

Other products available from Apollo:

- **Stainless Steel Gobos**
- **Aluminum Gobos**
- **Glass Gobos**
- **Dichroic Glass Filters**
- **Gel Filters**
- **Gel Frames**
- **Gel Cabinets**
- **Donuts**
- **Pattern Holders**
- **Stage Foil**
- **Intelligent Lighting Wheels**
- **Gaffer Tape**
- **Gobo Rotators**

SPECTRA



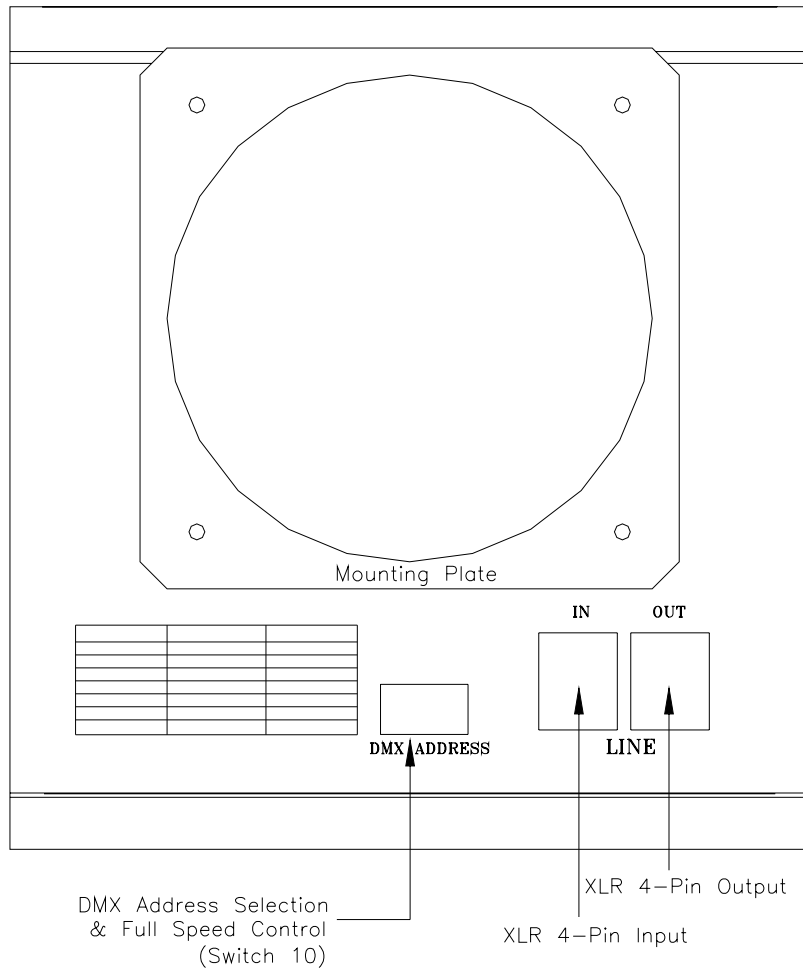
Scroller Operating Manual

Apollo Design Technology, Inc.
4130 Fourier Drive
Fort Wayne, IN 46818
USA
Tel: 260-497-9191 Fax: 260-497-9192

www.internetapollo.com



Rear Panel View



Spectra Q Repairs

- All Spectra Q scrollers are covered by a 12-month parts and labor warranty.
- Need assistance? Call Apollo Design Technology, Inc. at 800-288-4626 for details.

Serial Number: _____

Date Purchased: _____

Purchased From: _____

Note: A range of mounting plates is available to suit most fixtures (see section i) for current selection).

Standard Spectra Q Features:

- Digital circuitry.
- Various length gel string scrolling capability (2-16 colors).
- Read USITT DMX512 (1990) protocol for individual addressing and easy grouping of multiple units.
- Equipped with integral cooling fan.
- Equipped with three diagnostic LED indicators.
- XLR 4-pin connectors supply power and control signals.

Other Scroller Accessories:

- Power Supplies
- Mounting Plates
- 4 Pin Accessory Cables
- 5 Pin Accessory Cables
- Gel Strings
- Hot Mirror Glass
- Apollo Stage Foil

Product Overview

The family of Spectra Q scrollers are designed to be some of the most reliable color changers available. The use of digital circuitry and high technology composite materials produces affordable color changers, which are capable of scrolling gel strings of various lengths from 2 to 16 colors.

The Spectra-Q's are designed to give years of trouble free use, providing that they are regularly adjusted and used in accordance with the instructions detailed in this manual. If you should experience any problems, which fall outside of the scope of this manual, contact the selling dealer for further details.

If the selling dealer is unable to satisfy your servicing needs, contact Apollo Design Technology Inc. directly for full service:

USA:
Apollo Design Technology Inc.
4130 Fourier Drive
Fort Wayne, IN 46818
Tel: (260) 497-9191
Fax: (260) 497-9192

Product Description

The Spectra-Q's will read USITT DMX512 (1990) protocol, which enables individual addressing of each unit. This allows for easy grouping of multiple units. The units are individually addressed by setting the 10-position binary switch, or by setting the three rotary decimal switches (SQ5, SQ8) as described in section f.

The Spectra-Q's are supplied power and control signals by means of an XLR 4-pin input connector. The XLR 4-pin output may then be used to connect other units to the same line. Each chain line must be terminated by patching the output from the last unit in the chain to its corresponding return connection on the PSU as shown in the System Diagram page 5, or with a DMX terminator.

Note: *The quantity of Spectra-Q color changers and maximum cable length per distribution line is dependent upon the size of PSU used and the collective amperage draw of the units connected (see page 5 for full details).*

The Spectra-Q's are equipped with an integral cooling fan. Each unit is also equipped with three diagnostic LED indicators (found on the underside of the unit); showing Power, DMX signal, and DMX level (see section j – Troubleshooting on page 10 for full details).

Operation

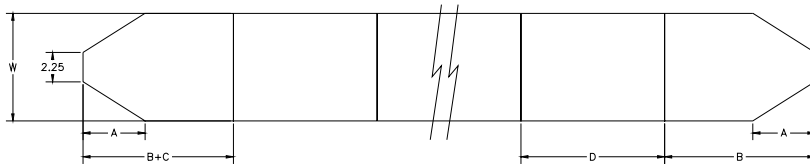
A summary of Spectra-Q's operations has been divided into the following sections:

- a) **Gel Description** – page 3
- b) **Gel Dimensions** – page 3
- c) **Gel String Assembly** – page 4
- d) **Control and Power Cables** – page 4
- e) **Loading Gel Strings and Calibration** – page 5
- f) **Setting the Address** – page 6
- g) **PSU Options** – page 8
- h) **Mounting Position** – page 9
- i) **Lighting Fixtures and Mounting Plates** – page 9
- j) **Troubleshooting** – page 10

a) Gel Description

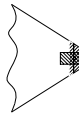
The standard gel consists of a leader, gel frames, and a tail. Apollo Gel, Procolor HT+, Rosco Supergel, Lee, and GAMcolor are the recommended brands. The leader and tail are taped to gel tabs, which are inserted into the slots on each of the rollers.

b) Gel Dimensions



	SQ 1	SQ 3	SQ 5	SQ 6	SQ 7	SQ 8
A	4 3/4	4 3/4	0	4 3/4	3 1/2	0
B	10 1/2	10 1/2	8	10 1/2	4	8
C	1	0	0	1	0	0
D	11	10	18	12	7	18
W	8 1/4	6 31/32	17	9 1/2	5 1/4	25

* in inches



DETAIL TAPING GEL TABS
VALID FRONT AND BACK

Note: The gel tabs are not included in the A dimension.

Note: The gel strings for SQ5 and SQ8 are not tapered, nor are the gel tabs used. The gel string is taped directly to the roller tubes.

Spectra-Q PSU 08 Specification:

Dimensions:	9 1/4"(W) x3 1/8"(H) x9"(D) 235mm(W) x80mm (H) x230mm (D)
Weight:	3.5lb / 1.6kg.
Power Requirements:	100 to 240VAC 50/60Hz
Power Consumption:	3A at 100 to 240VAC 50/60Hz
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	Powder-coated aluminium
Mounting Options:	Either freestanding or truss mounted using C-clamp.
Color:	Black
Circuit Out Connectors:	Two XLR 4-pin female (power and control protocol)
Return Connectors:	Two XLR 4-pin male (power and control protocol)
Power Input Connector:	IEC 10A, UL rated, supplied with detachable power cord
Control Out Connector:	XLR 5-pin female (DMX link)
Control Input Connector:	XLR 5-pin male (protected with clamping diodes)
North American Approvals:	CSA approved for Canada and USA Radiated Emissions: Complies with FCC part15, subpart B, class A for unintentional radiators.

European Approvals: Complies with EU directives: EMC 89/336/EEC and LVD 73/23/EEC. Harmonized standards applied in order to verify compliance with directives: EN55022 (class B), EN50082-1 & EN60950

Spectra-Q5 and Spectra-Q8 Color Changers Specification:

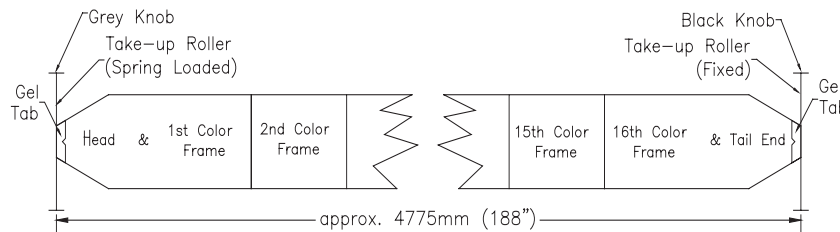
	Width	Height	Depth	Weight	Aperture
SQ5	20.5"	25"	3"	11lb	16"x16"
SQ8	20.5"	32.5"	3"	12.1lb	15"x24"

Gel frame capacity:	between 2-16 frames
Speed:	6 seconds with dipswitch 10 to Off
Speed2:	12 seconds with dipswitch 10 to On
Address:	1 to 512 set on 3 Rotary Decimal Switches
Power Requirements:	24VDC
Power Consumption:	1 Amperes peak at 24VDC with dipswitch 10 to Off 0.75Amperes peak at 24VDC with dipswitch 10 to On
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	Powder coated aluminium
Mounting Plate:	Made to fit specific lighting fixtures. Please consult Apollo Design Technology.
Color:	Black
Input Connector:	XLR 4-pin male (power and control protocol)
Output Connector:	XLR 4-pin female (power and control protocol)
North American Approvals:	Radiated Emissions: Complies with FCC part15, subpart B, class A for unintentional radiators. Low voltage Directive: Complies with CSA 22.2 950, UL 1950
European Approvals:	Complies with EU directives: EMC 89/336/EEC Class A. Harmonized standards applied in order to verify compliance with directives: EN56022: 1994, EN50082-1: 1992 & EN60950

c) Gel String Assembly

To join a leader, tail, gel and tab together, a high temperature, clear gel tape is recommended.

An example of the completed Spectra-Q3 string should look like this:



d) Control and Power Cables

Apollo Design Technology 4 pin data cable (accessory cable) is recommended for use with the Spectra-Q color changing system. Other high quality shielded cables are also recommended.

The Spectra-Q utilizes an XLR 4-pin cable system. This is used for power and data transfer. Pins 1 and 4 serve as 24VDC power. Pins 2 and 3 are used for USITT 1990 DMX512 control protocol.

Note: It is very important to ensure that the drain wire from the cable shield is connected to **both** connector cases, should you use cable other than the Apollo brand.

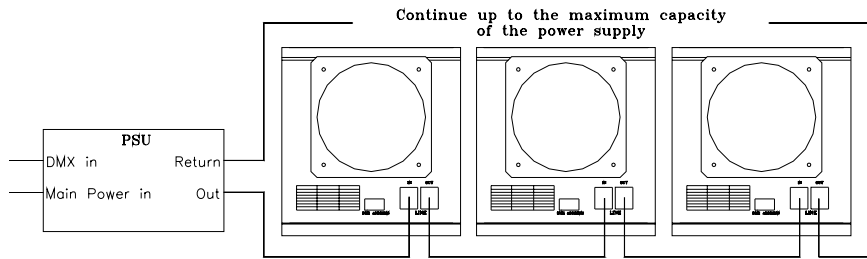
When assembling XLR 4-pin cables, heat shrink should be used on each individual pin to prevent short circuits.

Note: Damage will occur if power connections short-circuit to control protocol or ground shield connections.

The pins are wired one to one, in the following format:

Pin	Function
1	0V DC
2	Control Data Minus
3	Control Data Plus
4	Plus 24V DC
Chassis	Ground Bonding

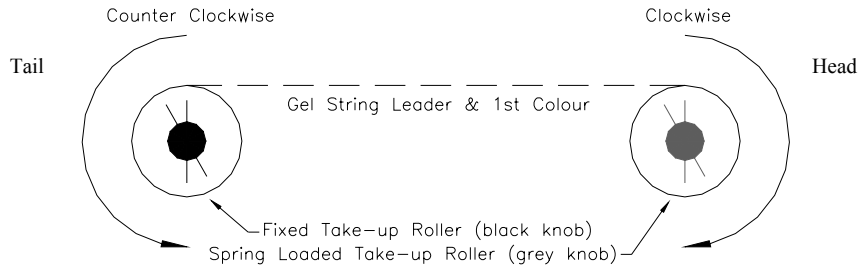
System Diagram



Note: Total cable length per circuit must not exceed 200 feet/60m on the PSU 08

e) Loading Gel Strings, Applying Tension and Calibration:

Procedure for SQ1, SQ3, SQ6



To load the gel string into the scroller, the following procedure should be followed:

- 1) Slit, puncture or cut out the clear gel covering the “V” area of the tail end metal tab. Attach the metal tab to the hook on the flat side of the center hub of the fixed roller (black knob) by sliding the hook up and through the “V” area of the tab.
- 2) Manually wind the gel string onto the fixed roller.
- 3) Remove the slack by holding the roller and pulling the end of the string until tight.
- 4) Repeat Step 1 to hook the leader gel tab to the center hub of the spring roller (grey knob).
- 5) Insert the rollers onto the respective shafts (color coded) and engage them with the locking mechanisms at the base of each shaft.

To apply tension to the gel being loaded, the following procedure should be followed:

- 1) Hold fixed roller (black knob).
- 2) Lift spring-loaded roller (grey knob) until it rotates freely.
- 3) Rotate spring-loaded roller clockwise one and one half turns while lifted.
- 4) Reengage the spring-loaded roller with the locking mechanism at the shaft’s base by pushing it down. The roller should snap into place.

Spectra-Q1 and Spectra-Q6 Color Changers Specification:

	Width	Height	Depth	Weight	Aperture
SQ1	12”	13.25”	3.25”	4.18lb	7.5”
SQ6	13”	14.125”	3.25”	5.06lb	8.5”

Gel frame capacity:	between 2-16 frames
Speed:	2 seconds with dipswitch 10 to Off
Speed2:	4 seconds with dipswitch 10 to On
Address:	10 pin binary dipswitch address up to 512 channels
Power Requirements:	24VDC
Power Consumption:	0.8Amperes peak at 24VDC with dipswitch 10 to Off 0.6Amperes peak at 24VDC with dipswitch 10 to On
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	Powder coated aluminium
Mounting Plate:	Mounting plates are available to suit numerous fixtures
Color:	Black
Input Connector:	XLR 4-pin male (power and control protocol)
Output Connector:	XLR 4-pin female (power and control protocol)
North American Approvals:	Radiated Emissions: Complies with FCC part15, subpart B, class A for unintentional radiators. Low voltage Directive: Complies with CSA 22.2 950, UL 1950
European Approvals:	Complies with EU directives: EMC 89/336/EEC Class A. Harmonized standards applied in order to verify compliance with directives: EN56022: 1994, EN50082-1: 1992 & EN60950

Spectra-Q7 Color Changer Specification (SQ7)

Dimensions:	8" (w) x 9 1/4" (h) x 3" (d) 205 mm (w) x 235 mm (h) x 75 mm (d)
Aperture:	5" diameter / 127mm
Weight:	2.3lb (without mounting frame) / 1.05kg.
Gel Frame Capacity:	2-16 frames
Speed:	1.5 seconds end-to-end 16 frames on high speed
Speed 2:	3.0 seconds end-to-end 16 frames on low speed
Address:	Binary address to 512 channels
Power Requirements:	24V DC
Power Consumption:	0.7 Amperes nominal 0.9 Amperes peak
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	UL94 VO rated reinforced PBT compound
Mounting Plate:	Unit ships with mounting plate to fit into 6.25" color frame slot.
Color:	Black
Input Connector:	XLR 4-pin male (power and control protocol)
Output Connector:	XLR 4-pin female (power and control protocol)
North American Approvals:	Radiated Emissions: Complies with FCC part15, subpart B, class A for unintentional radiators. Low voltage Directive: Complies with CSA 22.2 950, UL 1950
European Approvals:	Complies with EU directives: EMC 89/336/EEC Class A. Harmonized standards applied in order to verify compliance with directives: EN 56022:1994, EN 50082-1: 1992 & EN 60950

Note: One and one half turns (revolutions) of the spring-loaded roller are required to tension the gel.

Do Not Over Tension. This will cause damage to the unit, i.e. broken springs, bent shafts and premature wear on mechanical components. It will also increase the ambient noise level of the unit. Always ensure that fixed roller does not rotate while completing this procedure.

- 5) Power up the unit. A self-calibration procedure will begin to set the 100% and 0% gel string settings (It is advisable to have control protocol at the zero level to verify the gel string has been loaded properly).

Procedure for SQ7

- 1) Clip the tail end gel tab to the center hub of the right hand side roller.
- 2) Manually wind the gel string onto the right hand side roller.
- 3) Remove the slack by holding the roller and pulling the end of the string until tight.
- 4) Hold the leader of the gel string in line with the left hand side roller. Turn the left hand side roller four full turns counter clockwise.
- 5) Clip the leader end gel tab to the center hub of the left hand side roller.

Procedure for SQ5 and SQ8

SQ5 and SQ8 have dual motor drive, which automatically tensions the gel string at power up.

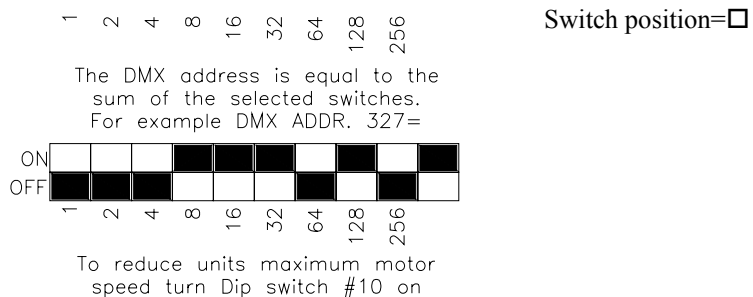
- 1) Attach the leader to the left hand side roller using six pieces of paper tape – three places on the over side and three on the under side, top middle and bottom respectively.
- 2) Manually wind the gel string on to the left hand side roller. Remove the slack by holding the roller and pulling the end of the string until tight.
- 3) Attach the tail to the right hand side roller using six pieces of paper tape – three places on the over side and three on the under side, top middle and bottom respectively.

f) Setting the Address

The **SQ1, SQ3, SQ6 and SQ7** can be addressed easily by setting the binary dipswitches located on the rear panel (see diagram on page 2). To set your desired address, move the appropriate switches to either the on (up) or the off (down) position.

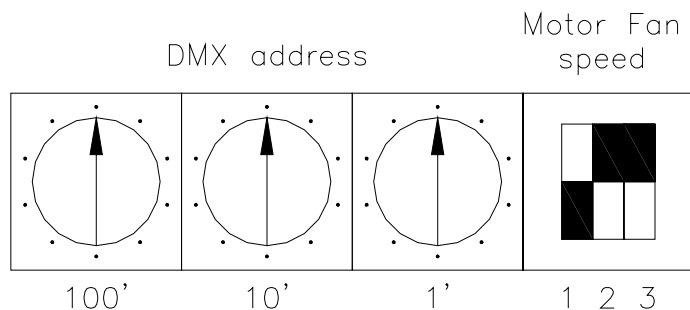
Note: All switches in the down position are 0.

For example:



Switch number 10 in DMX controlled mode is used to reduce the maximum scrolling speed by approximately 50% when ON. This can be used in environments that are particularly noise sensitive or when available power is insufficient.

The **SQ5 and SQ8** can be addressed easily by setting the address number on the three Rotary Decimal switches located on the rear panel. The Rotary Decimal switches from left to right correspond to the hundreds, tens and ones of the address number.



The three binary switches are used to set the maximum scrolling speed and the fan speed. Switch 1 reduces the maximum scrolling speed approximately by 50% when ON. The fan speed has four settings:
 Switch 2 off, 3 off – high
 Switch 2 off, 3 on – medium high
 Switch 2 on, 3 off – medium low
 Switch 2 on, 3 on – low

Spectra-Q3 Color Changer Specification (SQ3)

Dimensions:	11 1/4”(W) x11 5/8”(H) x3 1/2”(D) 285mm(W) x295mm (H) x89mm (D)
Aperture:	6 3/4” diameter / 171 mm
Weight:	4.5lb (without mounting frame) / 2.04 kg.
Gel Frame Capacity:	between 2-16 frames
Speed:	2 seconds with dipswitch 10 to Off
Speed 2:	3.25 seconds with dipswitch 10 to On
Address:	10 pin binary dipswitch address up to 512 channels
Power Requirements:	24VDC
Power Consumption:	0.7Amperes peak at 24VDC with dipswitch 10 to Off 0.4Amperes peak at 24VDC with dipswitch 10 to On
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	UL94V0 rated reinforced PBT compound
Mounting Plate:	Mounting plates are available to suit numerous fixtures.
Color:	Black
Input Connector:	XLR 4-pin male (power and control protocol)
Output Connector:	XLR 4-pin female (power and control protocol)
North American Approvals:	Radiated Emissions: Complies with FCC part15, subpart B, class A for unintentional radiators. Low voltage Directive: Complies with CSA 22.2 950, UL 1950
European Approvals:	Complies with EU directives: EMC 89/336/EEC Class A. Harmonized standards applied in order to verify compliance with directives: EN56022: 1994, EN50082-1: 1992 & EN60950

Note: A high percentage of problems are caused by corrupt DMX control protocol. We highly recommend the use of genuine Apollo Design Technology cables for all Spectra-Q color changers and Roto Q units.

Limited Warranty

Your Spectra-Q color changers and PSU are covered by a 12-month warranty against defects in manufacture. The warranty covers parts and labor but excludes the cost of freight. In the case of any warranty claims, please contact Apollo Design Technology Inc. directly at 4130 Fourier Drive, Fort Wayne, IN 46818 USA

SQ1, SQ3			SQ5, SQ8			SQ7		
DMX Value	% Value	Frame#	DMX Value	% Value	Frame#	DMX Value	% Value	Frame#
0		1	0		1	0		1
16	6	2	20	8	2	18	7	2
32	13	3	38	15	3	36	14	3
48	19	4	58	23	4	54	21	4
64	25	5	76	30	5	72	28	5
80	31	6	94	37	6	90	35	6
96	38	7	112	44	7	106	41	7
112	44	8	128	50	8	122	48	8
130	51	9	146	57	9	138	54	9
148	58	10	162	63	10	156	61	10
166	65	11	178	70	11	172	67	11
184	72	12	194	76	12	188	73	12
202	79	13	210	82	13	204	80	13
220	86	14	226	88	14	222	87	14
238	93	15	240	94	15	238	93	15
256	100	16	256	100	16	256	100	16

g) PSU Options

The Spectra-Q color changer is compatible with the following power supplies:

- Apollo Roto-Q power supplies
- Spectra-Q PSUs
- Chroma-Q power supplies
- Rainbow power supplies
- Wybron Forerunner power supplies

DO NOT PLUG SPECTRA-Q INTO COLORAM POWER SUPPLIES!

Because of reversed power pin designation, this will cause serious damage to the Spectra Q electronics.

PSU XX stands for POWER SUPPLY UNIT and the number XX corresponds to the maximum number of **Spectra-Q3** color changers it can power simultaneously.

The Spectra-Q PSU is available in 2 sizes:

- PSU 08 5.4A
- PSU 02 1.66A

Both PSU models have a universal power input -100 to 250VAC, 50 or 60Hz. The only change required is an AC cord matching the available power outlet.

Each Spectra-Q PSU 08 is equipped with the following:

- 1) XLR5 male and female sockets as DMX input and thru sockets
- 2) DMX data indicator (green)
- 3) Main power indicator (red)
- 4) Two XLR male 4 pin output sockets for POWER & DMX
- 5) Two XLR female 4 pin output sockets for POWER & DMX
- 6) AC Power Cord

PSU 08 provides opto isolation between the incoming DMX and the DMX distributed to the color changer outputs. A separate line driver IC buffers each DMX output.

Each Spectra-Q PSU 02 is equipped with the following:

- 1) XLR5M as DMX input socket
- 2) Main power indicator
- 3) One XLR female 4 pin output socket for POWER & DMX
- 4) AC Power Cord

The basic purpose of the PSU is to combine the DMX control signal and the 24VDC power into individual lines. There are separate circuit outputs for distribution on each PSU, each capable of supplying power and data for Apollo Spectra-Q color changers.

The maximum total cable length for each output circuit is 200 feet/60m on the PSU 08.

All outputs are independent of one another, and each line has its own return. The purpose of the return line is to maintain a constant voltage level across all units on each line, to reduce line loss and to provide DMX signal termination. The return lines are recommended at cable lengths over 100'. When powering more than 4 Spectra-Q3 color changers it is recommended to make two groups powered by separate outputs on the PSU 08.

The PSU 08 has two Spectra-Q circuits and produces 5.4 amps maximum at 24VDC. This means a total of 8 Spectra-Q3 color changers can be powered through a single PSU 08. The power consumption is approximately 3 amps at 115VAC.

h) Mounting Position

The **SQ1, SQ3 and SQ6** are designed to work in an upright position with the base of the unit below the fixture. Do not mount in an inverted position with the base of the unit above the fixture, as the effect of the rising heat from the fixture may cause gel string damage or may loosen the rollers.

Always ensure that the Spectra-Q color changer is powered up before the lighting fixture and that you follow the reverse procedure at the end of the show. Failure to do so may cause gel string damage.

Always ensure that the safety cable attached to the Spectra-Q is attached to the yoke of the lighting fixture.

i) Lighting Fixtures and Mounting Plates

The Spectra-Q3 is designed to work with most lighting fixtures up to 1000 watts. The mounting plate fits into the color-frame slot of the respective lighting fixture.

The following mounting plates are available:

MP1	Mounting Plate for Par 64, 9 7/8"x10" – 6.5" aperture (165mm)
MP2	Mounting Plate for Source 4 Par, 7 1/2"x7 1/2" – 6.5" aperture
MP3	Mounting Plate for Source 4/Shakespeare/Strand SL/Selecon Pacific, 6 1/4" x 6 1/4" – 5" aperture
MP6	Mounting Plate 10"x10" – 7.5" aperture
MP7	Mounting Plate 10x10 – 8" aperture
MP8	Mounting Plate 12"x12" – 8 1/2" aperture
MP50	Mounting Plate for 5k Fresnels
MP80	Mounting Plate for 8-Lite fixtures

When the Spectra-Q3 is used on a 1K fixture like Par 64, we **strongly** recommend 7"x 7" hot mirror or heat resistant shield be placed under the mounting plate in order to protect the gel string from excessive heat.

j) Troubleshooting

Troubleshooting the Spectra-Q color changers is aided by the indications provided by the 3 diagnostic LED's located on the underside of the Spectra-Q.

All troubleshooting procedures should begin with an LED check.

This section is a guide to solving common problems:

Symptom	Possible Cause	Solution
All Spectra-Q's show no Power indicator (Red LED).	24V DC power supply is not providing power to Spectra-Q.	Check if main power is on and red 24V DC LED is on.
Single Spectra-Q power indicator is off (Red LED).	4-pin XLR cable has broken connection.	Replace 4-pin XLR cable.
Power indicator light in flashing (Red LED).	Gel string is jammed.	Re-adjust or replace faulty gel string and/or turn power off and then on again. This will reset the unit.
One or more Spectra-Q's are resetting when moving at high Speed.	Voltage has dropped below acceptable level.	Check that the return line has been installed. Check that maximum cable length has not been exceeded or too many SQ's on circuit.
DMX indicator on all Spectra-Q's are off (Green LED).	No DMX is present at the PSU.	Check that the DMX cable is properly connected to DMX input on the PSU. Check that DMX indicator light, located on the PSU, is on.
DMX indicator light on one group of Spectra-Q's are off (Green LED).	One output of the PSU has failed. Faulty XLR 4-pin cable at PSU output.	Test cables. Call selling dealer.
Level indicator does not respond to DMX control signal (Yellow LED).	Improper address. Damaged address switch.	Reassign unit addressing.
Roller rattles at high speed SQ1/SQ3/SQ6.	Bent shaft.	Call selling dealer.
Loose tension near center of gel string.	Damage by over tensioning spring in the grey knob roller.	Replace the grey knob roller.