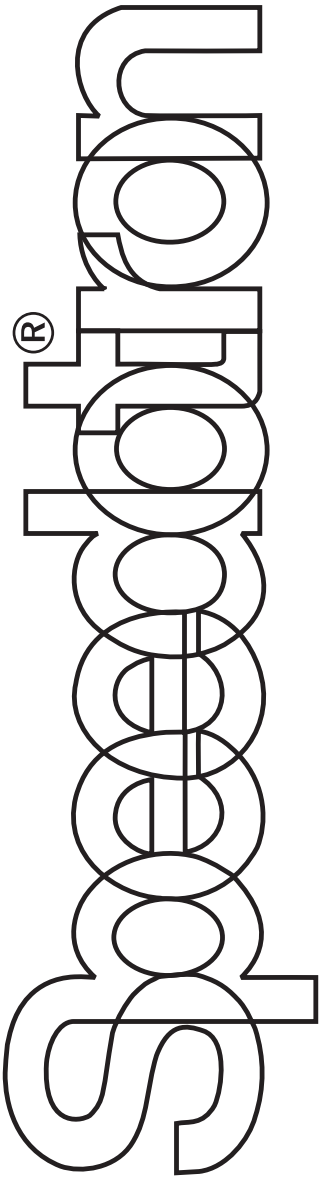

INSTRUCTION MANUAL FOR SPEEDOTRON BROWN LINE EQUIPMENT

WELCOME TO SPEEDOTRON

Thank you for purchasing Speedotron Brown Line equipment. The name Speedotron is synonymous with professional workmanship and the production of the finest electronic flash equipment you'll find anywhere. Backed by years of experience, our engineers have developed the Brown Line system to economically handle tough lighting situations through a wide range of power demands.

Speedotron's business has grown over the years without much fanfare or advertising. This success is the result of making satisfied users our best salesmen. Keeping with this tradition, we are determined to serve you well and to offer the most efficient, competent and courteous service anywhere. We have prepared this manual to acquaint you with the operational aspects of your new equipment and to assist you in getting the most from it.

Because this manual is a guide to the proper use of your equipment and not a photographic handbook, only information pertinent to the basic operation of Speedotron Brown Line is given.

The equipment you have purchased is durable and will stand up to the rigors of daily use either on location or in the studio. However, there are certain operating techniques that should be adhered to in order to obtain maximum performance. Treated with a reasonable amount of care, your Brown Line system will provide you with very dependable, consistent and long-lasting service.

Please help us to get to know you and fulfill our obligations to you. Return the enclosed warranty registration form to us immediately. Sending in this form will validate your warranty and put your name on our mailing list, enabling us to send you up-to-date information on new accessories and new applications for your present equipment.

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Power Supplies

Light Units

GENERAL POWER SUPPLY INSTRUCTIONS

For maximum equipment life and for safe, dependable operation of power supplies we advise you to follow these general rules.

Unpack equipment carefully. Examine all packing material. Should you notice any breakage or defect, notify the dealer and carrier (if shipped to you) immediately. Then please read all instructions before assembling your flash system in order to avoid damage to your equipment or injury to yourself.

Before doing anything with the power supply make sure that the ***Model*** and ***Power*** switches are in the off position.

Connect light head cable(s) to the ***Light Unit Outlet(s)*** on the power supply, selecting the appropriate outlets for the desired power level.

All Brown Line light units can handle at least 400 watt-seconds, and specific units are designed for a maximum of 1200 or 1600 watt-seconds. For power supplies that can produce more than 400Ws of power, you must be very careful that the flash tube you are using in your light unit can handle all the available power. **Never subject a flash tube to more watt-seconds than it is designed to handle.** If you are not sure that your flash tube can handle the power provided by the set-up you are using, check pages 25 and 26 in addition to the Power Distribution Chart on the side of your power supply. We recommend that you purchase at least one light unit that will accept the full output of the power supply.

To connect light units, align the light unit plug with the power supply outlet and apply even pressure while pushing. Black colored light unit connectors are of the "quick release" type that only require pushing the connector firmly until it is fully seated. Silvery colored light unit connectors must be threaded until they are fully seated. Both types prevent accidental cable removal. Make sure all light unit cables are firmly seated to prevent connector damage. Tape all cables to the floor and keep them out of the pathways to prevent accidents.

Never install light units while the power supply is turned on. Never insert or remove flash tubes while the light unit is connected to the power supply. Be sure flash tubes are fully seated into light unit sockets. (Read instructions in the Light Units section of this manual for more information on light unit assembly and operation.)

> In order to maximize the life of the power supply it is recommended that the capacitors be "formed" when a pack is not in use for 30 days or more. All that is required of the user is to turn on the power supply for about 10 to 20 minutes each month. This simple procedure prevents premature failure by maintaining the "elasticity" of the capacitors.

Speedotron power supplies are equipped with arc-protected outlets. However, as with any electrical equipment, arc-over (an electrical discharge between two physically disconnected electrical terminals) is a possibility. When light cables, flash tubes or power cords are improperly seated, arc-over may occur. Also, if your light unit or power supply malfunctions, or the power cord or the internal wiring in the studio is improperly terminated or defective, there is a chance of arc-over when connecting or disconnecting light units. Severe power supply damage and operator injury may result if arc-over occurs. That is why in spite of the arc-protection feature of Speedotron power supplies, you should always make sure your ***Model*** and ***Power*** switches are off when disconnecting or connecting light units. Plug sync extension into ***Sync*** socket and connect the other end to a PC cord designed for your camera or lens. The sync extension supplied with the power supply accepts the standard AC twin-blade type sync connector. A standard AC to PC sync cord will be required to connect the camera to the power supply's sync
extension.

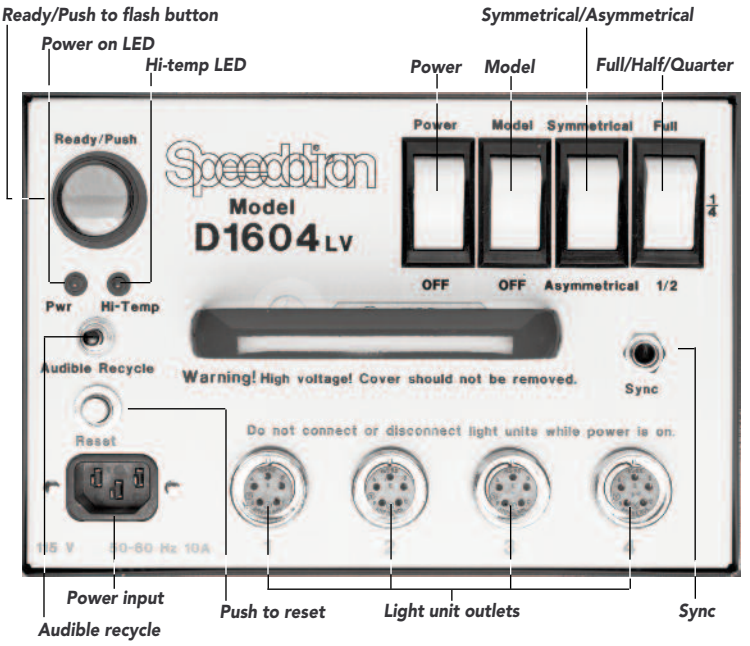
A slave tripper (Speedotron #23510) may be installed in the ***Sync*** socket (in place of the sync extension) to fire the power supply. If the power supply fails to flash when exposed to another light source with the slave installed in the ***Sync*** socket, remove the slave, rotate it 180° and reinstall it in the socket.

Connect AC power cord into ***Power Input*** on power supply. A 3-terminal ground power plug is utilized on Brown Line power supplies. For maximum performance and safety, it is strongly suggested that the 3-terminal cord supplied with the power supply be properly utilized and properly terminated at the main source of incoming power. Always use a three-wire ground power cord and a properly grounded wall outlet with all Speedotron power supplies. Failure to do so may cause the power supply to intermittently misfire. We do not recommend using an adapter and installing into a 2-blade
outlet.

Once the light units are properly assembled and installed, the power cord is installed and the sync extension is connected, turn the ***Power*** switch on.

Now refer to the Operating Instructions section of this manual for information regarding the proper use of your particular power supply.

Never attempt to make repairs to your Speedotron equipment. All electronic flash systems operate on high voltage and high power. It is very dangerous to open a power supply.



GENERAL DESCRIPTION OF CONTROLS

Power – turns power supply on and off (flashes light units when turning off).
Model – turns model lamp(s) on and off.
Symmetrical/Asymmetrical – controls power distribution. In the symmetrical position, power is split equally between all lights. In the asymmetrical position, power is distributed unequally and modeling lamp brightness on light units in outlets 3 and 4 is reduced.
Full/Half (on D604) or ***Full/Half/1/4*** (on D1204 and D1604) – controls the total amount of power delivered to light unit outlets.
Ready/Push to Flash – combination ready light and test flash button. Illuminates in green to indicate when power supply has recycled to 85%. Pressing the button when illuminated triggers the flash for testing or open flash applications.
Audible Recycle – controls audible ready tone (on/off).
Power On – green LED illuminates when power switch is turned on.
Hi-Temp – red LED lights, alarm tone sounds, when internal heat becomes excessive.
Sync – socket for sync extension or slave.
Push to Reset – resets circuit breaker. Circuit breaker disables power supply in case of malfunction.
Power Input – socket for AC power cord.
Light Unit Outlets (4) – sockets for connecting from one to four light units to power supply.

OPERATING INSTRUCTIONS

Operation of the D604, D1204 and D1604 power supplies is simple and straight forward. This sequence of operation is suggested for maximum life and dependability.

Make sure that the ***Model*** and ***Power*** switches are in the off position and the Push to ***Reset*** button is fully depressed into its socket. Connect light head cable(s) to the ***Light Unit Outlet(s)*** on the power supply. The outlets are wired in parallel so it does not matter in what sequence light head cables are connected.

Never connect or disconnect light units while power is on. Do not insert or remove flash tubes while power is on. Your Brown Line power supply is equipped with arc-protection, but should your light unit or power supply malfunction, or the power cord, or even the internal wiring in the studio be improperly terminated or defective, the chance of arc-over when connecting or disconnecting light units is greatly increased. Severe power supply damage and operator injury may result if arc-over occurs when light units are being disconnected or connected. To prevent this, you should always turn the power supply off when disconnecting or connecting light heads.

Never subject a flash tube to more watt-seconds than it is designed to handle. MW3 and M90 series (non-"Q") light units have a maximum rating of 400Ws, while "Q" versions are rated at 1200Ws. M11 light units are rated at 1200Ws* (with new MW9H flashtubes) and M11Q light units are rated at 2400Ws. We strongly recommend that at least one light unit in your system is capable of handling the maximum output of your power supply. If you are not sure if your flash tube and light unit can handle the power provided by the set up you are using, check pages 25 and 26 and the Power Distribution Chart on the side of your power supply.

Connect AC power cord into ***Power Input*** on power supply, then plug into a properly grounded outlet. Use proper 3-conductor grounded cord for operator safety and to reduce self-firing and misfiring caused by static electricity. Set ***Full/Half/1/4*** switch as desired ***(Full/Half*** switch on D604). This switch reduces the total output of the power supply. Do not switch the ***Full/Half/1/4*** switch until ready light is illuminated. Failure to follow this procedure may result in damage to the switch.

Plug sync connector into ***Sync*** socket and connect the other end to PC cord for camera. Once the camera is connected, tripping the shutter will automatically trigger the flash.

A slave tripper (Speedotron #23510), may be inserted into the ***Sync*** socket in place of the PC cord. In this mode of operation, the slave will activate the power supply when it senses a bright flash of light from another light source. If the power supply fails to flash when exposed to another light source with the slave installed in the sync socket, it may be necessary to remove the slave, rotate it 180° and reinstall it into the ***Sync*** socket.

****New MW9H flashtubes supplied with M11 light units handle up to 1200Ws. The MW9M flashtubes have a maximum capacity of 1000Ws.***

Turn on ***Power*** and ***Model*** switches. Wait until the green ***Ready/Push to Flash*** illuminates and press to check if the unit is operational. The light unit(s) should flash instantly when this button is pressed. If you wish to check the function of each individual light unit, we recommend that you turn off the ***Model*** switch and hold your hand in front of (not inside) the light unit to be tested. When you fire the unit you will feel the heat of the flash. This method is suggested because it is often difficult to determine by sight if one of the lights has failed to flash.

The D604, D1204 and D1604 power supplies are equipped with an audible ready signal (may be turned off) and high temperature alarm. A short audible tone along with a green ***Ready/Push to Flash*** light indicates that the power supply has recycled to 85 percent (ANSI standard). For very critical exposures, waiting several seconds after the green ***Ready/Push to Flash l***ight illuminates will ensure that the power supply is at 100 percent power. If the beep should prove distracting, depress the ***Audible Recycle*** switch to eliminate this short tone. The green ***Ready/Push to Flash*** light will still continue to illuminate.

Prolonged rapid flashing or storage in a high temperature environment (like the trunk of a car) or extended use in extremely warm environments may eventually produce enough heat to set off a steady alarm tone and red ***Hi-Temp*** LED indicator. The power supply should be turned off at the ***Power*** switch because continued use may cause severe damage. When the power supply has sufficiently cooled, normal operation may be resumed. (If the power supply is not turned off, the alarm will not clear.)

When the power supply has been exposed to extreme cold weather for an extended period of time, it is suggested that the unit be allowed to warm up to room temperature before connecting it to an AC power line.

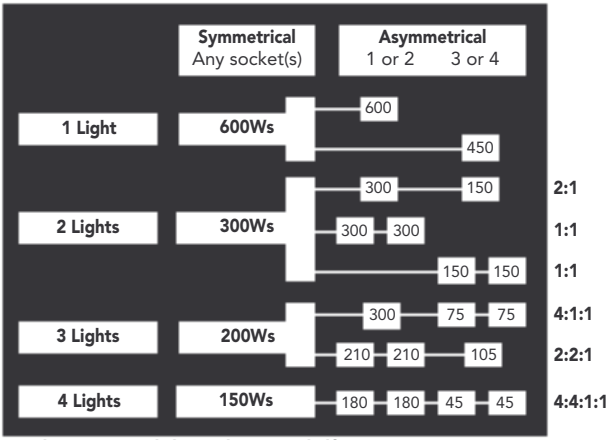
When disassembling the system, turn off ***Power*** and ***Model*** switches first. When the ***Power*** switch is turned off, the power supply will discharge by flashing all light units. Placing the ***Full/Half/1/4*** switch into the full position before turning off ***Power*** will ensure that all capacitors are discharged. If the power supply should be inadvertently switched off at a lower power setting, DO NOT immediately switch to full power! Damage to the switch may result. Wait at least 10 seconds before operating the ***Full/Half/1/4*** switch. Unplug the power cord and disconnect the light head cable(s).

POWER DISTRIBUTION TABLES

On the side of the D604, D1204 & D1604 power supplies there is a Power Distribution Table based on the full power setting. These tables should be used as guides for determining various lighting possibilities, guide numbers & exposures when using consistent flash tubes & reflectors. When different flash tubes and/or reflectors are used actual light output will vary, producing as much as a full f/stop discrepancy with the table.

Brown Line '04 power supplies, feature symmetrical and asymmetrical operation. Symmetrical output means all light units share equal output. To determine power levels, divide the maximum output by the number of light units to be used. In asymmetrical mode, outlets 1 and 2 receive a greater portion of the total output than outlets 3 and 4. (For specific power distribution refer to the charts below for the number and configuration of the lights to be used.)

D604 Power Distribution Table



Divide watt-seconds by 2 when using half power.

One light: **Symmetrical** mode in **any** outlet, will receive 600Ws.

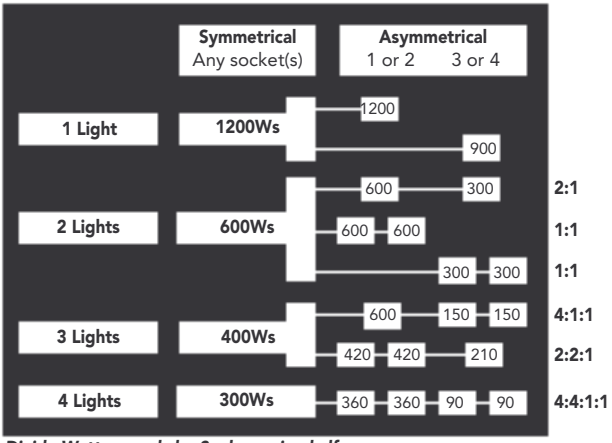
Asymmetrical mode in outlets 1 **or** 2, will receive 600Ws; when using outlets 3 **or** 4 output is 450Ws.

Two lights: **Symmetrical** mode, **all** outlets share an equal amount of power. Two lights each receive 300Ws (600Ws divided by 2).

Asymmetrical mode
Combination 1: one light in outlet 1 **or** 2 receives 300Ws; the second light in outlet 3 **or** 4 receives 150Ws.
Combination 2: in outlets 1 **and** 2 receive 300Ws each.
Combination 3: in outlets 3 **and** 4 will receive 150Ws each.

Following the table will quickly illustrate other combinations that are possible with up to four light units on the D604.

D1204 Power Distribution Table



Divide Watt-seconds by 2 when using half power.
Divide Watt-seconds by 4 when using quarter power.

One light: **Symmetrical** mode in **any** outlet, will receive 1200Ws.

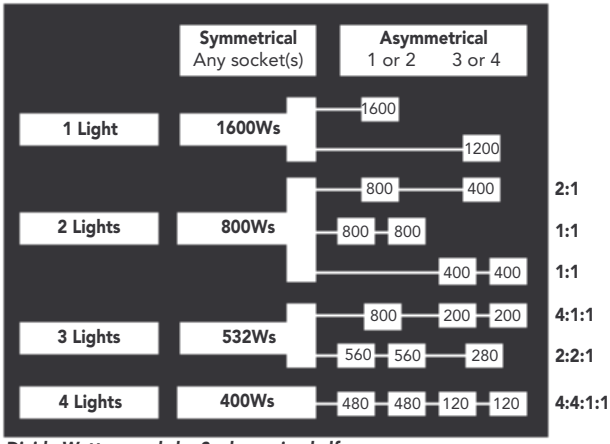
Asymmetrical mode in outlets 1 **or** 2, will receive 1200Ws; when using outlets 3 **or** 4 output is 900Ws.

Two lights: **Symmetrical** mode, **all** outlets share an equal amount of power. Two lights each receive 600Ws (1200Ws divided by 2).

Asymmetrical mode
Combination 1: one light in outlet 1 **or** 2 receives 600Ws; the second light in outlet 3 **or** 4 receives 300Ws.
Combination 2: in outlets 1 **and** 2 receive 600Ws each.
Combination 3: in outlets 3 **and** 4 will receive 300Ws each.

Following the table above will quickly illustrate other combinations that are possible with up to four light units on the D1204.

D1604 Power Distribution Table



Divide Watt-seconds by 2 when using half power.
Divide Watt-seconds by 4 when using quarter power.

One light: **Symmetrical** mode in **any** outlet will, receive 1600Ws.

Asymmetrical mode in outlets 1 **or** 2, will receive 1600Ws; when using outlets 3 **or** 4 output is 1200Ws.

Two lights: **Symmetrical** mode, **all** outlets share an equal amount of power. Two lights each receive 800Ws (1600Ws divided by 2).

Asymmetrical mode
Combination 1: one light in outlet 1 **or** 2 receives 800Ws; the second light in outlet 3 **or** 4 receives 400Ws.
Combination 2: in outlets 1 **and** 2 receive 800Ws each.
Combination 3: in outlets 3 **and** 4 will receive 400Ws each.

Following the above table will quickly illustrate other combinations that are possible with up to four light units on the D1604.

TECHNICAL SPECIFICATIONS

D604 Power Supply

Maximum power: 600Ws
Number of light unit outlets: 4

Recycle time:	watt-seconds	seconds
(to 85% voltage, ANSI standard)	.600	2.3
	300	1.3

Flash duration . . . . . .1/590 sec. (1.7 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 600Ws
Minimum power into one light unit: 225Ws
Minimum power per light with 4 light units: .22.5Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 10 amps peak
Size: . . . . . .5.9 x 9.1" (foot print) x 5.9" (case height)
Weight: . . . . . .11.2 lbs.
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number 250
(at ISO 100 w/M11Q fitted with 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)

D1204 Power Supply

Maximum power: 1200Ws
Number of light unit outlets: 4

Recycle time: (to 85% voltage, ANSI standard)	watt-seconds	seconds
	1200	4.1
	600	2.0
	300	1.0

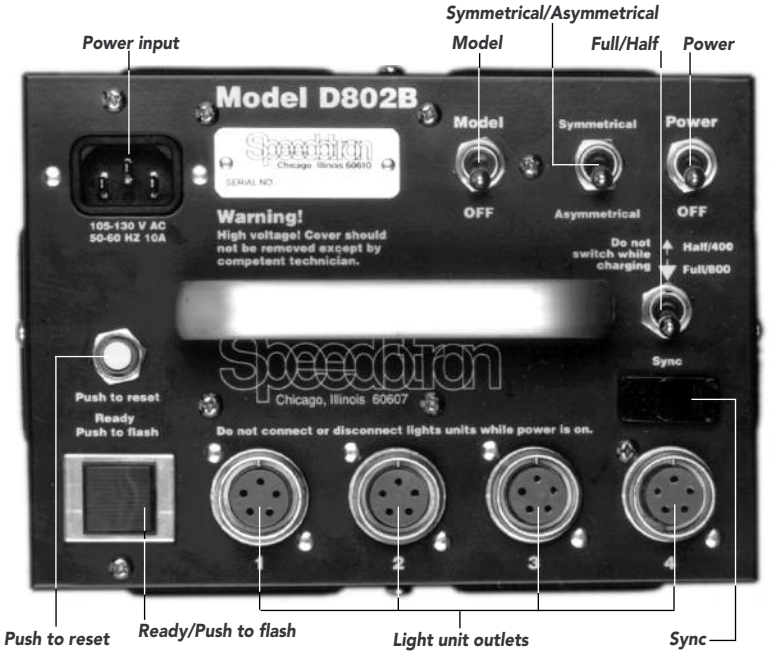
Flash duration : . . . . . .1/370 sec. (2.7 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 1200Ws
Minimum power into one light unit: 225Ws
Minimum power per light with 4 light units: .22.5Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 10 amps peak
Size: . . . . . .5.9 x 9.1" (foot print) x 7.9" (case height)
Weight: . . . . . .14.4 lbs
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number : 455
(at ISO 100 w/M11Q fitted 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)

D1604 Power Supply

Maximum power: 1600Ws
Number of light unit outlets: 4

Recycle time: (to 85% voltage, ANSI standard)	watt-seconds	seconds
	1600	6.0
	800	2.8
	400	1.3

Flash duration : . . . . . .1/350 sec. (2.9 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 1600Ws
Minimum power into one light unit: 300Ws
Minimum power per light with
4 light units: 30Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 10 amps peak
Size: . . . . . .6.4 x 9.5" (foot print) x 8.2" (case height)
Weight: . . . . . .16.2 lbs
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number : 540
(at ISO 100 w/M11Q fitted 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)



DESCRIPTION OF CONTROLS

Power – turns power supply on and off (flashes units when turning off D802 or D402).

Model – turns model lamp(s) on and off.

Symmetrical/Asymmetrical – controls power distribution. In the symmetrical position, power is split equally between all lights. In the asymmetrical position, power is distributed unequally and model lamp brightness on light units in outlets 3 and 4 is reduced.

Full/Half – controls amount of power delivered to light unit outlets.

Ready/Push to Flash – a combination ready light and test flash button. Illuminates to indicate when power supply has recycled to 85%. Pressing the button when illuminated triggers the flash for testing or open flash applications.

Sync – socket for sync extension or slave.

Push to Reset – resets circuit breaker. Circuit breaker disables power supply in case of malfunction.

Power Input – socket for AC power cord.

Light Unit Outlets (4) – sockets for connecting from one to four light units to power supply.

OPERATING INSTRUCTIONS

Operation of Brown Line power supplies is simple and straight forward. It is suggested that this sequence of operation be utilized for maximum life and dependability.

Make sure that the ***Model*** and ***Power*** switches are in the off position and the ***Push to Reset*** buttons are fully depressed into their sockets. Connect light head cable(s) to the ***Light Unit Outlet(s)*** on the power supply. The outlets are wired in parallel so it does not matter in what sequence light head cables are connected.

Never connect or disconnect light units while power is on. Do not insert or remove flash tubes while power is on. Your Brown Line power supply is equipped with arc-protection, but should your light unit or power supply malfunction, or the power cord, or even the internal wiring in the studio be improperly terminated or defective, the chance of arc-over when connecting or disconnecting light units is greatly increased. Severe power supply damage and operator injury may result if arc-over occurs when light units are being disconnected or connected. To prevent this, you should always turn the power supply off when disconnecting or connecting light heads.

Never subject a flash tube to more watt-seconds than it is designed to handle. MW3 and M90 series (non-"Q") light units have a maximum rating of 400Ws, while "Q" versions are rated at 1200Ws. M11 light units are rated at 1200Ws* (with new MW9H flashtube) and M11Q light units are rated at 2400Ws. We strongly recommend that at least one light unit in your system is capable of handling the maximum output of your power supply. If you are not sure if your flash tube and light unit can handle the power provided by the set up you are using, check pages 25 and 26 and the Power Distribution Chart on the side of your power supply.

Connect AC power cord into ***Power Input*** on power supply, then plug into a properly grounded outlet. Use proper 3-conductor grounded cord for operator safety and to reduce self-firing caused by static electricity. Set ***Full/Half*** switch as desired. This switch reduces the total output of the power supply. The difference between the "full" and "half" settings is one f-stop. After flashing, do not switch the ***Full/Half*** switch until ready light is illuminated, or until at least ten seconds after turning off unit. Failure to follow this procedure may result in damage to the switch.

Plug sync connector into ***Sync*** socket and connect the other end to PC cord for camera. Once the camera is connected, tripping the shutter will automatically trigger the flash.

A slave tripper (Speedotron #23510), may be inserted into the ***Sync*** socket in place of the PC cord. In this mode of operation, the slave will activate the power supply when it senses a bright flash of light from another light source. If the power supply fails to flash when exposed to another light source with the slave installed in the sync socket, it may be necessary to remove the slave, rotate it 180° and reinstall it into the ***Sync*** socket.

New MW9H flashtubes supplied with M11 light units handle up to 1200Ws. The MW9M flashtubes have a maximum capacity of 1000Ws.

Turn on ***Power*** and ***Model*** switches. Wait until the ***Ready/Push to Flash*** illuminates and press the button to check if the unit is operational. The light unit(s) should flash instantly when this button is pressed. If you wish to check the function of each individual light unit, we recommend that you turn off the ***Model*** switch and hold your hand in front of (not inside) the light unit to be tested. When you fire the unit you will feel the heat of the flash. This method is suggested because it is often difficult to determine by sight if one of the lights has failed to flash.

When disassembling the system or changing the position of a light unit connector in any outlet, it is a good habit to set the ***Full/Half*** switch to full first, then turn off ***Model*** and ***Power*** switches prior to disconnecting light units. If this procedure is not followed, allow 10 seconds between turning the ***Power*** switch off and adjusting the Full/Half switch. DO NOT immediately switch to full power! Damage to the switch may result.

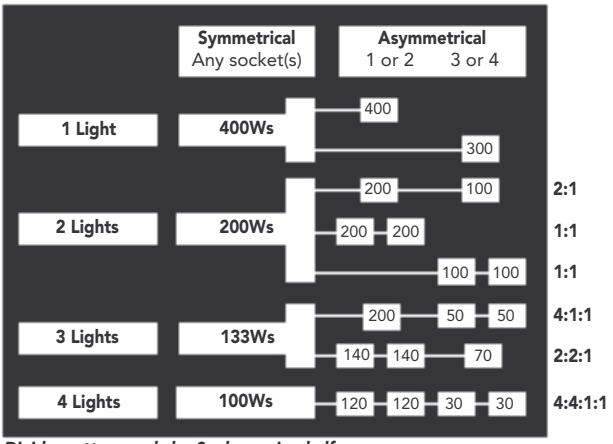
The D402 and D802B power supplies will flash their light units when turned off. Placing the ***Full/Half*** switch on the D402 and D802B into the full position before turning off ***Power*** will ensure that all capacitors are discharged.

POWER DISTRIBUTION TABLES

On the side of the D202, D402 and D802B power supplies, there is a Power Distribution Table based on the full power setting. These tables should be used as guides for determining various lighting possibilities, guide numbers and exposures when using consistent flash tubes and reflectors. When different flash tubes and/or reflectors are used actual light output will vary producing as much as a full f/stop discrepancy with the table.

The '02 Series feature symmetrical and asymmetrical operation. Symmetrical output means all light units share equal output. To determine power levels, divide the total watt-seconds by the number of light units to be used. In asymmetrical mode, outlets 1 and 2 receive a greater portion of the total output than outlets 3 and 4. (For specific power distribution refer to the charts below for the number and configuration of the lights to be used.)

D402 Power Distribution Table



Divide watt-seconds by 2 when using half power.

One light: **Symmetrical** mode in **any** outlet, will receive 400Ws.

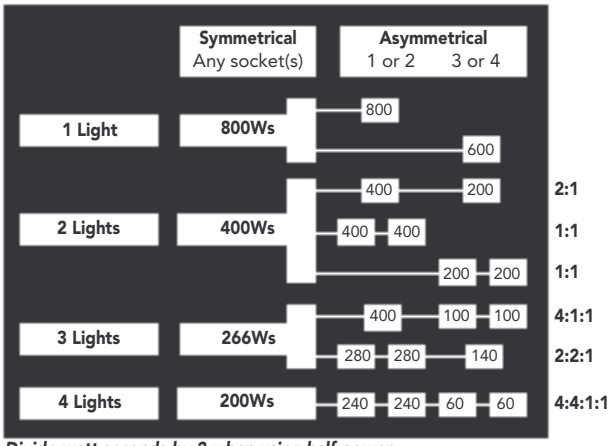
Asymmetrical mode in outlets 1 **or** 2, will receive 400Ws; when using outlets 3 **or** 4 output is 300Ws.

Two lights: **Symmetrical** mode, **all** outlets share an equal amount of power. Two lights each receive 200Ws (400Ws divided by 2).

Asymmetrical mode
Combination 1: one light in outlet 1 **or** 2 receives 200Ws; the second light in outlet 3 **or** 4 receives 100Ws.
Combination 2: in outlets 1 **and** 2 receive 200Ws each.
Combination 3: in outlets 3 **and** 4 will receive 100Ws each.

Following the table will quickly illustrate other combinations that are possible with up to four light units on the D402.

D802B Power Distribution Table



Divide watt-seconds by 2 when using half power.

One light: **Symmetrical** mode in **any** outlet, will receive 800Ws.

Asymmetrical mode in outlets 1 **or** 2, will receive 800Ws; when using outlets 3 **or** 4 output is 600Ws.

Two lights: **Symmetrical** mode, **all** outlets share an equal amount of power. Two lights each receive 400Ws (800Ws divided by 2).

Asymmetrical mode
Combination 1: one light in outlet 1 **or** 2 receives 400W; the second light in outlet 3 **or** 4 receives 200Ws.
Combination 2: in outlets 1 **and** 2 receive 400Ws each.
Combination 3: in outlets 3 **and** 4 will receive 200Ws each.

Following the table will quickly illustrate other combinations that are possible with up to four light units on the D802B.

TECHNICAL SPECIFICATIONS

D402 Power Supply

Maximum power: 400Ws
Number of light unit outlets: 4

Recycle time:	watt-seconds	seconds
(to 85% voltage, ANSI standard)	.400	1.75
	200	0.9

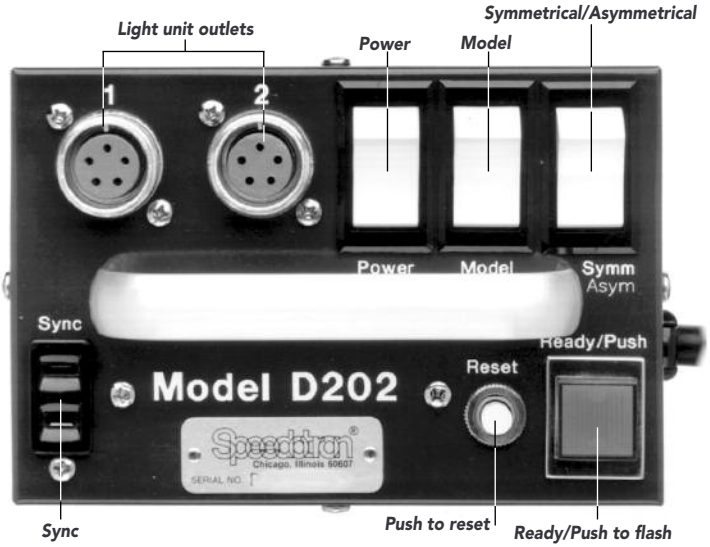
Flash duration : . . . . . .1/1200 sec. (.8 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 400Ws
Minimum power into one light unit: 150Ws
Minimum power per light with 4 light units: .15Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 10 amps peak
Size: . . . . . .5.5 x 7.9" (foot print) x 7.2" (case height)
Weight: . . . . . .11.5 lbs
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number : 270
(at ISO 100 w/M11Q fitted 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)

D802 Power Supply

Maximum power: 800Ws
Number of light unit outlets: 4

Recycle time:	watt-seconds	seconds
(to 85% voltage, ANSI standard)	.800	3.2
	400	2

Flash duration : . . . . . .1/830 sec. (2.9 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 800Ws
Minimum power into one light unit: 150Ws
Minimum power per light with 4 light units: .30Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 10 amps peak
Size: . . . . . .5.5 x 7.9" (foot print) x 7.2" (case height)
Weight: . . . . . .12 lbs
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number : 380
(at ISO 100 w/M11Q fitted 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)



DESCRIPTION OF CONTROLS

Power – turns power supply on and off. (Flashes light units when turning off.)

Model – turns model lamps on and off.

Symmetrical/Asymmetrical – controls power distribution. In the symmetrical position, power is split equally between all lights. In the asymmetrical position power is distributed unequally and the model lamp brightness/flash tube output of a light in outlet #2 is reduced.

Ready/Push to Flash – a combination ready light and test flash button. Illuminates to indicate when power supply has recycled to 85%. Pressing the button when illuminated triggers the flash for testing or open flash applications.

Sync – socket for sync extension or slave.

Circuit Breaker/Reset – resets circuit breaker. Circuit breaker disables power supply in case of malfunction. Does not affect model lamp circuit.

Light Unit Outlets (2) – sockets for connecting one or two light units to power supply.

OPERATING INSTRUCTIONS

Make sure that the ***Model*** and ***Power*** switches are in the off position and the ***Push to Reset*** button is fully depressed into its socket. Connect light head cable(s) to the ***Light Unit Outlet(s)*** on the power supply. The outlets are wired in parallel so it does not matter in what sequence light head cables are connected.

Never connect or disconnect light units while power is on. Do not insert or remove flash tubes while power is on. Your Brown Line power supply is equipped with arc-protection, but should your light unit or power supply malfunction, or the power cord, or even the internal wiring in the studio be improperly terminated or defective, the chance of arc-over when connecting or disconnecting light units is greatly increased. Severe power supply damage and operator injury may result if arc-over occurs when light units are being disconnected or connected. To prevent this, you should always turn the power supply off when disconnecting or connecting light heads.

The D202 is fully compatible with all Speedotron Brown Line light units and flash tubes.

Connect power supply cord into a 3-wire grounded AC outlet. This reduces misfires and self-firing caused by static electricity.

Plug sync connector into ***Sync*** socket and connect the other end to PC cord for camera. Once the camera is connected, tripping the shutter will automatically trigger the flash.

A slave tripper (Speedotron #23510), may be inserted into the ***Sync*** socket in place of the PC cord. In this mode of operation, the slave will activate the power supply when it senses a bright flash of light from another light source. If the power supply fails to flash when exposed to another light source with the slave installed in the sync socket, it may be necessary to remove the slave, rotate it 180° and reinstall it into the Sync socket.

Turn on ***Power*** and ***Model*** switches. Wait until the amber ***Ready/Push to Flash*** illuminates and press the button to check if the unit is operational. The light unit(s) should flash instantly when this button is pressed. If you wish to check the function of each individual light unit, we recommend that you turn off the ***Model*** switch and hold your hand in front of (not inside) the light unit to be tested. When you fire the unit you will feel the heat of the flash. This method is suggested because it is often difficult to determine by sight if one of the lights has failed to flash.

The D202 has symmetrical and asymmetrical power distribution. The two light units are connected in parallel when the symmetrical/asymmetrical switch is in the symmetrical position. With the switch in the asymmetrical position power will be distributed as shown by the power distribution table on the next page or on the side of the power pack.

TECHNICAL SPECIFICATIONS

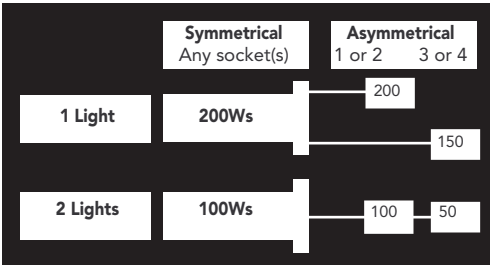
D202 Power Supply

Maximum power: 200Ws
Number of light unit outlets: 2

Recycle time:	watt-seconds	seconds
(to 85% voltage, ANSI standard)	200	3.25

Flash duration . . . . . .1/1200 sec. (.85 milliseconds)
(at full power w/one M11Q light unit measured 1/2 to 1/2 peak as per ANSI PH3.40)
Maximum power into one light unit: 200Ws
Minimum power into one light unit: 150Ws
Minimum power per light with 2 light units: .50Ws
Power input requirements: . . . . . .105-120VAC 50-60Hz. 4 amps peak
Size: . . . . . .4.4 x 6.5" (foot print) x 6.2" (case height)
Weight: . . . . . .6.5 lbs.
System voltage: 900V
Trigger voltage: 70V
Trigger current: . . . . . .0.000043A (43 micro-amps)
Guide number 190
(at ISO 100 w/M11Q fitted with 11-1/2" reflector measured at 10 feet, on axis with MW9QC flash tube)

D202 Power Distribution Table



One light: **Symmetrical** mode in **any** outlet, will receive 200Ws.
Asymmetrical mode: outlet 1 will receive 200Ws;
outlet 2 outputs 150Ws.

Two lights: **Symmetrical** mode, **both** outlets share an equal amount of power.
Two lights each receive 100Ws (200Ws divided by 2).

Asymmetrical mode: light in outlet 1 receives 100Ws;
the light in outlet 2 receives 50Ws.

Following the table will quickly illustrate other combinations that are possible with up to four light units on the D202

BROWN LINE LIGHT UNITS

General Instructions and Information

The Speedotron Brown Line light units described here may be used with any Speedotron Brown Line power supply using the five-pin MS outlet. All light units are supplied with a 20' wired-in cable.

Unpack and examine all equipment carefully. Should you notice any breakage or defect, notify your dealer (and the carrier if it was shipped to you) immediately. The flash tube(s) and model lamp(s) are packed in their original cartons. This affords sufficient protection and reduces the incidence of breakage during shipping. Make sure all packing materials are removed before using. This includes the pipe cleaners (used as packing material) inside some flash tubes.

Install flash tubes first. Always handle lamps and flash tubes with care. Because they can break if put under stress, handle them cautiously. Don't touch glass surfaces with your bare hands. If your fingers come in contact with the glass of the model lamp, wipe off carefully with alcohol. When removing or replacing lamps and tubes, always disconnect light units from power supply. Allow lamps to cool before handling. For instructions on how to insert model lamps into specific units, see the unit descriptions on the following pages.

Flash tubes must be inserted into the sockets all the way. Flash tube pins must align with the flash tube socket to be inserted. Apply gentle pressure. A slight rocking motion may be necessary when installing larger flash tubes. New flash tubes and sockets fit very tightly. Be sure all flash tubes and model lamps are fully seated into light unit sockets.

It is important to observe the maximum watt-seconds rating of these light units. **Never subject a flash tube to more watt-seconds than it is designed to handle.** MW3 and M90 series (non-"Q") light units have a maximum rating of 400Ws, while "Q" versions are rated at 1200Ws. M11 light units are rated at 1200Ws* (with new MW9H flashtubes) and M11Q light units are rated at 2400Ws. We strongly recommend that at least one light unit in your system should be capable of handling the maximum output of your power supply. If you are not sure that the flash tube in your light unit can handle the power provided by the set up you are using, check the following pages and the Power Distribution Chart on the side of your power supply. Failure to observe this precaution could drastically shorten the life of your flash tubes.

Connect light cable(s) to the ***Light Unit Outlet(s)*** on the power supply. Never connect or disconnect light units while Power is on. Do not insert or remove flash tubes or model lamps while Power is on.

New MW9H flashtubes supplied with M11 light units handle up to 1200Ws. The MW9M flashtubes have a maximum capacity of 1000Ws.

To connect light units, align the light unit plug with the power supply outlet and apply even pressure while pushing. Black colored light unit connectors are of the "quick release" type that only require pushing the connector firmly until it is fully seated. Silvery colored light unit connectors must be threaded until they are fully seated. Both types prevent accidental cable removal. Make sure all light unit cables are firmly seated to prevent connector damage. Tape all cables to the floor and keep them out of the pathways to prevent accidents.

Speedotron power supplies are equipped with arc-protected outlets. However, as with any electrical equipment, arc-over (an electrical discharge between two physically disconnected electrical terminals) is a possibility. When light cables or flash tubes are improperly seated, arc-over may occur. Also, if your light unit or power supply malfunctions, or the power cord or the internal wiring in the studio is improperly terminated or defective, there is a chance of arc-over when connecting or disconnecting light units. Severe power supply damage and operator injury may result if arc-over occurs. That is why, in spite of the arc-protection feature of Speedotron units, you should always make sure ***Power*** is off when connecting or disconnecting light units.

All Brown Line light units fit on top of 5/8" light stands. MW3U and MW3UCC accept umbrellas with shafts up to 3/8". MW3R and MW3RCC light units include an adaptor to fit onto 3/8" light stands.

Turn on power supply, wait for ***Ready*** light, then press ***Push to Flash*** button to verify proper operation. The model lamp may be turned on or off by the switch located on the top of the light unit assembly (insure that the ***Model*** switch at power supply is on).

For maximum performance and life, the model lamp should be used only when necessary and turned off after initial set-up or focusing is done. Although convection cooling is more than ample for normal usage, turning off the model lamp will eliminate heat and enable the light unit to run cooler, extending the life of all components.

After extended use or after transporting your system, inspect flash tubes for cracks and any unusual darkening (arc-over) around the tube sockets. If cracks or darkening are noted the flash tube is, most likely, near the end of its duty cycle. Cracked tubes will probably misfire. The normal duty cycle is 100,000 flashes for the majority of Speedotron Brown Line flash tubes.

Be sure replacement flash tubes are designed for the watt-second output requirements of Speedotron light units. Applying too much power severely shortens the life of flash tubes, may cause fine cracks to develop in the tube that may cause tube failure or, in the most extreme case, may cause the tube to shatter. For this reason, we suggest you always use Speedotron flash tubes and model lamps to insure safe and dependable operation.

FIXED REFLECTOR LIGHT UNITS

MW3R and MW3R/CC

The MW3R series light units share a common base, but are differentiated by the type of flash tube each contains. They feature 5-1/2" fixed reflector and are functional as background or hair lights. When installing flash tubes and model lights be sure that the unit is disconnected from the power supply. To assemble, first insert the flash tube according to the General Instructions, then insert the model lamp, using the packing material to hold the lamp. The 60W candelabra base model lamp threads into the reflector-mounted socket. The flash tubes are the MW3 (for MW3R) and MW3C (for MW3R/CC). Again, follow the General Instructions to attach the light unit to the power supply. It accepts several accessories listed below including snoots, barn doors and diffusers. The MW3R converts to the MW3R/CC by changing to the color corrected flash tube.

MW3U, MW3U/CC, MW3UQ and MW3UQ/CC

MW3U series light units share a common base, but are differentiated by the type of flash tube each contains. They feature 5-1/2" fixed reflectors for use with umbrellas. When installing flash tubes and model lamps be sure that the unit is disconnected from the power supply. To assemble, first insert the flash tube according to the General Instructions, then insert the model lamp, using the packing material to hold the lamp. The 150W candelabra base model lamp inserts into the reflector-mounted socket. Align the locking pins to the model lamp socket and use gentle pressure to insert and gently twist the lamp 1/4 turn. The flash tubes are the MW3 (for MW3U), MW3C (for MW3U/CC), MW3Q (for MW3UQ), and MW3QC (for MW3UQ/CC). Again, follow the General Instructions to attach the light unit to the power supply. The light units accept accessories listed below, including barn doors. It is recommended that snoots not be used with the MW3U series because of heat from the model lamp.

M90, M90/CC, M90Q and M90Q/CC

The M90 series light units share a common base, but are differentiated by the type of flash tube each contains. They feature 8-1/2" fixed reflector light units for use with umbrellas or as key and fill lights. When installing flash tubes and model lamps be sure that the unit is disconnected from the power supply. To assemble, first insert the flash tube according to the General Instructions, then insert the model lamps using the packing material to hold the lamps. The three 25W model lamps insert into the reflector-mounted sockets around the flash tube. Align the locking pins to the model lamp sockets and use gentle pressure to insert and gently twist the lamp 1/4 turn. The flash tubes are the MW3 (for M90), MW3C (for M90/CC), MW3Q (for M90Q), and MW3QC (for M90Q/CC). Again, follow the General Instructions to attach the light unit to the power supply. The light units accept several accessories listed below including snoots, barn doors and diffusers.

Technical Specifications

Maximum power:
- MW3 (for MW3R, MW3U, M90) 400Ws
- MW3C (for MW3R/CC, MW3U/CC, M90/CC) . . .400Ws
- MW3Q (for MW3UQ, M90Q) 1200Ws
- MW3QC (for MW3UQ/CC, M90Q/CC) 1200Ws

Flash duration (MW3 and MW3C):
- at 400Ws . . . . . .1/830 sec.
- at 200Ws . . . . . .1/1300 sec.

Flash duration (MW3Q and MW3QC):
- at 1200Ws . . . . . .1/500 sec.
- at 800Ws . . . . . .1/600 sec.
- at 600Ws . . . . . .1/830 sec.
- at 400Ws . . . . . .1/1200 sec.

Flash tube, standard . . . . . .MW3 — 900V, 400Ws
Flash tube, 5500°K color corrected . . . . . .MW3C — 900V, 400Ws
Flash tube, quartz standard . . . . . .MW3Q — 900V, 1200Ws
Flash tube, quartz 5500°K color corrected . . . . . .MW3C — 900V, 1200Ws
Model lamp
- MW3R series . . . . . .60W candelabra base
- MW3U series . . . . . .150W quartz halogen
- M90 series . . . . . .Three 25W locking base

ACCESSORIES FOR LIGHT UNITS WITH FIXED REFLECTORS

14218	barn doors for 5.5" reflectors (2 leaf)
14216	barn doors for 8.5" reflectors (2 leaf)
25519	diffuser, 5.5" mylar clip-on
25526	diffuser, 8.5" mylar clip-on
25211	gel holder, 5.5"
25213	gel holder. 8.5"
24206	snoot for MW3R light unit, 2" opening; used to provide rim lighting on hair and shoulders or other small objects.
24210	snoot for MW3R light unit, 3" opening; used to provide rim lighting on hair and shoulders or other small objects.
24213	snoot for M90 light unit; used to provide rim lighting on hair and shoulders or other small objects.
25210	flood adapter for M90 light unit; increases angle of coverage to 110° when inserted between tube and socket.

UNIVERSAL LIGHT UNITS (REMOVABLE REFLECTORS)

M11, M11/CC, M11Q and M11Q/CC

The M11 series universal light units share a common base, but are differentiated by the type of flash tube each contains. They are supplied with a removable 11-1/2" reflector when purchased individually or include a 7" umbrella reflector when purchased in an umbrella kit or flash systems. When installing flash tubes and model lamps be sure that the unit is disconnected from the power supply. To assemble, first insert the flash tube according to the General Instructions, then insert the model lamp, using the packing material to hold the lamp. The 150W quartz model lamp inserts into the center of the flash tube ring. Align the locking pins to the model lamp socket and use gentle pressure to insert and gently twist the lamp 1/4 turn. The flash tubes are the MW9M (for M11), MW9MC (for M11/CC), MW9Q (for M11Q), and MW9QC (for M11Q/CC). Again, follow the General Instructions to attach the light unit to the power supply. Universal light units accept a full range of quick-disconnect bayonet mount reflectors, snoots, barn doors, diffusers and a tube protector.

Technical Specifications

Maximum power:
- M11 and M11/CC 1200Ws
- M11Q and M11Q/CC 2400Ws

Flash tubes:
- M11, standard . . . . . .MW9H — 900V, 1200Ws
- M11/CC, 5500°K color-corrected . . . . . .MW9HC— 900V, 1200Ws
- M11Q, quartz standard . . . . . .MW9Q — 900V, 2400Ws
- M11Q/CC, quartz 5500°K color corrected . . . . . .MW9QC— 900V, 2400Ws

M11, M11/CC Flash duration
- at 800Ws . . . . . .1/740 sec.
- at 600Ws . . . . . .1/1100 sec.
- at 400Ws . . . . . .1/1500 sec.
- at 200Ws . . . . . .1/250 sec.

M11Q, M11Q/CC Flash duration
- at 1600Ws . . . . . .1/500 sec.
- at 1200Ws . . . . . .1/625 sec.
- at 800Ws . . . . . .1/830 sec.
- at 600Ws . . . . . .1/1000 sec.
- at 300Ws . . . . . .1/1500 sec.

Model lamp . . . . . .150W quartz halogen

UNIVERSAL LIGHT ACCESSORIES

Reflectors

24226 grid reflector, 11.5" for M11 series light units
24227 grid reflector, 16" - 50° for M11 series light units
24235 grid reflector, 20" - 50° for M11 series light units
24236 grid reflector, 22" for M11 series light units
24219 reflector, 7" for M11 series light units
14221 reflector for snoots, 7" black
14209 snoot for 7" reflector, 2.5" opening

Barn doors

14217 barn doors for 7" reflectors (2 leaf)
14540 barn doors for 11.5" reflectors (2 leaf)
14542 barn doors for 16" reflectors (2 leaf)
24215 NEW! 4-way barn door system for 7" reflector
24501 NEW! Cookaloris for 4-way system
24502 NEW! Diffused Glass filter for 4-way system
24503 NEW! Half Scrim for 4-way system
24504 NEW! Graduated Scrim for 4-way system
24505 NEW! Full Scrim for 4-way system

Diffusers

24511 NEW! Lightsox diffuser for 11" reflector
24512 NEW! Lightsox diffuser for 20/16" reflector
24510 NEW! Lightsox diffuser for 22" reflector
25525 diffuser, 7" mylar clip-on
25527 diffuser, 11.5" mylar clip-on
25528 diffuser, 16" mylar clip-on
25529 diffuser, 20" mylar clip-on

Gel holders

25212 gel holder, 7"
25214 gel holder, 11.5"
25215 gel holder, 16"
25216 gel holder, 20"

Grids (for M11 & M11Q)

14611 grid, 7" - 3°
14612 grid, 7" - 10°
14613 grid, 7" - 20°
14614 grid, 7" - 30°
14615 grid, 7" - 40°
14619 grids, set of four 7" (10°, 20°, 30°, 40°)
14601 grid, 11.5" - 10°
14602 grid, 11.5" - 20°
14603 grid, 11.5" - 35°
14608 grids, set of two 11.5" (20° & 35°)
14621 grid, 16" - 20°
14625 grid, 20" - 20°
14630 grid, 22"

GENERAL MAINTENANCE AND CARE

All Speedotron Brown Line equipment is ruggedly built. Nevertheless, it should be treated with the same care given to other pieces of quality photographic equipment. To protect the user, all Speedotron equipment is designed to be safe when used in accordance with instructions. To assure the maximum in safe, dependable service, the following guidelines should be carefully observed.

• Avoid kinking or pulling cables. Disconnect cables by pulling on the plug only. Never pull plugs out by the cable. Light cables as well as sync cords and AC power cords should be occasionally checked for wear, cracks, separation between cable and plug, and for indications of arc-over.

• Do not wrap the light unit cables around the light units. Coiling cables tightly stresses the internal wires and may lead to premature cable failure. If possible, keep the coil diameter at least 10 inches.

• If a cable becomes frayed, the insulation damaged, or the connectors bent or broken, have them repaired immediately.

• Keep all connectors, plugs and sockets free of dust, moisture and corrosion.

• Do not connect or disconnect light units or insert or remove flash tubes while the power supply is on.

• When using your equipment, be sure all cable, sync, power and flash tube connections are completely and properly installed.

• Do not attempt to make repairs to your Speedotron equipment yourself. It is very dangerous, and will void your warranty. Consult your dealer regarding authorized service in your area, or return the equipment to Speedotron.

• When you are not using your equipment, it is recommended that you store it in a dry place. Equipment should be charged up and flashed a few times at least once a month. This will keep your equipment in top working condition for many years.

• With your light unit disconnected, occasionally clean the interior surface of the reflector. Carefully remove the flash tube, and clean the glass cover. Only in this way will you conserve a consistent color temperature and light output. Dirt and dust deposits on the tube and reflector act like a filter to alter color.

• Never handle the quartz halogen model lamps with your bare hands. Use tissue or packing materials when installing and removing. The natural oils from your skin may cause the glass surface to heat unevenly and cause early failure. When removing these lamps allow sufficient cooling time before touching.

• To extend their life, the model lamp circuit should be turned off after set-up and focusing.

TROUBLE-SHOOTING

System will not work at all; no flash.
Check that sync cable, AC power cord and light unit cables are firmly and properly attached. Check that the flash tube is firmly seated. Check that ***Power*** switch is on. With metal camera bodies, you may be required to polarize the camera sync cable and the power supply sync extension in order to avoid possible misfires resulting from a build-up of static electricity. This is done by touching any unpainted metal part of the power supply with the unpainted part of the camera, or better still, with the outer shell or the grounded part of the sync cable with all sync cords attached. If the unit flashes, the plug on the sync cable should be reversed and then marked for future reference. Test fire the camera after reversing the sync extension cable (PC to power supply). If the unit still does not fire, reverse the PC to camera connection and try again. The trigger current is very low and is measured in microamperes, so it is impossible to even feel any shock when touching these contacts.

Occasional failure of all light units to flash.
Check sync cable and light unit cable connections. Make sure that the Ready indicator is illuminated before attempting to fire unit.

Occasional failure of one light unit only.
Check light unit cable connection. Inspect the cable. Check flash tube. Make sure that the Ready/Push to Flash indicator is illuminated before attempting to fire unit.

Reduced light output.
Check to see if Full/Half/Low or Full/Half/1/4 switch is in right position. Check flash tube; check power supply by comparing to similar pack with same light units if possible.

Flash tube glows after firing (afterglow); will not flash again until glow is gone.
If confined to one light unit, check flash tube by substitution. If it continues or all heads afterglow, power supply is at fault. If this is the case, turn power supply off immediately! Power supply needs repair.

Full/Half/Low or Full/Half/1/4 switch has no effect on recycle time or light output.
Power supply needs repair.

Circuit breaker on power supply pops.
Check that all cables on power supply and light units are properly connected. Also check for afterglow. If a circuit breaker blows, it is an indication that something is wrong. Normal operation will not blow circuit breakers.

Circuit breaker or fuse in studio blows.
Be sure AC line is rated for a minimum of 10 amperes and that high amperage electrical equipment is not operating on the same AC line.

Important: When checking power supplies, light units and cables, be sure that ***Power*** is off. Look for blackened, discolored or burned pins and sockets. If a ***Light Unit Outlet*** on the power supply is burned, blackened or discolored, it must be replaced before it is used. It could damage light units that are connected to it. Check that cables are not loose or frayed.

GUIDE NUMBERS

Guide numbers provide a starting point in calculating the proper exposure for pictures taken with flash. A guide number is a constant numerical value (for a given film speed/ISO) determined by multiplying the light source-to-subject distance by the f-stop in use on the lens. Consequently, dividing a given (known) guide number by the light source-to-subject distance will yeld the proper f-stop. For example, if the given guide number is 110 and the light source to subject distance is 10 feet, the f-stop required for proper exposure is f/11.

The formula is as follows:

guide number = G	G = D x F
light source-to-subject distance = D	D = G/F
f-stop = F	F = G/D

Important note: Guide number values provide a general starting point for exposure determination and vary depending on a myriad of factors such as power supply differences, surrounding area reflectance, flash tube differences, etc. In some instances such as extreme close-up and macro applications guide numbers will not provide accurate exposure information. All guide numbers are approximations and we recommend that test shots be produced to insure exposure accuracy.

The guide numbers bellow are based on exposure from one light only, on axis with an exposure index of ISO 100 in feet. The information supplied in the chart bellow is most accurate for use in small, light colored rooms. For large or dark colored rooms it may be necessary to open the lens 1/2 f-stop. For rooms which are both large and dark colored it may be necessary to open up as much as one full f-stop.

Guide Numbers at ISO 100/feet

Ws per flash tube	M90	M90 w/flood adapter	M11 w/7" reflector	M11 w/11" reflector
100Ws	123	80	68	135
200Ws	175	115	95	190
400Ws	245	160	135	270
800Ws	320*	220*	190	380
1200Ws	385*	265*	230	455
1600Ws	-	-	270*	540*

use quartz flash tube only

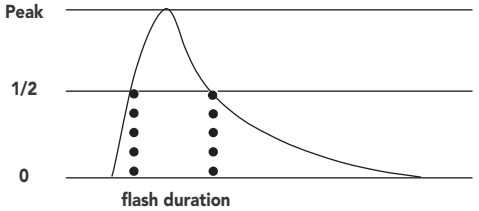
FLASH DURATION

Flash duration of a Speedotron Brown Line system will vary with the type of flash tube, the amount of power outputted and the number of light units connected to the power supply. For example, a D402 system with two M90 light units and two MW3R light units will have four MW3-1 flash tubes and a 400Ws power supply. When set to full power each flash tube will output 100 Ws with a flash duration of 1/1500 second.

Flash Duration in fractions of a second

Ws per flash tube	MW3-1	MW3Q	MW9H	MW9Q
100Ws	1/1500	1/1500	1/3000	1/3000
200Ws	1/1200	1/1200	1/2200	1/2200
400Ws	1/750	1/750	1/1400	1/1400
600Ws	-	1/580	1/1000	1/1000
800Ws	-	1/450	1/700	1/700
1200Ws	-	1/330	1/500	1/500
1600Ws	-	-	-	1/400

Flash duration is measured from 1/2 peak light output to 1/2 light peak output as illustrated below:



Light will continue to be produced for about five times the flash duration but will add little to the exposure. This will not affect action stopping abilities for most normal contrast subjects.

M11 w/16" reflector	M11 w/20" reflector	MW3R	MW3U w/o umbrella
105	113	95	95
150	160	135	135
210	225	190	190
295	320	255*	255*
355	380	305*	305*
420*	450	-	-

SPEEDOTRON'S LIMITED WARRANTY

Speedotron guarantees to repair or replace, free of charge, any part or parts (except for flash tubes and modeling lamps) found by factory inspection to be defective due to faulty material or workmanship, provided the equipment is returned to our factory prepaid. The period of warranty is two years from the date of original purchase. Flash tubes, which are warrantied by independent manufacturers, are covered for a period of one year only, and the length of manufacturer warranties on modeling lamps varies. The manufacturers' warranties covering flash tubes and modeling lamps are for defective merchandise only, and do not cover tubes that are cracked or broken.

The Speedotron two-year warranty does not apply to equipment which has been abused, cracked or broken in shipping, resold or rented (without written permission from Speedotron Corporation), which has the serial number removed or defaced, which has been modified or repaired by an unauthorized person, or which has been purchased from any source other than an authorized Speedotron dealer. A copy of the original sales receipt from an authorized Speedotron dealer is required at the time of warranty service.

Speedotron shall not be liable for any injury, loss or damage, direct or consequential, arising from the use or inability to use the product. Prior to use, the purchaser shall determine the suitability of the product for the intended use and assume all risks and liabilities.

The obligation of Speedotron Corporation is limited to repair or replacement only and no one is authorized to assume any obligation not in accordance with the above.

Do not attempt to make repairs to your Speedotron equipment. All electronic flash systems operate on high voltage and high power. There is a high risk of severe electrical shock when opening a power supply or light unit. Leave service to qualified and authorized electrical service personnel. Authorized service personnel are familiar with the procedure to fully discharge a live unit (flashing the unit is not enough to drain stored power even when the unit is unplugged). Repairs by unauthorized service personnel or by the user will void the Speedotron warranty.

Although we do have several service stations, we encourage you to send all repairs, under warranty or otherwise, to our factory to ensure the best possible service. Not only will your unit be properly repaired, but it will be given a routine updating of all circuitry that has been revised since your unit was manufactured.

Should service be necessary under this warranty, return the item to us, prepaid (we do not accept collect shipments). We, in turn, will expedite repairs and return the item to you, prepaid, via whatever means of transportation you used to ship it to us (applies to continental U.S.A. only).

This warranty is not valid unless you fill out and return your warranty registration card. Equipment should be registered within 10 days of purchase.

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