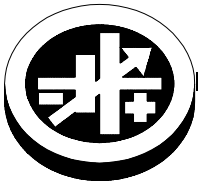


INSTRUCTION SHEET



KEPCO An ISO 9001 Company.

**CABLE
KIT
219-0449**

CABLE KIT NO. 219-0449

BOP 1000W MODELS (2) IN PARALLEL

I. DESCRIPTION.

This kit contains the cables and terminations required to operate two 1000 Watt BOP High Power models in parallel, effectively doubling the output current capacity. Only two identical models may be configured to operate in parallel. This kit can be used with all 1000W BOP models except BOP 36-28MG Rev 6 and earlier, BOP 10-75MG Rev 2 and earlier, and BOP 50-20MG Rev 1; Table 1 lists the equipment supplied.

Refer to the associated technical manual supplied with the High Power BOP power supply for all instructions regarding installation and operation of multiple units in parallel.

TABLE 1. EQUIPMENT SUPPLIED

Item	Quantity	Purpose	Kepeco Part Number
Master/Slave Power cable	1	Connects the OUTPUT terminals of the slave unit to the corresponding power OUTPUT terminals of the master.	118-1112
Master/Slave Common cable	1	Connects the COMMON terminals of the slave unit to the corresponding power COMMON terminals of the master.	118-1129
Digital Control (Bitbus) Cable	1	Provides communication between master and slave.	118-1108
Parallel Control Cable	1	Provides control signals required for parallel operation.	118-1119
Protection Cable	1	Provides protection signals required for parallel operation.	118-1126
Master Parallel Control Termination	1	Provides proper termination for Parallel Control Cable	195-0109
Slave Termination	1	Provides proper termination for the slave connection to the Protection Cable	195-0108
Master Termination	1	Provides proper termination for the master connection to the Protection Cable.	195-0107
Instruction Manual	1	Lists material supplied.	228-1485
Nut	2	Overcomes tight space for output cable connections. After securing bottom cable to output terminal stud using one nut, additional cables can be oriented for best layout and secured with separate nut.	102-0046

II. SPECIFICATIONS

Table 2 lists the model parameters unique to a parallel combination of two 1000W BOP Power Supplies. Table 3 lists the general specifications applicable all the parallel combinations listed in Table 2.

TABLE 2. MODEL PARAMETERS FOR TWO (2) HIGH POWER BOP 1000 WATT UNITS (PARALLEL)

Model	d-c Output Range		Closed Loop Gain	
	E _O Max	I _O Max	Voltage Channel	Current Channel
TWO 1000 WATT MODELS				
BOP 10-75MG	±10V d-c	±150A d-c	1.0	15.0
BOP 20-50MG	±20V d-c	±100A d-c	2.0	10.0
BOP 36-28MG	±36V d-c	±56A d-c	3.6	5.6
BOP 50-20MG	±50V d-c	±40A d-c	5.0	4.0
BOP 72-14MG	±72V d-c	±28A d-c	7.2	2.8
BOP 100-10MG	±100V d-c	±20A d-c	10.0	2.0

TABLE 3. GENERAL SPECIFICATIONS FOR TWO (2) HIGH POWER 1000W BOP UNITS CONNECTED IN PARALLEL

SPECIFICATION		RATING/DESCRIPTION	CONDITION
INPUT CHARACTERISTICS			
a-c voltage	nominal	230 Va-c	Single phase
	range	176 - 264 Va-c	
Frequency	nominal	50-60 Hz	>65 Hz, leakage exceeds spec
	range	47 - 65 Hz	
Current	176 Va-c	19A	maximum
	264 Va-c	13A	maximum
Power factor	Source	0.99 minimum	nominal output power
	Sink	0.97 minimum	
Efficiency		65%	minimum
Switching frequency		80 KHz	PFC Stage
EMC Compliance		EN61326-1 (1997)	Class A equipment
EMC immunity to:	ESD	EN61000-4-2	Electrostatic discharge
	Radiated RF	EN61000-4-3	
	EFT	EN61000-4-4	Electrical fast transient/burst
	Surges	EN61000-4-5	
	Conducted RF	EN61000-4-6	
EMC emissions	Conducted	EN61000-3-2	harmonics
		EN61000-3-3	fluctuation & flicker
	Conducted	EN55011/CISPR11	0.15 to 30 MHz
	Radiated	EN55011/CISPR11	30 to 1000 MHz

**TABLE 3. GENERAL SPECIFICATIONS FOR TWO (2) HIGH POWER 1000W BOP UNITS
CONNECTED IN PARALLEL (CONTINUED)**

SPECIFICATION		RATING/DESCRIPTION	CONDITION
INPUT CHARACTERISTICS - CONTINUED			
Leakage current		3.5 mA	230V a-c 47-63 Hz
Insulation coordination	Input	Installation Category II	
		Overvoltage Category II	
	Output	Installation Category II	
		Overvoltage Category II	
Pollution degree		2	
OUTPUT CHARACTERISTICS			
Type of stabilizer		Voltage-current, 4-quadrant	Switch mode
Switching frequency		100KHz	Output Stage
Source adjustment range	voltage	-100% to +100% of rating	0 to 50 deg C
	current	-100% to +100% of rating	
Sink adjustment range	voltage	-100% to +100% of rating	Recuperated energy is sent back into line for reuse
	current	-100% to +100% of rating	
Programming resolution / accuracy	Voltage	14 bits / 0.2%	
	Current	14 bits / 0.5%	
	Limits	12 bits / 0.5%	voltage or current
Readback resolution / accuracy	Voltage	16 bits / 0.2%	main or limit channel
	Current	16 bits / 0.5%	main or limit channel
Readback rate/array	measurement rate	1 ms (default)	range: 0.25-25ms
	measurement array	64 samples	
Voltage stabilization in voltage mode	source effect	0.05% of rating	min-max input voltage
	load effect	0.1% of rating	0-100% load current
	time effect (drift)	0.05% of rating	0.5 through 24 hours
	temperature	0.05%/deg C of rating	0 to 50 deg C
	ripple and noise	2% E ₀ max p-p	Includes switching noise
Current stabilization in current mode	source effect	0.05% of rating	min-max input voltage
	load effect	0.2% of rating	0-100% load voltage
	temperature	0.05%/deg C of rating	0 to 50 deg C
	ripple and noise	2% I ₀ max p-p	Includes switching noise
Error sensing		0.25V per wire	Above rated output
Transient recovery in voltage mode	maximum excursion	5% of nominal output	nominal voltage, 50% load step
	Recovery time	200 μsec	Return within 0.1% of set voltage
Isolation	voltage	300V	Output to ground

**TABLE 3. GENERAL SPECIFICATIONS FOR TWO (2) HIGH POWER 1000W BOP UNITS
CONNECTED IN PARALLEL (CONTINUED)**

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Output limiting		voltage and current limited in four quadrants	
Output Stage Protection		Heatsink overtemperature, switchers overcurrent for master and slave units	Triggers latched shutdown protection of entire master/slave combination
Input Stage Protection (PFC)		Overvoltage, undervoltage, overcurrent, heat sink overtemperature, fan inoperative for master and slave units	Triggers latched shutdown protection of entire master/slave combination
		Circuit breaker overcurrent	Trips circuit breaker to shut off unit (master or slave)
PROGRAMMING/DISPLAY CHARACTERISTICS			
Small signal Bandwidth	voltage channel	2 KHz minimum	into nominal resistive load, 10% of rating
	current channel	400 Hz minimum	Into short circuit, 10% of rating
Rise/Fall Time	voltage channel	500/200 μ sec	into nominal resistive load, 10-90%, 0 to \pm 100% of rating
	current channel	1.5/2.5 msec	into short circuit, 10-90%, 0 to \pm 100% of rating
Analog control	voltage channel	-10V to +10V	Full range output, 10K Ohm input impedance
	current channel	-10V to +10V	
Digital control	local	Panel-mounted keypad	Direct Entry
	remote	IEEE 488-2 (GPIB)	SCPI
	remote	RS 232	
	remote	RS 485 (BITBUS)	IEEE 1118
Display	front panel	4" backlit LCD displays all functions	
	remote	All parameters read back on GPIB or RS 232 buses	
BOP HIGH POWER INTERFACE CHARACTERISTICS			
Waveform Support	steps	1002	
	step dwell time	250 μ sec to 10 sec	
Storage	non-volatile	FLASH-type EEPROM 24Kbytes	
	** User setups	99	
	interface steps	99	
	** waveform display	1024 steps	
	** waveform - interface	1800 steps	
GENERAL (ENVIRONMENTAL) CHARACTERISTICS			
Temperature	operating	0 to +50 deg C	Full rated load
	storage	-20 to +85 deg C	
Cooling	Two internal fans per unit		exhaust to the rear
Humidity	0 to 95% RH		non-condensing
Shock	20g, 11msec \pm 50% half sine		non-operating
Vibration	5-10HZ:	10mm double amplitude	3 axes, non-operating
	10-55HZ:	2g	3 axes, non-operating
Altitude	sea level to 10,000 feet		
Safety Certification	a-c power	UL 3101-1 and EN 6101-1	Pending
** Optional Function. if you require an option that is not installed on your unit, please contact the factory for upgrade information.			