



DAL
ACOUSTICS

Director Pack
Professional Sound Reinforcement Loudspeaker System
Operation Instructions

DAL Acoustics loudspeaker systems are designed and manufactured in Germany by German Audio Engineering GmbH. German Audio Engineering works exclusively with upstream suppliers who can guarantee consistent and verifiable quality of their components and parts.

If you have a problem with one of our products, or if you need a spare part, please contact your local distributor or contact us directly.

Thank you for choosing a DAL Acoustics product.

System description:

The Director Pack systems is a medium sized active driven, vertical arrayed twin coaxial 2-way point source system, in a ported cabinet made of waterproof glued plywood with textured Poly Urea coating. The systems provides a coverage angel of 110° horizontal and 30° vertical and works band-limited by an external control system from 80Hz to 18000Hz. For full range operation the system must be supported by an appropriate sub-/low system as GAE BR218 / GAE BR118. The system is protected by a robust protective grill with foam overlay. Four integrated handles are provided for an easier handling. The Director Pack system is primarily intended for installations with medium to larger listening distance. In stand-alone or spaced array operation, it can be used as a main, support or effect speaker from below the Key note of a male speaker / singer. Due to its reproduction characteristics and the high maximum SPL Level, it is equally suitable for speech and music transmission. Featuring three 1,4" Hi driver with 3" Voice coils twin coaxial loaded by six of high efficient 6,5" cone drivers with 1,5" voice coils the Director Pack system provides an audio bandwidth of 80Hz - 18KHz with a Peak power handling of 2500W for the 6,5 inch cone transducers and 600 Watt peak for the high drivers.

When operated with the DAL Control & Drive System, the system is optimal parameterized for sonic quality and protected for maximum continuous and peak sound pressure level. The DAL Control & Drive Systems provides different settings for the operation of Director Pack combinations.

A single Director Pack offers a dispersion pattern for medium to long throw stand-alone operation. A vertically arrayed system of up to 3 Director Pack offers a dispersion pattern for medium to long throw including down fill.

Director pack accessories

U-Mounting Yoke vertical: Yoke Director Pack

Director Pack Fly ware

TV Spigot

Truss C-Clamp large



Notes on the operating instructions:

Observe the explanations and notes in these operating instructions. If you lend or pass on this product to third parties, please refer to this operating manual, pass on this operating manual.



This symbol in connection with the signal word "Beware" indicates a possibly dangerous situation. Failure to observe this safety instruction may result in serious injury or even death.



This symbol in connection with the signal word "Warning" indicates a possibly dangerous situation for persons with pacemakers. Non-observance can lead to serious injuries or even death.



This symbol in connection with the signal word "Caution" indicates a possibly dangerous situation with a high ambient noise level. It is recommended to wear hearing protection in case of high noise level.



This symbol in conjunction with the signal word "Caution" indicates a warning of a magnetic field present in the immediate vicinity of the object.



This symbol in connection with the signal word "Warning" indicates commands to observe product-relevant operating conditions.

General information

Operating instructions DAL Director Pack

The information in this operating manual is given to the best of our knowledge and is valid at the time of printing. We reserve the right to change specifications of the product at any time. German Audio Engineering does not guarantee the quality or suitability for use. German Audio Engineering GmbH (for DAL) assumes no liability for direct or indirect damage or consequential damage resulting from the use and operation of this product.

German Audio Engineering reserves the right to continuously develop the product further and to make changes to the product as a result. German Audio Engineering is always pleased to receive suggestions for improvement and comments on the product.

Contact: info@germanaudioengineering.com * www.GAE.de/DAL

German Audio Engineering GmbH

An der Strusbek 1 * 22926 Ahrensburg, Germany

Phone: +49 40 6077 487-0

Intended use and application, safety and operational reliability

Observe the following safety instructions when operating loudspeakers to avoid risks. The Director Pack loudspeaker has been designed exclusively for professional use in sound reinforcement systems. The loudspeaker may only be used by instructed and qualified persons. Observe the operating modes described in these operating instructions. Other uses are not permitted.

The Director Pack can be operated without the DAL Control & Drive electronics, but then it does not offer the performance data specified by us and will not have the same power handling capacity.

The Minimum operation parameters to adjust your external control system are specified in the table chart below.

In operation avoid Feedback, distorted signals (clipping), peaks resulting from plugging or unplugging devices in the signal chain, long term pure sine wave tones with high power and too weak power amplifiers not specified by their power ratings. Such signals and devices can cause loudspeaker overload or damages and are not covered by our warranty

Configuration parameters for external system controller

Low Channel			
Limiter (RMS)	+39,5dBu		
Polarity	+		
Gain	0,0dB		
Delay	0,56ms		
Limiter			
High Pass	100Hz	Butterworth 4 th Order	
Low Pass	750Hz	Butterworth 4 th Order	
System EQ Band 1	90Hz	BW 4,68Q	Gain +2,0dB
System EQ Band 2	267Hz	BW 4,35Q	Gain -2,4dB
System EQ Band 3	680Hz	BW 14,1Q	Gain -2,6dB
System EQ Band 4	1000Hz	BW 14,1Q	Gain -4,0dB

High Channel			
Limiter (RMS)	+33,2dBu		
Polarity	+		
Gain	-2,5dB		
Delay	0,0ms		
High Pass	750Hz	Butterworth 3 rd Order	
Low Pass	Off		
System EQ Band 1	680Hz	BW 14,1Q	Gain -2,6dB
System EQ Band 2	1,34KHz	BW 6,77Q	Gain -3,2dB
System EQ Band 3	2,5KHz	BW 8,43Q	Gain +4dB
System EQ Band 4	4,2KHz	BW 11,4Q	Gain -2,0dB
System EQ Band 5	5,0KHz	Hi Shelving 12dB	Gain -10dB
System EQ Band 6	5,5KHz	BW 4,68KHz	Gain +5dB
System EQ Band 7	9,83KHz	BW 14,1Q	Gain -1,6dB
System EQ Band 8	10,0KHz	BW 8,43Q	Gain +5,0dB
System EQ Band 9	15,6KHz	BW 14,1Q	Gain -1,4dB

Safety instructions:

Warning



Warning

Loudspeakers have a permanent magnetic field. Persons with pacemakers must not be in the immediate vicinity of loudspeakers, as magnetic fields can lead to interference with pacemakers. When repairing loudspeakers, it must be ruled out that the magnetic components come into contact with persons wearing pacemakers.

Warning



Caution

Loudspeakers have a permanent magnetic field. This can interfere with the operation of other components in the immediate vicinity that are magnetically sensitive.

Beware



Beware

The Director Pack is suitable for flown operation and offers mounting points for this purpose. For flown operation, the original Manufacturer hardware must be used and a proven static of the hanging point is mandatory. When installing and commissioning in standing or stacked operation, pay careful attention to secure footing and solid professional mounting. In stacked operation, the loudspeakers must be secured as a group against slipping or falling over, e. g. with suitable tension straps on stages. A falling loudspeaker can cause great damage to property and personal injury. Use only material specified by DAL for the installation and mounting of DAL loudspeakers. This work must be carried out by qualified personnel. Observe the applicable safety regulations when doing so.

Caution



Caution

Do not stand in the immediate vicinity of loudspeaker systems that are operated at high sound pressure levels. Wear hearing protection when testing and setting up speaker systems. These speaker systems - operated at high sound pressure levels - can endanger health. Even seemingly low sound pressure levels of 90dB/SPL can cause long-term impairment or damage to hearing.

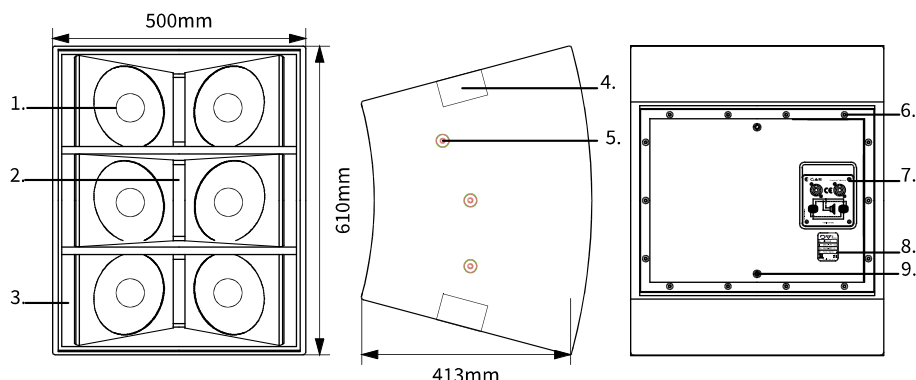
Attention



Attention

When setting up, storing and transporting loudspeakers, ensure that excessive environmental influences such as direct sunlight, moisture, vibrations and dust have no effect. When operating the loudspeakers, avoid feedback, distorted signal transmission and playback as well as signal peaks that can be caused by switching devices in the signal chain on and off or disconnecting them from the signal chain during operation. Make sure that the loudspeaker is not exposed to permanent thermal overloads, which may cause fire and result in damage to property and personal injury. DAL will not be liable for any damage caused in this way and will not accept any warranty or liability for consequential damage.

Technical Overview



(1.) 1 of 6 x 6,5“ Ndym Cone transducer: DAL Replacement cone transducer DAL 6,5TN02-19-038B, Order Code 1000251

(2.) 1 of 3 1,4” Ndym High Frequency Driver: DAL Replacement Voice Coil assembly DAL VC 1,4HFN05-072C, Order Code 1000413

(3.) Tuning Ports (6)

(4.) Transport Handles (4), on sites

(5.) Mounting Points M10 (6) sides, centered M10 is U-Yoke fixing point, all 3 mounting points for Director Pack Flyware

(6.) Fixing screws service lid

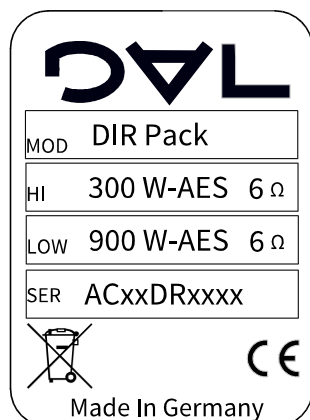
(7.) Connector Panel (1+/1- Low-drivers ; 2+/2- Hi-drivers) black, Order Code: 1000000002 Type DAL ASS-NL4-1sw. White, Order Code: 1000000003 Type DAL ASS-NL4-1ws) Fixing threads M6 (2) for Wall Mount, or lashing points

(8.) Manufacturer Plate with serial number

(9.) Lashing Points M8 (2)

Protective Front Grill with Foam Cover: Order Code: 20501380, Type DAL ASS-FGDIR-Pack)

Tools required for maintenance: Screwdriver and Bits: TX20, Allen Key 4mm, Allen Key 2,5mm



Director Pack– Manufacturer
Plate With Serial Number

Purchase of spare parts

Please state the serial number of your product when ordering spare parts. The serial number identification of your product can be found on the serial number plate recessed in the rear wall of the loudspeaker system. The illustration of the serial number plate is shown on the left. The S/N designation is followed by the serial number of the speaker system.

Technical Specifications

Acoustical Bandwidth (Director Pack FR-Mode) with DAL DS-4L/ DS-4M: 90Hz – 18KHz

Dispersion Director Pack (h x v): typically 110° horizontal, 30° vertical

Electrical Phase Response: +/- 45°: 150Hz – 20KHz

Nominal Impedance (Re): 60hm

System Power Low Drivers: 900W (AES), 1800W Peak

System Power High Drivers: 300W (AES, 600W Peak

Continuous SPL: >130dB/350W/1m, Pink Noise Crest Faktor 12dB

Total Peak SPL: > 136dB/2400W/1m, Music Signal

Dimensions (W x H x D mm): 500 x 610 x 413

Net Weight: 37,1kg

Connectivity: 2 x Speakon NL4 1+/1- Low Drivers; 2+/2- High Drivers

Standard Coating: textured black Poly Urea, optional RAL colours

Recommended Control & Drive System: DAL DS-4L, DAL DS-4M

For operation recall one of the following control setups for DAL DS-4L DAL DS-4M:

Director PackFR: Full range stand - alone operation, spaced arrays

Director Pack Array: Full range vertical arrayed systems

Parallel connection of multiple Director Pack systems and DAL Control & Drive Systems:

DS-4L: 2 systems per channel

DS-4M: 2 systems per channel

Technical Notes

Safety steels may be used only with the M10 threaded inserts. M6 or M8 threaded inserts in the rear are to be used exclusively with DAL original accessories or are designed as lashing points. After use, make sure that the countersunk screws belonging to the cabinet are screwed back into the threaded sleeves in order to maintain an air-tight system.

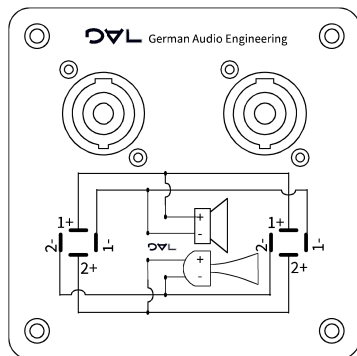
DAL protective grilles with foam lamination are the mechanical protection component for the built-in transducers and offer a high acoustic transmission as well as their affixing minimizes sonic influences of the grilles. The backing or covering of the grilles with foam serves also as UV-light protection, dust protection and improves the optical unobtrusiveness of the systems. Only undamaged grilles and foams can fulfill these tasks. Replace warped grilles or worn foams to maintain their function.

DAL loudspeaker systems with polyurea-coated or painted enclosures are basically suitable for temporary outdoor operation, even in the rain.

For indefinite operation outdoors as in fixed installations, the loudspeaker systems must be protected with a hood against direct sunlight and rain. If necessary, the loudspeaker should be equipped with the optional front grille with weather protection.

Most DAL loudspeaker systems can be supplied for extra charge from the factory in a weatherproof (WR) or sea-weatherproof (SWR) variant.

For indefinite operation outdoors in subtropical and tropical areas, the loudspeaker should be ordered as the WR variant. For indefinite operation at sea and other areas with a humid and salty atmosphere, the loudspeaker should be ordered in the SWR equipment variant. Both variants are manufactured at the factory only.



Director Pack NL4 connector panel

Connectivity And Electrical Operation

The Director Pack is connected via 2 Speakon® NL4 sockets connected in parallel on the connector panel. The connectivity is 1+/1- for the low drivers and 2+/2- for the hi drivers. Hi and Low drivers are both connected “in phase”.

Connectors Pin Assignment 1+/1-: The Director Pack is wired in such a way that a positive voltage at 1+ moves the cones of the low frequency transducers outwards. Please see polarity check in chapter test and maintenance.

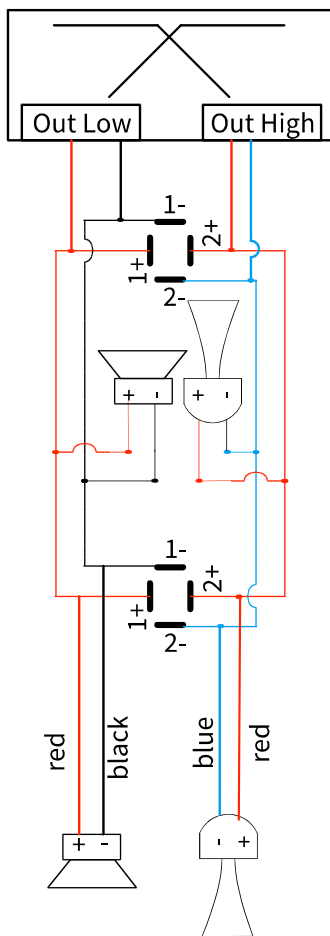
The Director Pack can NOT be operated without a dedicated system controller. The controller must provide an adjustable low filters, active cross over function, adjustable delay and sufficient parametric EQ for each channel. Use the DAL Control & Drive Systems to ensure factory specification, maximum performance and sonic characteristics.

Keep in mind that you may need to increase the required cable cross-section for parallel operation of multiple Director Pack on one amplifier channel. The same applies to long and longer cables between power amplifier and Director Pack. We recommend a minimum cross section of 2.5 qmm up to 20m cable length @80hm. Here the loss through the cable is approx. 5% of the amplifier power.

Installation And Rigging

The Director Pack is designed for installation with the dedicated U-Yoke e.g. on a DAL Sub-/Low system BR218. The U-Yoke can also be used to install the Director Pack over head fixed at ceiling or mounting points with proven load capacity. Installations such as multiple systems in flown operation must be provided using the dedicated Director Pack Flyware. When setting up, suspending and positioning the system, make sure it is on a firm and leveled surface and that the selected load points have a proven load-bearing capacity. Use approved stands and approved mounting accessories that are designed for the weight load. Additionally secure the stability of the speaker system and the flown operation to prevent personal injury and property damage.

Test And Maintenance



Director Pack - internal wiring schematic

The wiring of the loudspeaker components inside the cabinet is according to the diagram to the left. With an impulse phase checker, which delivers a signal with non-inverted phase, a signal of positive polarity is obtained directly measured in front of the cone transducer. If the same test is performed in front of the high frequency driver/horn, a signal with positive polarity is obtained.

If the diaphragm of the high-frequency driver is replaced, make sure that the original spacer ring made of a thin plastic material (if originally fit) remains in the driver so that the new voice coil is correctly positioned in the magnetic field. Transducer and horn need to fit back airtight in the cabinet after a service.

It is good practice to check loudspeaker systems frequently in concern of mechanical integrity and distortion free sound reproduction.

Here is a simple way to quickly check sound reproduction. Use a sine wave generator with sweep function or a tunable sine wave generator and a power amplifier. Adjust the test system to deliver an appropriate sound power level and tune the sine wave generator from low to high frequencies. Listen to the acoustic output the loudspeaker delivers. The signals should be free of audible distortions. Mechanical noise from the system or unwanted reproduction of side tones should be followed up by inspection and search for the root cause. Please note that for this test you need to drive the Device under test also via an appropriate system cross over / controller in front of the power amplifier.

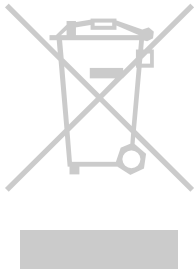
Fixing and mounting points should be inspected frequently.

Operation with DAL BR218 and DAL BR118

For the low end support in minimum 1 of B218 or 2 of BR118 will work together with 1 of Director Pack. There is the need of active control for the BR218 and BR218 plus a dedicated power amplifier.

Down below are the parameters to be adjusted for an external system controller. Please note that the parameter "Delay" should be measured on site with an FFT analyzer. Depending on the acoustic distance between BR218 and Director Pack the over all delay of Director Top or the BR218 must be adjusted. Doing that correctly will give an optimum summation at the acoustic cross over frequency between Director Pack and BR218.

Sub-/Low Channel with BR218 / BR118			
Limiter	+43dBu		
Polarity	+		
Gain	0,0dB		
Delay	to be adjusted locally		
High Pass	30Hz	Butterworth 3 rd Order	
Low Pass	90Hz	LinkwitzRiley 4 th Order	
Boost at Tuning	38Hz	BW3,9Q	Gain +3dB



Note on disposal

Observe the applicable national regulations and rules for disposal.

All products manufactured by German Audio Engineering GmbH are B2B products and are supplied to commercial customers. The adjacent symbol of the crossed-out trash bin can indicate that this product will be disposed of exclusively by German Audio Engineering GmbH. For DAL products that do yet bear this marking, the owner is responsible for proper disposal.

Our registration according to Elektro G is: WEEE-Register-Nr. DE 72073104



Manufacturer's declaration

The declaration applies to: DAL Director Pack 1000529 and all model variants that correspond to the factory design and have not been modified by others.

Applied national standards and technical specifications:

DIN 18800, DIN 1055, DGUV regulation 17, BGI 810-13

Hamburg, 01.06.2018