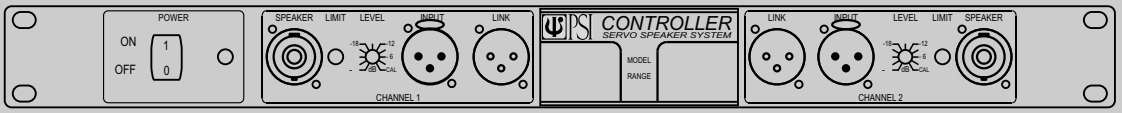
PSI CONTROLLER 3S

SWISS MADE BY RELEC SA 1400 YVERDON

OPERATING INSTRUCTIONS

Modèle : PSI CONTROLLER 3S



Uninterrupted Protection
The "Controller" only attenuates the signal if the overload is unacceptably high.

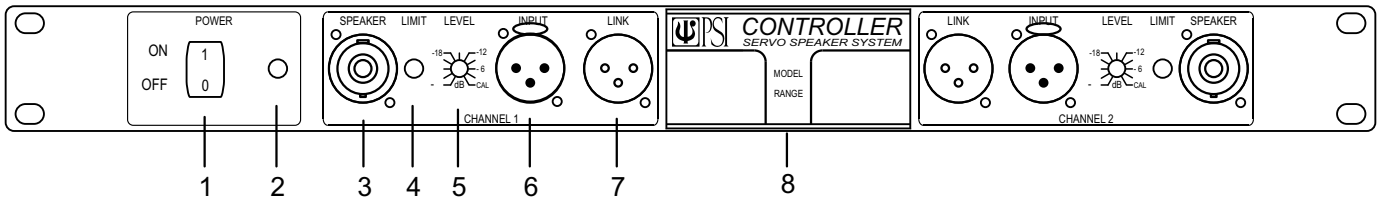
Easy to Use
No calibration is required, the front panel drawer is calibrated at the outset according to the loudspeaker model chosen.

Varied Uses
For wide band use, the draw indicates "left" and "right" channels. With use of bi-amplification, the draw indicates "low" and "high".

Front Panel Connections
The "Controller" and amplifier installed in the flight case do not require any access through the rear panel. The "link" outputs enable several amplifications to be set up in parallel.

Operates with wide Range of Power Supplies
The "Controller" can operate perfectly well with power supplies ranging from 160 to 260 V. If the power supply is too low, the “power” LED does not light up indicating that the power supplied to the loudspeaker is not controlled.

FRONT PANEL



1. ON/OFF Power supply switch.

2. POWER If there is insufficient voltage, the LED does not light up.

3. SPEAKER Speakon® socket: 1+, 1- loudspeaker output
2+, 2- control signal input.
(This output is linked with the rear speaker output for fixed applications)

4. LIMIT Audio signal attenuation display. In the case where a control signal error occurs, the display lights up permanently and the audio signal is attenuated.

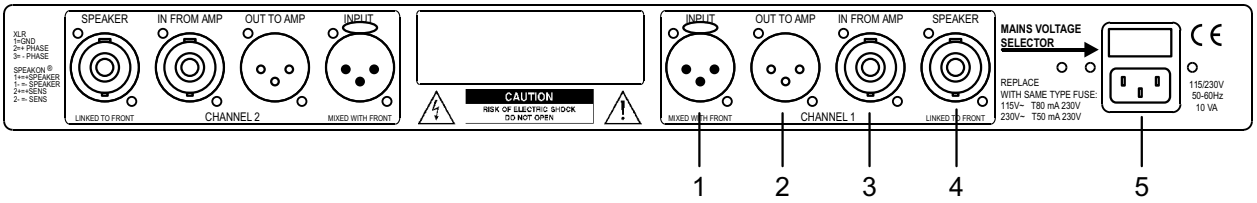
5. LEVEL Output level control.

6. FRONT INPUT XLR symmetrical input: 1 = ground
2 = in phase signal
3 = off phase signal
(This input is mixed with the rear input for fixed or special applications)

7. LINK Output connected in parallel with the input when bi-amplification is used; this output must be connected to the input signal of the second channel.

8. DRAWER The plug-in circuit contains the filtering, phase control and gain calibration functions. The selected loudspeaker model is indicated on the front panel along with the selected bandwidth and left-right and low-high functions.The drawer is maintained in place by a single screw to facilitate any changes.

REAR PANEL



1. INPUT XLR symmetrical input: 1 = ground
2 = in phase signal
3 = off phase signal
(This input is mixed with the front input for fixed or special applications)

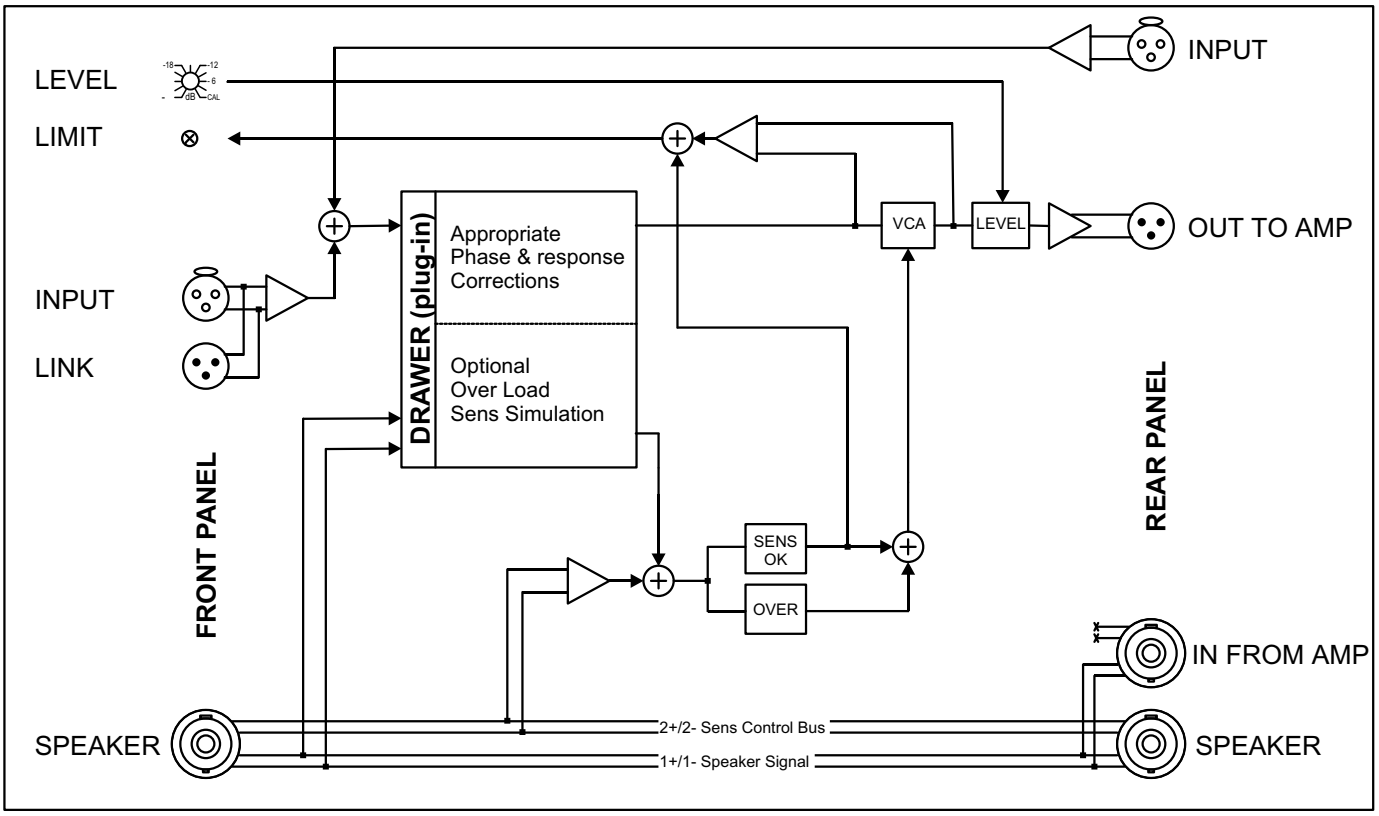
2. OUTPUT TO AMP Output of the "Controller" to the input of the amplifier.
XLR: 1 = ground
2 = signal (min 1kOhms load imp.)
3 = ground (min 1kOhms load imp.)

3. INPUT FORM AMP Input of the "Controller" from the loudspeaker output of the amplifier.
Speakon® socket : 1+ = From Amp.+
1- = From Amp.-

4. SPEAKER Speakon® socket: 1+, 1- loudspeaker output
2+, 2- control signal input.
(This output is linked with the front speaker output for fixed applications)

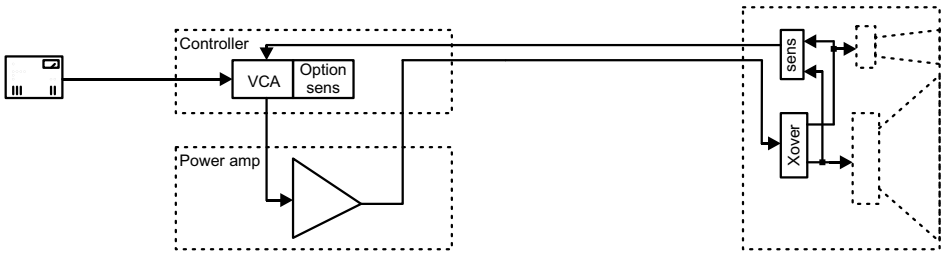
5. POWER SUPPLY
MAIN VOLTAGE SELECTOR 115V/230 V; 50-60 Hz; 10, VA
FUSE D=5x20, 115Vac :T80mA / 230Vac:T50mA

Controller block diagram

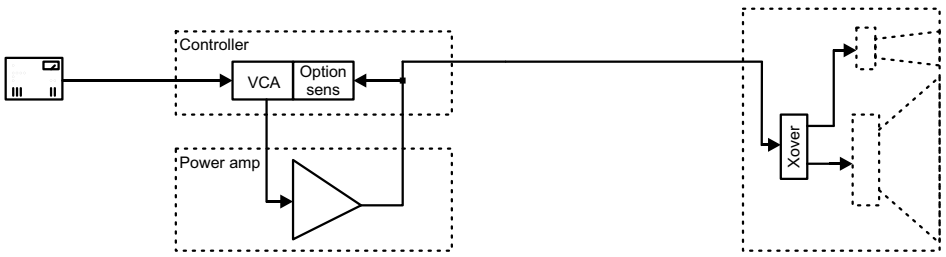


Sense control principe

Speaker with internal sens



Standard speaker without sens



Technical Specifications

Gain:	0 dB (adjustable)
Max. output voltage:	8.7 V RMS (+21 dBu)
Frequency response:	according to loudspeakers selected
Distortion:	< 0.02% in the selected bandwidth
Channel separation:	> 90 dB (20 Hz to 20 kHz)
A-weighted signal/noise ratio:	> 100 dB (ref. + 4 dBu)
Signal/noise ratio (20 Hz-20 kHz):	> 97 dB (ref. + 4 dBu)
Dynamic range:	> 117 dB
Limiting threshold:	according to loudspeakers, (P_{max} -3 dB)
Compression ratio:	automatic up to 30:1
Attack time:	automatic (min. 5 ms)
Release time:	50 ms
Maximum attenuation:	> 40 dB
Input impedance:	18 kOhms
Input symmetry in common-mode:	50 dB (20 Hz to 20 kHz)
Output impedance :	200 Ohms
Load impedance:	> 1 kOhms
Power supply:	160 to 240 V (on request 80 to 120 V)
Dimensions W x H x D:	Rack 1U. 483 x 44 x 185 mm
Weight (net):	2.3 kg

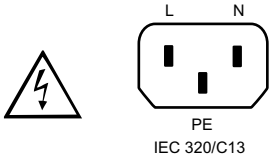
Installation

The PSI Controllers are designed for professional use. It is presumed that the units are operated only by trained personnel; servicing must be performed by qualified experts.

Before any connexion: Check ligne voltage selector setting before connecting the unit to the mains. The voltage selector is located inside the fuse holder next to the power inlet. The unit can be operate on main voltages of 115 or 230Vac, 50 to 60 Hz. Also check for correct value of primary fuse:

230V: T50mA L250V (5x20mm)
115V: T80mA L250V (5x20mm)
USA and Canada: 115V: 80mA slow blow UL/CSA 5x20mm)

Mains cable: Depending on your country, the Controllers comes with an IEC main cable or a female IEC 320/C13 main cable socket. This socket has to be connected to an appropriate main cable by a trained technician with respect to your local regulation.



Female plug (IEC320), view from contact side:
L : live; brown
N: neutral; blue
PE: protective earth; green an yellow

Why the need to control the power supplied ?
Music contains extremely high modulation peaks, i.e. in the region of + 10 dB compared to the average signal level. These modulation peaks represent ten times the average power required. In view of the fact that a loudspeaker can handle these power peaks, it is interesting to have an amplifier with sufficient headroom.

It is for this reason that the "Controller" checks that the duration of the peak does not exceed what the loudspeaker can handle.

The concept of the "Controller" involves placing detectors in the loudspeakers that supply a voltage proportional to the power supplied to each transducer.

The control signal controls the compression circuit located in the "Controller" which attenuates the signal only when the duration of the overload exceeds the acceptable power of each transducer.

Why modify the bandwidth ?
A loudspeaker always behaves as a filter in the sense that it only lets through without alteration part of the spectrum supplied, for example, from 50 Hz to 500 Hz for a woofer or from 50 Hz to 15 000 for a multichannel loudspeaker.

At the limits of the bandwidth, the signal is usually attenuated but only slightly deformed. Appropriate equalization can therefore considerably extend the spectrum supplied by a loudspeaker. However, beyond the limits of the bandwidth, the signal supplied is always a hindrance to the smooth operation of the loudspeaker. What effectively happens is the lower frequencies create excessive excursions which induce a high amount of distortion by intermodulation in the audible frequency range, and furthermore, the power supplied outside the bandwidth is not transmitted but contributes to overheating, and because of this, it decreases the useful sound pressure.
A plug-in circuit that is accessible through the front panel of the "Controller" contains filters, the frequencies and quality factors of which are adjusted according to the type of loudspeaker. The front panel of the drawer indicates the loudspeaker model and useful bandwidth.

The reproduction quality will therefore be substantially improved with appropriate filtering.

Yverdon, March 1,2000

RELEC SA
Z.I. Petits-Champs
CH-1400 YVERDON
Tél. ++41 (0)21 426 04 20
Fax. ++41 (0)21 426 04 51