Data sheet

Direct Drive VA Amplifier

with Battery charger 4XD125B (580242)



The Direct Drive VA Amplifier product range incorporates innovative design features for which a design Patent is pending.

The 1U 19inch rack mountable direct drive 4 channel voice alarm amplifier unit (Part number: 580242) provides 4 x 125W power output. The unit can be configured to provide 2 x 250W power output. Each channel provides an independent 100V audio output. The unit has an integral battery charger for charging 24V lead acid batteries of up to 65Ah used to provide standby supply in the event of mains failure.
It is designed for direct integration and is fully compatible with VARIODYN® D1 DOM module and can also be used with other VA/PA systems.

Features

- 4-channel Direct-Drive amplifier for voice alarm application that utilise industry standard 100V speakers
- High efficiency (>80% typical) Class D Amplifiers
- Delivers maximum possible power under any overload or overdrive condition to maintain intelligibility of voice messages
- Integrated temperature compensated battery charger designed to EN54 Part 4, capable of charging up to 65Ah battery pack
- Compliant with IEC BS EN 60268-3, 55013 55020 norms
- Microcontroller based extensive self monitoring and control
- Protection against overload and wiring short
- Protection against overheating
- Temperature management with variable speed fan assisted cooling
- System control and monitoring via VARIODYN® D1 DOM module or other VA/PA system control module
- Full status reporting, diagnostics and control over CAN bus

General indicators

- Mains Power (green LED)
- CPU Status (green LED)
- System Fault (yellow LED)
- Battery Power (yellow LED)

Channel indicators

- Power (green LED)
- High (green LED)
- Low (green LED)
- Clip (yellow LED)
- Error (yellow LED)

For detailed description of the indications, fault relay state, EN54-4 power fault output and fan operation, see: *4188-1033_Indications sheet*

100V outputs

There are four 100V outputs available at the connector marked 'SPK 1/2 OUT' and 'SPK 3/4 OUT' on the rear of the unit. These outputs are for connection to the VARIODYN® D1 DOM module or other VA/PA system control module.

Control Interface

The control inputs are via a connector marked 'CONTROL I/F' that can be connected to the VARIODYN® D1 DOM module or other VA/PA controller.

Extension interface

The 'EXTENSION INTERFACE' provides 'Common Fault' output by voltage free contacts. External input is for system fault reset and automatic fans test.
CAN-bus interface is for remote control and monitoring supporting DeviceNet communication protocol.

Mains supply

The mains power to the unit is via an IEC connector having an integral protection fuse.

External battery supply

The external batteries connect to the unit at the 'BATT' connector and are charged by the integral temperature compensated charger. The fully monitored 24V standby supply is used in the event of mains supply failure.
A leaded temperature sensor connects to the 'BATT TEMP' connector, with the sensor positioned in between the batteries to monitor the temperature of the external batteries for automatic charge voltage adjustment.
If using an external standby supply the internal battery charger must be configured as 'disabled' and the temperature sensor MUST NOT be connected to the 'BATT TEMP' connector.

Technical data

	Amplifier (4XD125)
Output power (mains powered)	4 x 125W / channel into a load of 80Ω or
Output power (battery powered)	2 x 250W / channel into a load of 40Ω
Weight (approximate)	9.05Kg
Heat dissipation (idle) Mains powered	60W max.
Battery powered (channels enabled)	21W max.
Battery powered (channels disabled)	5W max.
Mains fuse	F6,3AH250V
Nominal mains voltage	230V AC 50 / 60Hz +10% to -15%
Battery capacity and type	Valve regulated lead-acid battery: 38Ah min. 65Ah max.
Battery operating voltage range	21,5V DC to 28,5V DC
Battery charger current limit	3.4A
Battery source impedance	0.2Ω max.
Overall dimensions in mm	45 height x 483 width x 402 deep
Colour	RAL 7016 (Fine texture)
Ambient operating temperature	-5°C to +55°C
Storage temperature	-10°C to +55°C
Relative humidity	Up to 93% (non condensing)
Air flow direction	from front to rear of the amplifier unit
Function	Class D, transformerless 100V outputs
Frequency response at the rated power	20Hz to 22KHz ± 3dB
Distortion at the rated power (resistive load)	< 0,3% THD at 1kHz sine wave
Signal to noise ratio at rated power	90dB (A - weighted)
Maximum load capacitance	200nF #
Channel separation	> 75dB
Voltage gain	42dB
Input sensitivity	0dBu for rated output power
Input impedance (balanced)	20KΩ
Efficiency at a maximum load	>80% typical (Battery powered)
Self-oscillation frequency at idle	300kHz (± 20kHz)
Overload protection	Protected against short-circuit or output overload
Thermal protection	Protected against overheating by temperature controlled fans~

Excessive load capacitance may result in a degradation in performance.
~ Excessive temperatures may result in the amplifier temporarily reducing the output level until the normal operating temperature is achieved.

Amplifier	Description	230V AC			24V DC		
		1/8 load*	1/3 load	full power**	1/8 load	1/3 load	full power
125W	Current	0.638A rms	1.13A rms	2.95A rms	4.28A	9.44A	26.5A
	Heat dissipation	56.3W	79W	209W	40.5W	51.2W	131W

Measured with maximum loading of 80Ω on each output channel
* A 1/8 load (-9dB of full power) is the typical power for music just reaching the clipping level on peaks.
** Full power is measured using a 1KHz sine wave on each channel at the full rated output power.

There are no 'user' serviceable parts inside the amplifier equipment.

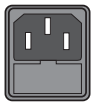
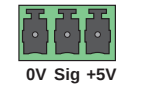
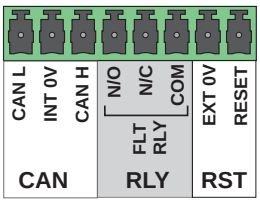
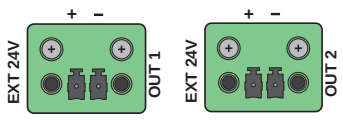
Rear view of the Amplifier

- Hazardous voltages are present at the 'SPK 1/2 OUT' and 'SPK 3/4 OUT' connector.
- All service work must be undertaken by a trained engineer.

Before doing any service work on an amplifier unit ALWAYS isolate the mains supply and disconnect the battery:

- At a rack mounted amplifier unit, isolate the mains supply to the rack system.
- At a standalone amplifier unit, isolate the mains supply by switching OFF the power to the unit and then unplug the mains lead at the IEC inlet.



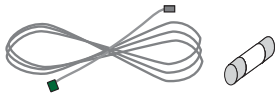
Connectors	Label	Descriptions
	FUSE:F6.3AH 250V 230V ~ 50-60Hz 2.5A	'MAINS' 3-pin earthed IEC type C14 connector with an integral fuse rated F6,3AH 250V Earth point
 SPK 1 / 2 OUT SPK 3 / 4 OUT +2- I +1- +4- I +3- **Use 2 x PLUG1**	+ & - SPK 1 + & - SPK 2 + & - SPK 3 + & - SPK 4	100V Speaker circuits 1, 2, 3 and 4 , each connector is rated 10A nominal (12A max.)
 BATT + - Use **PLUG2** **Ensure correct polarity when wiring.**	+ BATT - BATT	'BATT' connector provides connection for charging external 24V battery pack of up to 65Ah capacity (with 'CONFIG' switch 3 in OFF position) or to external backup standby power supply (with 'CONFIG' switch 3 in ON position). Recommended cable size is 10mm² with maximum length of 2m. Each conductor rated 41A nominal (66A max.).
 BATT TEMP 0V Sig +5V **Use Temperature sensor lead**	0V (black) Sig (white) 5V (red)	'BATT TEMP' connector provide connection for a 'Temperature sensor lead'. The temperature sensor end of the lead must be positioned inbetween batteries being charged by the unit. **DO NOT use this connector when the Amplifier is powered from an external standby supply or it is configured for 'Mains only' system.**
 EXTENSION I/F CAN L INT 0V CAN H N/O N/C COM EXT 0V RESET CAN RLY RST Use **PLUG3**	CAN L 0V (Internal 0V) CAN H	CAN-bus interface connection for remote control and monitoring
	N/O N/C COM FLT RLY	Fault relay with voltage-free contacts rated 0.5A at 125V AC, 1A at 24VDC Fault free status: N/O and COM connected Any fault status: N/C and COM connected
	0V (return)	0V return for reset input only
	RESET	Line 'high' (12V to 28V) to reset system fault, (all other faults are auto-reset)
 + - + - EXT 24V OUT 1 EXT 24V OUT 2 **Use 2 x PLUG 4**	+ EXT 24V - EXT 24V	24V supply to power the VA Controller & associated equipment 29.3V max. (when the unit is powered from Mains supply) 19V min. (when the unit is powered from battery only), Maximum ripple and noise of 200mVpp. 2.1A +/- 0.1A in total for both outputs or either output individually. The recommended cable size is 0.5mm².

Connector pack



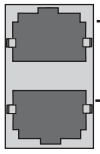
2 x PLUG1 1 x PLUG 2 1 x PLUG 3 2 x PLUG 4

Temperature sensor lead & Fuse



F6,3H250V

Dual RJ45 Connectors 3/4



1/2

CONTROL I/F

Pin.	RJ45 Pin information	
1	CH2 In+ / CH4 In+	Balanced input for channel CH2 or CH4
2	CH2 In- / CH4 In-	
3	EN54-4 Power Fault O/P	Fault free status +24V, 0V or pulsing 2.5s On 2.5s Off
4	CH1 In+ / CH3 In+	Balanced input for channel CH1 or CH3
5	CH1 In- / CH3 In-	
6	0V (return)	0V return for control interface to VA/PA controller
7	Ext. 24V	Amplifier channels control signals, see table. 'CONFIG switch 2'.
8	Ext. amp. enable	

1. Always power-down the Amplifier before setting the 'CONFIG' Switches.
2. With the Amplifier powered-down use a non-metallic tool to change the settings of the 'CONFIG' Switches.
3. The 'CONFIG' Switch settings are read on Amplifier power-up.



GAIN LOW: Gain reduction on all amplifier channels for the purpose of system test.
GAIN MAX.: Maximum output normal operation
Low / Max GAIN

AMPLIFIER - REAR PANEL

1 … 8 'CONFIG' Switches

	OFF (DEFAULT)	ON
8. CAN identification	1 amplifier connected on the CAN bus	When 2 amplifers are connected on the CAN bus, then on ONE amplifier only this switch must be set to the ON position, for addressability.
7. System fault indication	Auto clear 2 min. after reset	Latched indication (clear only by pulse on Ext. I/F Reset input)
6. Gain reduction switch	6dB	20dB
5. Audio signal level	-20dB LOW LED -6dB HIGH LED	-6dB LOW LED -3dB HIGH LED
4. Standby battery power monitor	Full standby battery monitoring	Mains only operated system - standby power monitoring disabled
3. Battery charger	Enabled - charging external battery	Disabled - standby power by external PSU

2. Amplifier channel control

AUDIO CONTROL

OFF
Standalone mode: All channels will be auto-enabled if no external control signals are provided. Individual control of amplifier channels.

Amplifier Configuration	RJ45 1 Ext. 24V	RJ45 1 Ext amp. enable	RJ45 2 Ext. 24V	RJ45 2 Ext amp. enable
4x125W using Amplifier 4x125W	CH1 In	CH2 In	CH3 In	CH4 In
	Amp Ch 1 & Amp Ch 2		Amp Ch 3 & Amp Ch 4	
	Amp Ch 1	Amp Ch 2	Amp Ch 3	Amp Ch 4
2x250W using Amplifier 4x125W	CH1 In	CH2 In		
	Amp Ch 1+3 & Amp Ch 2+4		-	-
	Amp Ch 1+3	Amp Ch 2+4		

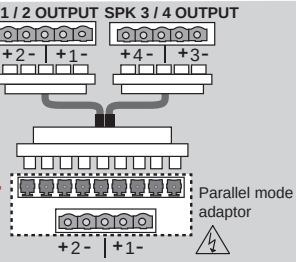
ON
VARIODYN D1 system mode. All channels will be disabled if no external control signals are provided. Control of amplifier channels in pairs.

1. Power configuration

AUDIO PATH

Amplifier Configuration	Switch 1	RJ45 CONTROL I/F **1/2**		RJ45 CONTROL I/F **3/4**		
4x125W using Amplifier 4x125W	OFF	CH1 In	CH2 In	CH3 In	CH4 In	← Amplifier Audio Channels
2x250W using Amplifier 4x125W	ON	CH1 In	CH2 In	← Amplifier Audio Channels		

CAUTION: Ensure the speaker outputs are wired using a Parallel mode adaptor.



Operating modes of Amplifier - settings of CONFIG Switches 2, 3 & 4 and Temperature sensor connection requirements

D1 system (Charger enabled)	**D1 system** External standby power (Charger disabled)	**D1 system** Mains only	**Standalone** (Charger enabled)	**Standalone** External standby power (Charger disabled)	**Standalone** Mains only
1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
Temperature Sensor ✓	Temperature Sensor ✗	Temperature Sensor ✗	Temperature Sensor ✓	Temperature Sensor ✗	Temperature Sensor ✗

NOTE: All other Operating modes selected by 'CONFIG' Switches 2, 3 & 4 and temperature sensor are recognised as INVALID and 'System Hardware Configuration Fault' will be raised where all amplifier channels, battery charger and DC power outputs will be disabled. The Amplifier has to be powered-down, 'CONFIG' Switches re-configured correctly and then powered-up for normal operation.

These amplifier products comply with: EN 60065:2002/A1:2006/A2:2010, video and similar electronic apparatus -Safety requirements.

At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre and in accordance with national or local legislation.

WEEE Directive:
At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre.
Do not dispose of with your normal household waste. Do not burn.

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