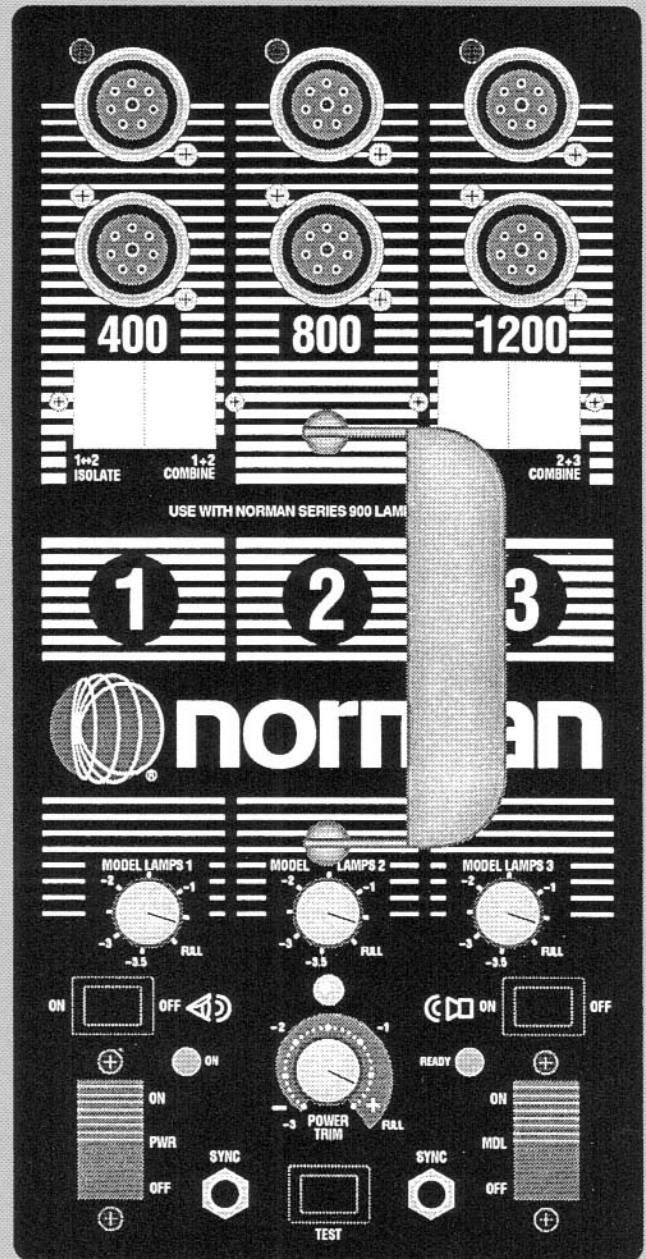




norman

INSTRUCTION MANUAL



P24/24



P24/24



Welcome to the Norman Family of interchangeable flash equipment.

Your new P24/24 power supply is engineered and constructed to provide years of dependable service. For this reason, its limited warranty is two full years from the date of purchase.

The 24/24 offers several features that photographers have been asking for, including a range of power levels which make this unit suitable for a wider range of photographic applications; from low-key portraiture to a large-scale set. We are confident that you will agree the 24/24 is one of the finest flash units that Norman has ever produced.

Its features include:

- ⑬ Three channels of power; 1200, 800 and 400 w-s. It's like having three units in one.
- ⑬ A 3-stop "Power Trim" dial that allows you to fine-tune the light output over a broad range while keeping all pre-selected lighting ratios intact.
- ⑬ Six lamphead outlets; two per channel.
- ⑬ Two sync outlets; one for the camera and one for a flash meter.
- ⑬ A built-in, stable, super-sensitive photo eye (switchable).
- ⑬ An audible ready signal (switchable).
- ⑬ Dependable and proven heavy duty circuits.
- ⑬ Interchangeable with all Norman Series 900 equipment which includes over 50 products; spot lights, "Tri-Lights," barn doors, reflectors, snoots, umbrellas, diffusers and so forth.



- 1 115 Volt AC Inlet
- 2 PWR (Power) Switch
- 3 MDL (Model) Switch
- 4 ON Indicator
- 5 READY Light (100% when lit)
- 6 TEST Button
- 7 Photo Eye Switch
- 8 Audible Ready Switch
- 9 POWER TRIM Dial
- 10 RESET 15 Amp Circuit Breaker
- 11 Dual SYNC Outlets
- 12 1+2 & 2+3 COMBINE/ISOLATE Switches
- 13 Lamphead Outlets (6)
- 14 MDL Lamp Dimmers (3; 1 per channel)

READ FIRST - IMPORTANT SAFEGUARDS - ON BACK COVER

EXPLANATION OF INDICATORS AND CONTROLS

1 – AC INLET

Connects to the AC power cable to the unit. The AC input voltage can be from 90 to 135 volts, 50-60 Hz, without affecting the light output.

2 – PWR Switch

Controls the AC power to the flash circuit. The main capacitors discharge automatically when either the PWR switch is OFF or the AC Power cable is disconnected.

3 – MDL Switch

Turns the modeling lamps ON or OFF. The MDL switch operates independent from the PWR switch so that the modeling lamps can be operated whether or not the flash portion of the unit is energized.

4 – ON Indicator

Illuminates red when the PWR switch is ON and when the power is reaching the circuit.

5 – READY Light

Illuminates green when the circuit reaches 100% voltage stabilized output.

6 – TEST Button

Test flashes the system. It is also handy for multiple-exposure open-shutter photography.

7 – Photo Eye Switch

Turns the photo-eye ON or OFF. This enables you to trigger the power supply from another electronic flash unit without using a sync cord. The eye is a super-sensitive I.R. (infra red) type that provides stable and dependable remote triggering. (The photo cell is located between the POWER TRIM Dial and the #2 MODEL LAMP Dimmer.)

8 – Audible Ready Switch

Turns the Audible Ready “beeper” ON or OFF. The Audible Ready signal serves two purposes.

1. Informs you when the unit is ready to flash without having to look at the READY Light.
2. Informs you that the unit has flashed. This is especially handy when the pack is being used on the Photo-Eye mode in conjunction with another flash unit.

9 – POWER TRIM Dial

The POWER TRIM permits the power output of the pack to be adjusted in accurate, repeatable increments over a 3–stop range. All lights are simultaneously adjusted without affecting your pre-existing lighting ratios.

There are two basic purposes of the POWER TRIM feature.

1. To fine-tune the flash output to match a pre-selected f/stop setting on the camera.
2. To adjust the light output over a wide range in a continuous sweep. For example, one light can be adjusted in this manner from 50 w-s to 2400 w-s when used in conjunction with the “1+2” and “2+3” switches, as illustrated below:

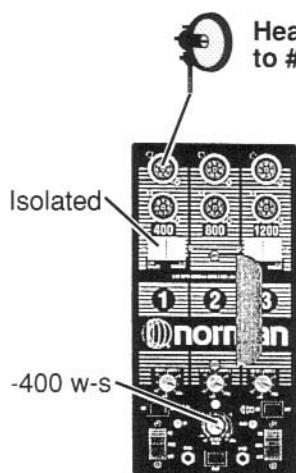


Fig. 1

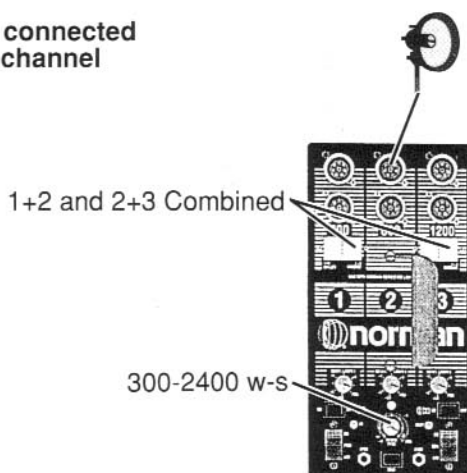


Fig. 2

To operate the POWER TRIM Dial simply adjust the knob to the desired light output level. The READY Light will go OFF and the SYNC Outlets will be disabled until the automatic internal adjustment has been completed. The 32-detent dial enables you to repeat a previous setting without the aid of a flash meter. Simply note the number of “clicks” from the end of the rotation.

EXPLANATION OF INDICATORS AND CONTROLS

10 – 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 mode lamps are ON, the RESET breaker is probably activated causing the button to pop out about 1/4 inch. To reset the breaker, simply wait about 30 seconds and depress the button.

Because of its unique charging circuit, the P24/24 is "kind" to household circuit breakers. Many photographers find that the Norman P12/12, P20/20 and P24/24 model power packs will operate in locations where competitive units might cause overloading of the main circuit breaker in the shooting location.

11 – DUAL SYNC Outlets

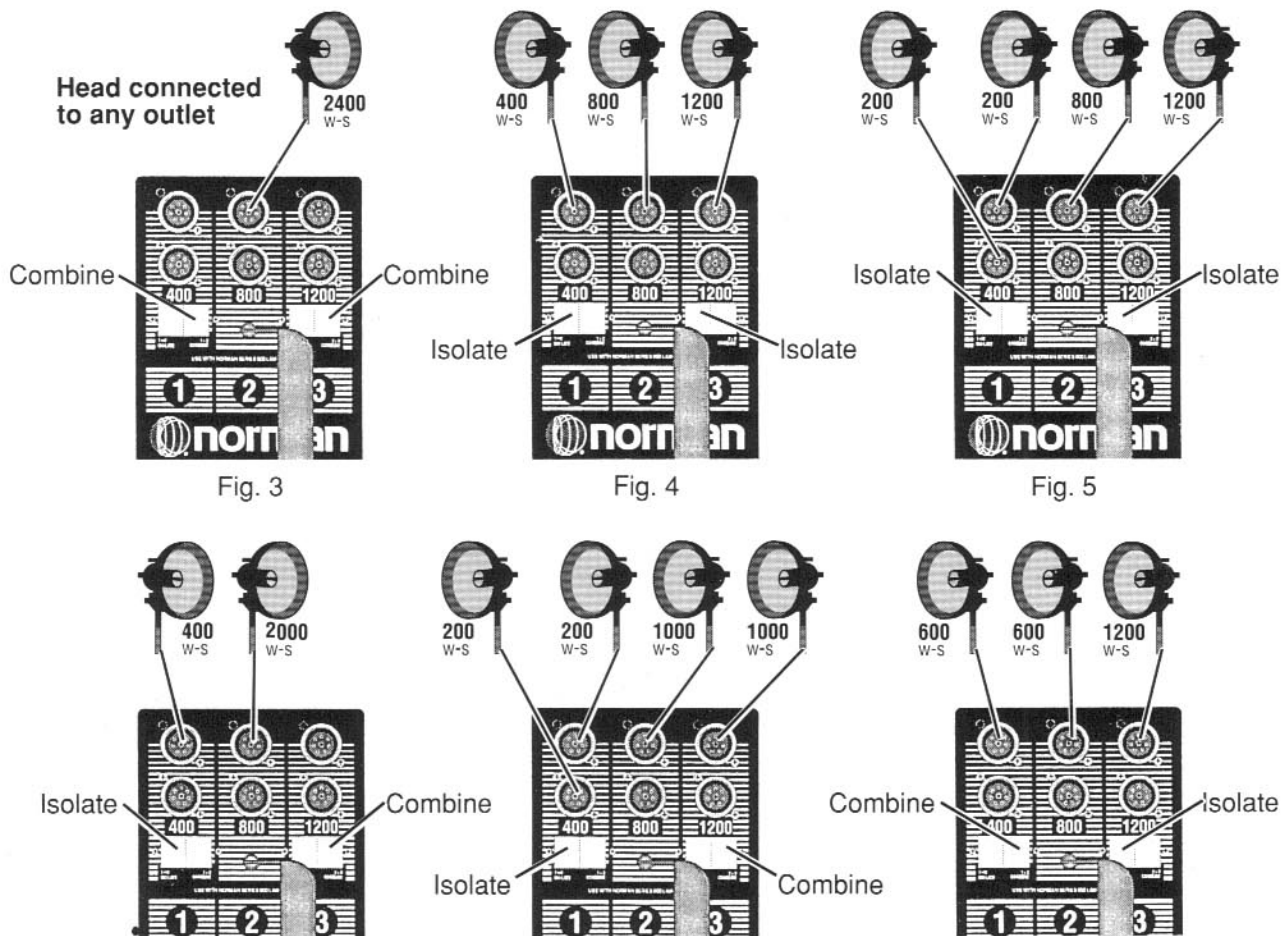
Triggers the flash. You may use either outlet as both are wired together (in parallel):

1. Camera - Plug your camera sync cord into one outlet. Proper polarity is important with most cameras. 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 this causes the unit to flash, reverse the sync cord polarity by turning the plug half way around and reconnecting. Improper polarity can cause self-flashing and/or intermittent operation.
2. Flash Meter - To prevent having to unplug your camera sync cord when metering the light output, this second outlet is provided. Simply leave your flash meter connected as desired.

12 – 1+2 and 2+3 COMBINE/ISOLATE Switches

Connects or isolates the lighting channels. To receive all 2400 w-s on a single lamphead, simply set both switches to their COMBINE modes. This establishes the entire unit as a single 2400 w-s channel with six lamphead outlets. Therefore, the light will be evenly split between the number of lampheads used.

Hundreds of possible lighting combinations are possible. Several are illustrated below:



EXPLANATION OF INDICATORS AND CONTROLS

13 – Lamphead Outlets

These six outlets operate with all Norman Series 900 lampheads including the TRI-LITE 2000, FS-6 and FS-10 Fresnel lens spotlights. The circuit is arc protected which enables you to connect and disconnect lampheads with the power ON. To prevent wear on the model lamp connector pins, it is best to switch OFF the model lamps prior to connecting. (The same precaution would be true with any household lamp whereby you would save the plug by switching the lamp off when connecting.)

14 – MODEL LAMP Dimmers (3)

Dims the modeling lamps so they will ratio to the flash outputs. The dimmers are calibrated in f/stop increments over a 3½ f-stop range. Proper adjustment of the modeling lamp dimmers enable you to see the actual light ratios, highlights 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. 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 two Channel 1 connectors.

Dimmer “2” Controls the modeling lamps on the two Channel 2 connectors.

Dimmer “3” Controls the modeling lamps on the two Channel 3 connectors.

You will probably choose to set the modeling lamp to full brilliance on the lamphead that is at the highest power level.

For example, in Fig. 9 the highest output lamphead is 800 w-s. Therefore, set that particular modeling lamp to full brilliance by turning the MODEL LAMP 2 Dial to the “FULL” position. The other lamphead is at 400 w-s. This is one f/stop less than 800 w-s. Hence, set the MODEL LAMP 1 Dial to the “-1” position (one stop reduction). Now the modeling lamps are in ratio to the flash outputs.

Refer to the chart (Fig. 10) for additional information on the relationship between watt-seconds and f/stops.

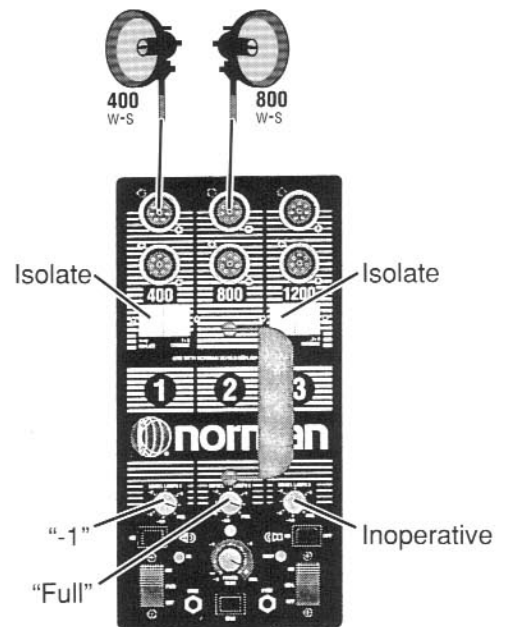


Fig. 9

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 one f/stop gain; 800 w-s to 1600 w-s equals another f/stop gain, and so forth).

To get an increase of 1/2 f/stop multiply watt-seconds by 1.5. For example, 400 w-s x 1.5 equals 600 w-s. Therefore, 600 w-s is a 1/2 f/stop gain over 400 w-s. Here is a chart that illustrates this principle.

100 w-s	}	equals – 1 f/stop gain	}	2 f/stops	}	Total gain 4½ f/stops
200 w-s						
400 w-s	}	equals – about ½ f/stop gain	}	1 f/stop	}	
600 w-s						
800 w-s	}	equals – about ½ f/stop gain	}	1½ f/stop gain	}	
1200 w-s						
1600 w-s	}	equals – about ½ f/stop gain	}		}	
2400 w-s						

Fig. 10

EXAMPLE OF MODEL LAMP AND FLASH SETTINGS

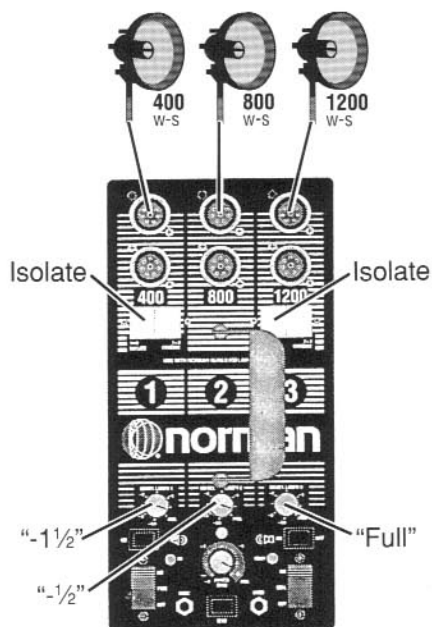


Fig. 11

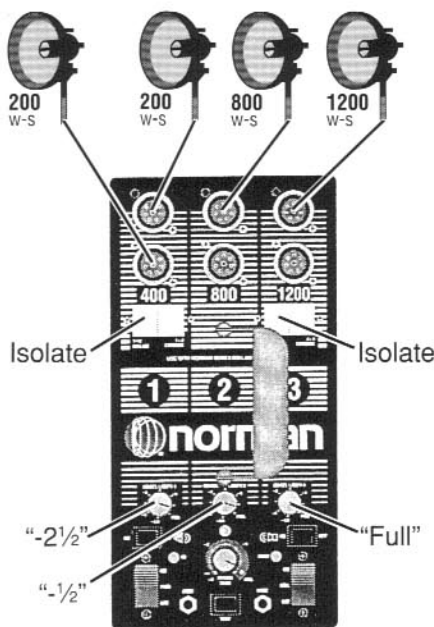


Fig. 12

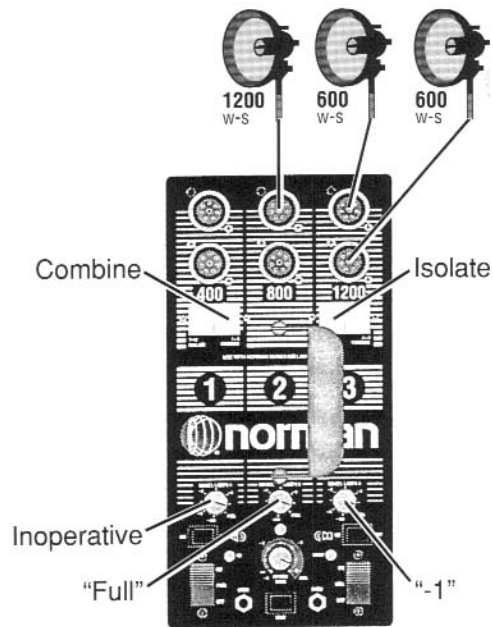


Fig. 13

P24/24 SPECIFICATIONS

OUTPUT LEVEL (Watt-Seconds)	2400	2000	1200	800	400
RECYCLE TIME (seconds to 100% output)	3.5	2.5	1.8	1.0	.5
FLASH DURATION*	1/200	1/240	1/400	1/600	1/1200
LIGHT OUTPUT					
Reflector Type 5DL	6,000	5,000	3,000	2,000	1000
Reflector Type 5E-2	30,000	25,000	15,000	10,000	5,000
Reflector Type 5U-2	90,000	75,000	60,000	30,000	15,000
Reflector Type 5W	27,600	22,500	13,500	9,000	4,500
Reflector Type 5X	9,000	7,500	4,500	3,000	1,500

ENERGY STORAGE:
2400 watt-seconds total

AC INPUT VOLTAGE:
90-135 volts, 50-60 Hz
(sinewave)

DC OUTPUT VOLTAGE:
900 volts (volts stabilized)

FUSE (circuit breaker):
15 amperes

WEIGHT:
18 lbs. 13 oz.

SIZE:
13" L x 6.5" W x 9" H
(to top of connectors)

*When reducing the power with the POWER TRIM Dial, flash duration is virtually unaffected. Therefore, if the power was reduced in this manner from 2400 w-s to 1200 w-s, the flash duration would remain at approximately 1/200 as opposed to becoming 1/400.

IMPORTANT SAFEGUARDS

In accordance with UL 122 and UL 1012 specifications for photographic equipment and power supplies.

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. Lamphead must be disconnected from power supply when inserting or removing flash tube or modeling lamp.
4. Do not operate the appliance with a damaged cord or if the appliance has been dropped or damaged until it has been examined by a qualified serviceman.
5. 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.
6. When practical, unplug the appliance from the electric outlet when not in use. Never yank the cord to pull from the outlet. Grasp the plug and pull to disconnect.
7. 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.
8. CAUTION - Designed for indoor use only. Do not operate outside in the rain or inclement weather or in the presence of standing water.