![pmc®]

Type 8421-9002

FEATURES

- Up to 4 points per module and 64 points per 19" flush mount enclosure
- Displays are back-lit with long life LEDs or industry standard bulbs and engraved to suit
- Dimmer controls are built in
- Microprocessor controlled logic
- Incoming faults are captured (after time delay) and auto reset when acknowledged and fault is cleared
- Displays are RED when a fault is displayed and white when inactive
- New alarms flash red until acknowledged and remain steady on until reset
- Audible alarms can be silenced without acknowledging visual alarm
- Field programmable options for each point include:
  - Time delay (½ to 60 sec)
  - NO, NC and NO with end of line resistor fault contact input
  - Disable groups
  - First out groups
  - Bridge repeater groups
  - Remote display outputs
  - Repeater reflash output
  - Internal horn operation
- Available support equipment includes:
  - Rotating beacons
  - Air/electric horns
  - Bridge repeaters
  - Cabin repeaters
  - Watchkeeping systems
  - Cabin call systems
  - Control relays
- Flashing silence button indicates which panel is annunciating
- All modules are plug-in and front removable without tools
- Conformally coated printed circuit boards
- Suitable for use on UMS vessels
- Marine approvals
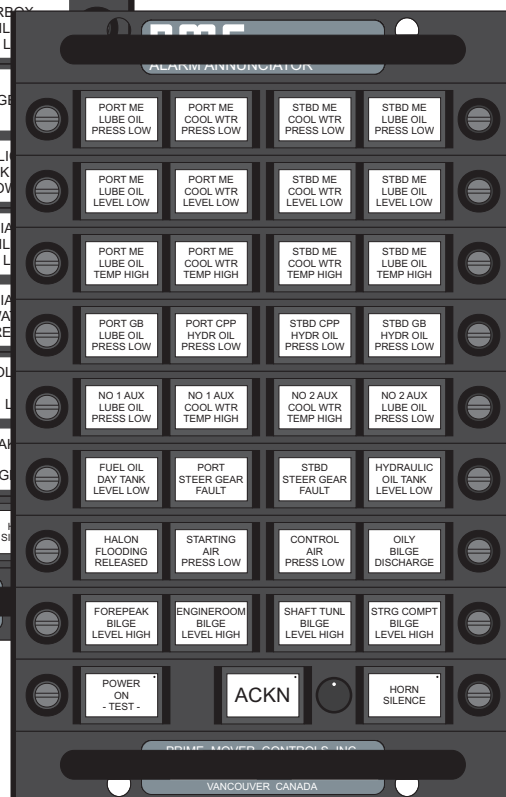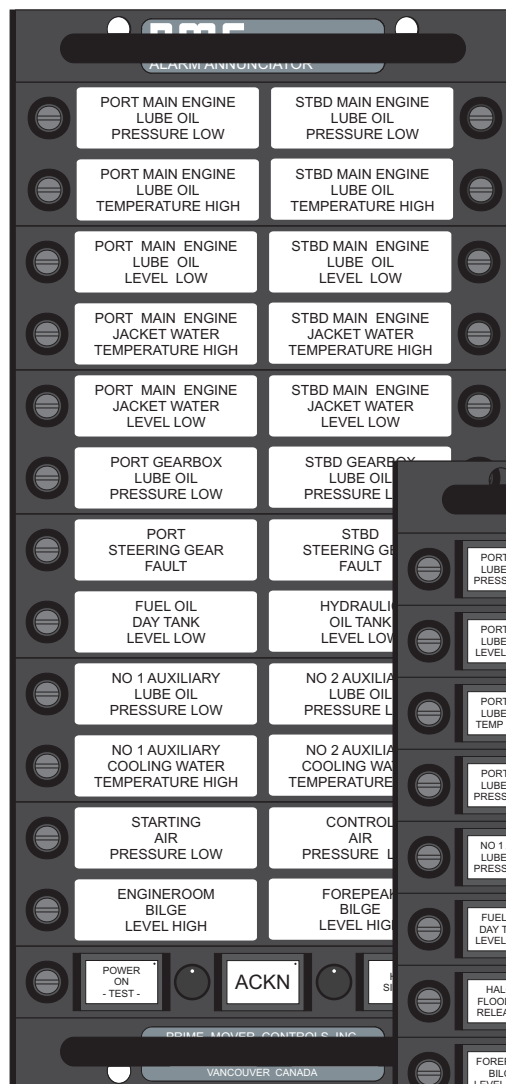
PRIME MOVER CONTROLS INC.

GENERAL

The Type 8421 Alarm Annunciator is an integral part of the 8421 Universal Display and Control (UDC) series of products designed specifically for the marine industry. It is a compact, modular solid-state alarm annunciator for operation with digital (on-off) type sensors. Operating voltage is 12, 24 or 32 VDC direct from ship's batteries. Special cables are not required.

Highly visible engraved LED type displays offer a large white engraving surface, which becomes a brilliant red when turned on. LAMP type displays feature coloured lenses in a compact high-density format.

Up to four alarm points per module are provided using CMOS circuitry under microprocessor control. In a 19" high enclosure, up to 32 LED or 64 LAMP display alarm points are available. Dimming control is included as required.

All modules are plug-in and front removable without tools. Lenses and bulbs are front replaceable and an internal fuse is accessible on the control module. All PC boards are ultrasonically cleaned, conformal coated and system tested prior to shipment.

OPERATION

Remote fault contacts may be normally open (closed on fault) or normally closed (open on fault). Also, using an optional end of line resistor, open circuit, line shorts and status change can be detected. Each alarm is delayed by an adjustable time period of 0.5 to 60 seconds. Any alarm that persists longer than the set time delay is captured and will be held until acknowledged. Automatic reset occurs after the alarm has been acknowledged and corrected.

The front display will flash for each new fault until acknowledged and will remain on steady while the fault persists. Also, new faults operate on internal horn as well as external horn/beacon circuits. Horns will operate until acknowledged or silenced. However, if silenced first, the alarm display will continue to flash until it is acknowledged. When a new fault occurs the silence pushbutton flashes. This provides a quick visual indication of which enclosure is annunciating the alarm, in multiple enclosure installations.

A test pushbutton is provided which, while it is pressed, will insert a fictitious fault into the input of all circuits. Pushing the button for longer than the maximum delay also checks time delays. Testing may occur at any time without altering the status of existing alarm displays.

FEATURES

Additional features which are included as standard, and which may be field programmed, include:

- **Disarm groups:** each point may be disarmed singly or as part of a group by an external NO contact. While disarmed, the alarm point stays off.
- **First out groups:** each point may be included in a first out group. The first fault that appears in the group will cause its front display to flash normally. Subsequent faults within the group that occur before the first is acknowledged will flash at a rate different than normal.
- **Repeater groups:** each point may be included in a repeater group. When any point in the group is in a fault mode a signal is sent to the remote group repeater, which than indicates that a fault exists in that group.
- **Repeater reflash:** any new fault in a repeater group will cause the remote repeater to begin flashing and also re-trigger the horn.
- **Secondary display outputs:** any point may be set to provide an output signal which follows the alarm, or the display light, or the input fault status.

All field programming can be done at the rear terminals or included jumpers and switches on each printed circuit board. A readily accessible fuse is provided in the control module. All PC boards are conformal coated and system tested before shipment.

EQUIPMENT

Additional equipment is available to complete the alarm system including: remote group alarm repeaters, single point displays, cabin repeaters, watch keeping systems, cabin call systems, logic and control units, overload alarms, air horns, electric and electronic horns, rotating beacons, strobes, mimic displays etc.

ALARM SEQUENCE DIAGRAM

EXECUTED CONCURRENTLY FOR ALL POINTS

LOGIC
WAITS FOR
POWER UP

- CONFIGURE SYSTEM

- SET FRONT DISPLAY
  TO STEADY OFF
- SET GROUP REPEATER
  TO STEADY OFF

LOGIC
WAITS FOR
FAULT

ARMED
AND
FAULT
EXISTS

FAULT CLEARED
BEFORE TIME
DELAY EXPIRED

TEST PB
PRESSED

DIS-
ARMED

LOGIC
WAITS FOR
TIME DELAY
TO EXPIRE

FIRST ALARM
IN FIRST OUT
GROUP

SUBSEQUENT
ALARM IN FIRST
OUT GROUP

- TURN ON HORNS
- FLASH FRONT DISPLAY
- FLASH GROUP
  REPEATER

- SILENCE HORNS
- SET SECONDARY
  OUTPUT TO
  STEADY OFF

- FLASH FRONT DISPLAY
  INTERMITTENTLY
- FLASH GROUP
  REPEATER

LOGIC
WAITS FOR
RESPONSE
FROM
OPERATOR

SILENCE PB
PRESSED

FAULT
STILL
CLEAR

ACKNOWLEDGE
PB PRESSED

POINT ARMED AND
FAULT RETURNED TO NORMAL
BEFORE 1/2 SEC EXPIRED

- SET FRONT DISPLAY TO STEADY ON
- SET GROUP REPEATER TO STEADY ON
- RESET FIRST OUT GROUP STATUS
- SILENCE HORNS

LOGIC
WAITS FOR
FAULT
TO CLEAR

POINT

DIS-
ARMED

LOGIC
WAITS FOR
1/2 SEC

FAULT CLEARED

PRIME MOVER CONTROLS, INC.

FIELD SELECTABLE OPTIONS PROVIDED FOR EACH ALARM POINT

FUNCTION	STANDARD FACTORY SETTINGS	PROGRAMMABLE OR REAR TERMINAL OPTIONS
First Out Group	None	Created by connecting specific rear terminals together
Repeater Group	None	Created by connecting specific rear terminals together
Disable Group	None	Created by connecting specific rear terminals together
Time Delay	Minimum value of 1/2 second	Time delays are switch selectable for each alarm point in one second intervals up to 10 seconds and at fixed values of 15, 20, 30 and 60 seconds
Alarm Field Contact	NC Normally closed contact - opens on fault	- NC Normally Closed, opens on fault - NO Normally Open, closes on fault - NO+ELR Normally Open with End of Line resistor, close on fault (open circuit and line short are also treated as faults)
Disable Input or Secondary Output	Disable Input	- Disable input; connect terminal to common negative line to disable alarm point - Secondary Open Collector output, with the following three optional drive capabilities: 　1. Output Follows Display - output is active low when the front alarm display is on and high impedance when the display is off; output flashes high/low when the front display flashes 　2. Output Follows Alarm - output is steady active low while front display is flashing; output is high impedance when display is steady on or off 　3. Output Follows Fault - output is steady active low while remote alarm field contact remains in fault mode (while front display is flashing or steady on); when fault contact is normal the output is high impedance
Internal Horn	Enabled	- Enabled: the internal alarm horn operates for each new incoming alarm condition - Disabled: the internal alarm horn does not operate for each new incoming alarm condition

LENS OPTIONS - SHOWN FULL SCALE WITH TYPICAL ENGRAVING

No.1 AUXILIARY DIESEL
JACKET WATER
TEMPERATURE HIGH

LENS SIZE 0.85" x 2.5" (22 x 63)

FUEL OIL
DAY TANK
LEVEL LOW
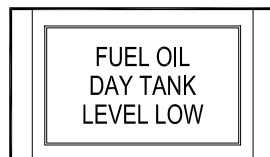
LENS SIZE 0.6" x 1.0" (15 x 25)

PORT MAIN ENGINE
LUBE OIL PRESSURE
EXTREME LOW
-SHUT DOWN ENGINE-

LENS SIZE 1.85" x 2.5" (47 x 63)

- BACKGROUND COLOR IS WHITE WHEN UNPOWERED
- BACKGROUND COLOR IS RED WHEN POWERED
- LENSES ARE FRONT REMOVABLE

D1	C1 M9 ▭▭▭▭▭▭▭▭▭▭▭ M20 B1 A1
POS. 16	POSITION 16 POS. 16
D5 C5	B5 A5
D1 C1	B1 A1
POS. 15	POSITION 15 POS. 15
D5 C5	B5 A5
D1 C1	B1 A1
POS. 14	POSITION 14 POS. 14
D5 C5	B5 A5
D1 C1	B1 A1
POS. 13	POSITION 13 POS. 13
D5 C5	B5 A5
D1 C1	B1 A1
POS. 12	POSITION 12 POS. 12
D5 C5	B5 A5
D1 C1	B1 A1
POS. 11	POSITION 11 POS. 11
D5 C5	B5 A5
D1 C1	B1 A1
POS. 10	POSITION 10 POS. 10
D5 C5	B5 A5
D1 C1	B1 A1
POS. 9	POSITION 9 POS. 9
D5 C5	B5 A5
D1 C1	B1 A1
POS. 8	POSITION 8 POS. 8
D5 C5	B5 A5
D1 C1	B1 A1
POS. 7	POSITION 7 POS. 7
D5 C5	B5 A5
D1 C1	B1 A1
POS. 6	POSITION 6 POS. 6
D5 C5	B5 A5
D1 C1	B1 A1
POS. 5	POSITION 5 POS. 5
D5 C5	B5 A5
D1 C1	B1 A1
POS. 4	POSITION 4 POS. 4
D5 C5	B5 A5
D1 C1	B1 A1
POS. 3	POSITION 3 POS. 3
D5 C5	B5 A5
D1 C1	B1 A1
POS. 2	POSITION 2 POS. 2
D5 C5	B5 A5
D1 C1	B1 A1
POS. 1	POSITION 1 POS. 1
D5 C5	B5 A5
D1 C1	B1 A1
POS. 0	POSITION 0 / CONTROL POS. 0
D7	C7 PMC ▭▭▭▭▭▭▭ M8 P/N 8421-9019 B7 A7
	M1

REAR VIEW OF 19" PANEL

PRIME MOVER CONTROLS, INC.

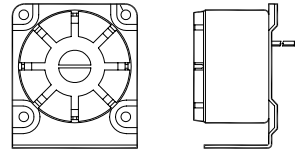# ALARM SYSTEM ACCESSORIES
- ALL ITEMS SHOWN QUARTER SCALE-

ROTATING BEACON
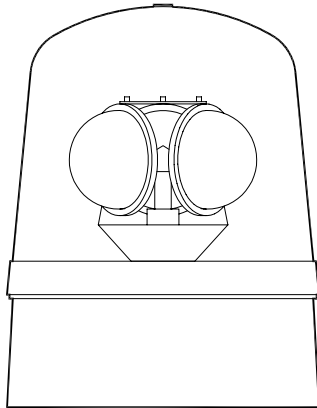
HOOD COLORS:
RED
GREEN
AMBER
BLUE
CLEAR

PMC PART No. 8540-1400
12VDC/24VDC/120VAC OPERATION AT 70 W.

ELECTRONIC HORN

RATED 112 DBA AT 10'

PMC PART No. 8540-1311
12VDC/24VDC OPERATION

ELECTRIC HORN - SIREN
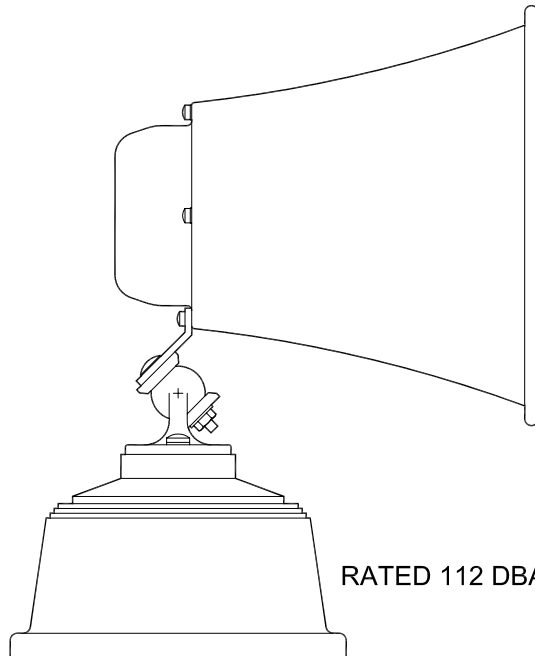
RATED 112 DBA AT 10'

PMC PART No. 8540-1314
24VDC/120VAC OPERATION

SOLENOID ACTUATED AIR HORN
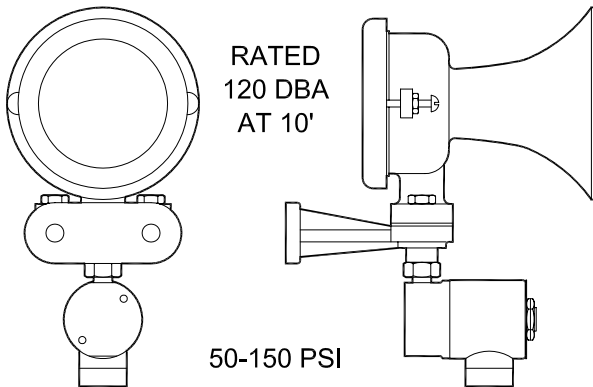
RATED 120 DBA AT 10'

50-150 PSI

PMC PART No. 8540-1310
12VDC/24VDC/120VAC OPERATION

REMOTE ALARM REPEATERS AND DISPLAYS

POWER ON TEST

HORN SILENCE

POWER ON TEST

HORN SILENCE

CABIN ALARM - WATCHKEEPING
PMC PART No. 8421
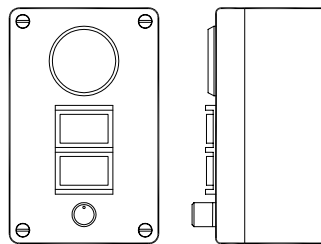
SINGLE POINT DISPLAY
PMC PART No. 8121-2000

BRIDGE ALARM REPEATER
PMC PART No. 8421

12VDC/24VDC OPERATION

TYPICAL ELECTRICAL CONNECTIONS
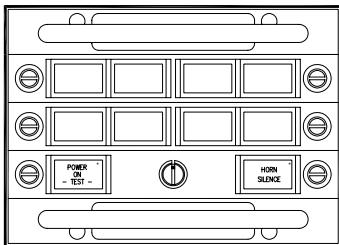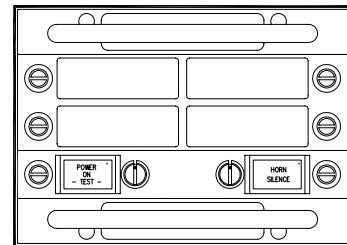
+ — 24 VOLTS DC — —

FUSE TERMINAL   DISCONNECT TERMINAL

FIRST OUT GROUP No.1

REPEATER GROUP No.1

A3 A4 A5 — ALARM POSITION 6A (ROW 6 ITEM A) — **A1** FAULT CONTACT — NORM OPEN PRESS SWITCH CLOSED = FAULT
A2 DISABLE CONTACT — NORM OPEN LIMIT SWITCH CLOSED = DISARMED

A3 A4 A5 — ALARM POSITION 5A (ROW 5 ITEM A) — **A1** FAULT CONTACT — NORM CLOSED RELAY CONT OPEN = FAULT
A2 — DISABLE GROUP No.___

D3 D4 D5 — ALARM POSITION 5D (ROW 5 ITEM D) — **D1** FAULT CONTACT **D2** — EOR — NORM OPEN TEMP SWITCH WITH END OF LINE RESISTOR CLOSED = FAULT OPEN LINE = FAULT SHORTED LINE = FAULT

C3 C4 C5 — ALARM POSITION 4C (ROW 4 ITEM C) — **C1** FAULT CONTACT **C2** — NORM CLOSED LEVEL SW OPEN = FAULT

A3 A4 A5 — ALARM POSITION 3A (ROW 3 ITEM A) — **A1** FAULT CONTACT **A2** — NORM CLOSED PRESS SW (OIL) OPEN = FAULT

B3 B4 B5 — ALARM POSITION 2B (ROW 2 ITEM B) — **B1** FAULT CONTACT — NORM CLOSED PUSHBUTTON OPEN = FAULT
B2 DISABLE CONTACT — NORM CLOSED LIMIT SWITCH OPEN = ARMED

TO BRIDGE REPEATER INDICATOR LIGHT

B3 B4 B5 — ALARM POSITION 1B (ROW 1 ITEM B) — **B1 B2** — NORM OPEN ALARM POSITION INPUT NOT CONNECTED = OFF / DISABLE INPUT NOT CONNECTED ALARM FUNCTIONS NORMALLY

REPEATER GROUP No.2

TO BRIDGE REPEATER INDICATOR LIGHT

C3 C4 C5 — ALARM POSITION 1C (ROW 1 ITEM C) — **C1 C2** — NORM CLOSED ALARM POSITION, INPUT SHORTED TO COMMON=OFF E.G. UNUSED SPARE POSITION / DISABLE INPUT SHORTED TO COMMON = ALARM IS DISABLED

REPEATER GROUP No.3

TO BRIDGE REPEATER INDICATOR LIGHT

C3 C4 C5 KA — CONTROL MODULE — **D7 A3 A4 A5** KF — TO EXTERNAL FLASHING RELAY
TO EXTERNAL ALARM RELAY

B6 TEST
A7 SIL   ACKN **A6** — EXTERNAL OPTIONAL NORM OPEN ACKNOWLEDGE PB
D1 + POSITION 0 — **D2**

EXTERNAL OPTIONAL NORM OPEN SILENCE PB

EXTERNAL OPTIONAL NORM OPEN TEST PB

PRIME MOVER CONTROLS, INC.

ARRANGEMENTS, DIMENSIONS AND CUTOUTS

FRONT VIEW	SIDE VIEW	REAR VIEW	CUTOUT

FRONT VIEW modules: 16, 15, 14, 12, 11, 10, 8, 7, 6, 4, 2, 1, 0

A — 7" / 177.8

SIDE VIEW — 8.05" / 204.5 — 0.7" — 18

REAR VIEW — 6.45" / 163.8 — B

CUTOUT sizes: 19" SIZE, 15" SIZE, 11" SIZE, 7" SIZE, 5" SIZE

C D

4" / 101.6 — E
6.55" / 166.4
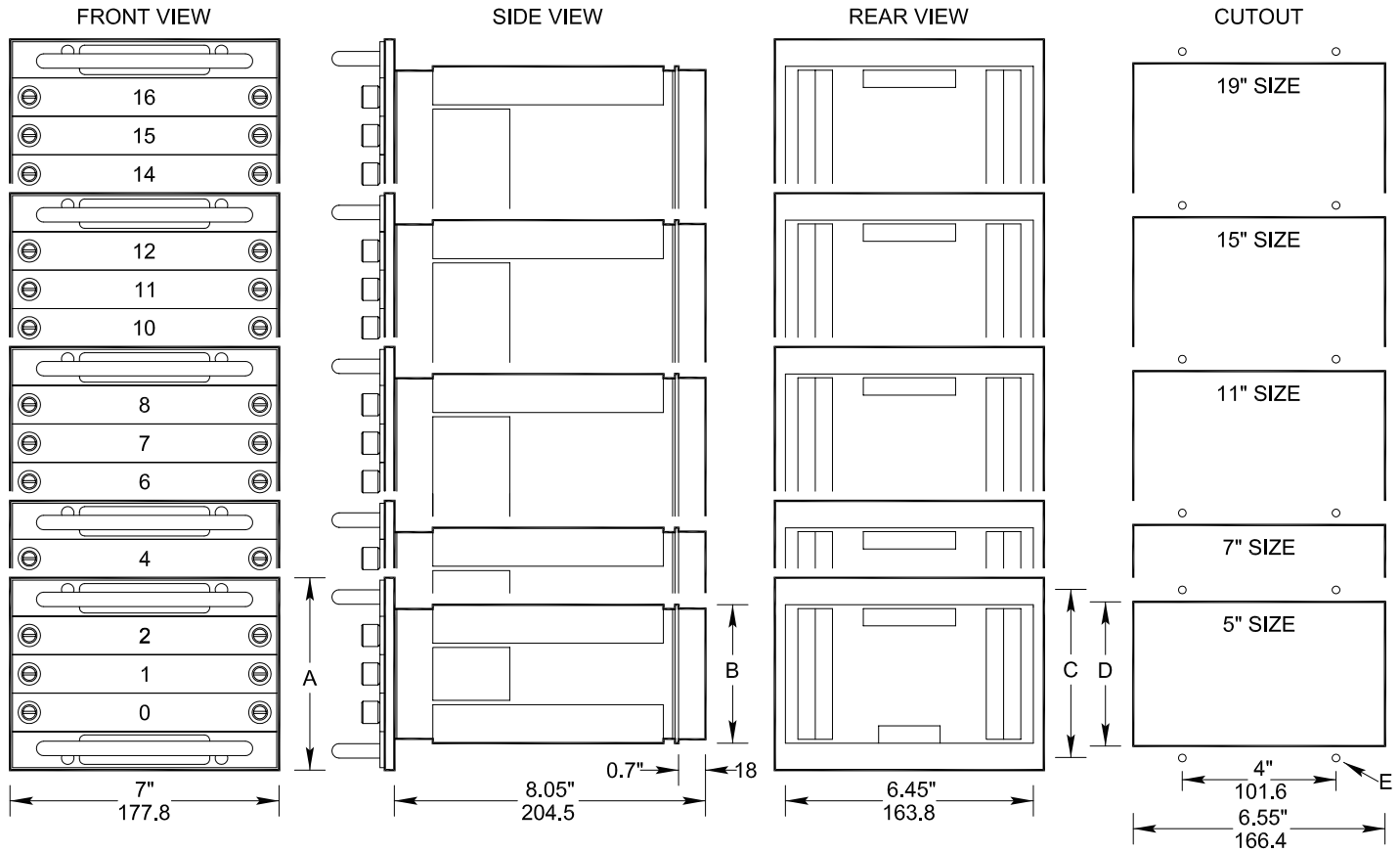
ENCLOSURE DIMENSIONS (INCHES)

A	5	7	11	15	19
A	5	7	11	15	19
B	3.60	5.60	9.60	13.60	17.60
C	4.37	6.37	10.37	14.37	18.37
D	3.75	5.75	9.75	13.75	17.75
E	4 HOLES DRILL 0.220 OR TAP 10-24 UNC				
F	MOUNTING HARDWARE KIT P/N 8800-9045				

Mounting hardware kit "F", included with each panel,
consists of 4 socket cap machine screws, nuts and washers

ENCLOSURE DIMENSIONS (mm)

A	127.0	177.8	279.4	381.0	482.6
A	127.0	177.8	279.4	381.0	482.6
B	91.4	142.2	243.8	345.4	447.0
C	111.0	161.8	263.4	365.0	466.6
D	95.3	146.1	247.7	349.3	450.9
E	4 HOLES DRILL 5.50 OR TAP M5 X 0.8				
F	MOUNTING HARDWARE KIT P/N 8800-9046				

SPECIFICATIONS

Components:
- Control Module — Weight: 0.480kg (1.06lbs) — Power: 0.290 amps at 24 volts DC
- Quad 1" Lamp Switch Module — Weight: 0.305kg (0.67lbs) — Power: 0.380 amps at 24 volts DC
- Dual 2" LED Display Module — Weight: 0.360kg (0.79lbs) — Power: 0.360 amps at 24 volts DC
- Dual 1" LED Display Module — Weight: 0.305kg (0.67lbs) — Power: 0.380 amps at 24 volts DC
- Enclosure 19" — Weight: 2.950kg (6.50lbs) — Power: None - passive unit
- Enclosure 15" — Weight: 2.380kg (5.25lbs) — Power: None - passive unit
- Enclosure 11" — Weight: 1.850kg (4.08lbs) — Power: None - passive unit
- Enclosure 7" — Weight: 1.350kg (2.98lbs) — Power: None - passive unit
- Enclosure 5" — Weight: 1.120kg (2.47lbs) — Power: None - passive unit

Display:
- engraved translucent front replaceable lens backlit by LED diffused packages or by two incandescent bulbs
- display flash rate synchronization available between multiple enclosures

Illumination:
- backlit displays show white when off and brilliant red when powered - with full range internal dimming circuits
- lamp displays include two front removable bulbs

Power Input:
- nominal 12-24 VDC (lamp) 24-32 VDC (LED)
- range 10.8-28.8 VDC (lamp) range 19.2-38.4 VDC (LED)
- input current, see totals above
- reverse and overvoltage protection to 120 VAC
- input power fuse, 5 amps, type ABC-5

Environmental:
- storage -40°C to +75°C
- operating 0°C to +70°C

Physical:
- maximum 19"Hx7"Wx6"D (483x178x152mm)
- weight, see totals above

PRIME MOVER CONTROLS INC.
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