



# COMMUNICATIONS ENERGY DIVISION

COMMERCIAL ELECTRIC PRODUCTS

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MODEL 1750

## RING GENERATOR

- 1750-S-3      Basic 30 watt Ringing System \_\_\_\_\_ Hz
  - 1 system per unit
  - 1 fuse alarm extension relay
  - 1 major alarm extension relay
  
- 1750-D-3      30/30 watt Ringing System \_\_\_\_\_ Hz
  - 2 systems per unit with automatic transfer
  - 1 fuse alarm extension relay
  - 1 minor alarm extension relay
  - 1 major alarm extension relay
  
- 1750-T-3      60/30 watt Ringing System \_\_\_\_\_ Hz
  - 3 systems per unit with automatic transfer
  - 1 fuse alarm extension relay
  - 1 minor alarm extension relay
  - 1 major alarm extension relay
  
- 1750-Q-3      90/30 watt Ringing System \_\_\_\_\_ Hz
  - 4 systems per unit with automatic transfer
  - 1 fuse alarm extension relay
  - 1 minor alarm extension relay
  - 1 major alarm extension relay

Available Options:

- M1            17/20/25/50Hz selectable
- M2            17/20/25/30Hz selectable

{1} TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
{1} TABLE OF CONTENTS	1
{2} SPECIFICATIONS	
2.1 Environmental	2
2.2 Reliability	2
2.3 Electrical	2
2.4 Power Data - PD1750D3	3
{3} INSTALLERS INSTRUCTIONS	
3.1 Location	4
3.2 Recommended wire sizes	4
3.3 Connections	4
3.4 Startup procedure	7
3.5 Ringing frequency adjustment	8
3.6 Ringing voltage adjustment	8
{4} GENERAL OPERATING DESCRIPTION	
4.1 System arrangement	9
4.2 System component functions	9
{5} PARTS LIST	
5.1 Ordering Information	10
5.2 Recommended spare parts list	10
5.3 Subassembly parts list	10
{6} TROUBLESHOOTING	
6.1 Troubleshooting Index	11
6.2 Troubleshooting Procedure	13
{7} DRAWINGS	
{8} WARRANTY AND SERVICE INFORMATION	16

{2} SPECIFICATIONS

## 2.1 Environmental

This equipment is to operate in a location with an ambient temperature range of 0 to 50 degrees C. The area surrounding the equipment should provide a free circulation of air. The humidity should not exceed 93% non-condensing.

## 2.2 Reliability

The Mean Time Between Failure when operated in the proper environmental conditions @ 30 degrees C is 3,000,000 hours.

## 2.3 Electrical

The installer is to make all other electrical connections as required. Refer to the drawings in section {7} and the text in section {3} for details of connections to the basic unit's terminal blocks and output distribution fuse holders located on the rear of the unit.

**WARNING** - Wire size to be used should be adequate to carry the full rated load of each output. Refer to **Recommended Wire Sizes** in section {3} of this manual for a wiring guide.

**WARNING** - Do not replace a fuse with a larger amperage rating than indicated on the front of the unit. See listing below.

<u>Loc.</u>	<u>Max.</u>	<u>Description</u>
SYS1	1.3A	Ring Generator 1 (SYS1)
SYS2	1.3A	Ring Generator 2 (SYS2)
SYS3	1.3A	Ring Generator 3 (SYS3)
F1-3	0.4A	Total of all Ringing Distribution Fuses per module (75VAC).
F1-3	0.35A	Total of all Ringing Distribution Fuses per module (86VAC).

2} continued

## 2.4 Power Data

ISSUE	17	50	30
DATE	3	19	99

RINGING GENERATOR INPUTS

Model 1750-	Input D.C Volts	Nominal D.C Volts	Amps. (No Load)	Amps. (Full Load)	
				@86VAC	@75VAC
S-3	(-) 44-56	50	0.09	0.7 @ 30W	0.8 @ 30W
D-3			0.18	0.8 @ 30W	0.9 @ 30W
T-3			0.28	1.5 @ 60W	1.6 @ 60W
Q-3			0.37	2.2 @ 90W	2.3 @ 90W
Input Filter (Noise to battery 20dBrc)					

RINGING GENERATOR OUTPUTS

Model 1750-	Ringing A.C. Volts	Nominal A.C. Volts	Amps. (Full Load) 30W / 30W / 30W	Ringing Frequency Limits	Audible Tone Superimposed Frequency Limits
D-3	0.40				
T-3	0.35 / 0.35				
Q-3	0.35 / 0.35 / 0.35				
S-3	73-77	75	0.40	+/-0.5%	Not available
D-3			0.45		
T-3			0.45 / 0.45		
Q-3			0.45 / 0.45 / 0.45		

TEMPERATURE REQUIREMENTS

Temperature Range (C)	Extended Temperature Range (C)
0 to 50 C	-40 C to +65 C

PWR-1750-30

## {3} INSTALLERS INSTRUCTIONS

### 3.1 Location

The equipment is mounted on a 23” relay rack with 1-3/4” hole spacing and requires 1.75” of vertical mounting space. The area surrounding the equipment must have free circulation of air.

After mounting the equipment in place, perform a final visual inspection prior to connections and startup. Open the front cover and make sure the circuit cards are fully seated in their sockets. Check the unit for loose fasteners, remnants of packaging materials, or other damage from shipping and handling.

### 3.2 Recommended Wire Sizes

<u>Connection</u>	<u>Maximum Size</u>	<u>Minimum Size</u>
Pos. Gnd	16 AWG	18 AWG
Neg. Battery	16 AWG	18 AWG
Distribution	22 AWG	24 AWG
Alarm Outputs	22 AWG	24 AWG

### 3.3 Connections

Refer to drawings in section {7} of this manual.

A good ground is essential for the proper operation of this equipment. The installer should run a wire from the exchange ground to the I/O terminal block GND's. Refer to the Outline drawing for location of this terminal block, the following connection list for the proper wiring of Neg. Battery and section 3.2 for the recommended wire size.

**CAUTION:** The installer at this time should go to section {3} under **3.4 Startup Procedure** before connecting up the I/O terminal blocks to the office.

{3} continued

Connections to the I/O terminal blocks located on the back of the unit.

**STANDBY / ALARMS**

	<u>PL1#</u>	<u>Designation</u>	<u>Description</u>
F1.	12	-MB	Battery (-48V) to Standby/Alarms thru onboard fuse
	11	-GND	Ground to Standby/Alarms. Note 1.
	10	MJN	Major alarm relay (NORMAL) contact.
	9		Not used.
	8	MJA	Major alarm relay (ALARM) contact.
	7		Not used.
	6	MJC	Major alarm relay (COMMON) contact.
	5	MNC	Minor alarm relay (COMMON) contact.
	4	MNN	Minor alarm relay (NORMAL) contact.
	3	MNA	Minor alarm relay (ALARM) contact.
	2	FA	Fuse alarm (COM) contact.
	1	FAO	Fuse alarm output (ALARM) contact.

### **RING GEN 1**

	<u>PL2#</u>	<u>Designation</u>	<u>Description</u>
	8	-MB	Battery (-48V) to Ring Gen 1 thru onboard fuse F1
	7	-48B RTN	Ground to Ring Gen 1. Note 1.
	6	FRG1	Fused Ringing for distribution (F1).
	5	RTN	Ringing Return (F1).
	4	FRG2	Fused Ringing for distribution (F2).
	3	RTN	Ringing Return (F2).
	2	FRG3	Fused Ringing for distribution (F3).
	1	RTN	Ringing Return (F3).

{3} continued

### **RING GEN 2**

	<u>PL3#</u>	<u>Designation</u>	<u>Description</u>
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8	-MB	Battery (-48V) to Ring Gen 2 thru onboard fuse F1.
7	GND	Ground to Ring Gen 2. Note1.
6	FRG4	Fused Ringing for distribution (F4).
5	RTN	Ringing Return (F4).
4	FRG5	Fused Ringing for distribution (F5).
3	RTN	Ringing Return (F5).
2	FRG6	Fused Ringing for distribution (F6).
1	RTN	Ringing Return (F6).

Note 1. The installer should bring in (2) battery feed circuits each fused at 5 amperes to power the unit. This will assure ringing current to the office even if one of the feeds should be lost. Bring the following wires to the I/O terminal block located on the unit. The first feed via #16 AWG wire to terminal -MB on Ring Gen 1. Bring the second feed via #16 AWG wire to terminal -MB on Ring Gen 2 and Standby/Alarms.

{3} continued

### 3.4 Startup Procedure

Before performing the preliminary electrical test open the front cover and switch the STANDBY (D-3 and T-3 only), RING GEN 1 and RING GEN 2 (T-3 only) switches to their *OFF* (down) positions. The installer should next complete the ground connections to Ring Gen 1 (GND), Ring Gen 2 (GND) and Standby/Alarms (GND) along with the

battery feed connections to Ring Gen 1 (-MB), Ring Gen 2 (-MB) and Standby/Alarms (-MB) as described in section {3} under **3.3 Connections** of this manual. The installer at this time can perform a preliminary test. This test will assure that there was no damage to the unit in shipment.

**Facing the front of the unit perform the following steps.**

1. Switch STANDBY (D-3 and T-3 only), RING GEN 1 and RING GEN 2 (T3 only) switches to their *ON* (up) positions.
  - The *STANDBY (D-3 and T-3 only)*, *RING GEN 1* and *RING GEN 2 (T-3 only)* green lights are on.
2. Allow the unit to run a few minutes undisturbed and verify that the *STANDBY (D-3 and T-3 only)*, *RING GEN 1* and *RING GEN 2 (T-3 only)* green lights remain lit. The *MN* yellow light (*D-3 and T-3 only*), *MJ* red light and *FA* red light should not light.

{3} continued

### **3.5 Ringing Frequency Adjustment**

The ringing generator frequency is determined by jumpers located on the CERM-M ringing generator card(s). See chart below to select proper frequency.

Frequency	Jumper
F1	J4, J5
F2	J5
F3	
F4	J4

**CAUTION** - Do not remove or replace circuit cards with power applied to the unit. First remove the input fuse and switch on/off switch to OFF. Removing or replacing cards with power applied to the unit may damage solid state components.

**CAUTION** - Plug-in circuit cards utilize C-MOS solid state components which can be damaged by electrical static discharge. If cards are removed from the unit for any reason, be sure to observe appropriate handling precautions.

### 3.6 Ringing Voltage Adjustment

The output voltage of each ringing generator is set at the factory to 86 volts . An optional voltage of 75 volts is available by jumpering J6 on each of the CERM-M ringing generator cards.

## {4} GENERAL OPERATING DESCRIPTION

### 4.1 System Arrangement

The Model 1750 consists of a painted steel frame containing electrical and electronic components, most of which are on plug-in printed circuit cards. Depending on the model the unit contains the following :

1750-S-3 (one 30 watt ringing generator with no backup)

1750-D-3 (one 30 watt ringing generator backed up by a 30 watt ringing generator)

1750-T-3 (two 30 watt ringing generators backed up by a 30 watt ringing generator)  
1750-Q-3 (three 30 watt ringing generators backed up by a 30 watt ringing generator)

Refer to section {7} of this manual for an outline drawing and card location drawings for this equipment.

## 4.2 System Component Functions

### Ringling Supply Circuit; CERM-SF30 or CERM-M

The ringling generator card provides a continuous ringling current (86 volt, 20Hz at 0.34 ampere) to the office exchange.

A GREEN LED status indicator mounted on the RING GEN card is visible thru the front cover and indicates that the card is normal when lit.

### Monitor / Transfer Circuit

The three LED status indicators mounted on the STANDBY module which are visible thru the front cover, are listed below starting from left to right:

MN	YEL LED	Lights yellow indicating a minor alarm.(D-3, T-3 and Q-3 only)
MJ	RED LED	Lights red indicating a major alarm.
FA	RED LED	Lights if a fuse opens and a fuse alarm is being extended.

## {5} PARTS LIST

### 5.1 Ordering Information

<u>Part No.</u>	<u>Description</u>	<u>Lead Time</u>
1750-S-3	30W Ringling Generator	8 Weeks
1750-D-3	30/30W Ringling Generator	8 Weeks
1750-T-3	60/30W Ringling Generator	8 Weeks

1750-Q-3	90/30W Ringing Generator	8 Weeks
1750-30/SK	Spare Parts Kit	1 Week

## 5.2 Recommended Spare Parts List

<u>Part No.</u>	<u>Description</u>	<u>Qty. Spares Recommended</u>
CERM-SF30	Ringing Generator Card (Single Freq.)	1
CERM-M	Ringing Generator Card (Multiple Freq.)	1
F-7113	1.3A Fuse - Type GMT	1

## 5.3 Subassembly Parts List

<u>Part No.</u>	<u>Description</u>	<u>Quantity Per Unit</u>
CE1RB	Backplane	1
CERM-SF30	Ringing Generator Card (Single Freq.)	3 (T3 only)
CERM-M	Ringing Generator Card (Multiple Freq.)	3 (T3 only)
CEMS-AT	Alarm/Transfer Card	1
CEMS-T	Transfer Card	2 (T3 only)
F-7113	Fuse, GMT 1.3ampere	3 (T3 only)

{6} TROUBLESHOOTNG

## 6.1 Troubleshooting Index

SUB-ASSEMBLY DESCRIPTIONS:

<u>Card Label</u>	<u>Description</u>	<u>Sheet #</u>
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CERM-M

Ringling Generator Card (Multiple Freq.)

6-RM-001

## 6.2 Troubleshooting Procedure

SYMPTOM / CAUSE / SOLUTION

A46020

### {6} CERM-M RINGING GENERATOR CARD

This card contains an onboard ring generator module G1 to generate ringing power. The frequency and voltage is determined by 2-pin shorting blocks. Shorting blocks determine the frequency (F1 = J4,J5; F2 = J5; F3 = None; F4 = J4) and output voltage (75Vrms = J6; 86Vrms = None).

Supporting circuitry includes an input fuse, R/C input filter and monitor circuit that provides a -48 volts output in case ringing fails. The ringing is turned on/off for servicing by SW1. Pin jacks on the front of the card are for measuring ringing output.

connections viewing rear of edge connector

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-----
+GND -----|12 1|
Ring Output -----|11 2|
      On-Line -----|10 3|
      Fuse Alarm -----|9 4|
                        |8 5|
-48Vin-----|7 6|
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sheet 6-RM-001

schematic W-4415

{6} continued

## 6.2 Troubleshooting Procedure

The MODEL 1750-\_\_ does not require routine maintenance. If trouble is experienced, the following guide may be of help in locating the defective component. A set of spare cards will be of help in quickly isolating a problem. Refer to sections {3} and {6} of this manual for background information.

**CAUTION** - Do not remove or replace circuit cards with power applied to the unit. First remove the input fuse and wait a few seconds for the power supply voltages to bleed off. Removing or replacing cards with power applied to the unit may damage solid state components.

**CAUTION** - Plug-in circuit cards utilize C-MOS solid state components which can be damaged by electrical static discharge. If cards are removed from the unit for any reason, be sure to observe appropriate handling precautions.

If trouble is experienced, observe the green LEDs thru the front cover of the unit and use the following guide to help identify and correct the problem. If you need help in diagnosing or correcting a problem, do not hesitate to contact the factory for technical support.

**SYMPTOM** - Either the RING GEN 1 or the RING GEN 2 (D-3, T-3 and Q3 only) green LED is extinguished, identifying the system in trouble and the minor alarm yellow LED is on.

**POSSIBLE CAUSE AND SOLUTION** - The problem is most likely the result of a temporary overload which has caused the unit to self-protect and indicate a fault. Check to see if fuse is open on the sys that failed (F1). If opened, set on/off switch to OFF, replace the fuse and reset on/off switch to On. . If the unit will not remain reset but continues to go into minor alarm, check for the proper output voltage at the pin jacks (J2 & J3). If the ringing voltage has been lost, replace the CEWT-M ringing generator card in the defective system.

**SYMPTOM** - The STANDBY and RING GEN 1 or RING GEN 2 (D-3, T-3 and Q3 only) green LED is switching on and off, along with minor and major alarms.

**POSSIBLE CAUSE AND SOLUTION** - The problem is most likely the result of an overload which has caused both units to self-protect and then recover. Check for the proper output voltage at the pin jacks (J2 & J3). If the ringing voltage is erratic check for an overload condition of more than 30 watts. If this is the case add another 30 watt module.

sheet A1750 1 of 2

{6} continued

**SYMPTOM** – Major alarm has been extended (S3 only).

**POSSIBLE CAUSE AND SOLUTION** – Replace CERM ringing generator card. Switch on/off switch to OFF, replace with a new fused CERM card, reset on/off switch to On. If the problem still persists call the factory.

**SYMPTOM** - The red FUSE ALARM LED is lit.

**POSSIBLE CAUSE AND SOLUTION** – A distribution output or ringing generator input fuse has opened. Replace fuse. If the problem still persists call the factory.

sheet A46020 2 of 2

{7} SYSTEM DRAWINGS

**7.1 Drawing Index**

HARDWARE:

<u>Drawing #</u>	<u>Description</u>
B-4426	Outline / Card Layout

SCHEMATICS:

<u>Drawing #</u>	<u>Description</u>
C-4423	Connection Diagram
* W-4223	Wiring Diagram

\* Not provided unless authorized.

## {8} WARRANTY

COMMERCIAL ELECTRIC PRODUCTS CORPORATION, the SELLER, warrants that this product shall be free from defects in material and workmanship during the first 90 days after the product is activated. During said period, SELLER will repair or replace any defective parts free of charge to BUYER, including any labor costs. In addition, SELLER shall repair or replace any defective parts, so discovered by BUYER to be defective within two years from the date of shipment of same, provided BUYER promptly so notifies SELLER. In no case shall SELLER'S liability under this warranty extend beyond two years from the date of shipment of said product. This warranty shall not apply if this product is misused, modified, repaired, or otherwise abused by BUYER or others. The repair or replacement of defective parts, or the refund of the invoice cost thereof, as shall be determined by SELLER in its sole discretion, shall be the limit of SELLER'S liability hereunder and shall be BUYER'S sole and exclusive remedy.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES. SELLER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE WITH RESPECT TO ANY PRODUCTS EXCEPT AS HEREIN EXPRESSLY PROVIDED.

SYSTEMS AND EQUIPMENT NOT ECONOMICALLY RETURNABLE TO THE FACTORY

In the event that the product involved is a system or equipment which, in the judgment of SELLER, is not economically returnable to the factory or if SELLER has performed the installation, supervised the installation, or performed testing and turn-on, circuit components and SELLER'S repair labor are covered by this warranty for the first 90 days from date of turn-on and circuit components are warranted for two years from the date of shipment. Upon request, SELLER will send a service technician to the site to determine if the unit is defective in circuit components or workmanship, and will repair the equipment. If the failure is SELLER'S fault, no invoice for circuit components or repair labor will be issued if the complaint has been issued within the first 90 days from date of turn-on. If the complaint is issued more than 90 days from the date of turn-on but within two years from date of shipment, BUYER will be billed at the prevailing CUSTOMER SERVICE RATES but will not be billed for circuit components. If the problem occurs after two years from the date of shipment, circuit component and repair labor are billable. If the problem has been created by misuse or abuse of the equipment or by malfunction of associated equipment or by environmental conditions, at any time after shipment, BUYER will be billed for circuit components and labor.

#### GENERAL PROVISIONS

COMMERCIAL ELECTRIC PRODUCTS CORPORATION shall not be obligated to pay any costs or charges incurred by the customer or by any other party. In no event will COMMERCIAL ELECTRIC PRODUCTS CORPORATION be liable for consequential damages. No waiver, alteration, or modification of any of the provisions herein shall be binding on COMMERCIAL ELECTRIC PRODUCTS CORPORATION unless in writing and signed by an authorized official of COMMERCIAL ELECTRIC PRODUCTS CORPORATION. If, during any warranty period, the subject equipment has, in the opinion of COMMERCIAL ELECTRIC PRODUCTS CORPORATION, been modified or misrepaired, the warranty will be void unless the modifications or repairs have been made after consultation with COMMERCIAL ELECTRIC PRODUCTS CORPORATION and upon the recommendation of COMMERCIAL ELECTRIC PRODUCTS CORPORATION.

COMMERCIAL ELECTRIC PRODUCTS CORPORATION recommends that all shipments of equipment be inspected by the customer for hidden damage upon receipt from the carrier to insure that a timely claim be filed, if necessary, by the customer. COMMERCIAL ELECTRIC PRODUCTS CORPORATION will not pay claims for shipping damages.