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# *DLS Ultimate series*

## *Nordica 10 & Nordica 12*

### *Car Audio subwoofers*

#### **Welcome**

Thank you for buying a DLS Ultimate Nordica subwoofer. The subwoofer must be installed correctly in order to work well. This manual will show you how to install it like a pro. Please read the entire manual before beginning the installation. Install the subwoofer yourself if you feel confident with our instructions and if you have the proper tools. However if you feel unsure, turn over the installation job to someone better suited to it.

The speakers are designed for enclosure mounting. In "open air" installations the power handling capacity is reduced by 30% from the nominal value. **We don't recommend "open air" installations for these subwoofers.**

#### **Connection of subwoofer**

How to connect depends on what type of amplifier you use. The best is to follow the instructions given in the manual for the amplifier. Most amplifiers today have built-in lowpass crossover and possibilities to connect your subwoofer in bridge mode. These subwoofers have a 4 ohm nominal impedance. Two 4 ohm subwoofers are often connected in stereo mode since most amplifiers can't handle bridge mode loads below 4 ohms.

For Nordica subwoofers we recommend the use of an 2 ohm stable amplifier with a minimum output power of 200 Watts RMS.

Make sure to connect in ways that don't ruin the amplifier. If you have a DLS Ultimate amplifier it's possible to connect two subwoofers in parallel, these amplifiers are 1 ohm stable.

We also recommend the use of a subsonic high pass filter. This gives a better bass reproduction with less "rumble". In most DLS amplifiers this feature is already built-in.

For wiring use high class speaker wires, min AWG11 (4 mm<sup>2</sup>). For example **DLS SC 2x4**.

#### **Enclosure damping**

Most enclosures should be damped inside with synthetic (acoustic) wool or damping mat (line). Attach the damping material on the wall opposite from the speaker and port.

In a sealed box we recommend the use of damping wool.



#### **Technical Assistance**

For technical assistance ask the shop where the product was sold or the distributor in your very country. You can always contact the DLS Helpdesk in Sweden on e-mail : [info@dls.se](mailto:info@dls.se) Information can also be found on our WEB-site [www.dls.se](http://www.dls.se)

We follow a policy of continuous advancement in development. For this reason all or part of specifications & designs may be changed without prior notice.

#### **Subwoofer enclosures, general**

Build your enclosure in a stable and airtight material. The best is MDF-board, 19 mm, or particle board, 22 mm. Larger enclosures must have bracing inside to avoid vibrations. The enclosure must be completely airtight. Use sealing compound in all joints, also around the cable terminals. The size of the enclosure is decided by the speaker data.

#### **Sealed (closed) enclosures**

Sealed enclosures are easy to build. The size is not critical, but it can't be too small. The speaker data such as Fs, Qts, Vas and X-max decides the size of the enclosure.

Large speakers need larger boxes. Two speakers need a box of the double size etc. The enclosure must be completely airtight.

A sealed enclosure should be filled with acoustic wool up to 75%.

A sealed enclosure has a lower efficiency than a vented enclosure, but they can handle high power and are easy to build. A subwoofer in a sealed enclosure creates a tight bass suitable for the audiophiles listening to classical music, jazz and soft rock.

#### **Important**

Think of the speaker weight when you do your install. Use heavy bolts when fastening the sub to the enclosure baffle.

#### **Break-in period**

Allow the speaker to play for at least 15-20 hours. After this time the performance is correct.

#### **Warranty service**

This speaker is covered by warranty, depending on the conditions in the country where it is sold. If the speaker is returned for service, please include the original dated receipt with the product.



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# Technical specifications for DLS Ultimate Nordica 10

Nordica 10			
Art.no	10-25910	Re, DC-resistance	3,2 ohm
Size	25 cm (10")	BL product	12
Impedance	4 ohm	Sensitivity (SPL 1W/1m)	87,0 dB
Rec. power (RMS)	200 W min, 500 W max	Resonant freq. (Fs)	33,7 Hz
Freq. range	25 Hz - 2 kHz	Vas (litre)	22,4
Voice coil, diameter	50 mm (2")	Vas (ft <sup>3</sup> )	0,79
Voice coil length	31 mm (1,22")	Qms	9,2
X-max	+11,5 mm (0,45")	Qes	0,65
Cms	0,16 mm /N	Qts	0,61
SD	314 cm <sup>2</sup>		
Cone material	Aluminium		
Magnet, diameter	144 mm (5,67")		
Installation depth	140 mm (5,51")		
Mounting hole	236 mm (9,29")		
Outer diameter	265 mm ( 10,43")		
Weigth	6,7 kg (14,77 lbs)		

# Technical specifications for DLS Ultimate Nordica 12

Nordica 12			
Art.no	10-25912	Re, DC-resistance	3,3 ohm
Size	30 cm (12")	BL product	14,4
Impedance	4 ohm	Sensitivity (SPL 1W/1m)	89,7 dB
Rec. power (RMS)	200 W min, 500 W max	Resonant freq. (Fs)	25,4 Hz
Freq. range	20 Hz - 2 kHz	Vas (litre)	75,8
Voice coil, diameter	50 mm (2")	Vas (ft <sup>3</sup> )	2,67
Voice coil length	31 mm (1,22")	Qms	10,3
X-max	+11,5 mm (0,45")	Qes	0,49
Cms	0,203 mm/N	Qts	0,47
SD	513 cm <sup>2</sup>		
Cone material	Aluminium		
Magnet, diameter	144mm (5,67")		
Installation depth	148 mm (5,82")		
Mounting hole	282 mm (11,1")		
Outer diameter	315 mm ( 12,4")		
Weigth	7,2 kg (15,87 lbs)		

## About the recommended enclosures

The performance of these recommended enclosures will vary from vehicle to vehicle. It is more difficult to get a tight and well defined bass in a SEDAN vehicle because of the tightness between trunk and interior. In most cases the recommended enclosures on next page is the best choice. The sealed box is to be preferred.

- The given enclosure volume is the inner volume.
- Volumes occupied by speaker have already been added to the given enclosure volumes so don't add any more volume.

## Enclosure placing in vehicles

In **small vehicles** like VW Golf, Peugeot 206, 306 and similar the bass box should be installed with speakers directed backwards. Alternatively directed upwards. This way of mounting is valid for all types of vehicles where the trunk is incorporated with the inner compartment.

In **sedan vehicles** with the passenger compartment separated from the trunk, the enclosure should be installed with speakers directed towards the rear seat. Some cars have an opening in the middle of the rear seat for loading skis etc. You can install the enclosure behind this opening and direct speaker through this opening.

In **large vehicles** like station wagons the best sound is achieved with the enclosure installed behind the rear seat with speakers directed backwards. Alternatively you can install the enclosure on one side of the luggage compartment.

## Important notice!

Nordica 10 & Nordica 12 have a design with "open voice coil" for improved cooling of the voice coil. This construction also give the best sound performance. To prevent dirt from entering the voice coil gap, follow these instructions:

- Keep the speaker in the plastic bag until it is time for installing the speaker in the box.
- Clean the speaker box inside from dust and dirt before mounting the speaker, use a vaccum cleaner.

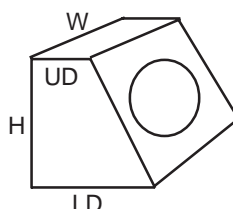
## Calculate your own enclosure

### Box volumes:

When calculating the inner volume of an enclosure you just multiply the width (W) x height (H) x depth (D). Use measures in dm and you will get the answer in litres.

### A trapezoid box is calculated as this:

$$\text{Vol} = \text{width (W)} \times \text{height (H)} \times \frac{\text{upper depth (UD)} + \text{lower depth (LD)}}{2}$$



Be sure to measure the inside dimensions.

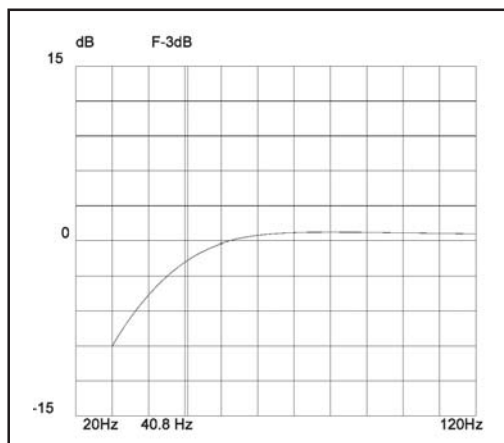
## Recommended enclosure Nordica 10

### Sealed enclosure:

Wiring : Single voice coil  
 Volume : 19 / 0,67 (litre / ft<sup>3</sup>)  
 Damping : Acoustic wool  
 F3 : 40,8 Hz

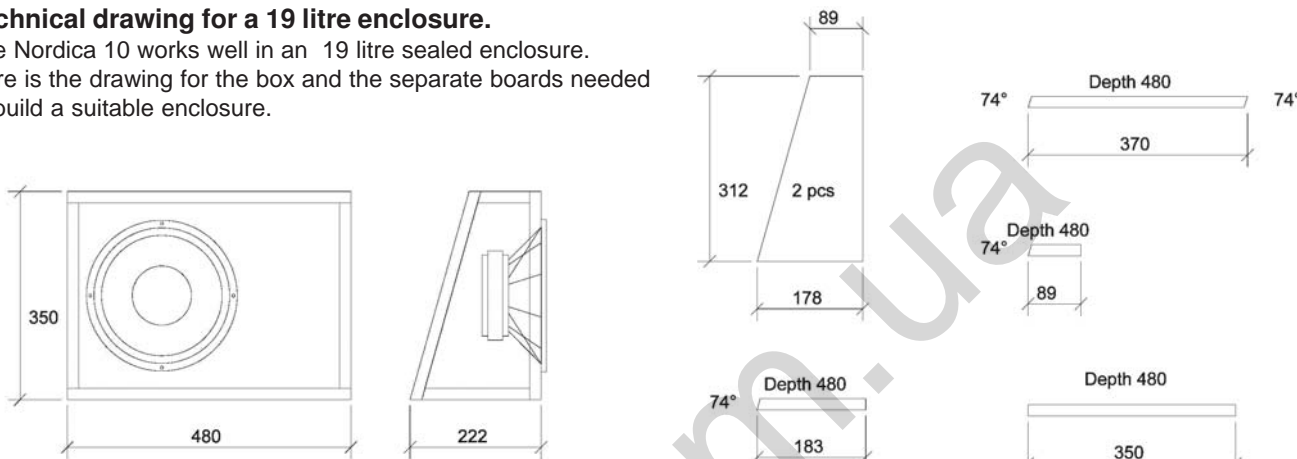
### Outside box dimensions:

Width : 480 mm (18,89")  
 Height : 350 mm (13,77")  
 Lower depth : 222 mm (8,74")  
 Upper depth : 122 mm (4,8")  
 Material : MDF 19 mm (3/4")



### Technical drawing for a 19 litre enclosure.

The Nordica 10 works well in an 19 litre sealed enclosure.  
 Here is the drawing for the box and the separate boards needed to build a suitable enclosure.



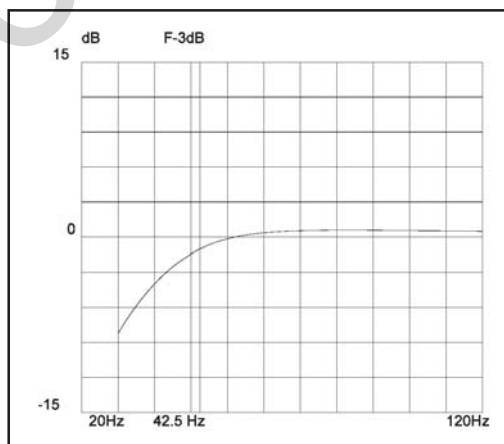
## Recommended enclosure Nordica 12

### Sealed enclosure:

Wiring : Single voice coil  
 Volume : 33 / 1,16 (liter / ft<sup>3</sup>)  
 Damping : Acoustic wool  
 F3 : 42,5 Hz

### Outside box dimensions:

Width : 500 mm (19,68")  
 Height : 400 mm (15,74")  
 Lower depth : 284 mm (11,18")  
 Upper depth : 184 mm (7,24")  
 Material : MDF 19 mm (0,75")



### Technical drawing for a 33 litre enclosure.

The Nordica 12 works well in a 33 litre sealed enclosure.  
 Here is the drawing for the box and the separate boards needed to build a suitable enclosure.

