norman

INSTRUCTION MANUAL

2000

2000

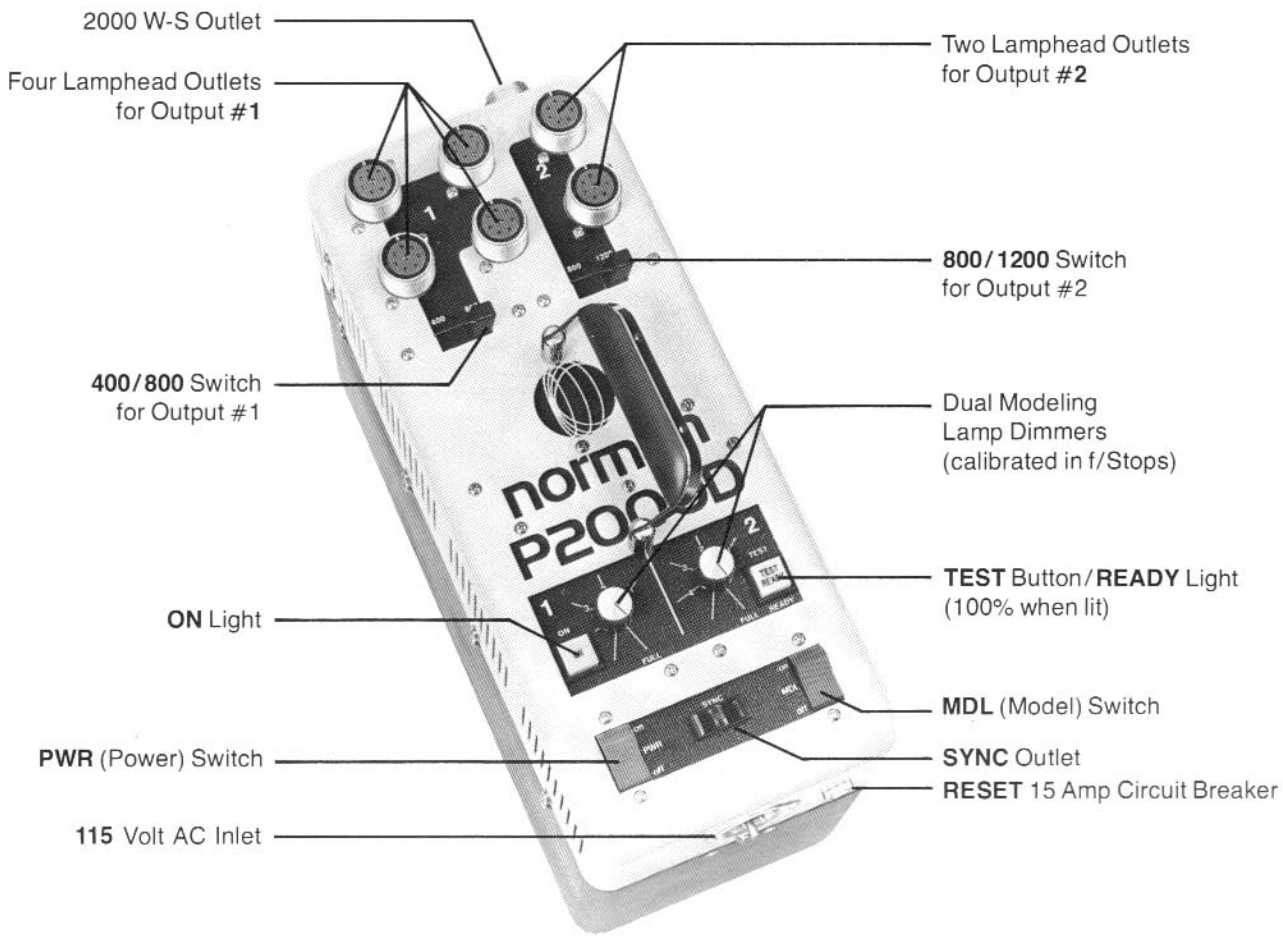
Welcome to the Norman family of *interchangeable* flash equipment.

You have just purchased a Norman 2000 flash unit that will provide you with years of dependable service. It has a heavy duty 2000 watt-second circuit, and several exclusive design features and conveniences not found on other commercially available flash equipment.

- A flash ratio feature that allows you to effectively have two power units in one so you can obtain more light from some lights than others.
- A ratio light distribution feature that allows you to adjust the modeling lamp intensities in direct proportion to the flash outputs.
- Seven lamphead outlets!
- A heavy duty transformerless circuit that enables you to flash the unit for extended periods without overheating the power supply. This transformerless design has also reduced the weight by 20 lbs. over our previous transformer type units.
- Interchangeable with the complete Norman Series 900 equipment line which includes over 50 items — reflectors, snoots, barn doors, power supplies, umbrellas, diffusers, etc.

It is our sincere desire that you will benefit from the engineering and manufacturing expertise that has brought you this unique system.

If we can be of service or if you have any suggestions or questions, please do not hesitate to contact us.



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IMPORTANT SAFEGUARDS

in accordance with UL 122 specifications for photographic equipment.

When using your photographic equipment, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions.
2. Care must be taken as burns could occur from touching the modeling lamp.
3. Do not operate the appliance with a damaged cord or if the appliance has beed dropped or damaged until it has been examined by a qualified serviceman.
4. If an extension cord is necessary, a cord with a suitable current rating should be used. Cords rated for less amperage than the appliance may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
5. When practical, unplug the appliance from the electrical outlet when not in use. Never yank the cord to pull from the outlet. Grasp the plug and pull to disconnect.
6. To avoid electric shock hazard, do not disassemble this appliance, but take it to a qualified serviceman when service or repair work is required. Incorrect reassembly could cause an electric shock hazard when the appliance is subsequently used.

EXPLANATION OF INDICATORS AND CONTROLS

AC INLET

Connects to the AC power cable. The AC input voltage is 115 volt, 60 Hz.

PWR Switch

Controls the AC power to the flash circuit. The main capacitors automatically discharge when the PWR switch is off.

NOTE — it is not necessary to turn the PWR switch off when connecting or disconnecting lights on power supplies manufactured after serial #13480.

MDL Switch

Turns the modeling lamps on or off. The MDL switch operates independent of the PWR switch so that the modeling lamps can be turned on with the flash circuit left off.

ON Indicator

Illuminates when the PWR switch is on and when the power is reaching the circuit.

TEST/READY Light

Illuminates when the circuit reaches 100% voltage stabilized output. The unit can be flashed by depressing the TEST/READY light.

RESET Circuit Breaker

Rated at 15 amps. It automatically protects the flash circuit against excessive overloads. If the ON light goes off but the PWR switch and modeling lamps are on, the RESET breaker is probably activated causing the button to pop out about ¼ inch. To reset the breaker simply wait about 30 seconds and depress it back to its normal position.

SYNC Outlet

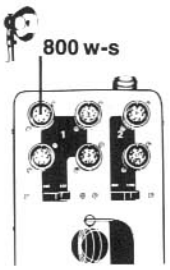
Triggers the flash. Plug your camera sync extension cord into this outlet. Proper polarity is important with most cameras (cameras with grounded sync contacts). To check polarity, simply touch any exposed (non-painted and non-anodized) metal on the camera body to any exposed (non-painted and non-anodized) metal on the flash unit. If the unit flashes when this is done, reverse the sync cord to achieve the correct polarity. This establishes a common ground between the camera body and the flash unit. If the polarity is incorrect, the unit could self flash or flash intermittently.

EXPLANATION OF INDICATORS AND CONTROLS

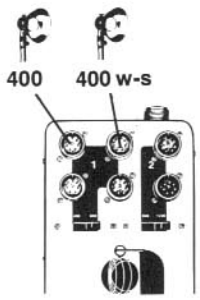
400/800 Switch

Controls the light output on the four output #1 connectors. All four connectors are connected together (in parallel) so the light output is split evenly between each of the connectors. See illustrations below:

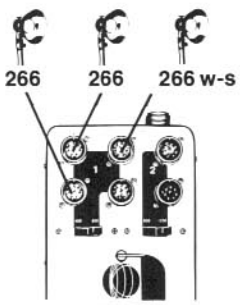
SWITCH SET TO 800



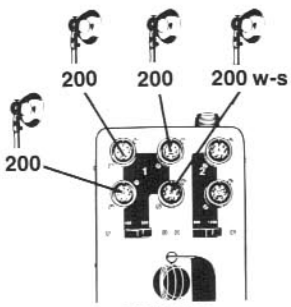
1 LIGHT



2 LIGHTS

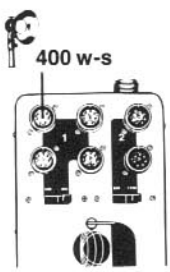


3 LIGHTS

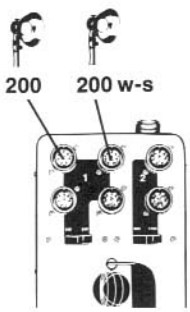


4 LIGHTS

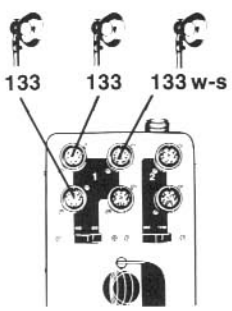
SWITCH SET TO 400



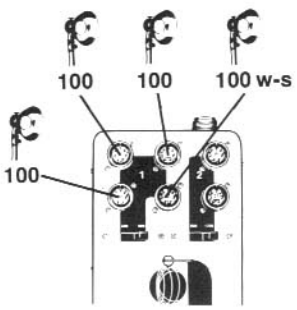
1 LIGHT



2 LIGHTS



3 LIGHTS

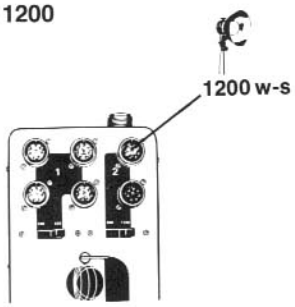


4 LIGHTS

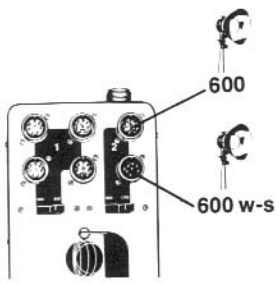
800/1200 Switch

Controls the light output on the two output #2 connectors. Both connectors are connected together (in parallel) so the light output is split evenly between them. See illustrations below:

SWITCH SET TO 1200

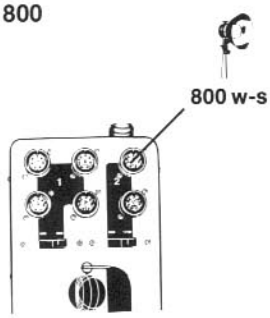


1 LIGHT

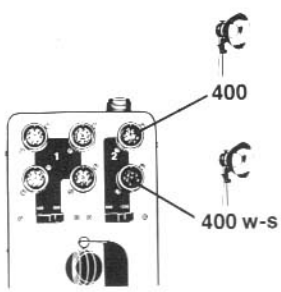


2 LIGHTS

SWITCH SET TO 800



1 LIGHT

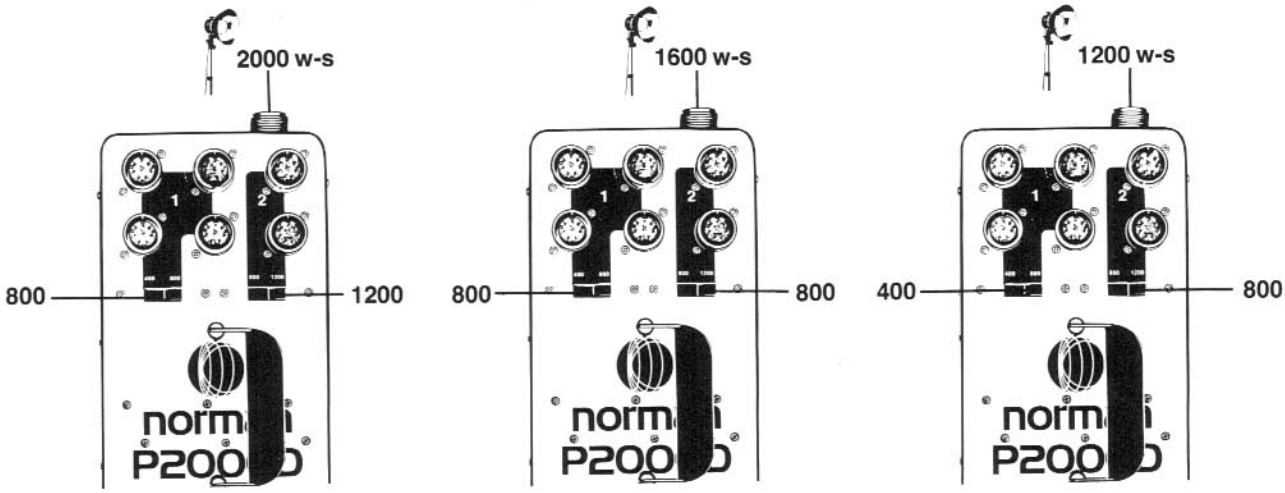


2 LIGHTS

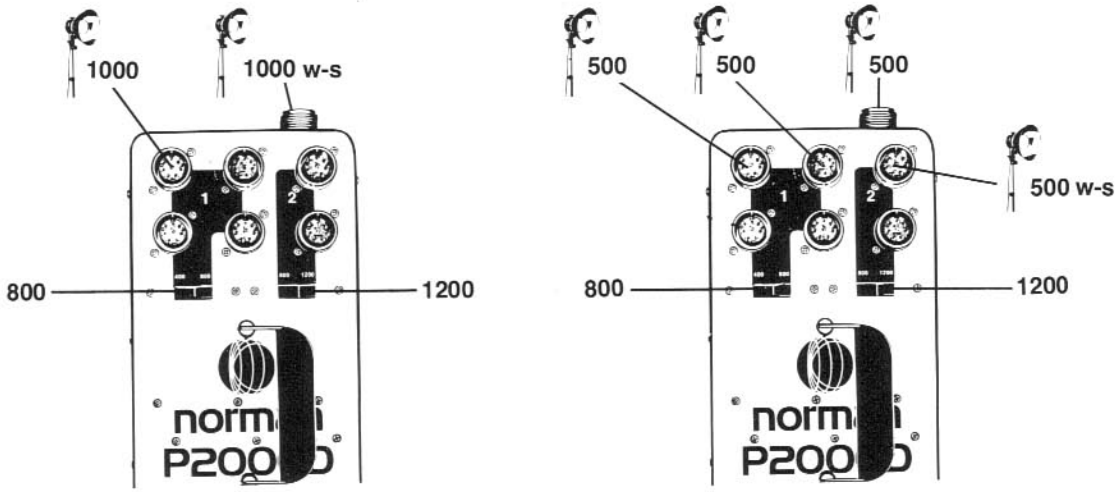
EXPLANATION OF INDICATORS AND CONTROLS

2000 W-S Outlet

Enables you to obtain the full 2000 w-s output on a single lamphead. The 400/800 switch and the 800/1200 switch must be both set to their maximum outputs to achieve the full 2000 w-s as illustrated below:



The output #1 and output #2 channels are automatically tied together (in parallel) when using the 2000 w-s outlet. Therefore, as you insert additional lampheads to any other outlet, the light output is split evenly among the lights as illustrated below:

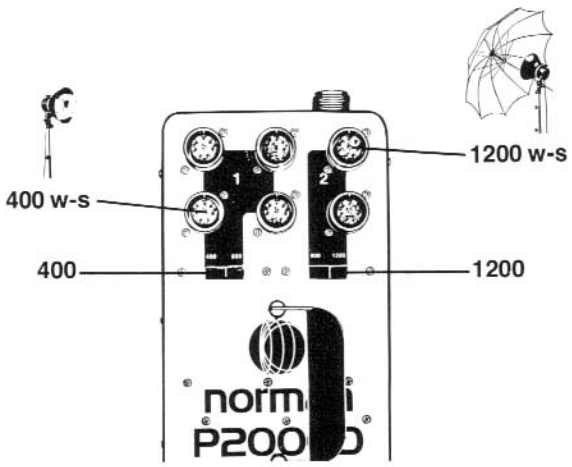


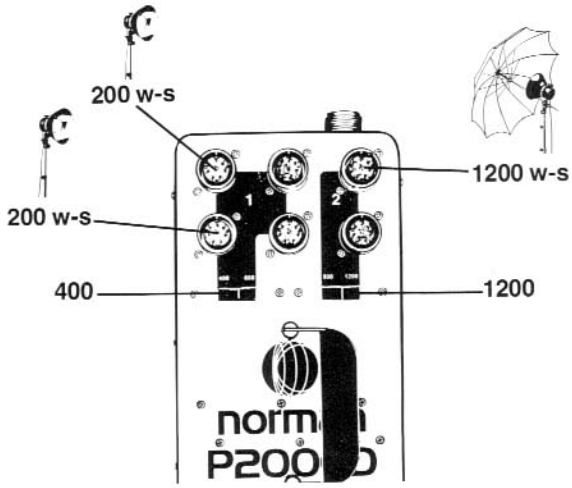
CAUTION — Only insert a connector into the 2000 w-s outlet when the ready light is on or when the power supply has been off for at least ten seconds. Units manufactured before serial number 13460 must have the PWR switch "off" for at least ten seconds before inserting or removing lampheads from *any* outlet.

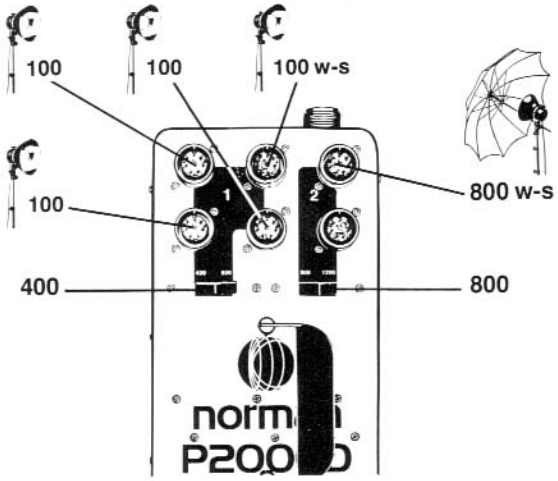
EXPLANATION OF INDICATORS AND CONTROLS

RATIO OUTPUTS USING BOTH OUTPUT #1 AND OUTPUT #2 SIMULTANEOUSLY

It is obvious that numerous light output combinations are possible when using both output #1 and output #2 simultaneously. In order that you visually see the effects of these lighting ratios, your power supply is equipped with dual modeling lamp dimmers.







P2000-D SPECIFICATIONS

OUTPUT LEVEL (Watt-Seconds)	2000	1600	1200	800	400
RECYCLE TIME (seconds to 100% output)	2.75	2.5	1.75	1	.6
FLASH DURATION	1/240	1/300	1/400	1/600	1/1200
LIGHT OUTPUT Reflector Type 5C	5,000	4,000	3,000	2,000	1,000
Reflector Type 5E-2	25,000	20,000	15,000	10,000	5,000
Reflector Type 5U-2	75,000	60,000	45,000	30,000	15,000
Reflector Type 5W	22,500	18,000	13,500	9,000	4,500
Reflector Type 5X	7,500	6,000	4,500	3,000	1,500

ENERGY STORAGE:
2000 watt-seconds total

AC INPUT VOLTAGE:
105-135 volts, 50-400 Hz (sine wave)

DC OUTPUT VOLTAGE:
900 volts (volts stabilized)

FUSE (circuit breaker):
15 amperes

WEIGHT:
29 lbs.

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EXPLANATION OF INDICATORS AND CONTROLS

MODELING LAMP DIMMERS

Dims the modeling lamps so that they will ratio to the flash outputs. The dimmers are calibrated in one f/stop increments (four f/stop range). Proper adjustment of the modeling lamp dimmers enable you to see the actual light ratios and shadow detail with the modeling lamps. You can also raise or lower the overall modeling lamp brilliance and still maintain the proper balance to the flash. A real asset when photographing people where the modeling lamps are uncomfortably bright for the subject. Also convenient when all the flash outputs are on low power and you need more light to focus on the subject.

DIMMER #1 — Controls the modeling lamps on the four output #1 connectors.

DIMMER #2 — Controls the modeling lamps on the two output #2 connectors and on the 2000 w-s connector.

There is a ½ f/stop relationship between 800 w-s and 1200 w-s. Therefore, if one light is at 1200 w-s (output #2) and another light is at 800 w-s (output #1), the output #2 (1200 w-s) dimmer could be set to full and the output #2 (800 w-s) dimmer could be set between full and "1" (½ f/stop) less than the modeling lamps on output #2 (just like the flash). Refer to illustration #1:

For additional information on the relationship between watt-seconds and f/stops, refer to chart below.

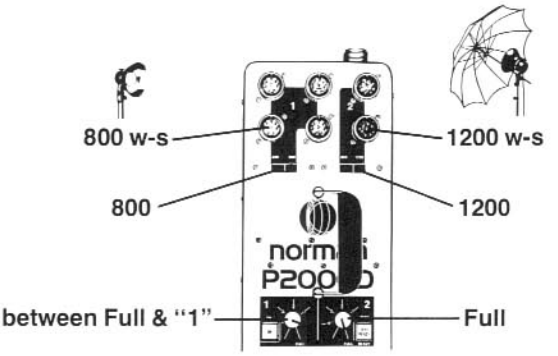

Illustration #1

If a second light were added to output #1 the flash outputs on that side would be reduced by one f/stop (to 400 w-s each). This would enable you to still compose your lighting with the modeling lamps. Refer to illustration #2:

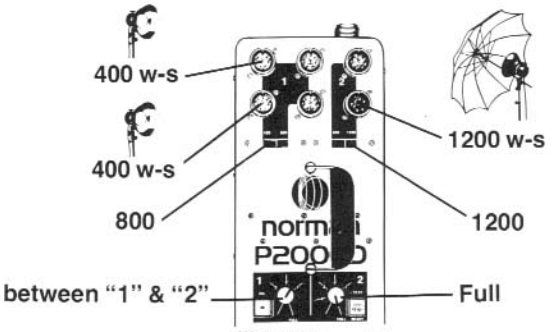

Illustration #2

If the modeling lamps are uncomfortably bright for the subject you can lower them in direct ratio by adjusting both dimmers by the same amount. See illustration #3:

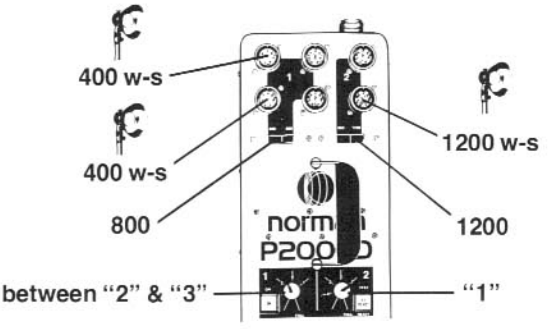

Illustration #3

RELATIONSHIP BETWEEN WATT-SECONDS AND f/STOPS (USING THE SAME REFLECTOR)

Remember, when you double the watt-seconds you gain one f/stop (400 w-s to 800 w-s equals a one f/stop gain; 800 w-s to 1600 w-s equals another f/stop gain).

To get an increase of ½ f/stop multiply watt-seconds by 1.5. For example, 400 w-s x 1.5 equals *600* w-s. This is a ½ f/stop increase. Here is a chart that illustrates this principle:

100 w-s to 200 w-s	*equals* — 1 f/stop gain	*total gain equals* — 2 f/stops	4½ f/stops
200 w-s to 400 w-s	*equals* — 1 f/stop gain		
400 w-s to 600 w-s	*equals* — ½ f/stop gain	*total gain equals* — 1 f/stop	
600 w-s to 800 w-s	*equals* — ½ f/stop gain		
800 w-s to 1200 w-s	*equals* — ½ f/stop gain	*total gain equals* — 1 f/stop	
1200 w-s to 1600 w-s	*equals* — ½ f/stop gain		
1600 w-s to 2000 w-s	*equals* — ¼ f/stop gain	*total gain equals* — ¼ f/stop	

Therefore, increasing the power from 100 w-s to 2000 w-s yields an increase of 4½ f/stops.