

# DRAWMER



## S2 Dual Channel Vacuum Tube Compressor

### OPERATOR'S MANUAL

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## ONE YEAR LIMITED WARRANTY

Drawmer Electronics Ltd., warrants the Drawmer S2 Dual Channel Vacuum Tube Compressor to conform substantially to the specifications of this manual for a period of one year from the original date of purchase when used in accordance with the specifications detailed in this manual. In the case of a valid warranty claim, your sole and exclusive remedy and Drawmer's entire liability under any theory of liability will be to, at Drawmer's discretion, repair or replace the product without charge, or, if not possible, to refund the purchase price to you. This warranty is not transferable. It applies only to the original purchaser of the product.

For warranty service please call your local Drawmer dealer. Alternatively call Drawmer Electronics Ltd. at +44 (0)1709 527574. Then ship the defective product, with transportation and insurance charges prepaid, to Drawmer Electronics Ltd., Coleman Street, Parkgate, Rotherham, S62 6EL UK. Write the RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem. Drawmer will not accept responsibility for loss or damage during transit.

This warranty is void if the product has been damaged by misuse, modification or unauthorised repair.

THIS WARRANTY IS IN LIEU OF ALL WARRANTIES, WHETHER ORAL OR WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. DRAWMER MAKES NO OTHER WARRANTY EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. PURCHASER'S SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE REPAIR OR REPLACEMENT AS SPECIFIED HEREIN.

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# **DRAWMER**

## **S2**

### Dual Channel Vacuum Tube Compressor

## SAFETY CONSIDERATIONS

### CAUTION - MAINS FUSE

TO REDUCE THE RISK OF FIRE  
REPLACE THE MAINS FUSE ONLY WITH  
A FUSE THAT **CONFORMS TO IEC127-2.**  
250 VOLT WORKING, TIME DELAY TYPE  
AND BODY SIZE OF 20mm x 5mm.  
THE MAINS INPUT FUSE MUST BE  
RATED AT 230V=T500mA and 115V=T1Amp.

### CAUTION - MAINS CABLE

DO NOT ATTEMPT TO CHANGE  
OR TAMPER WITH THE  
SUPPLIED MAINS CABLE.

### CAUTION - SERVICING

DO NOT PERFORM ANY SERVICING.  
REFER ALL SERVICING TO QUALIFIED  
SERVICE PERSONNEL.

### WARNING

TO REDUCE THE RISK OF FIRE OR  
ELECTRIC SHOCK DO NOT EXPOSE  
THIS EQUIPMENT TO RAIN OR MOISTURE.



**In the interests of product development, Drawmer reserve the right to modify or improve specifications of this product at any time, without prior notice.**

# DRAWMER S2 DUAL CHANNEL VACUUM TUBE COMPRESSOR



## INTRODUCTION

The new S2 Signature Series Dual Channel Tube Compressor is the latest product to emerge from Ivor Drawmer's high end designs and offers an 'all tube - no technical compromise' circuit using only the highest grade components. The S2 features a host of new creative processing possibilities never before found in an all analogue dynamics package.

**BIG-** Retains bass frequencies and minimizes undesirable 'pumping' by rolling off the detection signal at 75, 125 or 250Hz (user switchable). A fully variable level control allows for the desired amount of Big processing and an in/out switch provides the option to remove from the signal path for A/B comparison.

**BRIGHT-** A dynamic high frequency enhancer to keep compressed audio sounding fresh and bright with continuously variable frequency control (500Hz to 20kHz) and amount of dynamic enhancement.

**DRY-** Mixes user defined amount of 'uncompressed' signal with the compressed signal to create 'parallel compression effect' without the need for external mixing devices.

- 2 CHANNEL SOFT-KNEE TUBE COMPRESSOR
- FULLY BALANCED INTERNAL SIGNAL PATH
- CLASS A DESIGN
- ISOLATION TRANSFORMERS IN AND OUT
- 'ALLTUBE' CIRCUIT DESIGN
- VARIABLE ATTACK AND RELEASE WITH OPTIONAL 'PROGRAMME DEPENDENT' AUTO RELEASE OPERATION
- DUAL MONO OR STEREO LINK OPERATION
- SWITCHABLE 'PEAK' OR 'VU' METERING TO DISPLAY TRANSIENTS
- SWITCHABLE +10dB OR +20dB METER RE-SCALE MODES
- 8 SEGMENT GAIN REDUCTION METERING
- 'VARIABLE-BIG' MODE FOR RETAINING LOW FREQUENCIES
- 'VARIABLE-AIR' MODE FOR ENHANCING HIGH FREQUENCIES
- 'DRY' MIX MODE FOR 'PARALLEL COMPRESSION EFFECT'
- BALANCED XLR INPUTS/OUTPUTS

# INSTALLATION

The S2 is designed for standard 19" rack mounting and occupies 3U of rack space. Fibre or plastic washers may be used to prevent the front panel becoming marked by the mounting bolts. Always connect the mains earth to the unit.

Because the S2 contains six valves it will generate more heat than a simple solid state unit. Avoid mounting the unit directly above power amplifiers or power supplies that radiate significant amounts of heat. In addition it is advised that you leave at least 1U of space above to allow heat to dissipate. Alternatively, a fan should be fitted somewhere near to the rear of the unit to circulate cooler air and help expel any excess heat. (see fig. 1)

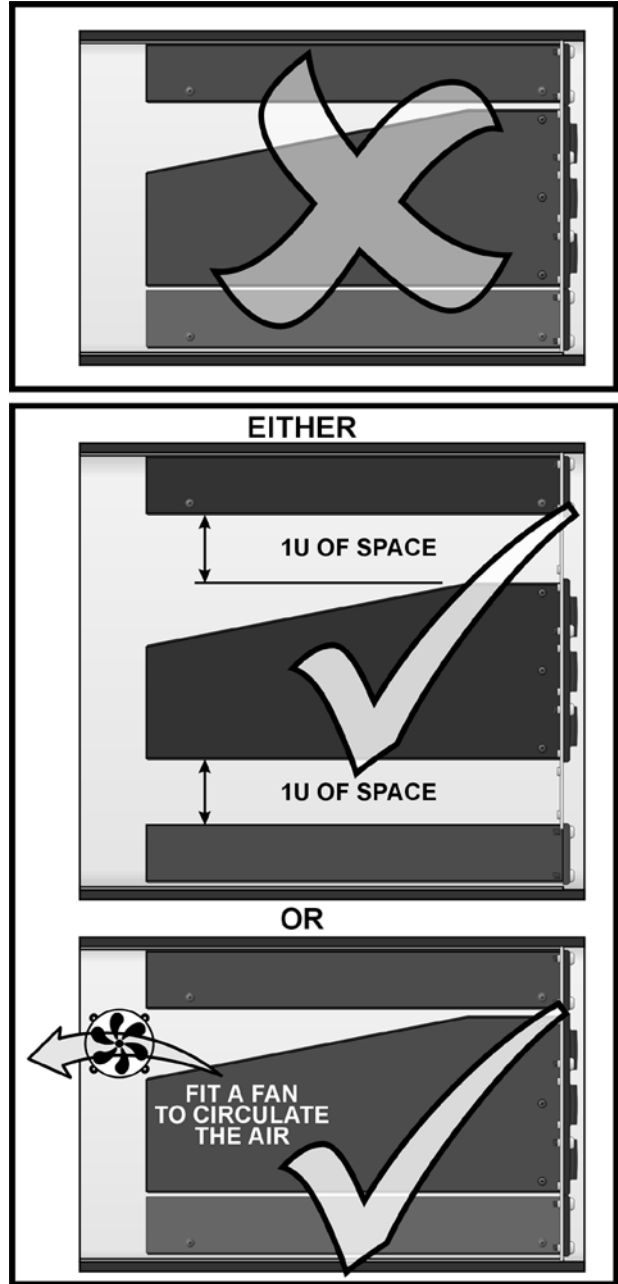


fig.1 RACK MOUNT POSITIONING

## Stereo Signal Input

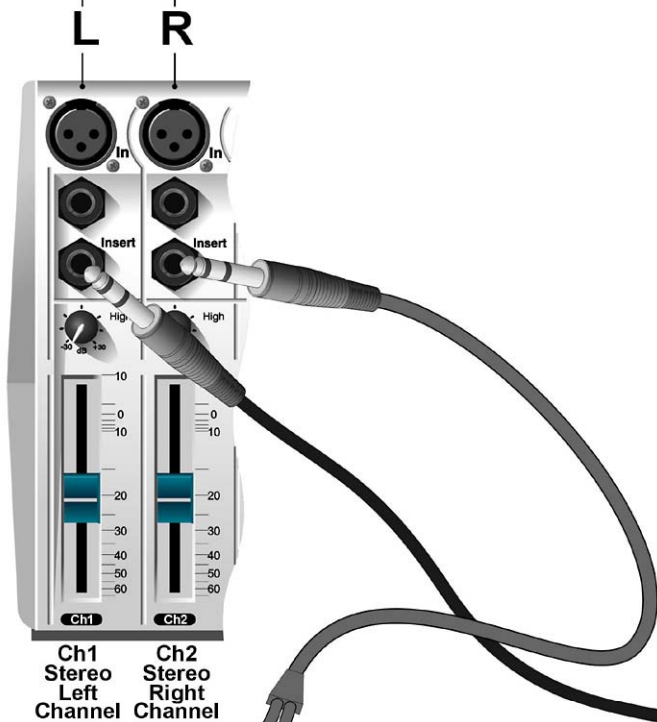
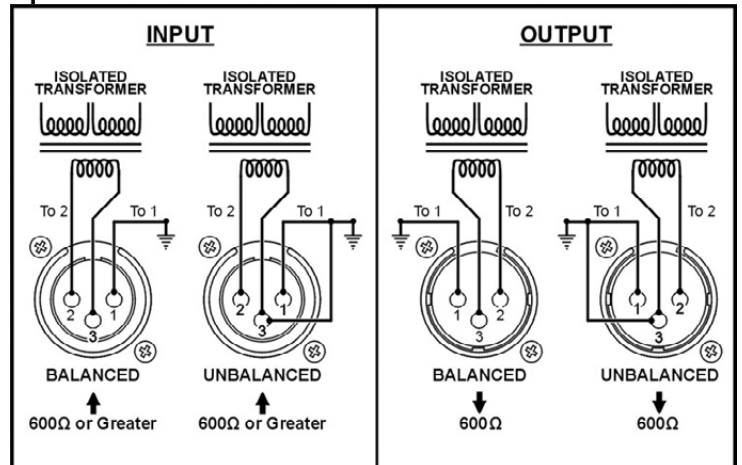
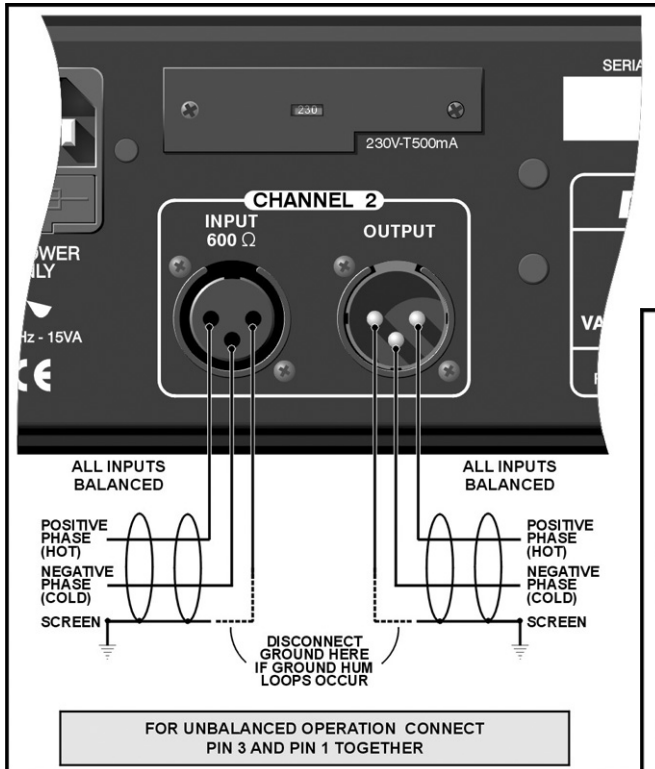


fig.2 TYPICAL S2 SETUP

## AUDIO CONNECTIONS

The inputs and outputs are electronically balanced on conventionally wired XLRs (pin 1 screen, pin 2 hot, pin 3 cold and XLR shell is connected to chassis). The operating level is nominally +4dBu. Balanced use is recommended.

fig.3 XLR WIRING



### • Ground Loops:

If ground loop problems are encountered, never disconnect the mains earth, but instead, try disconnecting the signal screen on one end of each of the cables connecting the outputs of the S2 to the patchbay. If such measures are necessary, balanced operation is recommended.

### • Interference:

If the S2 is to be used where it may be exposed to high levels of disturbance such as found close to a TV or radio transmitter, we advise that it is operated in a balanced configuration. The screens of the signal cables should be connected to the chassis connection on the XLR connector as opposed to connecting to pin 1. The S2 conforms to the EMC standards.

## POWER CONNECTION

The unit will have been supplied with a power cable suitable for domestic power outlets in your country. For your own safety it is important that you use this cable. The unit should **always** be connected to the mains supply earth using this cable, and no other.

If for some reason the unit is to be used at a mains input operating voltage which is different to that as supplied, the following procedure must be carried out.

- 1: Disconnect the unit from the mains.
- 2: Remove the two screws holding the voltage selection cover-plate.
- 3: Remove the cover plate and slide the switch fully to its opposite end.
- 4: Rotate the cover plate one half turn (180 degrees) and refit the two screws.
- 5: Replace with a correctly rated fuse for the selected operation voltage in the IEC socket:  
230V-T500mA and 115V-T1Amp
- 6: Re-connect to mains power source.

**Never disconnect the earth  
from the mains supply**

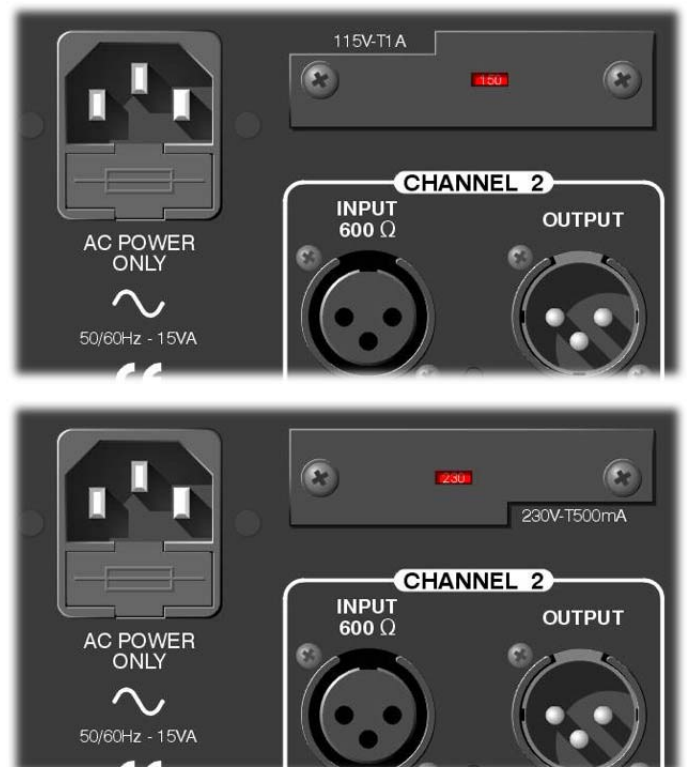
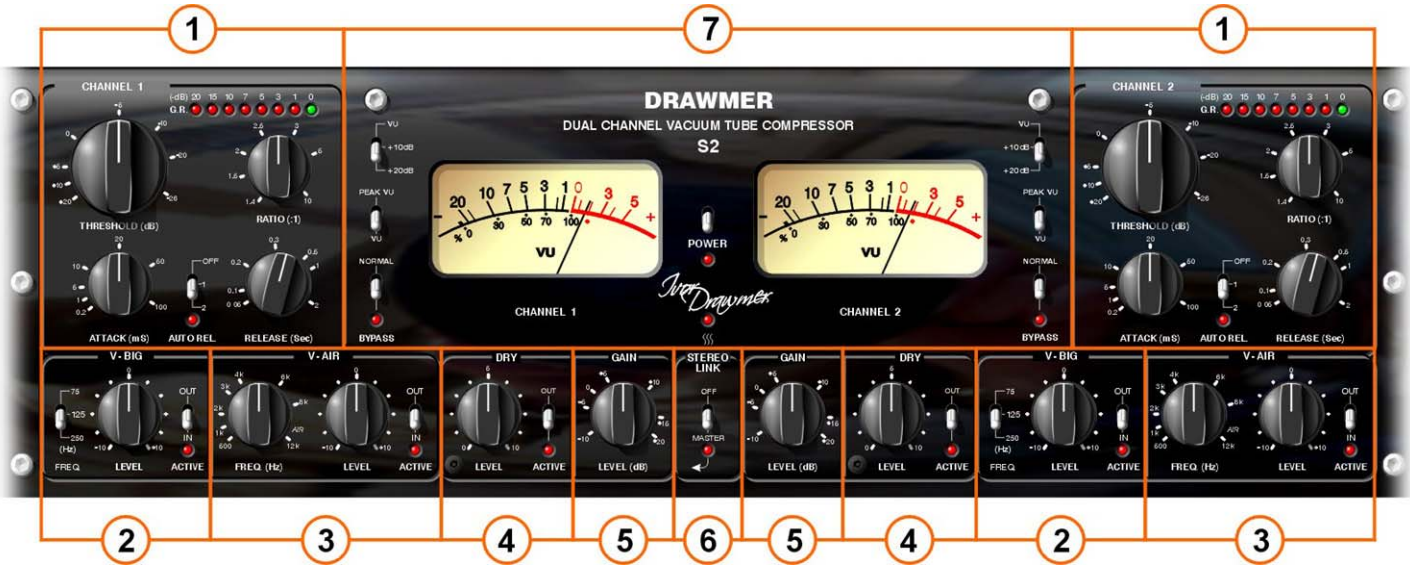


fig.4 Altering the Voltage

CONTROL DESCRIPTION



1 MAIN COMPRESSOR CONTROLS

**Threshold:** +20dB - -26dB

Determines the input level above which gain reduction will be applied. In order to provide as transparent processing as possible Soft knee compression takes place for signals exceeding the threshold level by a few decibels, above which level conventional 'ratio' compression is applied.

**Gain Reduction Meter:**

Eight Leds at 0,-1,-3,-5,-7,-10,-15,-20dB

**Ratio:** 1.4:1 - 10:1

Sets the final compression ratio that will be applied once the 'soft-knee' region of the threshold control is exceeded.

A ratio of 1:1 provides no compression, whereas approaching 10:1 corresponds to more of a limiter.

**Attack:** 0.2mS - 100mS

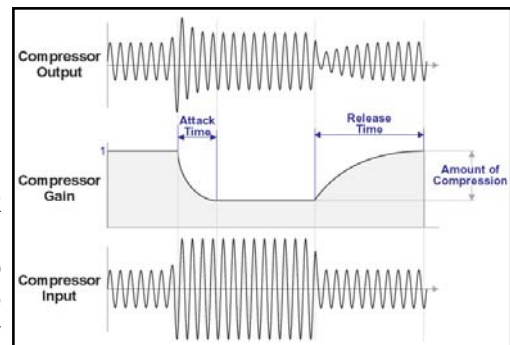
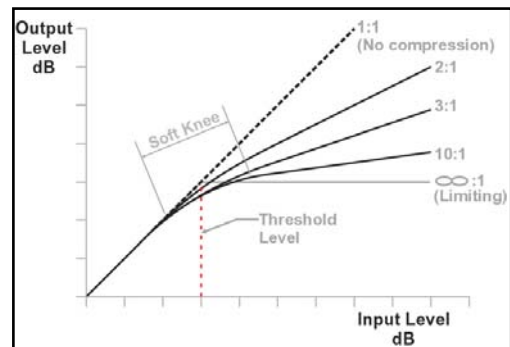
Controls the speed that the compressor responds to signals that exceed the level set by threshold. For most musical uses, an initial attack setting of between 1 and 20 mS is typical and least obtrusive, with slower settings allowing the start of a percussive or transient signal to pass unaltered, before the compressor reacts. However, bringing the level under control quickly, using a very fast attack time, generally gives more natural results on vocals and mixes.

**Auto Release:** Off - 1 - 2

When selected, Auto disables the Release control and continually optimises the release times to suit the dynamics of the material being processed - with 1 having a slightly quicker release than 2 to further suit the varied signals. In general, this setting will produce the least obtrusive level control on signals with widely varying dynamics such as complete mixes.

**Release:** 0.05S - 2.0Seconds

Sets the time taken for the signal to return to normal after the input level has fallen below threshold. For most signals setting the release at around 0.2 to 0.6 seconds is a good starting point. Be careful with very long release settings, the Compressor might never have enough time for a total recovery between the signal peaks. However, if set too fast, the signal may "pump", which can be used creatively, but is generally undesirable.



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## 2 V-BIG

Unlike previous Drawmer compressors the S2 V-Big control is fully variable allowing complete and subtle adjustments to the perceived level of bass, and the control of 'pumping' and ducking that occurs.

**Frequency:** 75, 125, 250 Hz

Sets the frequency that the 'V-Big' control operates at, enabling the engineer to target a specific bass frequency.

**Level:** -10 - +10

With the control set in a positive position the side chain's sensitivity to low frequencies is reduced, with the result that less gain reduction is applied to those frequencies, creating the effect that the bass is louder or 'bigger'. It also has the benefit of reducing the ducking and pumping effect that occurs by high frequencies being 'pulled down' in sync with the bass, helping to make mix compression much more affable.

If set in a negative position the opposite occurs i.e. with bass frequencies being quieter and pumping increased. At the 0 position the 'V-Big' control is effectively off.

**Active:** Off - On

Switches the 'Big' control on and off.

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## 3 V-AIR

V(ariable)-Air is used to manipulate the high end of an audio signal so that it sounds more intimate, detailed and transparent, but without making it sound harsh or introducing any noticeably unnatural artefacts. Cymbals are more vibrant without becoming splashy, and vocals sound more open but without becoming sibilant.

On the S2 the 'V-Air' section is not just an everyday side chain E.Q. that most compressor's would incorporate, replacing any dulling of high frequency detail by simply adding gain, but a fully variable dynamic process that works in conjunction with the compressor, giving more 'brightness' as and when it's required. Being full range the S2 will compress quiet high frequencies whenever the low frequencies are being brought under control, resulting in a dulling of these high levels, and in the worst cases, pumping - it is here where the V-Air controls are at their most effective. As shown previously, the 'Big' section can also improve things.

**Frequency:** 500Hz - 12kHz

Sets the frequency at which the 'V-Air' control operates, enabling the engineer to target a specific frequency.

**Level:** -10 - +10

At the 0 position the 'V-Air' control is off. In a positive position higher frequencies are enhanced, to add definition, particularly to the human voice and acoustic instruments - a negative position has the opposite effect, and may be used to bring back the balance to a mix whose cymbals are too conspicuous, for example.

**Active:** Off - On

Switches the 'V-Air' control on and off.

---

## 4 DRY

Dry works by adding the original signal coming into the unit to the compressed signal that has been processed by the S2, effectively reducing the perceived amount of compression taking place. It is easiest to think of it as being similar to a parallel compressor, but with the advantage of being one simple knob. It provides completely variable control over the whole amount of compression taking place without having to alter numerous settings in order to do so.

**Level:** 0 - 10

At the 0 setting a fully wet (compressed) signal is passed through to the output. As the control is turned up to 10 the dry signal (no compression) is added, thus lowering the perceived amount of compression. Unlike conventional wet/dry mixes the signal is never completely dry, even at 10 there is still a little compression taking place - use the 'unit bypass' (section 7) switch for a completely dry signal.

**Active:** Off - On

Switches the 'Dry' control on and off. When 'off' the signal is fully 'wet' i.e. compressed.

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## 5 GAIN

**Gain:** *-10dB - +20dB*

During compression the signal is attenuated, gain may be required to produce the required output level. The amount of gain required in order to bring the signal level to the same as at input is displayed on the G.R. meter.

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## 6 STEREO LINK

**Stereo Link:** *Off - Master*

When processing stereo signals, the compression settings of both channels should be the same, otherwise the stereo image will wander if one channel receives more compression than the other. When 'Stereo Link' is *in* the side chain follows both channels and forces the compressor to react to whichever of the channels is at the highest level at any given time, processing both signals according to the settings of Channel 1 (Master). The only exception to this are the 'Gain' controls, these remain independent - this is in order to provide a level balance between the two channels.

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## 7 METERING AND POWER

**VU Meters:**

Two moving coil VU meters monitor the level of the output signal of each channel.

**Pad:** *Vu - +10dB - +20dB*

A three-position switch adjusts the meters to show either normal output level, (and for those working at 'hot' output levels) VU +10dB or VU +20dB modes. i.e. with the switch at VU +10dB - when the VU meter reads 0dB the actual level is +10dB.

**Response:** *Peak VU - VU*

On smooth, gentle pieces of music the "VU" (average level) setting would be sufficient, however, on fast dynamic signals the "Peak VU" setting provides more accurate readings.

**Bypass:** *Off - On*

A fully balanced hard-wire unit bypass connects the input directly to the output, enabling an instant wet/dry comparison. Note: in bypass the VU meters display the levels as though the unit is still compressing. This has been implemented to provide the user with optimum control of the meters.

**Temperature Led**

The S2 is at optimum temperature when the front panel LED indicator is lit, i.e. after the soft start and when the valves have reached optimum temperature - this may take a few seconds.

**Power:** *Off - On*

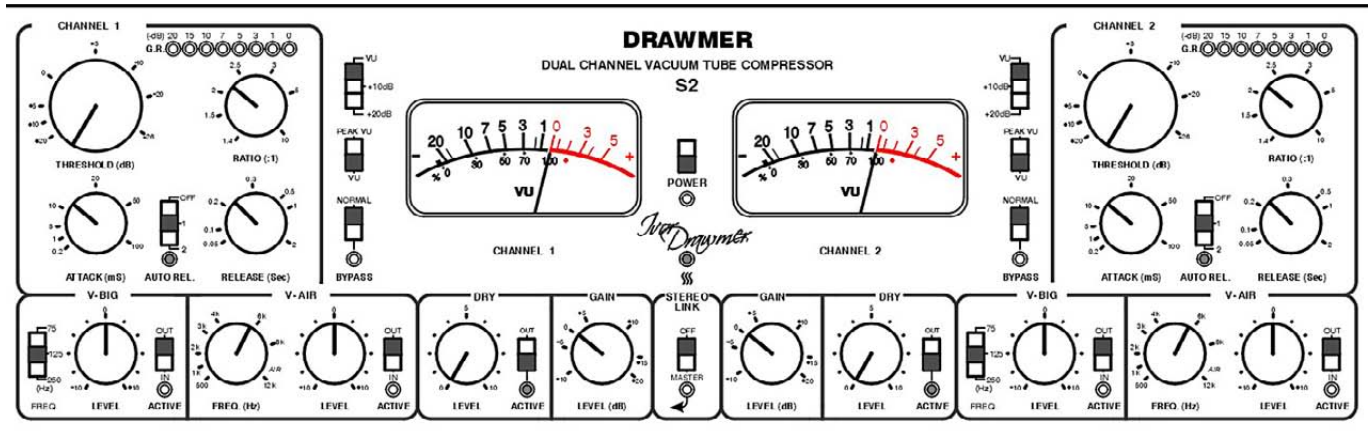
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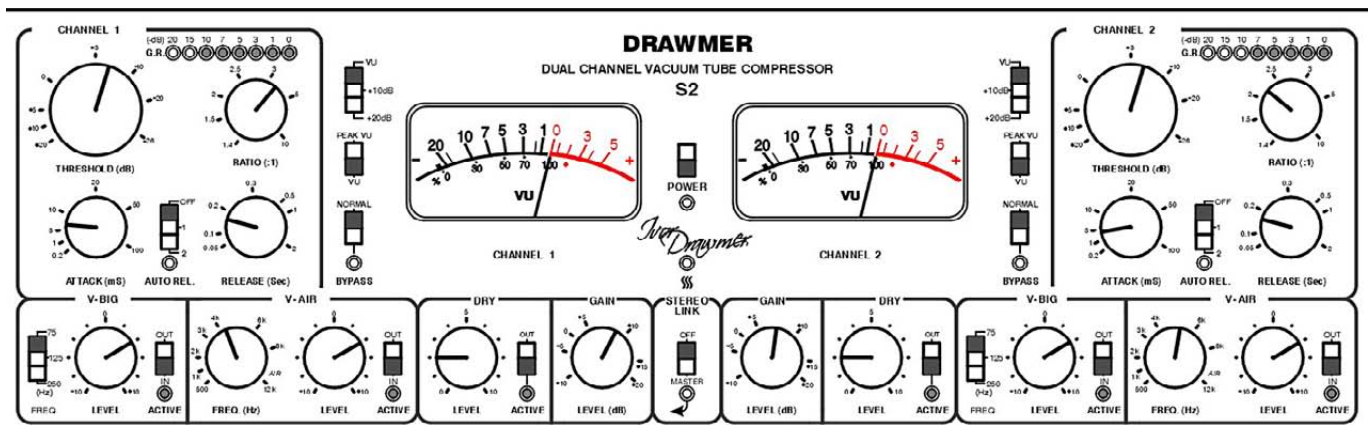
## QUICK SETUP PROCEDURE

Please note that the following procedure is only a guide. All audio is different, requiring numerous settings, however, this should give a good starting point:

- 1) For single channel use, each channel can be considered as being completely independent and set up accordingly. For use with stereo signals such as complete mixes or submixes, the S2 should be switched to **Stereo Link** mode and all setting up done using the left hand channel controls.



- 2) To begin set the compressor controls as above - **Threshold** fully anti-clockwise, **Ratio** set to 2:1, the **Attack** in a mid position (around 20mS) and the **Auto Release** switch to 1, with **Gain** at 0dB. **V-Big**, **V-Air** and **Dry** can be bypassed for the time being.
- 3) Keeping an eye on the **Gain Reduction Meters** alter the **Threshold** control for each channel to a level that 'triggers' the compressor, and then adjust the the **Ratio** until the desired compression level is achieved - as a rule, higher ratios provide a higher degree of control but also tend to be more audible in operation when high levels of gain reduction are required - a G.R. level up to -10dB is acceptable.
- 4) Compensate for the overall drop in output caused by the compression by adjusting the **Gain** control until 0dB is reached on the **Output VU meter** (more if in +10dB VU or +20dB modes).
- 5) Set the **Attack** knob according to the speed of the audio being processed. It is recommended that the **Auto Rel.** switch remains on, as it adapts dynamically to the audio, however, if manual release is preferred set the **Auto Rel.** switch to **off**, and adjust the **Release** control. Bear in mind that too short a release time will result in pumping.
- 6) At this point the **Bypass** switches can be toggled to listen to the affect that the S2 is having on the audio. Repeat steps 2,3 and 4 to suit.
- 7) **V-Big** can now be introduced - set the switch to your target **frequency**, and rotate the **level** control until the desired amount of bass is reached.
- 8) To improve the audio at higher frequencies use the **V-Air** section, setting the controls in much the same way as V-Big - adjust to suit your taste.
- 9) The S2 is now basically set up, however, further control is provided via the **Dry** section. With the switch active, rotating the **level** control clockwise adds the original, uncompressed signal to the compressed, effectively reducing the perceived amount of compression taking place. Using **Dry** can bring even the most severely compressed audio under control - again, adjust to suit your own taste. The **Gain** control may need to be adjusted to bring the output to a suitable level.



## GENERAL INFORMATION

### IF A FAULT DEVELOPS

For warranty service please call Drawmer Electronics Ltd. or their nearest authorised service facility, giving full details of the difficulty.

A list of all main dealers can be found on the Drawmer webpages.

On receipt of this information, service or shipping instructions will be forwarded to you.

No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be issued. Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured.

All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

### CONTACTING DRAWMER

Drawmer Electronics Ltd., will be pleased to answer all application questions to enhance your usage of this equipment. Please address correspondence to:

Drawmer (Technical Help line)  
Coleman Street  
Parkgate  
Rotherham  
S62 6EL  
UK

Alternatively contact us by E-mail on :

for sales enquiries: sales@drawmer.com  
or for technical issues: tech@drawmer.com

Further information on all Drawmer dealers, Authorised service departments and other contact information can be obtained from our web pages on:

<http://www.drawmer.com>

## S2 DUAL CHANNEL VACUUM TUBE COMPRESSOR DATA SPECIFICATION

### INPUT

Input Impedance 600 Ohms or greater  
Maximum Input Level +30dBu

### OUTPUT

Output Impedance 600 Ohms  
Maximum Output Level +30dBu @ 10k Ohms Load  
+26dBu @ 600 Ohms Load

### FREQUENCY RESPONSE

<24Hz to 38kHz -1dB  
<10Hz to 60kHz -3dB

### CROSSTALK

< -80dB @ 10kHz  
< -74dB @ 20kHz

### NOISE AT UNITY GAIN

with flat EQ response switched in circuit

	Wideband	22Hz - 22kHz
AV	-79dB	-84dB
	-87dB	-94dB

### % DISTORTION (THD & NOISE) @ 1kHz

0dB (ref +4) 0.03%  
10dB (ref +4) 0.1%  
20dB (ref +4) 0.4%

### POWER REQUIREMENTS

230Volt or 115V at 50-60hZ, 60VA

### FUSE RATING

T500mA for 230Volt, T1A for 115Volt  
Conforming to IEC 127-2

### FUSE TYPE

20mm x 5mm, Class 3 Timed-Blo, 250Volt working

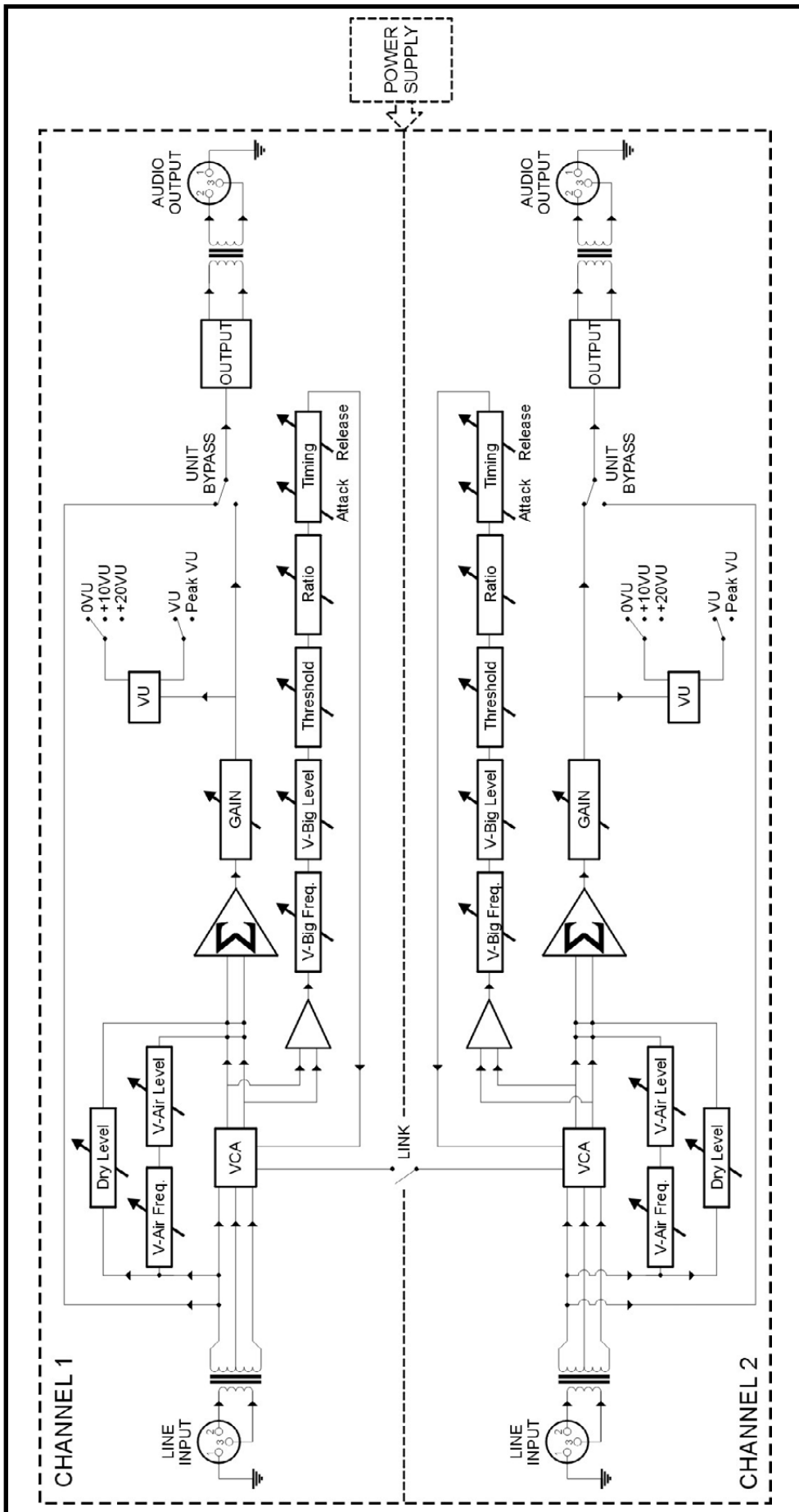
### CASE SIZE

482mm (W) x 132mm (H) x 315mm (D)

### WEIGHT

9.3Kgs

# BLOCK DIAGRAM





## DRAWMER

### DUAL CHANNEL VACUUM TUBE COMPRESSOR S2

*Just Drawmer*

#### CHANNEL 1

THRESHOLD (dB)

RATIO (1:1)

RELEASE (Sec)

ATTACK (ms)

V-BIG

V-AIR

LEVEL

FREQ. (Hz)

ACTIVE  BYPASS

#### CHANNEL 2

THRESHOLD (dB)

RATIO (1:1)

RELEASE (Sec)

ATTACK (ms)

V-BIG

V-AIR

LEVEL

FREQ. (Hz)

ACTIVE  BYPASS

STEREO LINK  OFF  MASTER

GAIN

LEVEL (dB)

LEVEL

FREQ. (Hz)

ACTIVE  BYPASS

POWER

VU

CHANNEL 1

VU

CHANNEL 2

# DRAWMER S2 Session Recall

Session No.	
Date	
Artist	
Tape Location	

DRAWMER ELECTRONICS LTD ~ Coleman Street  
Rotherham ~ S. Yorkshire ~ UK

