMs the flexibility to meet increasingly complex industry specifications. The DSE2130 provides an additional eight digital inputs, with four of these configurable for use as analog inputs. All inputs are configured within the host controller.

DSE2133 DSENET® RTD / Thermocouple Input Expansion Module

The DSE2133 Input Expansion Module is used in conjunction with supported DSENet controllers to provide 8 additional configurable inputs. Up to four modules can be linked together to provide up to 32 additional inputs. The inputs can be configured as RTD or Thermocouple inputs in the 'host controller'.

DSE2131 Ratiometric Input Expansion Module

The DSE2131 Ratiometric Input Expansion module is used in conjunction with supported DSENet controllers to provide additional, flexible, input functionality. The ratiometric inputs can be configured in a number of ways to connect to digital switches, resistive sensors, 0 to 10VDC signals or 4 to 20 mA signals.

DSE2152 Analog Output Expansion Module

The DSE2152 Analog Output Expansion Module is used in conjunction with supported DSENet controllers to provide 6 additional outputs. The outputs can be individually configured as 0 to 10V or 4 to 20mA, via the "host controller". Up to four DSE2152 modules can be linked together to provide up to 24 additional outputs. An ID switch is provided on the module for identification.

Paint & Powder Coat

BLUE STAR Power Systems Inc.

Generator Set

Blue Star Power Systems, Inc. completely paints all of its generator sets in our state-of-the-art downdraft paint booth. It begins with an extensive cleaning of the unit through sanding and a full wipe down using an alkaline-based cleaner. Once completely clean, the unit is then painted with Cardinal Industrial Semigloss paint. Electrostatic paint equipment ensures correct and even coverage. The unit then receives a complete covering of Cardinal Industrial Clear Coat in a hammer texture to provide extra protection and a durable long-lasting easy-to-clean finish.

Performance Characteristics

- 3.0+ Mils TDFT
- Xenon Arc 1100 hours - Excellent Weatherability
- 1000 Hour Salt Spray - Over Primer - Passed (3.0 Mils Total TDFT)
- Adhesion, Crosshatch - 5B
- Gloss 90+ @ 60˚

Generator Set Enclosure

Blue Star Power Systems, Inc. provides Cardinal Industrial Hammer Textured Semi-Gloss Polyester Powder Coating as standard on all our enclosures. Long term exterior durability, high performance mechanical properties and high gloss are standard characteristics of Cardinal Powder Coating. Cardinal TGIC Polyester Coating exceeds UL 2200 & CSA requirements.

Performance Characteristics

- Cured Powder Properties 2.0+ Mils DFT
- PCI Powder Smoothness 1 Mil
- Pencil Hardness 2H+
- Flexibility 1/8 in Diameter - No Fracture
- Salt Spray ASTM-B117 1000 Hours - Pass
- Humidity ASTM-02247 1000 Hours - Pass
- Adhesion, Crosshatch - 5B
- Gloss 90+ @ 60˚

Standard Colors

White | T012-WH260

Gray | C013-GR08

Custom Colors

Custom Colors: Blue Star Power Systems, Inc. offers custom color options for your generator set enclosure. Cardinal is licensed by PANTONE® to accurately simulate both the PANTONE MATCHING SYSTEM® colors and the PANTONE® Textile Color System® with our powder and liquid coatings. Additional Charges apply.

Sub-Base Fuel Tanks

Blue Star Power Systems, Inc. provides either Diamond Vogel Nexgen Technology Paint or Cardinal Industrial Hammer Textured Semi-Gloss Polyester Powder Coat on all of our sub-base fuel tanks. Nexgen and Cardinal Industrial both offer excellent coverage and performance characteristics. Nexgen and Cardinal Industrial both exceed UL requirements.

Performance Characteristics

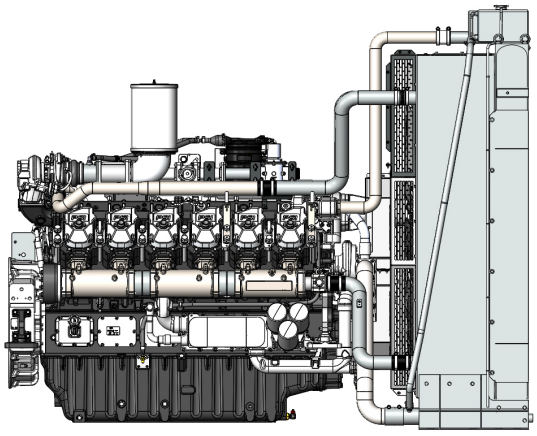
- 3.0+ Mils TDFT
- Xenon Arc 1100 Hours
- 500 Hour Salt Spray - Over Primer - Passed (3.0 Mils Total TDFT)
- Adhesion Crosshatch - 5B
- Gloss 90+ @ 60˚

Standard Color

Jet Black | IB-9541

Radiators

Blue Star Power Systems, Inc. radiators offer a variety of styles and configurations including radiator and charged air assemblies, radiator and aftercooler assemblies with durable core construction. Our radiators are compact and efficient meeting the most stringent enclosure footprint requirements. All radiators are sized for 50˚C (122˚F) ambient. The single-source design ensures a perfect match with your generator set package.



Radiator Features

Standard Radiator Package

- Engine-specific tank design with variant coolant connection locations and sizes (dependant on engine size)
- Complete cooling package with mounting foot and plumbing kit
- All steel construction of top and bottom tanks
- Dual Core designs -
    - Jacket Water / Charged Air Circuit
    - Jacket Water / After Cooler Circuit
- Individual radiators designed to meet manufacturer's specific requirements
- Top tank has built in expansion capacity - no need for an external recover tank
- Full or partial deration system built into the top tank
- Standard cooling package includes fan shroud & fan guard
- Corrosion preventive options:
    - Hot dipped galvanizing on all steel parts or stainless steel
    - Epoxy coated cores

Fan-On Radiator Design

- Engine-specific tank design with variant coolant connection locations and sizes (dependant on engine size)
- Rigid built construction for fan support
- High speed bearings within pillow blocks
- Dual Core designs with variable jacket water / after cooler circuit designs
- All steel construction of top and bottom tanks
- Individual radiators designed to meet manufacturer's specific requirements

Circuit Breakers

BLUE STAR Power Systems Inc.

Blue Star Power Systems, Inc. MC (Molded Case) Series Circuit Breakers are the highest quality in the industry. They will protect the power system and corresponding equipment from damaging fault currents circuits and overloads.

80% Rated Circuit Breakers

80% rated breakers can only be applied continuously at 80% of the rated breaker. Tripping of the circuit breaker if the current goes above 80% will depend on the amount of current and the duration.

100% Rated Circuit Breakers

100% rated breakers can be applied at 100% of their current rating continuously.

Accessories

Shunt Trip - Provides a means of tripping the circuit breaker from a remote source by energizing a solenoid in the breaker. This can be achieved through the panel faults such as engine shutdowns, overcurrent, etc. The circuit breaker will have to be reset locally in the event of a tripped breaker.

Bell Alarm / Alarm Switch - Provides remote indication of whether the circuit breaker is in a tripped position. The bell alarm will remain unchanged during on-off operations and during operation by the Push-to-Trip button on the circuit breaker.

Auxiliary Switch/Contacts - Provides remote indication of whether the circuit breaker is in an open or closed state.

Ground Fault Indication/Alarm - Adjustable relay that indicates a ground fault condition with adjustable time delay.

Trip Unit

LI Breakers - Includes adjustable Long-Time pickup and delay and adjustable Instantaneous pickup.
LSI Breakers - Includes features of LI Breakers with addition of Short-Time pickup and delay.

Breaker Model	Amperage	Percentage Rated	Maximum Voltage Rating (AC)	UL Listed Interrupting Rating (kA)			Lug Qty. and Size (Cu & Al)
				240	480	600	
H-Frame	15-150	80% or 100%	600	25	18	14	(1) #14-3/0
Q-Frame	70-250	80%	240	10	-	-	(1) #4-300 kcmil
J-Frame	150-175 200-250	80% or 100%	600	25	18	14	(1) #4-4/0 (1) 3/0-350 kcmil
L-Frame	125-400 200-600	80% or 100% 80%	600 600	65	35	18	(2) 2/0-500 kcmil
M-Frame	300-800	80%	600	65	35	18	(3) 3/0-500 kcmil

Breaker Model	Frame Size	Percentage Rated	Maximum Voltage Rating (AC)	UL Listed Interrupting Rating (kA)			Lug Qty. and Size (Cu & Al)
				240	480	600	
P-Frame	600 800 1000 1200	80% or 100%	600	65	35	18	(3) 3/0-500 kcmil (4) 3/0-500 kcmil
R-Frame (LSI Standard)	1600 2000 2500 3000	100%	600	65	35	18	(12) 3/0-750 kcmil (15) 3/0-750 kcmil (18) 3/0-750 kcmil (21) 3/0-750 kcmil

Product data sheet
Characteristics

LGL36600U31X
Circuit breaker, PowerPact L, unit mount, Micrologic 3.2, 600A, 3 pole, 18kA, 600VAC, 80% rated

Product availability: Non-Stock - Not normally stocked in distribution facility

Price*: 7484.00 USD

Main

Range	PowerPact
Product name	PowerPact L
Device short name	L-Frame
Product or Component Type	Circuit breaker
Device Application	Distribution

Complementary

Line Rated Current	600 A
Poles description	3P
Control Type	Toggle
Breaking capacity code	G
Breaking capacity	65 KA 240 V AC 50/60 Hz UL 489 35 KA 480 V AC 50/60 Hz UL 489 18 KA 600 V AC 50/60 Hz UL 489 20 KA 250 V DC UL 489 20 KA 500 V DC UL 489
[Ue] rated operational voltage	600 V AC 50/60 Hz IEC 60947-3
Network Frequency	50/60 Hz
[Ics] rated service breaking capacity	65 KA 220/240 V AC 50/60 Hz IEC 60947-2 35 KA 380/440/415 V AC 50/60 Hz IEC 60947-2 18 KA 500/525 V AC 50/60 Hz IEC 60947-2 20 KA 250 V DC IEC 60947-2 20 KA 500 V DC IEC 60947-2
[Uimp] rated impulse withstand voltage	8 KV IEC 60947-2
Trip unit technology	Electronic, standard, Micrologic 3.2, LI
Continuous current rating	80 %
[Ui] rated insulation voltage	750 V IEC 60947-2
Trip unit name	Micrologic 3.2
Protection technology	Current limiter

Suitability for isolation	Yes IEC 60947-2
Utilisation category	Category A
AWG gauge	2 x AWG 2/0...500 kcmil aluminium/copper
Local signalling	Ready 1 LED green) Alarm 1 LED 90 % Ir orange) Alarm LED 105 % Ir red) Switched off (OFF) 1 trip indicator green)
Mounting mode	Unit mount lug)
Mounting Support	Lug
Electrical connection	Lugs line Lugs load
Terminal identifier	AL600LS52K3
Long time pick-up adjustment range	0.25...1 x In
Tightening torque	442.54 Lbf.In (50 N.m) 0.11…0.37 in² (70…240 mm²) (AWG 2/0...500 kcmil)
Number of slots	2 auxiliary switch OF plug-in) 1 alarm switch SD plug-in) 1 overcurrent trip switch SDE plug-in) 1 voltage release MN or MX plug-in)
Wire stripping length	1.22 In (31 mm) 2.40 In (61 mm)
Color	Black
Height	13.39 In (340 mm)
Width	5.51 In (140 mm)
Depth	4.33 In (110 mm)
Net Weight	13.67 Lb(US) (6.2 kg)
Communication interface	Modbus Ethernet

Environment

Standards	UL CSA NEMA NOM-003-SCFI-2000 IEC 60947-2
Product certifications	UL CSA NOM
IP degree of protection	Front cover IP40
Pollution degree	3 IEC 60947-1
Ambient air temperature for operation	28…158 °F (-2…70 °C)
Ambient Air Temperature for Storage	-58…185 °F (-50…85 °C)
Operating altitude	< 6561.68 ft (2000 m) without derating 5000 m with derating

Ordering and shipping details

Category	01116 - L ELEC TRIP UNIT MOUNT BREAKER/SW
Discount Schedule	DE2
GTIN	00785901594437
Nbr. of units in pkg.	1
Package weight(Lbs)	1 Lb(US) (0.45 kg)
Returnability	No
Country of origin	US

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	8.80 In (22.352 cm)
Package 1 width	14.00 In (35.56 cm)
Package 1 Length	31.70 In (80.518 cm)

Offer Sustainability

Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: DIN-P, which is known to the State of California to cause cancer, and DID-P, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
EU RoHS Directive	Compliant EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
PVC free	Yes

Contractual warranty

Warranty	18 months

Product Life Status : Commercialised

CB / CL Series Block Heaters

BLUE STAR Power Systems Inc.

Features

- Constant circulation of coolant through the engine achieves even heat distribution
- One-piece, heavy-duty, pressure die-cast aluminum tank with a bolt-on flange element assembly
- Fixed thermostat ON: 100˚F, OFF: 120˚F (optional temp ranges available)
- All parts replaceable - easy to service
- CSA and cULus approved
- Classified weather tight
- Models available for Class I, Group D (Hazardous Locations) applications
- Various voltages and 3 phase units available

Easy Starts

- Saves warm-up time
- Saves fuel
- Prolongs battery life
- Protects the Environment
- Reduces “white smoke” upon start-up
- Engine is ready for full power operation
- Reduces noise pollution

Reduces Engine Wear

- 90% of engine wear is due to low jacket water temp upon start-up
- Stops destructive condensation
- Extends engine life

Specifications

Part Number	Volts	Watts	Phase	Amps
10591	120	2500	1	20.8
11376	208	2500	1	12.0
10592	240	2500	1	10.4
14208	480	2500	1	5.2
11136	120	3000	1	25.0
11137	208	3000	1	14.4
10593	240	3000	1	12.5
11138	480	3000	1	6.3
11139	208	4000	1	19.2
10594	240	4000	1	16.7
11140	480	4000	1	8.3
11141	208	5000	1	24.0
10595	240	5000	1	20.8
11142	480	5000	1	10.4

Industrial Batteries

BLUE STAR Power Systems Inc.

Engine Starting Batteries

Blistering heat and bitter cold are ruthless battery killers. That's why Blue Star Power Systems, Inc. utilizes a pioneered climatized battery. Designed to offer you long-life and high-performance starting power that will get your gen-set running even under extreme conditions. Blue Star Power Systems, Inc. "all-climate" batteries stand up to the harshest temperatures and are available in sizes and configurations to fit almost any application.

Standard Features

- Unique Manifold Vent - Virtually eliminates corrosion by venting gases away from terminals and cables
- Exclusive TRP™ Construction – Rib reinforced TRP™ container significantly improves the vibration and impact resistance
- Armored Plate Cell Bonding - Vibration is the number one killer of commercial batteries. To solve this problem, the cells of every battery are bonded
- Polyethylene Enveloped Separator Design – Super tough polyethylene material reduces electrical resistance and provides higher cranking performance
- Center Lug Design - Suppresses the vibration inherent in traditional construction for improved performance (where applicable)
- TTP™ - Through-the-Partition inter-cell connectors create a shorter current path to deliver more power to the terminals
- Heavy Duty Cases - Reinforced polyethylene or hard rubber cases stand up to the demands of standby gen-sets
- Convenient Lifting Slots - a handle is built in the top of the battery for easy carrying and transportation
- Protective Bottom Design - Waffled bottom design provides protection against nuts, bolts, or stones that might become lodged under the battery
- Computer Designed Radical Grids - An improved state-of-the-art design which adds power and resists vibration
- Threaded Accessory Ports - Features a sealed "O" ring that does not work loose during severe service (78DT only)

Specifications

	NEMA Type			Dimensions (Inches)			
BCI Group Size	Part Number	CCA at 0˚F	CCA at 32˚F	Length	Width	Height	Weight (lbs.)
78DT	78DT-HD	800	960	10-11/16	7-1/16	8-1/8	54
4D	4D-HD	1000	1200	19-9/16	8-5/16	10	95
8D	8D-HD	1300	1560	20-3/4	11	10	117

Deep Sea Battery Charger

BLUE STAR Power Systems Inc.

The DSEBC2410Ei is an enclosed intelligent battery charger designed to work with multiple battery types across a wide range of applications.

The advanced technology has been developed to automatically detect system settings and charging profiles including cell voltage and boost voltage to provide high-levels of charging support.

A comprehensive range of input and output protections ensure a continued safe charging environment also enabling the use of the charger as a power supply.

Key Benefits

- Fully flexible to maximize the life of the battery
- Suitable for a wide range of battery types
- NFPA110 Compliant
- Fault output
- Maximum 91% operating efficiency
- No external intervention for boost mode
- Multiple chargers can be linked together to provide larger current output
- Can be permanently connected to battery and utility supply. No need to disconnect through high load conditions.
- cULus Listed

Advanced Features

- Intelligent two, three and four stage charging profiles
- 12V / 24V auto voltage detection for multiple battery types
- Adjustable current limit
- Can be used as a battery charger, power supply or both at the same time
- Automatic or Manual boost and storage charge functions to help maintain battery condition
- Digital Microprocessor Technology
- Temperature compensation for battery charging
- Low Output Ripple and superb line regulation
- Available in two variants (LCD display or LCD display & analog meters)
- Full Protection
- AC input Under voltage | AC input Over voltage
- Battery charger output Over voltage | Battery charger output Over current
- Battery temperature compensation with over temperature protection
- Output short circuit and inverse polarity protection with auto recovery
- Automatic power de-rating at high ambient temperatures
- Battery charger failure indication
- Automatic Boost Mode boosts and equalizes cell charge improving battery performance and life
- Power Save Mode
- Once the battery is fully charged the chargers switch to Eco-Power to save energy consumption
- Can be integrated into external systems through MODBUS RTU using RS485
- Fully configurable via DSE Configuration Suite PC Software
- DSE2541 External remote display option

Specifications

AC Supply	
Voltage Range	90V to 305V (L-N)
Frequency Range	48 Hz to 64 Hz (L-N)
DC Output Rating	
Output	10ADC at 12V & 24VDC
Ripple and Noise	<1%
Efficiency	>86%
Auxiliary Output	100mA at 12VDC
Regulation	
Line	<0.5%
Load	2%
Temperature Sensor Input - PT1000	
Protections	
Short Circuit	DC Over and Under Voltage
DC Over Current	Reverse Polarity
Over Temperature	AC Under & Over Voltage
Battery Charger Failure	
Charge Failure Relay - 3A at 30VDC Volt Free Relay	
Temperature Rating	
Operating Temp Rating	-30°C to +55°C (-22°F - 131°F)
Compatible Battery Profiles	
- Lead Acid - Lead Crystal - Ni-Cad 18 Cell - Ni-Cad 20 Cell	- Calcium - Lithium Phosphate - VRLA-AGM - VRLA-GEL

Sub-Base Fuel Tanks

Blue Star Power Systems, Inc. sub-base fuel tanks are listed and manufactured under UL 142 & ULC-S601 standards for steel above ground tanks, which guarantees that every fuel tank meets the structural and mechanical integrity requirements for mounting a generator set directly on top of the tank. This provides a convenient, efficient, and safe way to store fuel for your generator set.

Sub-Base Fuel Tank Standard Features

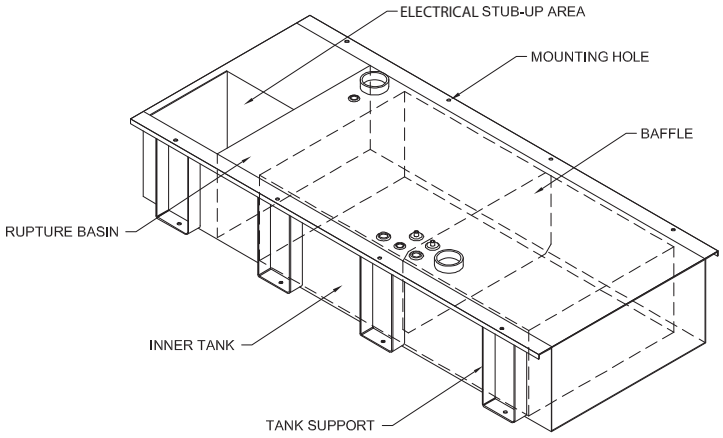
- Double walled secondary containment UL 142 & ULC-S601 Listed
- Electrical stub-up openings are standard to provide generator set wiring provisions through the base tank
- Heavy gauge steel construction
- Diamond Vogel Nexgen Technology Paint or Cardinal Industrial Hammer Textured Semi-Gloss Polyester Powder Coat
- Standard fittings: fuel supply with check valve (sized per unit), fuel return (sized per unit), 2" NPT for normal vent, 2" - 6" NPT for emergency vent (sized per unit), 2" NPT for manual fill, 1 1/2" NPT for fuel level gauge, and 3/8" NPT basin drain (plugged). Removable 1/2" supply dip tube standard (size may vary with gen-set model). 1 1/2" NPT for leak detection
- Interior tank baffle: Separates cold engine supply fuel from hot returning fuel
- Direct reading fuel level gauge
- Low fuel level and fuel leak alarms

Design Options

- High and critical low fuel level shutdowns or alarms
- Full pumping control systems for a true day tank system with a full array of electrical options
- Additional Tank Fittings
- Custom Fuel Tank Designs (sizes and shapes)
- Fuel Heater
- Fill / Spill Containment

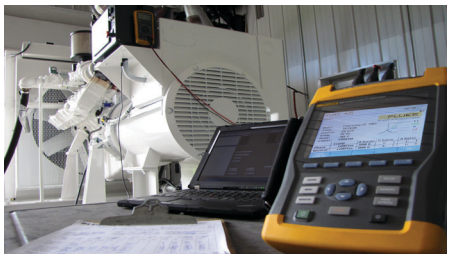
Blue Star Power Systems, Inc. offers two distinctive types of double wall sub-base fuel tanks, those with an electrical stub up area (standard) and those without. Each type can be customized to any specification to meet your specific requirements.

UL 142 & ULC-S601 double wall secondary containment sub-base fuel tank with stub-up.



Factory Load Test

Blue Star Power Systems, Inc. factory testing is performed with the same extreme diligence and attention to detail that is given to the prototype testing process. Every engine generator set receives a complete factory load test that certifies and ensures that the set will function in accordance to every specific application. Test metering will have an accuracy of 1.3% or better. This metering equipment is calibrated annually, and is directly traceable to the National Institution of Standards & Technology (NIST). All test procedures are conducted in accordance with MIL-STD-705C where applicable.



Factory Acceptance Testing Procedures

- Insulation Resistance Test (301.1c)*
- High Potential Test (302.1b)*
- Alternator Over Speed
- Complete Engine Inspection
- Generator Inspection
  - Winding Resistance Test (401.1b)
  - Exciter Field Stator
  - Main Field Stator
- Mounting & Coupling Inspection
- Engine Fuel System Inspection
- Engine Lube Oil System Inspection
- Engine Cooling System Inspection
- DC Charging System Inspection
- Main Output Circuit Breaker Inspection

* Performed By Alternator OEM

- Anticipatory Alarms and Shutdowns Test (505.2b, 515.1b, 515.2b)
- Optional Equipment Inspection (513.2a)
- Load Test (640.1d
  - Regulator Range Test (511.1d)
  - No Load
  - MAX Load © 1.0 P.F. (640.2d)
  - MAX Load @ 0.8 P.F.
  - Block Loads @ 0-25%, 0-50%, 0-75%, 0-100% of rated load tests (640.2d)
- 1.0 Power Factor Max Load
- 1.0 Power Factor Max Block Load Pickup
- Full Name Plate Rated Load.
- Standard Readings Taken Every 5 Minutes.

Standard Reading Recorded During Load Test Inspection

Run Time	**AC Frequency**
AC Voltage	**Exciter Field Voltage**
AC Amperage	**Exciter Field Current**
kVA	**Lube Oil Pressure**
kWe	**Engine Coolant Temp.**
Power Factor	**Ambient Temp.**

Factory Load Test Summary

All engine generator sets are visually inspected prior to testing. This includes a complete visual/mechanical inspection to ensure that all fasteners and electrical connections are secure, that all rotating components are free of obstruction/ interference and are properly guarded.

Once the unit is started, the AC voltage and frequency are set to rated values. The unit is operated at no load while all of the safety shutdowns and warnings are verified and tested. The unit is then restarted and run at 25%, 50% and 100% of rated load and power factor until the engine temperature has stabilized for at least ten minutes. During the rated and maximum load pickup portion of the test, the voltage regulator gain, stability and under frequency compensation adjustments are set for optimal performance. All test procedures are performed in accordance with MIL-STD-705C where applicable.

Throughout these test procedures the AC parameters, engine oil pressure, engine temperature, exhaust temperature, timing and air/fuel ratio (gaseous units) are monitored and recorded. The unit and all installed accessory equipment are continually examined for oil and coolant leaks, excessive vibration and foreign noises.

Once all test procedures are performed and recorded, the unit is allowed a cool down period prior to being shut down. The unit is once again inspected for leaks, loose fasteners and connections prior to leaving the test facility.

The unit receives another complete final inspection process prior to packaging and shipment.

Note: All units are tested after the painting process is complete to prevent unforeseen difficulties resulting from the painting process being performed after testing.

Witnessed Factory Load Test

Standard witnessed factory load testing must be scheduled and approved at least four weeks prior to the engine generator sets scheduled shipping date. Any requests for witnessed factory load testing after this four week period may incur additional charges.

Witnessed Extended Run Factory Load Test

Witnessed extended run factory load testing must be scheduled and approved at the time of order placement. Any requests for witnessed extended run factory load testing after this time could be denied and would if approved incur additional cost.

All units are built and tested to cUL, CSA and NFPA 110 standards.

Engine Generator Set Two (2) Year 2000 Hour Standby Limited Warranty

BLUE STAR Power Systems Inc.

Your Blue Star Power Systems, Inc. product has been designed and manufactured with care by people with many years of experience. Blue Star Power Systems, Inc. warrants to its Buyer that the product is free from defects in materials and/or workmanship for the period of time outlined below. If the product should prove defective within the time period outlined below, it will be repaired, adjusted or replaced at the option of Blue Star Power Systems, Inc., provided that the product, upon inspection by Blue Star Power Systems, Inc., has been properly installed, maintained and operated in accordance with Blue Star Power Systems, Inc.'s Installation and Operating Manuals. This limited warranty is not valid or enforceable unless: (1) all supporting maintenance records are kept on file with the end user and made available upon request from factory, and (2) the generator set is routinely exercised in accordance with operating instructions. This warranty does not apply to malfunctions caused by physical damage, misuse, improper installation, repair or service by unauthorized persons, or normal wear and tear. The warranty is not assignable.

Blue Star Power Systems, Inc. product warranty period: Engine generator set: Parts and Labor for two (2) years from the date of factory invoice or 2000 hours (whichever occurs first). Accessories (installed on the engine generator set or shipped loose): Parts and Labor for one (1) year from the date of factory invoice or 2000 hours (whichever occurs first). Transfer Switches: If purchased with a generator set (same order number): Parts and Labor for two (2) years from the date of factory invoice or 2000 hours (whichever occurs first).

The start of the warranty period can be adjusted to the date of unit start-up (limited to 180 days from invoice date) provided that the following information is provided to Blue Star Power Systems, Inc. within 30 days of start-up. The warranty will not be effective unless a copy of the Blue Star Power Systems, Inc. start-up validation checklist is properly and completely filled out and returned to Blue Star Power Systems, Inc. within 30 days of start-up. Additionally, the engine manufacturer's engine registration form must be completed and returned to the engine manufacturer as stated in the instructions with the registration form.

To obtain warranty service: Contact your nearest Blue Star Power Systems, Inc. Service Representative. For assistance in locating your nearest authorized service representative, contact Blue Star Power Systems, Inc., Attention: Service Department (see contact information below).

Warranty service may be performed by authorized Blue Star Power Systems, Inc. service providers only. Service work performed by unauthorized persons will void all warranties.

Blue Star Power Systems, Inc. shall not be liable for any claim in amount greater than the purchase price of the product. In no event shall Blue Star Power Systems, Inc. be held liable for any special, indirect, consequential or liquidated damages including but not limited to: loss of profits, loss of time, increased overhead, delays, loss of business opportunity, good will, or any commercial or economic loss.

Blue Star Power Systems, Inc. shall not be liable for any claim that requires replacement of engine, part, or component of the gen-set that is no longer manufactured or available. Additionally, Blue Star Power Systems, Inc. will not be liable for any engine replacement that may require emissions tier level change.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE DESCRIBED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, OR OTHERWISE CREATED UNDER THE UNIFORM COMMERCIAL CODE, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, OR WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

The following items and/or circumstances are excluded from this limited warranty:

- Engine starting batteries: The battery manufacturers' warranty applies. Consult your local battery supplier for warranty service.
- Fuel system and/or governing system adjustments performed during or after start-up.
- Normal maintenance items: Consumable items such as belts, filters, fluids, and hoses.
- Adjustments and tune–ups performed during start-up or thereafter. Start-up, training, tuning, and adjustments for any paralleling or bi-fuel system.
- Loose connections (electrical and mechanical) not found during start-up.
- All fluid level related items including low coolant not found during start-up or checked during regular maintenance intervals.
- Shipping damage of any type. All equipment is shipped F.O.B. Blue Star Power Systems, Inc. and risk of loss transfers to the carrier once loaded for shipment. It is the responsibility of the receiving party to sign for the receipt of, and note any shipping damage to the equipment. Freight damage claim filing is the responsibility of the receiving party. In the rare event that damage occurs during shipment, Blue Star Power Systems, Inc. will not warrant any damage to the unit resulting from shrink wrap.
- Any special access fees, equipment, requirements or after hours scheduling to gain access to the equipment for warranty service purposes.
- Buyer requested rental generators used while warranty work is being performed.
- Damages caused by acts of nature, such as lightning, wind, flood, or earthquake.
- Any damage due to situations beyond the control of the manufacturing and/or workmanship of the product.
- Use of non-protected steel enclosure within 10 miles of the coast.
- Improper installation or operation as outlined in the Installation and Operation Manuals.
- Misapplication of the equipment such as usage outside the original design parameters as stated on the nameplate of the equipment.
- Equipment purchased at the standby rating that is being used in a prime power application(s).
- Diesel engine "Wet Stacking" or Regeneration issues due to lightly loaded diesel engines.
- Travel labor and mileage for mobile generator sets.
- More than one trip to the job site because a service vehicle was not stocked with normal service parts.
- Lodging expense associated with unit repair and excessive mileage charges (limit to 300 miles round trip from nearest service center).
- Failure to properly exercise and maintain your equipment per manufacturer's specifications will void all warranty.
- Equipment modifications made without the written consent of Blue Star Power Systems, Inc. will void all warranties.
- Any equipment or components added including fuel tanks and enclosures not installed at the Blue Star Power Systems, Inc. factory.

This agreement is deemed made and executed in North Mankato, Nicollet County, Minnesota and shall be construed and interpreted in accordance with the laws of the state of Minnesota without giving effect to its conflicts of laws principals. Each of the parties submits to the exclusive personal jurisdiction and venue with respect to any action or proceeding arising out of, in connection with, relating to, or by reason of this agreement before the district court of the state of Minnesota, located in Nicollet County and agrees that all claims in respect of the action or proceeding may be heard and determined in any such court.

168737-County of Fresno

TRANSFER SWITCH SUBMITTAL

REVISION 00

Samantha Rea
ASCO Power Technologies
5735 W
Las Positas Blvd #400
Pleasanton, CA. 94588
United States
Tel # 209-4796-357
Samantha.Rea@ASCOPower.com

September 8, 2023

168737-County of Fresno

Reference Quote: K3-23-582137-1-2
Sales Order: N/A

TRANSFER SWITCH DETAILS

ATS NAME	QTY	AMPS / POLES (VOLTS)	BYPASS	TRANSITION TYPE	CATALOG NUMBER	ACCESSORIES	OUTLINE DRAWING	WIRING DIAGRAM	BOM NUMBER
	1	0600 / 4 (208V)	N/A	OPEN	J03ATSB30600CG0C		1001393-001	978745	1012460

Transfer Switch Withstand and Closing Ratings

				300, 4000 & 7000 Series							4000 & 7000 Series				7000 Series							
ATS NAME	FRAME SIZE	SWITCH RATING AMPS		CURRENT LIMITING FUSES				SPECIFIC BREAKER			TIME BASED				Short Time Ratings[3] (sec)							
															480V Max.				600V Max.			
		Transfer Switches	Bypass Switches	480V Max.	600V Max.	MAX SIZE, A	CLASS	240V Max.	480V Max.	600V Max.	Time(Sec)	240V Max.	480V Max.	600V Max.	.13	.2	.3	.5	.1	.13	.3	.5
-	J	600	600	200kA	200kA	800	L	65kA	85kA	42kA	0.05	65kA	42kA[5]	35kA	7.5kA[9]		-		-			
						600	J															

NOTES:
1) All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition.
2) Application requirements may permit higher WCR for certain switch sizes.
3) Short Time ratings are provided for applications involving circuit breakers that utilize trip delay settings for system selective coordination
5) Switches utilizing overlapping neutral (code "C") have 35kA, 0.050 Sec time-based rating at 480V Max
9) Short Time Rating applies to 600A Bypass switch only, the 600A Transfer Switch does not have a Short Time Rating

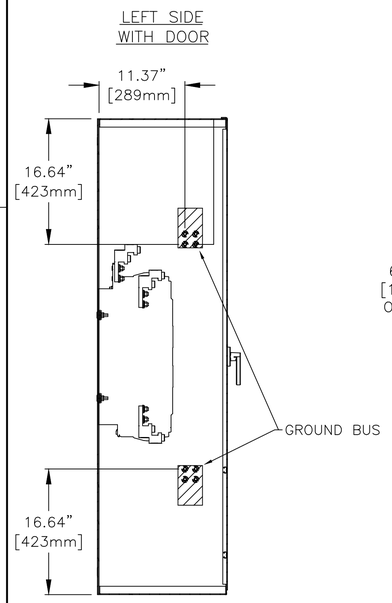
168737-County of Fresno

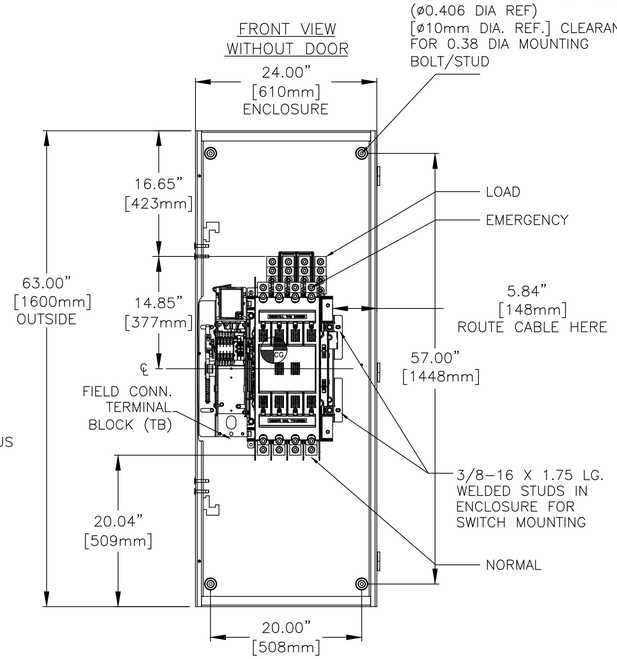
Transfer Switch Details

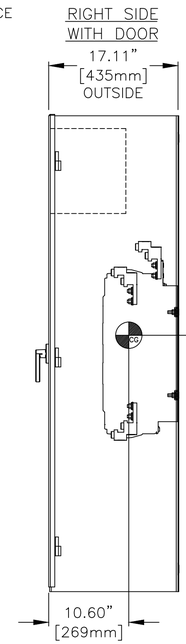
#1	ATS	AMPS: 0600	QTY: 1

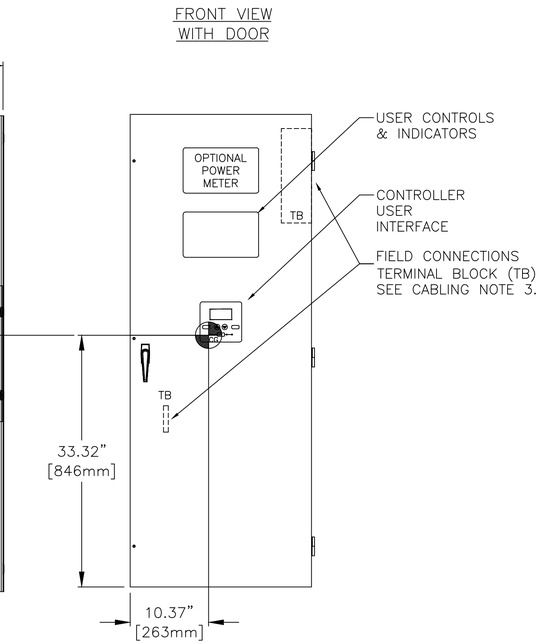
Product	:	Series 300	Catalog Number	:	J03ATSB30600CG0C
Service Voltage / Hz	:	208V/60Hz	Optional Accessories	:	
Bypass Isolation	:	Not Applicable	Product Description	:	300 Series, Automatic Open Transition Transfer Switch
No. of Switched Poles	:	4	Neutral Configuration	:	Switched [B]
Withstand Rating: Frame = J, Switch Rating = 0600, Series = 300	:	See WCR Table Below	No. of Cables & Lug Size	:	2, 1/0 AWG to 600 MCM
Enclosure	:	1(C)-UL Type 1 Enclosure	Service	:	Three Phase, 4-wire
Extended Warranty	:	Not Included	Markings	:	

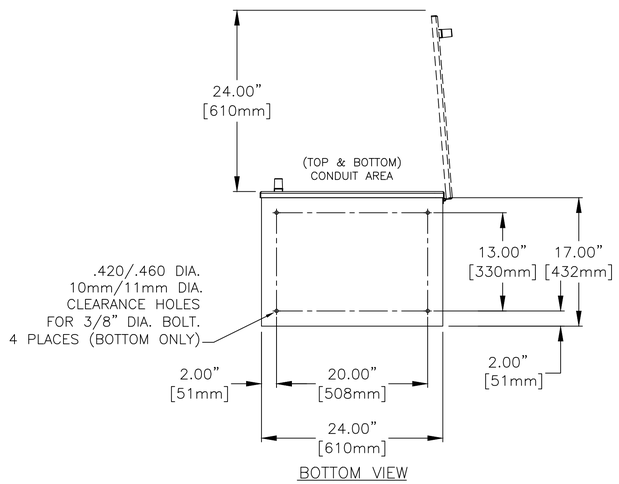
OUTLINE FOR ASCO® 300 SERIES 600 AMPERE "J" FRAME (J3ATS,J3NTS,J3ADTS,J3NDTS) FRONT CONNECTED TRANSFER SWITCHES TYPE 1 ENCLOSURE











GENERAL NOTES

1. TYPE 1 ENCLOSURE. FREE STANDING. FLOOR MOUNTED OR WALL MOUNTED. 12 GAUGE CONSTRUCTION.
2. NEC STANDARD GAUGE PAN TYPE DOOR WITH LOCKABLE HANDLE.
3. FINISH: ANSI 61 GRAY, POLYESTER POWDER STANDARD. OTHER ANSI COLORS AVAILABLE CONSULT FACTORY UL RECOGNIZED.
4. RECOMMENDED CLEARANCES:
   FRONT: 24.00" [610mm]
5. A 20% RATED GROUND BUS IS PROVIDED.
6. UNIT IS DESIGNED FOR COMBINATION TOP AND BOTTOM CABLE ENTRY.
7. A FULL RATED NEUTRAL CONNECTION FOR EACH SOURCE AND THE LOAD IS OPTIONAL. WHEN PROVIDED IT IS IN ONE OF THE FOLLOWING FORMATS AS SPECIFIED BY THE CATALOG NO. NEUTRAL TYPE;
   A. SOLID (COPPER BUS) NEUTRAL
   B. SWITCHED NEUTRAL POLE
8. CG CENTER OF GRAVITY.

CABLING NOTES

1. ALL SIZES SUPPLIED STANDARD WITH MECHANICAL (SCREW TYPE) LUGS. (SEE AMP SIZE BELOW)
   A. LUG MATERIAL: ALUMINUM ALLOY 6061-T6 WITH ELECTRO TIN PLATED FINISH.
   B. SCREW MATERIAL: ALUMINUM ALLOY 6262-T9 WITH ELECTRO TIN PLATED FINISH.
   C. UL LISTED, CSA CERTIFIED.
   D. LUG SCREW TIGHTENING TORQUE PER UL 486B: 19 FT-LBS.
   E. SUITABLE WIRE BENDING SPACE IS PROVIDED. (SEE AMP SIZE BELOW)
2. GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS. (SEE AMP SIZE BELOW),
3. CUSTOMER TERMINAL BLOCKS:
   FOR ALL 300 SERIES 3ADTS, 3NDTS UNITS THE TB WILL BE MOUNTED ON THE UPPER RIGHT INSIDE OF ENCLOSURE. FOR 3ATS AND 3NTS UNITS TB WILL BE MOUNTED ON THE TRANSFER SWITCH FRAME AS INDICATED.

NOTES 600 AMP SWITCHES

1. SUPPLIED WITH STANDARD MECHANICAL (SCREW TYPE) LUGS ON THE NORMAL, EMERGENCY & LOAD BUS STABS. ONE (1) LUG PER PHASE AND NEUTRAL EACH SUITABLE FOR CONNECTION OF TWO (2) #2 -600MCM CU/AL CABLES.
   A. SUITABLE WIRE BENDING SPACE IS PROVIDED FOR UP TO TWO (2) 600MCM CABLE PER TERMINAL PER NEC.
2. GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS;
   SIX (6) #2 -600MCM CU/AL CABLE CONNECTIONS.

REV. TO SHEET	ECN NO.	BY	APP.	DATE
C	289439 SEE ECN	TR	NS	05/07/21
B	250619 SEE ECN	TR	BK	
A	246848 SEE ECN	TR	BK	2/20/14
—	245094 ISSUED	BWM	SDH	10/28/13

PROJECT NAME:

COMPOSITE OUTLINE
300 SERIES TS "J"
600 AMP TYPE 1

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	BWM	10/28/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	10/28/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE NONE | SIZE DS

DWG. NO. 1001393-001

DRAWING REV. C | ECN NO. 289439 | SHEET 1 OF 1

THREE PHASE WIRING FOR ASCO® 300 SERIES TRANSFER SWITCHES (J3ATS/J3NTS) 600 AMPERES WITH GROUP G CONTROLS

GENERAL INFORMATION

THIS WIRING APPLIES TO 300 SERIES TRANSFER SWITCHES THAT UTILIZE THE "J" FRAME POWER TRANSFER SWITCH RATED 600 AMPERES.

THE GROUP G CONTROLLER PROVIDES EITHER AUTOMATIC (J3ATS) OR NON–AUTOMATIC [MANUAL] (J3NTS) OPERATION BASED ON ITS FACTORY SETTING ACCORDING TO THE CUSTOMER ORDER REQUIREMENTS.

THE TYPE OF TRANSFER SWITCH PROVIDED CAN BE DETERMINED FROM THE PRODUCT IDENTIFICATION MARKINGS LOCATED ON BOTH THE POWER TRANSFER SWITCH AND THE COVER OF THE GROUP G CONTROLLER.

ALL OPERATIONAL SETTINGS AND SEQUENCES OF THE GROUP G CONTROLLER AND ITS RELATED OPTIONAL ACCESSORIES (1UP, 18RX, 23G) ARE PROVIDED IN THE USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400.

INFORMATION FOR INSTALLATION AND TESTING OF THE TRANSFER SWITCH IS PROVIDED IN THE INSTALLATION MANUAL, ASCO 3ATS, 3ADTS, 3NTS & 3NDTS, J–DESIGN 150–600 A TRANSFER SWITCHES, PART NUMBER 381333–404.

ENGINE CONTROL CONTACTS

FEATURE 7 & FEATURE 8:
ONE SET OF FORM C CONTACTS "NR" (FEAT. 7 N/C, FEAT. 8 N/O) THAT CHANGE POSITION ON EXPIRATION OF THE FEATURE 1C, OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES TIME DELAY, AND RESET ON EXPIRATION OF THE FEATURE 2E ENGINE COOLDOWN TIME DELAY.
AN AUXILIARY CONTACT THAT IS CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE, IS CONNECTED ACROSS THE N/C CONTACT (FEATURE 7).

AN ADDITIONAL SET OF ENGINE STARTING CONTACTS ARE AVAILABLE ON THE GROUP G CONTROLLER WHEN THE FEATURE SETTING OF THE CONTROLLER OUTPUT CONTACTS "OP1" IS SET TO OPERATE AS "NR2".

ADDITIONAL, OPTIONAL ENGINE STARTING CONTACTS "NR2" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" AND/OR "OP3" PROVIDE THE ENGINE STARTING FUNCTION WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "NR2".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

LOAD DISCONNECT FEATURE

FEATURE 31: INCLUDES SUB–FEATURES 31F, 31G, 31M, 31N
A SET OF FORM C CONTACTS ARE PROVIDED ON THE GROUP G CONTROLLER AS "OP1". WHEN THE FEATURE SETTING OF "OP1" IS SET TO OPERATE THE CONTACTS AS "FEATURE 31", THE TIME DELAY SETTINGS OF THE SUB–FEATURES ARE AVAILABLE.

"OP1" CAN BE SET TO OPERATE TO PROVIDE THE FOLLOWING FUNCTIONS USING THE TIME DELAY SETTINGS ASSOCIATED WITH EACH SUB–FEATURE;

31F – NORMAL TO EMERGENCY PRE–TRANSFER SIGNAL
31G – EMERGENCY TO NORMAL PRE–TRANSFER SIGNAL
31M – NORMAL TO EMERGENCY POST–TRANSFER SIGNAL
31N – EMERGENCY TO NORMAL POST TRANSFER SIGNAL

THE "OP1" OUTPUT CONTACTS CHANGE POSITION FOLLOWING EACH OF THE ABOVE TIME DELAYS.

ADDITIONAL LOAD DISCONNECT CONTACTS, "FEATURE 31" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2 AND/OR "OP3" WILL PROVIDE LOAD DISCONNECT FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "FEATURE 31".

ALL OUTPUT CONTACTS ("OP1", "OP2", "OP3") SET TO OPERATE AS "FEATURE 31", SHARE THE COMMON TIME DELAY SETTINGS OF SUB–FEATURES 31F, 31G, 31M, AND 31N.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

INPHASE TRANSFER FEATURE FOR LOAD TRANSFER

INPHASE TRANSFER CONTROL INITIATES AN INPHASE TRANSFER OF LOADS BETWEEN LIVE SOURCES. THIS IS USED TO PREVENT NUISANCE TRIPPING OF DISTRIBUTION CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS ASSOCIATED WITH OUT OF PHASE TRANSFER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

SOURCE AVAILABILITY SIGNALS

SIGNALS INDICATING THE AVAILABILITY OF THE NORMAL & EMERGENCY SOURCES IS PROVIDED WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "RL5" (EMERGENCY SOURCE AVAILABLE) AND "RL6" (NORMAL SOURCE AVAILABLE) CHANGE POSITION WHEN THE SOURCE IS ACCEPTABLE.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

COMMON ALARM & NOT IN AUTO SIGNALING FEATURES

A SET OF FORM C CONTACTS IS PROVIDED ON THE GROUP G CONTROLLER AS "OP1". THE FEATURE SETTING OF "OP1" CAN BE SET TO OPERATE THE CONTACTS AS A "NOT IN AUTO" SIGNAL.

WHEN "OP1" IS SET FOR "NOT IN AUTO", THE OUTPUT CONTACTS CHANGE POSITION WHEN THE TRANSFER IS BEING INHIBITED FROM TRANSFERRING TO THE EMERGENCY SOURCE (FEATURE 34B) OR THE TRANSFER SWITCH HAS BEEN SET FOR NON–AUTOMATIC (MANUAL) OPERATION.

WHEN OPTIONAL ACCESSORY 11BE "SOFTWARE BUNDLE" IS PART OF THE TRANSFER SWITCH ASSEMBLY, "OP1" MAY ALTERNATIVELY SET FOR A "COMMON ALARM" SIGNAL. THE OUTPUT CONTACTS CHANGE POSITION WHEN A "COMMON ALARM" IS NOT PRESENT AND RESET WHEN A "COMMON ALARM" CONDITION IS PRESENT. THE "COMMON ALARM" SIGNAL CONDITIONS ARE SELECTABLE.

ADDITIONAL "COMMON ALARM" AND "NOT IN AUTO" CONTACTS ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2 AND/OR "OP3" WILL PROVIDE SIGNAL FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "COMMON ALARM" OR "NOT IN AUTO".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

EXTERNAL POWER SUPPLY COMPATIBILITY

USE OF AN EXTERNAL POWER SUPPLY IS USEFUL WHEN REQUIRED TO EXTEND THE FOLLOWING CONTROLLER TIME DELAYS BEYOND 6 SECONDS;

FEATURE 1C – OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES
FEATURE 1F – OVERRIDE MOMENTARY EMERGENCY SOURCE OUTAGES

AN EXTERNAL POWER SUPPLY IS ALSO USEFUL WHEN THE TRANSFER SWITCH IS USED WITH COMMUNICATIONS FEATURES BY ENABLING THE CONTROLLER TO CONTINUE COMMUNICATING.

AN EXTERNAL POWER SOURCE MAY BE PROVIDED TO THE CONTROLLER, UNTIL THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE, BY USE OF;

– AN EXTERNAL 24 VDC POWER SUPPLY WITH ACCESSORY 18RX (RELAY EXPANSION MODULE)
OR
– OPTIONAL ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY MODULE)

EXTERNAL 24 VDC POWER SUPPLY "1G":
AN EXTERNAL 24 VDC POWER SUPPLY MAY BE USED TO POWER THE CONTROLLER WHEN ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" WILL PROVIDE EXTERNAL 24 VDC POWER SUPPLY FUNCTIONALITY WHEN ITS FEATURE SETTING IS SET TO OPERATE AS "1G". ADDITIONALLY, JUMPERS MUST BE RECONFIGURED ON ACCESSORY 18RX (RELAY EXPANSION MODULE) TO ENABLE THIS FUNCTION AS FOLLOWS;

REMOVE JUMPERS "J1" 1–2 & "J1" 3–4
CONNECT JUMPERS "J1" 5–7 & "J1" 6–8

THE OUTPUT CONTACTS CHANGE POSITION WHEN EITHER THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE AND RESET WHEN NEITHER SOURCE IS AVAILABLE. THE "OP2" N/C CONTACT SWITCHES CUSTOMER PROVIDED +24 VDC FROM THE EXTERNAL POWER SUPPLY TO THE CONTROLLER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY):
WHEN OPTIONAL ACCESSORY 1UP IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY, THE CONTROLLER IS PROVIDED WITH LIMITED RESERVE POWER (APPROXIMATELY 3 MINUTES).

LOAD CURRENT METERING

WHEN OPTIONAL ACCESSORY 23GB IS PART OF THE TRANSFER SWITCH ASSEMBLY, THREE PHASE CURRENT MEASUREMENTS ARE AVAILABLE FOR DISPLAY ON THE GROUP G CONTROLLER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR INFORMATION ON USE.

ADVANCED-FUNCTION SOFTWARE BUNDLE

WHEN OPTIONAL ACCESSORY 11BE IS PART OF THE TRANSFER SWITCH ASSEMBLY, AN ADVANCED–FUNCTION SOFTWARE BUNDLE IS AVAILABLE TO PERFORM THE FOLLOWING FUNCTIONS;

– SERIAL COMMUNICATIONS (RS–485)
– PROGRAMMABLE ENGINE EXERCISER
– EVENT LOG
– COMMON ALARM SIGNAL CAPABILITY ON GROUP G CONTROLLER "OP1" OUTPUT.

(3 PHASE SENSING ONLY)
– 3 PHASE EMERGENCY SOURCE SENSING.
– PHASE ROTATION SENSING.
– EMERGENCY VOLTAGE UNBALANCE SENSING.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR INFORMATION ON THESE FUNCTIONS.

NON-AUTOMATIC (MANUAL) OPERATION

TRANSFER SWITCH ASSEMBLIES FACTORY SET FOR NON–AUTOMATIC OPERATION PROVIDE USER INITIATED, ELECTRICAL OPERATION OF THE TRANSFER SWITCH TO EITHER AVAILABLE SOURCE. THE TRANSFER SWITCH ASSEMBLY IS PHYSICALLY IDENTICAL TO THAT OF THE AUTOMATIC TYPE.

WHEN THE TRANSFER SWITCH IS SET FOR NON–AUTOMATIC OPERATION, A CUSTOMER PROVIDED SELECTOR SWITCH MAY BE USED TO OPERATE IT FROM A REMOTE LOCATION.

REMOTE CONTROL FEATURES

THE FOLLOWING CONTROL PANEL INPUTS PROVIDE REMOTE CONTROL FUNCTIONS FOR THE TRANSFER SWITCH. EACH FUNCTION CAN BE IMPLEMENTED BY THE CUSTOMER PROVIDING THE FORM OF CONTROL DESCRIBED. EACH CONTROL CONTACT MUST BE SUITABLE FOR A 5 VDC LOW ENERGY CIRCUIT.

EXTERNAL FEATURE 17: REMOTE TRANSFER TO EMERGENCY FEATURE (FOR AUTOMATIC TRANSFER TYPE ONLY) – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. RE–CLOSURE OF THE CONTACT ACTIVATES THE FEATURE 3A "RETRANSFER TO NORMAL (IF JUST TEST) TIME DELAY PRIOR TO RETRANSFER. IN THE EVENT THAT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE CUSTOMER SUPPLIED CONTACT IS OPEN, THE TRANSFER SWITCH WILL AUTOMATICALLY RETRANSFER TO THE NORMAL SOURCE.

EXTERNAL FEATURE 6B: REMOTE BYPASS OF RETRANSFER TO NORMAL TIME DELAY – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES FEATURE 3A RETRANSFER TO NORMAL DELAY IF ACTIVE.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON–AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333–400 FOR SETTING INFORMATION.

NOTES

1. SWITCH SHOWN DE–ENERGIZED CONNECTED TO NORMAL SOURCE.
2. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1, PART 1–101A.
3. O INDICATES CUSTOMER CONNECTION POINTS.
4. ● INDICATES FACTORY CONNECTION POINTS.
5. CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.
6. THE TRANSFER UNIT IS MOUNTED ON THE BACK INSIDE SURFACE OF THE ENCLOSURE. THE CONTROL PANEL AND ANY OPTIONAL ACCESSORIES ARE MOUNTED ON THE INSIDE SURFACE OF THE DOOR.
7. AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
8. GROUND STRAP ON CONTROL PANEL IS AFFIXED TO CHASSIS (ENCLOSURE) AT LOWER LEFT CONTROL PANEL MOUNTING STUD.

CATALOG NUMBER SUFFIXES

TS FRAME	CATALOG TYPE	NEUTRAL TYPE	PHASE POLES	AMPS	VOLT CODE	CONTROLLER	OPTIONAL ACCESSORY	ENCLOSURE CODE
J	3ATS 3NTS	A B	3	600	C D E F G H J K L M N P Q R	G	X	C F G H L M N P Q BLANK FOR NONE	BLANK FOR OPEN TYPE

EXPLANATION OF CATALOG NUMBER CODES

NEUTRAL TYPE		VOLTAGE CODES 3 PHASE (3 OR 4 WIRE) 50 OR 60 Hz		ENCLOSURE CODES		
CODE	DESCRIPTION	CODE	NOMINAL VOLTAGE	CODE	TYPE	DESCRIPTION
A	SOLID			BLANK		OPEN TYPE (NO ENCLOSURE)
B	SWITCHING			C	1	GENERAL PURPOSE, INDOOR
		C	208			
		D	220	F	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT
		E	230	G	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT
		F	240	H	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)
		G	277	L	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT
		H	380			
		J	400			(SECURE ENCLOSURES)
		K	415	M	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT
		L	440	N	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT
		M	460	P	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)
		N	480	Q	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT
		P	550*			
		Q	575*			
		R	600*			

REV.	TO SHEET	ECN NO.	BY	APP.	DATE
G		278589	TR	BK	05/03/19
		SEE ECN			
F		275211	TR	BK	10/16/18
		SEE ECN			
E		266495	MKA	JPB	04/10/17
		SEE ECN			
D		251210	AJ	MM	10/17/14
		SEE ECN			
C		247770	SDH	SDH	4/14/14
		SEE ECN			
B		246325	AE	BK	01/16/14
		SEE ECN			
A		242580	SDH	SDH	5/30/13
		SEE ECN			
–		242255	SDH	SDH	5/6/13
		ISSUE			

CATALOG NUMBER _____
ASCO® CERTIFIED TO S.O. _____
BY _____
DATE _____
FORM REV G

PROJECT NAME:

WIRING DIAGRAM
300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

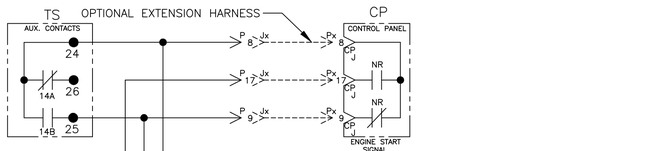
	BY	DATE
DRAWN BY	SDH	5/6/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/6/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING
SCALE NONE SIZE DS
DWG. NO. 978745
DRAWING REV. G ECN NO. 278589 SHEET 1 OF 6

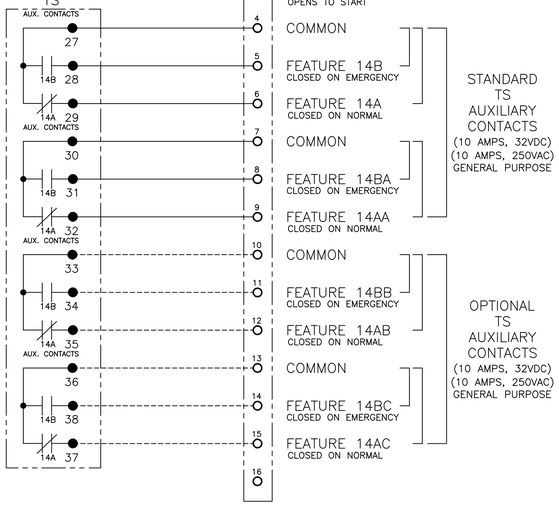


LOCATED ON FRONT OF TRANSFER SWITCH FRAME

TB (FIELD CONNECTIONS), WIRE RANGE: 22–12 AWG

1 COMMON
2 FEATURE 7 — CLOSES TO START
3 FEATURE 8 — OPENS TO START

ENGINE STARTING SIGNALS
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)



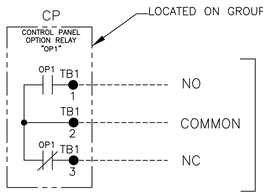
4 COMMON
5 FEATURE 14B — CLOSED ON EMERGENCY
6 FEATURE 14A — CLOSED ON NORMAL
7 COMMON
8 FEATURE 14BA — CLOSED ON EMERGENCY
9 FEATURE 14AA — CLOSED ON NORMAL

STANDARD TS AUXILIARY CONTACTS
(10 AMPS, 32VDC)
(10 AMPS, 250VAC)
GENERAL PURPOSE

10 COMMON
11 FEATURE 14BB — CLOSED ON EMERGENCY
12 FEATURE 14AB — CLOSED ON NORMAL
13 COMMON
14 FEATURE 14BC — CLOSED ON EMERGENCY
15 FEATURE 14AC — CLOSED ON NORMAL
16

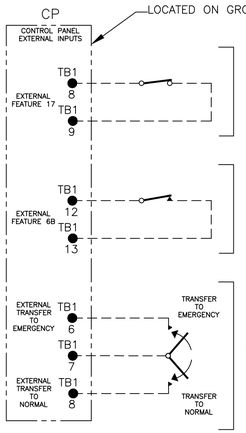
OPTIONAL TS AUXILIARY CONTACTS
(10 AMPS, 32VDC)
(10 AMPS, 250VAC)
GENERAL PURPOSE

CONTROLLER OPTION RELAY "OP1" (STANDARD)



OPTION RELAY "OP1"
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)
REFER TO USER'S GUIDE
PN 381333–400
FOR SETTING INFORMATION.

CONTROLLER REMOTE CONTROL FEATURES



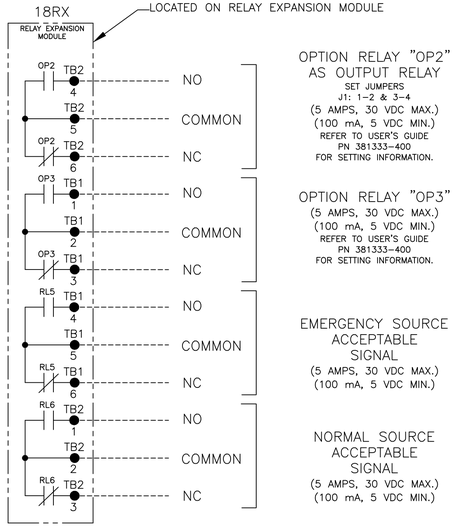
LOCATED ON GROUP G CONTROLLER

EXTERNAL FEATURE 17
REMOTE TRANSFER
TO EMERGENCY
[AUTOMATIC TRANSFER TYPE ONLY]
OPEN TO TRANSFER TO EMERGENCY
(N/C CONTACT, 5VDC LOW ENERGY RATING)
REFER TO USER'S GUIDE PN 381333–400
FOR SETTING INFORMATION.

EXTERNAL FEATURE 6B
REMOTE BYPASS OF RETRANSFER
TO NORMAL TIME DELAY
OPEN TO BYPASS TIME DELAY
(MOMENTARY N/C CONTACT,
5VDC LOW ENERGY RATING)
REFER TO USER'S GUIDE PN 381333–400
FOR SETTING INFORMATION.

EXTERNAL MANUAL TRANSFER
REMOTE TRANSFER TO
NORMAL OR EMERGENCY
[NON–AUTOMATIC TRANSFER TYPE ONLY]
(MOMENTARY SPDT, CENTER–OFF CONTACTS,
5VDC LOW ENERGY RATING)

OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE)



LOCATED ON RELAY EXPANSION MODULE

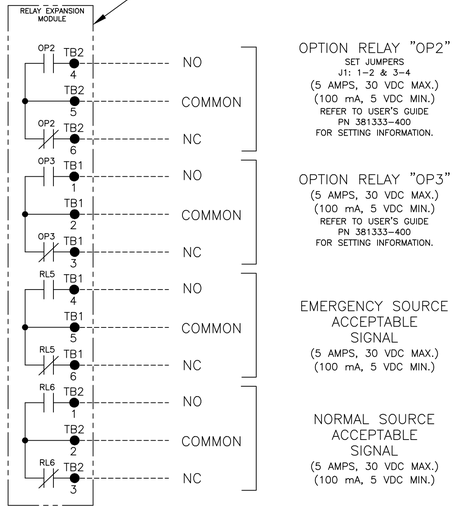
OPTION RELAY "OP2"
AS OUTPUT RELAY
SET JUMPERS
J1: 1–2 & 3–4
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)
REFER TO USER'S GUIDE
PN 381333–400
FOR SETTING INFORMATION.

OPTION RELAY "OP3"
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)
REFER TO USER'S GUIDE
PN 381333–400
FOR SETTING INFORMATION.

EMERGENCY SOURCE
ACCEPTABLE
SIGNAL
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)

NORMAL SOURCE
ACCEPTABLE
SIGNAL
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)

OPTIONAL ACCESSORY 18RX1 (SECOND RELAY EXPANSION MODULE)



LOCATED ON RELAY EXPANSION MODULE

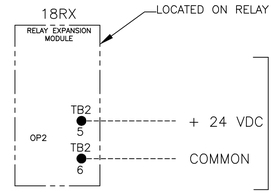
OPTION RELAY "OP2"
SET JUMPERS
J1: 1–2 & 3–4
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)
REFER TO USER'S GUIDE
PN 381333–400
FOR SETTING INFORMATION.

OPTION RELAY "OP3"
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)
REFER TO USER'S GUIDE
PN 381333–400
FOR SETTING INFORMATION.

EMERGENCY SOURCE
ACCEPTABLE
SIGNAL
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)

NORMAL SOURCE
ACCEPTABLE
SIGNAL
(5 AMPS, 30 VDC MAX.)
(100 mA, 5 VDC MIN.)

"OP2" OPTIONAL USES



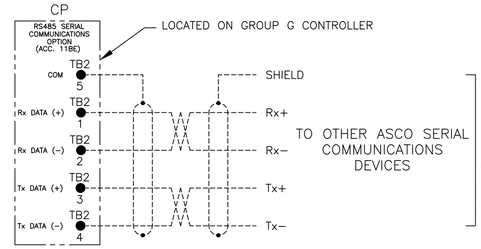
LOCATED ON RELAY EXPANSION MODULE

OPTION RELAY "OP2"
AS EXTERNAL POWER
SUPPLY INPUT
"1G"
SET JUMPERS AS FOLLOWS:
REMOVE JUMPERS "J1" 1–2 & "J1" 3–4
CONNECT JUMPERS "J1" 5–7 & "J1" 6–8

(24 VDC NOM., 15 W MAX.)
INPUT RANGE: 21.6 VDC MIN
27.6 VDC MAX.
REFER TO USER'S GUIDE PN 381333–400
FOR SETTING INFORMATION.

RS485 SERIAL COMMUNICATIONS OPTION

AVAILABLE WITH OPTIONAL ACCESSORY 11BE: ADVANCED–FUNCTION SOFTWARE BUNDLE
REFER TO USER'S GUIDE PN 381333–400 FOR SETTING INFORMATION.



LOCATED ON GROUP G CONTROLLER

TO OTHER ASCO SERIAL COMMUNICATIONS DEVICES

NOTES:
1. EARTH GROUND SHIELD AT HOST DEVICE ONLY.
2. FIELD WIRING: USE UL LISTED, STRANDED, TWISTED PAIRS, OVERALL FOIL SHIELD WITH STRANDED DRAIN WIRE SUITABLE FOR RS422 EQUIVALENT TO:

(STANDARD 80°C) BELDEN 9842 OR 9829
OR ALPHA 6202C OR 6222C

(PLENUM RATED) BELDEN 89729 OR 82729
OR ALPHA 58902

REV.	ECN NO.	BY	APP.	DATE
G	278589	TR	BK	05/03/19
	SEE ECN			
F	275211	TR	BK	10/16/18
	SEE ECN			
E	266495	MKA	JPB	04/10/17
	SEE ECN			
D	251210	AJ	MM	10/17/14
	SEE ECN			
C	247770	SDH	SDH	4/14/14
	SEE ECN			
B	246325	AE	BK	01/16/14
	SEE ECN			
A	242580	SDH	SDH	5/30/13
	SEE ECN			
—	242255	SDH	SDH	5/6/13
	ISSUE			

PROJECT NAME:

WIRING | DIAGRAM

300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	SDH	5/6/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/6/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE NONE | SIZE DS

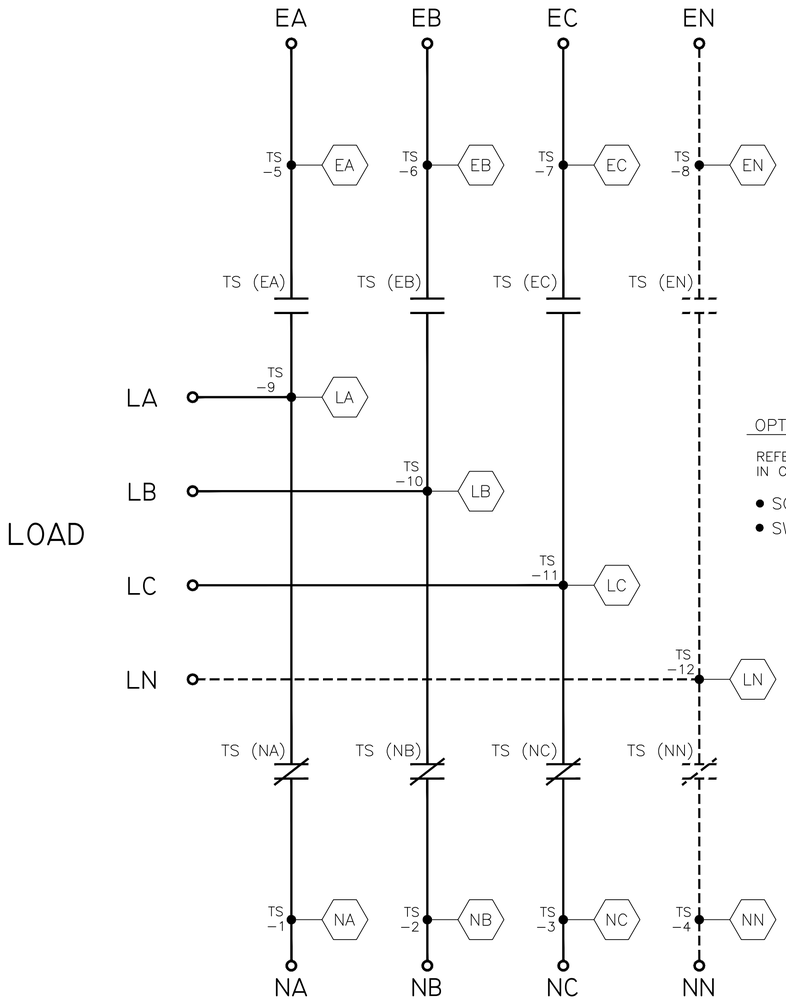
DWG. NO. 978745

DRAWING REV. G | ECN NO. 278589 | SHEET 2 OF 6

MAIN POWER POLES

TS OPERATOR CIRCUIT

EMERGENCY



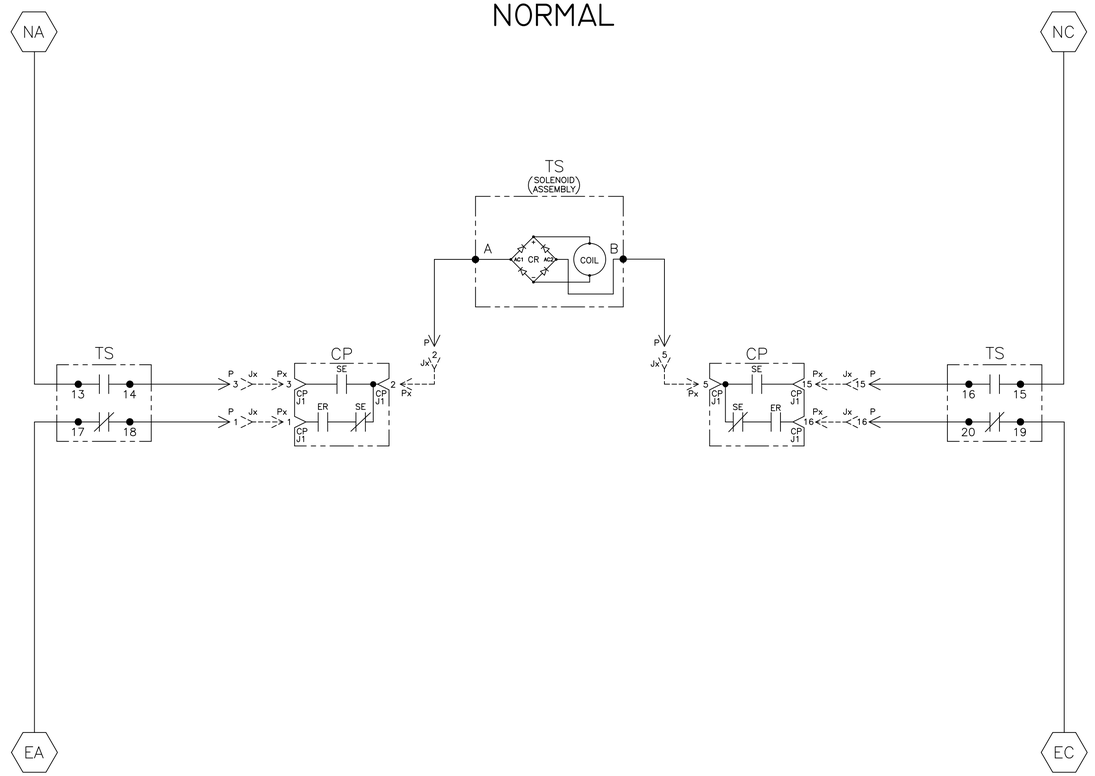
NORMAL

OPTIONAL NEUTRAL TYPES

REFER TO "EXPLANATION OF CATALOG NUMBER CODES" IN CATALOG NUMBER CHART ON SHEET 1.

- SOLID BUS PLATE
- SWITCHING CONTACTS

NOTE:
ATS SHOWN CLOSED ON NORMAL SOURCE.



EMERGENCY

TS CONTROL CONTACTS					
TS	SOLENOID POSITION				
	CLOSED NORMAL	BEFORE TDC >	<	BEFORE <TDC	CLOSED EMERG
13–14					
15–16					
17–18					
19–20					

TDC (TOP DEAD CENTER)
TRANSFER SWITCH TEST & ADJUSTMENT PROCEDURE SPECIFIES CONTROL CUT–OFF (CONTACT OPENING) SETTING.

REV.				
G	278589 SEE ECN	TR	BK	05/03/19
F	275211 SEE ECN	TR	BK	10/16/18
E	266495 SEE ECN	MKA	JPB	04/10/17
D	251210 SEE ECN	AJ	MM	10/17/14
C	247770 SEE ECN	SDH	SDH	4/14/14
B	246325 SEE ECN	AE	BK	01/16/14
A	242580 SEE ECN	SDH	SDH	5/30/13
—	242255 ISSUE	SDH	SDH	5/6/13

PROJECT NAME:

WIRING DIAGRAM

300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	SDH	5/6/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/6/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

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ASCO® ASCO Power Technologies, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

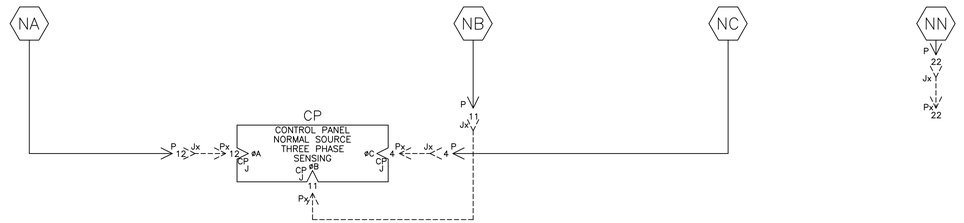
SCALE NONE SIZE DS

DWG. NO. 978745

DRAWING REV. G ECN NO. 278589 SHEET 3 OF 6

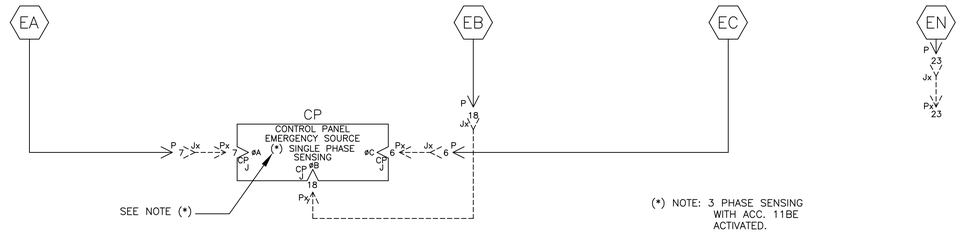
NORMAL SOURCE CIRCUITS

NORMAL



EMERGENCY SOURCE CIRCUITS

EMERGENCY

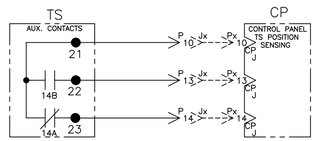


(*) NOTE: 3 PHASE SENSING WITH ACC. 11BE ACTIVATED.

LOAD TERMINAL CIRCUITS

LOAD

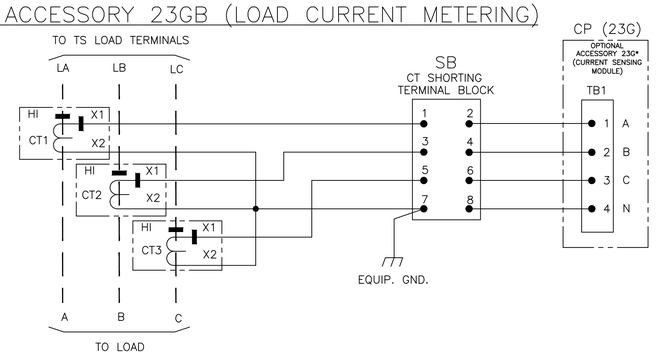
CONTROL SIGNALS & INDICATION



ADDITIONAL CIRCUITS

OPTIONAL ACCESSORY 23GB (LOAD CURRENT METERING)

CURRENT TRANSFORMER RATIO TABLE	
SWITCH RATING	CT RATIO
600A	600:5A



REV.	ECN NO.	BY	APP.	DATE
G	278589	TR	BK	05/03/19
	SEE ECN			
F	275211	TR	BK	10/16/18
	SEE ECN			
E	266495	MKA	JPB	04/10/17
	SEE ECN			
D	251210	AJ	MM	10/17/14
	SEE ECN			
C	247770	SDH	SDH	4/14/14
	SEE ECN			
B	246325	AE	BK	01/16/14
	SEE ECN			
A	242580	SDH	SDH	5/30/13
	SEE ECN			
—	242255	SDH	SDH	5/6/13
	ISSUE			

PROJECT NAME:

WIRING DIAGRAM

300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	SDH	5/16/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/16/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

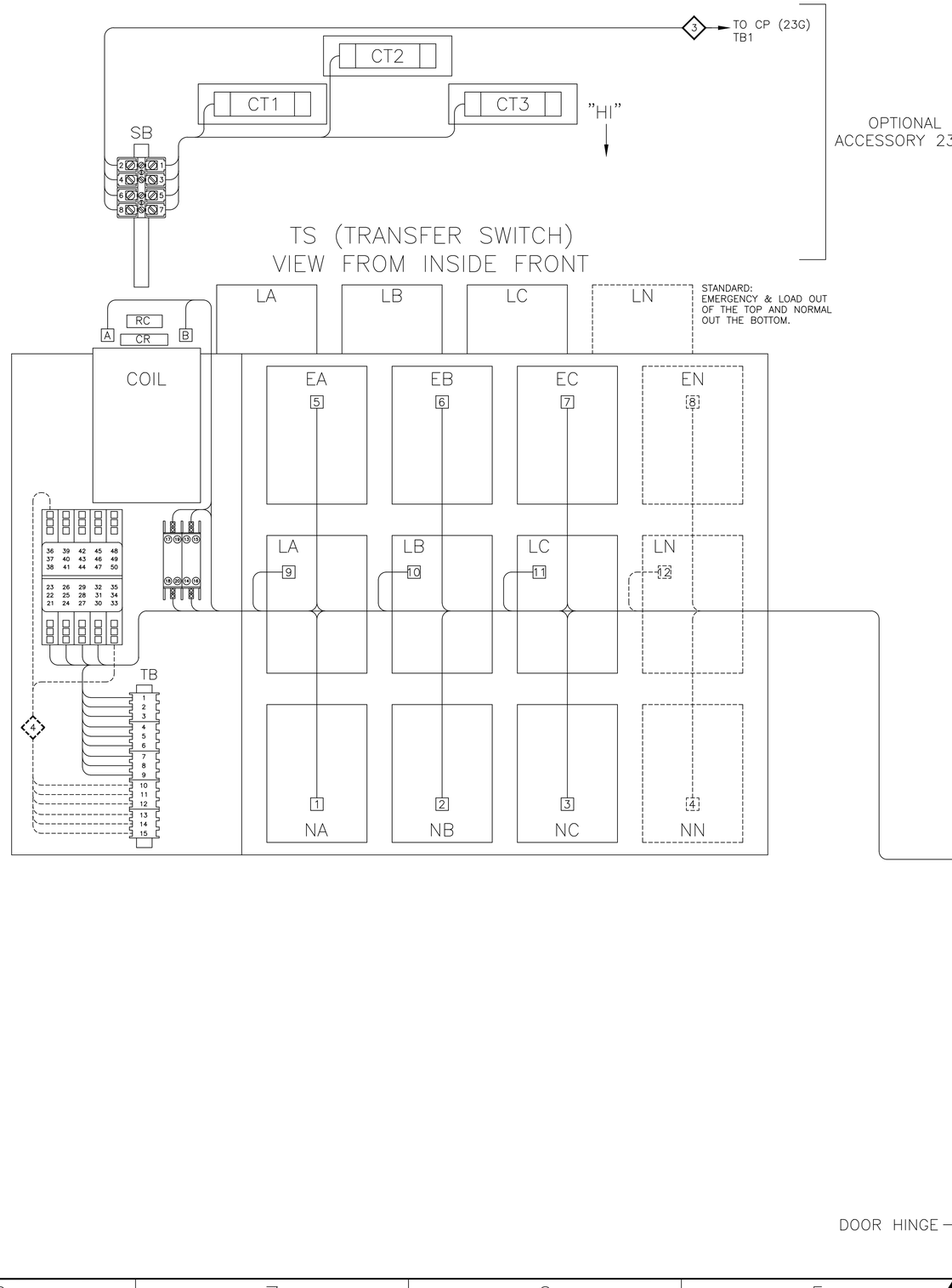
SCALE NONE SIZE DS

DWG. NO. 978745

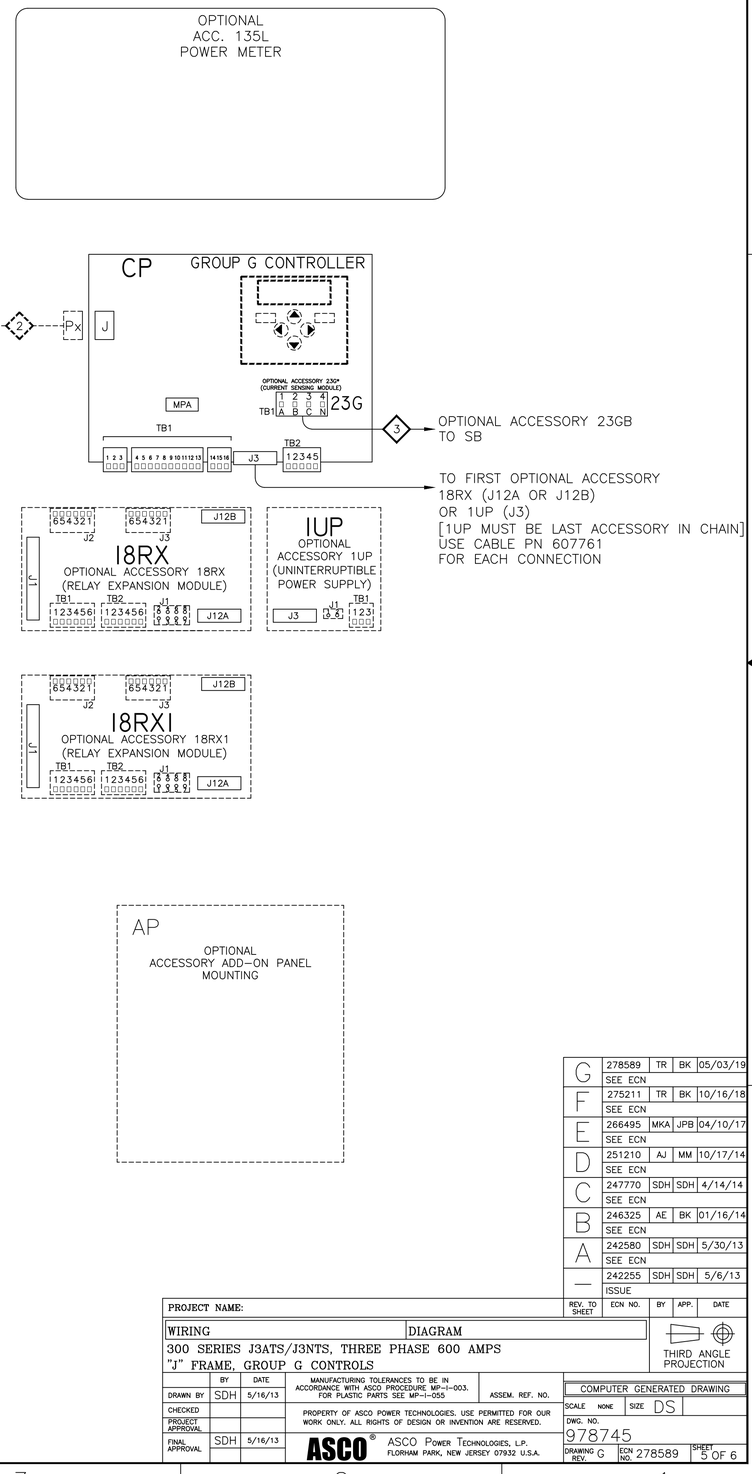
DRAWING REV. G ECN NO. 278589 SHEET 4 OF 6

PHYSICAL DIAGRAM

TS (TRANSFER SWITCH) VIEW FROM INSIDE FRONT



DOOR (INSIDE)



REV. TO SHEET	ECN NO.	BY	APP.	DATE
G	278589	TR	BK	05/03/19
	SEE ECN			
F	275211	TR	BK	10/16/18
	SEE ECN			
E	266495	MKA	JPB	04/10/17
	SEE ECN			
D	251210	AJ	MM	10/17/14
	SEE ECN			
C	247770	SDH	SDH	4/14/14
	SEE ECN			
B	246325	AE	BK	01/16/14
	SEE ECN			
A	242580	SDH	SDH	5/30/13
	SEE ECN			
—	242255	SDH	SDH	5/6/13
	ISSUE			

PROJECT NAME:

WIRING DIAGRAM

300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	SDH	5/16/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/16/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE NONE SIZE DS

DWG. NO. 978745

DRAWING REV. G ECN NO. 278589 SHEET 5 OF 6

WIRE RUN LISTING

1 ← HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED ☐

WIRE No.	HARNESS 781247 (P) MAIN TS	CLR	AWG
1	P-1,TS-18		18
2	P-2,TS-A		
3	P-3,TS-14		
4	P-4,TS-3		
4	TS-3,TS-15		
5	P-5,TS-B		
6	P-6,TS-7		
6	TS-7,TS-19		
7	P-7,TS-5		
7	TS-5,TS-17		
8	P-8,TS-24		
8	TS-24,TB-1		
9	P-9,TS-25		
9	TS-25,TB-2		
10	P-10,TS-21		
11	P-11,TS-2		
12	P-12,TS-1		
12	TS-1,TS-13		
13	P-13,TS-22		
14	P-14,TS-23		
15	P-15,TS-16		
16	P-16,TS-20		
17	P-17,TB-3		
18	P-18,TS-6		
19	P-19,TS-9		
20	P-20,TS-10		
21	P-21,TS-11		
22	P-22,TS-4		
23	P-23,TS-8		
24	P-24,TS-12		
25	TS-27,TB-4		
26	TS-28,TB-5		
27	TS-29,TB-6		
31	TS-30,TB-7		
32	TS-31,TB-8		
33	TS-32,TB-9		
	REMOVE WIRES		
	ADD WIRES		

2 ← HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED ☐

WIRE No.	HARNESS 309320-005 (P_x,J_x) OPTIONAL 8" EXTENSION HARNESS	CLR	AWG
1	P_x-1,J_x-1		16
2	P_x-2,J_x-2		
3	P_x-3,J_x-3		
4	P_x-4,J_x-4		
5	P_x-5,J_x-5		
6	P_x-6,J_x-6		
7	P_x-7,J_x-7		
8	P_x-8,J_x-8		
9	P_x-9,J_x-9		
10	P_x-10,J_x-10		
11	P_x-11,J_x-11		
12	P_x-12,J_x-12		
13	P_x-13,J_x-13		
14	P_x-14,J_x-14		
15	P_x-15,J_x-15		
16	P_x-16,J_x-16		
24	P_x-17,J_x-17		
25	P_x-18,J_x-18		
26	P_x-19,J_x-19		
27	P_x-20,J_x-20		
28	P_x-21,J_x-21		
29	P_x-22,J_x-22		
30	P_x-23,J_x-23		
31	P_x-24,J_x-24		
	REMOVE WIRES		
	ADD WIRES		

3 ← HARNESS LOCATOR

WIRE No.	OPTIONAL ACCESSORY 23GB (CT,SB,CP(23G)-TB1)	CLR	AWG
300	CT1-X1,SB-1		16
301	CT2-X1,SB-3		
302	CT3-X1,SB-5		
300	SB-2,CP(23G)-TB1-1		
301	SB-4,CP(23G)-TB1-2		
302	SB-6,CP(23G)-TB1-3		
303	CT1-X2,CT2-X2	GRN	
303	CT2-X2,CT3-X2	GRN	
303	CT3-X2,SB-7	GRN	
303	SB-7,EQUIP-GND	GRN	
303	SB-8,CP(23G)-TB1-4	GRN	

4 ← HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED ☐

WIRE No.	OPTIONAL AUXILIARY CONTACTS (TS,TB) FIELD TERMINATIONS	CLR	AWG
35	TS-33,TB-10		16
36	TS-34,TB-11		
37	TS-35,TB-12		
38	TS-36,TB-13		
40	TS-37,TB-15		
39	TS-38,TB-14		

WIRE No.	ADDITIONAL WIRES	CLR	AWG
			16

REV.	TO SHEET	ECN NO.	BY	APP.	DATE
G		278589	TR	BK	05/03/19
		SEE ECN			
F		275211	TR	BK	10/16/18
		SEE ECN			
E		266495	MKA	JPB	04/10/17
		SEE ECN			
D		251210	AJ	MM	10/17/14
		SEE ECN			
C		247770	SDH	SDH	4/14/14
		SEE ECN			
B		246325	AE	BK	01/16/14
		SEE ECN			
A		242580	SDH	SDH	5/30/13
		SEE ECN			
—		242255	SDH	SDH	5/6/13
		ISSUE			

PROJECT NAME:

WIRING DIAGRAM

300 SERIES J3ATS/J3NTS, THREE PHASE 600 AMPS
"J" FRAME, GROUP G CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	SDH	5/6/13
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	SDH	5/6/13

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE NONE SIZE DS

DWG. NO. 978745

DRAWING REV. G ECN NO. 278589 SHEET 6 OF 6

Limited Warranty

Series 150, 200, 300 and 4000 Power Transfer Switches

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General

ASCO Power Technologies, LP products and systems are in our opinion the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances we offer with our products the following Limited Guardian Warranty Against Defects in Material and Workmanship.

Please read your Guardian Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

Limited Warranty Against Defects in Material and Workmanship:

Product Description	Series	Catalog Code
Automatic Transfer Switch	150, 200	1ATS, 2ATS
	300	3ATS, 3ADTS
	4000	4ATS, 4ADTS, 4ACTS
Non-Automatic Transfer Switch (Electrically Operated)	300	3NTS, 3NDTS
ASCO Lighting Control Panels	4000	4NTS, 4NDTS, 4NCTS
Manual Transfer Switch	300	3MTS, 3MTQ, 3MUQ, 3MPQ, 3MGQ, 3MGDQ, 3MTDQ
Service Entrance Transfer Switch (SEATS)	300	3AUS, 3ADUS, 3APS, 3ARS, 3MUS
Power Transfer Load Center (PTLC)	300	300L
Quick Connect Panels	300	3QCN, 3QCU, 3QCD
Electrically Operated Bypass Switch	4000	4ATE, 4NTE, 4ADTE, 4NDTE

Limited Warranty

ASCO warrants that the ATS will be free from defects in material and workmanship and will conform to ASCO's standard specifications for the ATS for a period of twenty four (24) months from date of product shipment from ASCO (the "Warranty Period"). This Limited Warranty does not extend to subsequent owners of the structure during the Warranty period.

Terms of Warranty

The foregoing Limited Warranty is conditioned upon user's compliance with the following:

1. The ASCO Power Transfer Switch is installed in accordance with ASCO specifications and state and local codes and standards by an electrician licensed in the state of installation.

2. The ASCO Power Transfer Switch is maintained in accordance with ASCO instructions and used under normal conditions for the purposes intended by ASCO.

All warranty field-related repairs, replacements or adjustments must be made by ASCO Services Inc. or its duly authorized representative.

Optional Available Extended Warranty

Optional extended warranty coverage may be purchased from ASCO for a specified fee at the time of the original sale. If purchased, Warranty period shall be extended up to an additional thirty - six (36) months beyond the standard twenty - four (24) months to provide up to five (5) year coverage applicable to the above referenced products, except for 3AUS, 3APS, and 3ARS products where the warranty period for the circuit breaker shall be limited to 24 months from date of shipment from ASCO. The length of optional extended coverage shall be reflected on the ASCO invoice and/or order acknowledgement document.

ASCO Power Technologies™

Warranty Extends To First Purchaser for Use, Non-Transferable

This Warranty is extended to the first person, firm, association, or corporation for whom the ASCO product specified herein is originally installed for use (the "user") in the fifty United States or Canada. This Warranty is not transferable or assignable without the prior written permission of ASCO.

Assignment of Warranties

ASCO assigns to user any warranties which are made by manufacturers and suppliers of components of, or accessories to, the ASCO product and which are assignable, but ASCO makes no representations as to the effectiveness or extent of such warranties, assumes no responsibility for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

Drawings, Descriptions

ASCO warrants for the period and on the terms of the Warranty set forth herein that the ASCO product will conform to the descriptions contained in the certified drawings, if any, applicable thereto, to ASCO's final invoices, and to applicable ASCO product brochures and manuals current as of the date of product shipment ("descriptions"). ASCO does not control the use of any ASCO product. Accordingly, it is understood that the descriptions are not Warranties of performance and not Warranties of fitness for a particular purpose.

Warranty Claims Procedure

Within a reasonable time, but in no case to exceed thirty (30) days, after user's discovery of a defect, user shall contact ascopowerwarranty@ascopower.com. Subject to the limitations specified herein, an ASCO Services field service representative will repair the non-conforming ASCO product warranted hereunder, without charge for parts, labor, or travel expenses. Warranty coverage will apply only after ASCO's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty . All defective products and component parts replaced under this Warranty become the property of ASCO.

Warranty Performance of Component Manufacturers

It is ASCO's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, ASCO may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in ASCO's opinion, such work can be performed in less time, with less expense, or in closer proximity to the ASCO product.

Items Not Covered By Warranty

This Warranty does not cover damage or defect caused by misuse, improper application, wrong or inadequate electrical current or connection, negligence, inappropriate on site operating conditions, repair by non-ASCO designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, water, or other corrosive liquids or gases, acts of God, theft or installation contrary to ASCO's recommendations or specifications, or in any event if the ASCO serial number has been altered, defaced, or removed.

This Warranty does not cover shipping costs, installation costs, external circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does not include labor costs or transportation charges arising from the replacement of the ASCO product or any part thereof or charges to remove or reinstall same at any premises of user.

Repair or replacement of a defective product or part thereof does not extend the original Warranty period.

The products listed in this Warranty are not for use in the control area or any reactor connected or safety applications or within the containment area of a nuclear facility or for integration into medical devices.

Limitations

This Warranty is in lieu of and excludes all other Warranties, express or implied, including merchantability and fitness for a particular purpose.

User's sole and exclusive remedy is repair or replacement of the ASCO product as set forth herein.

If user's remedy is deemed to fail of its essential purpose by a court of competent jurisdiction, ASCO's responsibility for property loss or damage shall not exceed the net product purchase price.

In no event shall ASCO assume any liability for indirect, special, incidental, consequential or exemplary damages of any kind whatsoever, including without limitation lost profits, business interruption or loss of data, whether any claim is based upon theories of contract, negligence, strict liability, tort, or otherwise.

Miscellaneous

No salesperson, employee, or agent of ASCO is authorized to add to or vary the terms of this Warranty. Warranty terms may be modified, if at all, only in writing signed by an ASCO officer.

ASCO obligations under this Warranty are conditioned upon ASCO timely receipt of full payment of the product purchase price and any other amounts due. ASCO reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to user or others.

In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the Warranty period, the remaining terms and provisions shall continue in full force and effect.

This Warranty shall be governed by, and construed under, the laws of the State of New Jersey, without reference to the conflict of laws principles thereof.

This Warranty represents the entire agreement between ASCO and user with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings, or agreements relating to this subject.

10/08/21 Publication No. 381339-334

EQUIPMENT STORAGE REQUIREMENTS

Equipment provided by Schneider-Electric and/or ASCO Power Technologies that is stored for a short-term duration (i.e., days to weeks) or long-term duration (i.e., months to years), must be kept in a cool, dry, temperature-controlled environment. Storage of equipment in open warehouses, locations without proper temperature and humidity control, and/or outdoor storage is not acceptable without the utilization of heating elements, thermostats, humidistats, and protection from weather and dirt. Failure to comply may result in moisture ingress and/or condensation to form resulting in rusting and or corrosion, component and/or equipment failure and replacement, and/or nullification of any manufacturer warranty.

For **General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less**, refer to ANSI NEMA PB 2.1-2013

Copies of the following documents should be included on the submittals, depending on the units that are on the proposal:

For ASCO Power Technology's **Switchgear and Switchboards**, refer to Instruction Bulletin **381333-393**.
For Schneider-Electric/Square D's **Power Zone 4 (PZ4) Switchgear**, refer to Instruction Bulletin **80298-002-09**.
For Schneider-Electric/Square D's **Power Zone 4 (PZ4) NEMA 3R Walk-In Switchgear**, refer to Instruction Bulletin **80298-156-02**.
For Schneider-Electric/Square D's **Quality, Efficient, Delivery" (QED2) Switchboard**, refer to Instruction Bulletin **80043-055-14**.
For Schneider-Electric/Square D's **Masterclad Metal-Clad Indoor Switchgear**, refer to Instruction Bulletin **6055-30.**

Flexible Power Transfer Solutions for Commercial & Industrial Applications

ASCO Power Technologies™

ASCO SERIES 300
Power Transfer Switches

ascopower.com

Life Is On Schneider Electric

ASCO SERIES 300 Automatic Transfer Switches

Power outages impact small and large facilities alike. ASCO SERIES 300 Automatic Transfer Switches offer rugged design and reliable performance to small and mid-size commercial and industrial facilities in packaged solutions that are easy to select, procure, install, and operate.

Every SERIES 300 generator transfer switch is engineered with ASCO's reliability expertise in a package that makes backup power accessible for small and mid-size facilities. Leveraging knowledge derived from a century of critical power transfer experience, each SERIES 300 is backed by the same ASCO technical support and service that solves the most demanding critical power challenges facing facilities today.

Product Details

Transfer Switch Overview

ASCO's SERIES 300 lineup offers flexible backup power solutions for businesses of every size.

SERIES 300 Automatic Transfer Switches

Designed to Fit Anywhere

The ASCO SERIES 300 product line provides the most compact design of generator power transfer switches in the industry.

Available to mount on walls or floors, all models through 2000 amperes are designed to be completely front-accessible. This permits installation flush against walls while allowing installation of cabling and connections from the front of the switch. Cable entrance plates are standard on 1600 and 2000 amperes units; these allow use of optional side-mounted pull boxes for additional cable bending space.

- 30 through 3000 amperes in compact designs
- Up to 600 VAC, single or three phase
- Listed to UL 1008 - Standard for Safety - Transfer Switch Equipment
- True double-throw operation: The single solenoid design is inherently interlocked to prevent simultaneous connections of two power sources.
- Will not transfer to a dead source - single solenoid operator derives power from the destination source
- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not-in-auto mode, and alert conditions.
- Integrated, multilingual, user interface for configuration and monitoring
- Available Delayed Transition operation
- Non-automatic operation can be selected without opening enclosure door
- Optional Relay Expansion Module with extra relays for accessory outputs
- Soft keys for test function and time delay bypass
- Emergency source failure alert indication
- Optional Historical Event Log
- Displays statistical ATS monitoring information
- Built-in diagnostic functions
- Password protection to prevent unauthorized actions
- Adjustable delay feature prevents nuisance transfer due to momentary utility power outages and generator dips
- Auxiliary contacts signal position of main contacts - two for normal and two for emergency position
- Standard solid neutral terminals
- Restriction of Hazardous Substances (RoHS) compliant controller
- Standard 2 year warranty. Optional 1, 2, and 3 year extensions

Power Knowledge

Basic Automatic Transfer Switch Functions

SERIES 300 Power Transfer Switch rated 200 amps

SERIES 300 Automatic Switching Solutions

Automatic and Non-Automatic Transfer Switching

ASCO Transfer Switches are available in both automatic and non-automatic types. Both are electrically operated. For automatic transfer switches, the controller initiates transfer between power sources . For non-automatic transfer switches, a user initiates transfer using local or remote controls.

SERIES 300 non-automatic transfer switches offer the following features:

- Models range from 30 through 3000 amperes, up to 600V
- Controller prevents inadvertent operation under low voltage conditions
- Source acceptability lights inform operator when sources are available to accept load
- Standard in-phase monitor for transferring motor loads betweem live sources

Power Knowledge

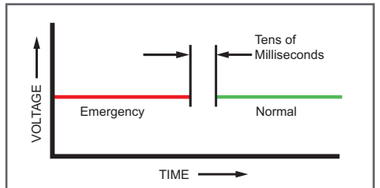
- Non-Automatic and Manual Transfer Switches for Backup Power Applications

400 Amp, Type 1 Enclosure

Open Transition Transfer Switching

ASCO Transfer Switches are available with a standard, 2-position, open transition models that reliably transfer loads in less than 100 milliseconds. Open transition switches are suitable for a wide range of applications.

- 30 to 3000 amps
- Single-operator switching mechanism prevents simultaneous connection of both sources
- Available In-Phase Monitor can be activated for transferring motor loads

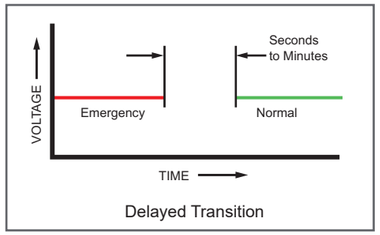


Open Transition

Delayed Transition Transfer Switching

ASCO Delayed Transition Transfer Switches transfer loads between power sources using a timed load disconnect position with an adjustable delay.

- 150 through 3000 amps
- Reliable, field-proven, dual-solenoid operating mechanism
- Mechanical interlocks to prevent simultaneous connection of both power sources
- Adjustable delay for load disconnect - 0 to 5 minutes
- Non-automatic models available in manual operation configuration
- Automatic models available with load shed feature



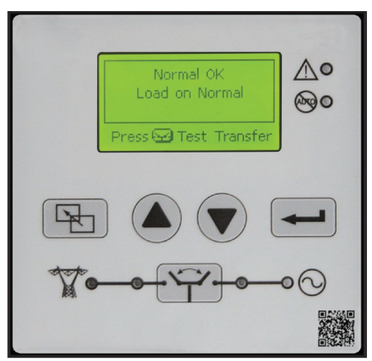
Delayed Transition

Power Knowledge

- Transition Mode Basics
- Transferring Motor Loads between Power Sources
- Transferring Loads with Zero Power Interruption

SERIES 300 Group G Controller

The SERIES 300 Group G Controller is reliable and field-proven. It provides all of the voltage, frequency, control, timing, and diagnostic functions required for most emergency and standby power applications.



- Touch pad programming
- Displays active timers
- On-board diagnostics
- Password protection
- Voltage and frequency sensing
- Status and control functions

Product Details

- Group G Controller

Transfer Switch Communications and Metering

Options to Customize Functionality and Increase Value

Product Details

5300 SERIES Annunciators

Remote Annunciation

Monitor Power Equipment Status from Anywhere

Monitoring and control transfer switches from across the room, building, or from Internet.

5310 – LED annunciator – Single ATS

5350 – LED annunciator – up to 8 ATSs

Product Details

5140 Connectivity Module

Communication

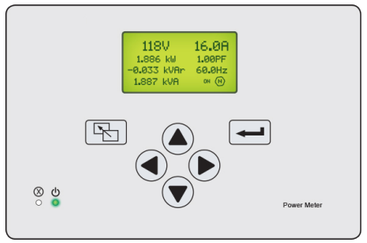
Turn Transfer Switches into Power Information Portals

5140 Connectivity Module – Makes status and power information from a single switch available to via ModBUS, SNMP, and web pages.

Metering

Transfer Switches are the Perfect Place to Monitor Power Flow, Power Conditions, and Power Events

5210 Power Meter – Provides deeper insight into circuit status and conditions.



Product Details

5210 Power Meter

SERIES 300 Optional Accessories

Communications	
11BE	Feature Bundle. Programmable engine exerciser with seven independenct routines run the generator with or without loads, on a daily, weekly, bi-weekly, or monthly basis. Controlled from the user interface keypad. • Event log display shows the event number, time and date, type and reason (if applicable). • Stores up to 300 events • RS485 Communication Port enabled common alarm output contact • On three-phase systems, Accessory 11BE enables line-to-line voltage imbalance sensing and three-phase sensing capabilities for the Emergency power source as well as the Phase Rotation checking for both power sources.
18RX	Relay Expansion Module provides accessory relays and includes one Form C contact for normal source availability (18G), and one Form C contact for emergency source availability (18B) (contact rating 5 amperes @ 30 VDC or @ 125 VAC resistive) (100 ma, 4 VDC min) Additional output relay is provided the default is to indicate a common alarm.
72EE	Connectivity module provides remote monitoring and control capabilities and includes accessory 11BE feature bundle
Environment and Power	
44A	Strip heater with thermostat for cold environment to prevent internal condensation and icing. External 120-volt AC power source required.
44G	Strip heater with thermostat, wired to load terminals on 208-240, 360-380, 460-480, 550-600 volt models. Contains wiring harnesses for all transfer switch sizes.
1UP	UPS back up power runs controller and LCD display for 30 seconds without AC power
Extension Harness	
37B	Six-foot extension harness for open type units to accommodate customer mounting of controls and switch
37C	Nine-foot extension harness for open type units to accommodate customer mounting of controls and switch
Indicators	
62W	Audible alarm with silencing feature to signal transfers to emergency. (For D-frame models, may require oversize enclosure depending on accessory combination).
Customer Control Circuits	
30A	Load-shed circuit initiated by opening of a customer-supplied contact (Open Transition model only)
30B	Load-shed circuit initiated by removal of customer-supplied control voltage (Open Transition model only)
30AA	Load-shed circuit initiated by opening of a customer-supplied contact (Delayed Transition model only)
30BA	Load-shed circuit initiated by removal of customer-supplied control voltage (Delayed Transition model only)
Surge Protection	
73	Surge suppressor rated 65 kA
Metering	
23GA, 23GB	Load Current Metering card measures either single or three-phase load current. Not available with Power Meter option 135L. Use 23GA for Single-Phase, 23GB for Three-Phase.
135L	Power Meter on load side (includes shorting block and current transformers). Not available with Load Current Metering options 23GA or 23GB.

Field Conversion Kits

Kit No.	Description
935147	Advanced Function Bundle Retrofit Kit (11BE) - See above accessory 11BE description for details.
935148	REX Module with Source Availability Contacts (Acc. 18RX)
935149	UPS to allow controller to run for 30 seconds minimum without AC Power (Acc. 1UP)
935150	1/3 Phase load current sensing card only (Acc. 23GA/GB)
K613127-001	Strip Heater (125 watt) 120 volt (Acc. 44A)
K613127-002	Strip Heater (125 watt) 208-480 volt (Acc. 44G)
948551	Quad-Ethernet Module (Acc. 72EE)
K609027	Cable Pull Box (1600-2000 amperes)

Withstand and Closing Ratings

FRAME	RATINGS AMPERES	CURRENT LIMITING FUSES				SPECIFIC BREAKER		
		480V MAX.	600V MAX.	MAX. SIZE, AMPS	CLASS	240V MAX.	480V MAX.	600V MAX.
D	30	100kA	-	300	J	22kA	22kA	10kA
		200kA	35kA	200	J			
		35kA	35kA	200	RK1			
	70-100	35kA	35kA	200	RK1	150kA	85kA	25kA
		200kA	35kA	200	J			
	150	35kA	35kA	200	RK1	150kA	85kA	25kA
		200kA	35kA	200	J			
	200	200kA	35kA	200	J	200kA	85kA	14kA
		35kA	35kA	200	RK1			
	230	100kA	-	300	J	200kA	85kA	14kA
E	260, 400	200kA	-	600	J	65kA	42kA	22kA
J	150, 200, 260	200kA	200kA	600	J	200kA	200kA	42kA
				800	L			
	400	200kA	200kA	600	J	65kA	50kA	42kA
				800	L			
	600	200kA	200kA	600	J	65kA	85kA	42kA
				800	L			
H	800-1200*	200kA	200kA	1200	L	65kA	150kA	65kA
G	1600-2000	200kA	200kA	2500	L	85kA	85kA	85kA
	2600-3000	200kA	200kA	4000	L	125kA	125kA	100kA
	4000	200kA	200kA	5000	L	100kA	100kA	100kA

Notes:

* Front connection only

All units are RMS Symmetrical Amperes

All Withstand and Closing Rating values are tested in accordance with UL 1008.
See **ASCO Publication 1128** for more information.

Application requirements may permit higher WCR for certain switch sizes.

Power Knowledge

- UL 1008 Transfer Switch Withstand and Closing Ratings
- Performance Testing for Transfer Switches

Additional SERIES 300 Product Information

Transfer Switches and Panels	Controls	Technical Information
Manual Transfer Switch	Group G Controller	Withstand and Closing Ratings
Manual Transfer Switch with Quick Connects		Weights and Dimensions and Ordering Info
Quick Connect Power Panel		Drawings
Dual Purpose Quick Connect Power Panel		Wiring Diagrams

SERIES 300 Manual Transfer Switching and Quick Connection Solutions

ASCO SERIES 300 Manual Transfer Switching and Quick Connection Solutions offer reliable service and application flexibility for a wide range of facilities.

Manual Transfer Switches

- Three-position, easy-to-use center-off switch
- Compact design - easy to install and maintain
- Designed to handle demands of motors and inrush currents

Power Knowledge

Differences Between Manual, Non-Automatic, & Automatic Transfer Switches

Product Details

SERIES 300 Manual Transfer Switch

Manual Transfer Switches with Quick Connects

- The ASCO SERIES 300 Manual Transfer Switch with Integrated Quick Connects provides a total temporary power connection and transfer solution
- Enables connection and control of a temporary or portable generator
- Provides a complete UL 1008-listed solution in a single unit

Product Details

SERIES 300 Manual Transfer Switch with Quick Connects

Quick Connect Panels

- Listed to UL 1008 Transfer Switch Accessory standard
- Utilizes standard Cam-Lok™ receptacles for quick connections
- Standard Type 3R construction is weatherproof with or without cable
- Utilizes standard Series 16 Single Pole quick connect receptacles

Power Knowledge

NEC Requirement for Permanent Manual Switching Means

Product Details

SERIES 300 Quick Connect Power Panel

Dual-Purpose Manual Transfer Switches with Quick Connects

- Provides both supplemental backup power and load testing connectivity through a single device.
- Listed to UL 891 by ETL
- Utilizes standard Series 16 Single Pole quick connect receptacles

Product Details

SERIES 300 Dual Purpose Quick Connect Power Panel

Life Is On | Schneider Electric™

ASCO Power Technologies - Global Headquarters
160 Park Avenue
Florham Park, NJ 07932
Tel: 800 800 ASCO

www.ascopower.com
customercare@ascopower.com

Publication 1195 R7. Printed in the U.S.A.