



# REFERENCE SERIES CAR AUDIO SPEAKERS

**PS4, PS5, PS6  
R4, R5A, R6A  
MS5, MS6  
R964, R1070**

## WELCOME

Thank you for buying a DLS REFERENCE speaker.

This manual will show you how to do a correct installation. Please read the entire manual before beginning the installation.

Install the speakers 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.

## INSTALLATION

Mount the speakers in the door or in the dashboard of your car. Normally they will fit in the factory pre-made mounting holes. If you want an improved sound reinforce with a baffle of MDF-board or similar. An installation high up on the door side is to be preferred. An alternative installation is in so called kick panels down on each side of the floor with the speakers facing up- and inwards towards the listener.

For two- or three way speaker systems with separate tweeter an installation of the tweeter close to the bass/mid element is to be preferred. The tweeter can also be installed on the dash-board, or recessed in the door with the accessories in the tweeter box.

It is important to fasten the speakers properly in order to avoid bad sound or rattling.

For speakers with separate filters in boxes or similar it is vital that they are attached properly to the interior of the vehicle to avoid rattling. Don't place them close to the internal wiring of the car, this can cause interference.

Avoid to install filter boxes in the door sides because they can easily be broken because of rattling or moisture. Make sure the cables don't get jammed causing a short circuit to ground. This can damage the output circuits of the head unit or amplifier.

The sealing strip coming with some of the kits can be used for improved sealing between the bass element and the mounting surface.

The tweeter installation for kits with separate tweeter is described on last page, or in the instruction sheet coming with the tweeters.

## SPEAKER ENCLOSURES

If you want to install the speaker in an enclosure the normal size for a sealed type is:

4" (10 cm) speakers	: 2-4 liters
5,25" (13 cm) speakers	: 6-8 liters
6,5" (16,5 cm) speakers	: 10-12 liters
8" (20 cm) speakers	: 15-20 liters
6 x 9" speakers	: 15-20 liters
7 x 10" speakers	: 20-25 liters

These volumes are only a guideline. The volumes can vary between different speakers. Contact your local DLS dealer for more exact information about your specific speaker.

## TWO-WAY SYSTEMS PS4, PS5 & PS6

These 2-way systems have a separate tweeter. The filters are combined lowpass and highpass in a plastic box with selectable tweeter level inside. PS-series have small installation depth and fits most modern vehicles.

On the following pages you can see how to connect the filters.

**The filters must be used, if you connect without them the sound becomes bad and you will destroy the tweeter.**

## TWO-WAY SYSTEMS R4, R5A & R6A

These 2-way systems have a separate tweeter. The filters are combined lowpass and highpass in a plastic box with selectable tweeter level inside. R-series are speakers with heavy magnet systems giving good speaker control but instead a larger installation depth.

On the following pages you can see how to connect the filters.

**The filters must be used, if you connect without them the sound becomes bad and you will destroy the tweeter.**

## COAXIAL SPEAKERS R964 & R1070

These coaxial speakers have a separate filter box with lowpass filter for the woofer and a highpass filter for the tweeter. The tweeter level can be adjusted inside the filter box in two steps, high and low. R964 has a bi-wiring option in the filter.

On the following pages you can see how to connect the filter.

**The filters must be used, if you connect without them the sound becomes bad and you will destroy the tweeter.**

## TWO-WAY SYSTEMS MS5 & MS6

These 2-way systems have a separate 28 mm tweeter. The filters are combined lowpass and highpass in a plastic box with selectable tweeter level inside. MS-series are speakers with heavy magnet systems. The woofers magnesium cone body delivers a tight & controlled bass.

On the following pages you can see how to connect the filters.

**The filters must be used, if you connect without them the sound becomes bad and you will destroy the tweeter.**

## IMPORTANT!

**The speaker cone is made of magnesium, a material of low weight with excellent acoustic qualities.**

**We recommend you to NEVER touch the cone body of MS5 or MS6 with your fingers.**

**Remaining deformation of the cone body will occur if you touch it.**

# SPEAKER FACTS FOR DLS REFERENCE SERIES

Model	Woofers	Tweeter	Nom. power	Max power	Sensitivity	Magnet size	Inst. depth	Mounting hole	Crossover
PS4	10 cm / 4"	20 mm / 0,8"	50 W	80 W	90 dB	80 mm / 3,15"	50 mm / 1,97"	98 mm / 3,85"	Separate box
PS5	13 cm / 5,25"	25 mm / 1"	50 W	80 W	92 dB	90 mm / 3,54"	45 mm / 1,77"	117 mm / 4,6"	Separate box
PS6	16,5 cm / 6,5"	25 mm / 1"	50 W	80 W	92 dB	90 mm / 3,54"	53 mm / 2,09"	146 mm / 5,75"	Separate box
R4	10 cm / 4"	20 mm / 0,8"	50 W	80 W	94 dB	80 mm / 3,15"	60 mm / 2,36"	102 mm / 4"	Separate box
R5A	13 cm / 5,25"	25 mm / 1"	80 W	120 W	94 dB	90 mm / 3,54"	60 mm / 2,36"	120 mm / 4,72"	Separate box
R6A	16,5 cm / 6,5"	25 mm / 1"	80 W	120 W	94 dB	100 mm / 4"	76 mm / 3"	140 mm / 5,5"	Separate box
R964	6 x 9"	25 mm / 1"	80 W	120 W	93 dB	120 mm / 4,7"	90 mm / 3,54"	150x220 mm / 5,9x8,7"	Separate box
R1070	7 x 10"	25 mm / 1"	100 W	150 W	93 dB	145 mm / 5,7"	80 mm / 3,15"	156x225 mm / 6,15x8,86"	Separate box
MS5	13 cm / 5,25"	28 mm / 1,1"	80 W	120 W	90 dB	90 mm / 3,54"	58 mm / 2,28"	120 mm / 4,72"	Separate box
MS6	16,5 cm / 6,5"	28 mm / 1,1"	100 W	150 W	92 dB	100 mm / 4"	67 mm / 2,64"	140 mm / 5,5"	Separate box

## RUNNING-IN PERIOD

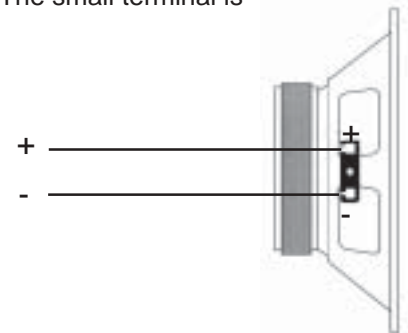
Allow the speakers to play for at least 15-20 hours. After this time the performance is correct.

### SPEAKER PHASING

To be sure to have the correct speaker polarity (phase) you can check this by using a 1,5 Volt battery. Connect a cable from the battery plus-pole to the speaker plus, and a cable from the battery minus to the speaker minus. If the speakers are correctly connected the speaker cone should move outwards on both right and left channel. This check must be made on the cables going from the speakers, to the output terminals of your car stereo or amplifier.

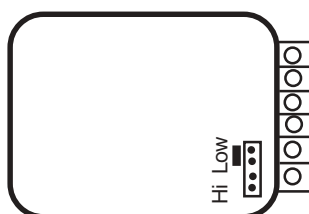
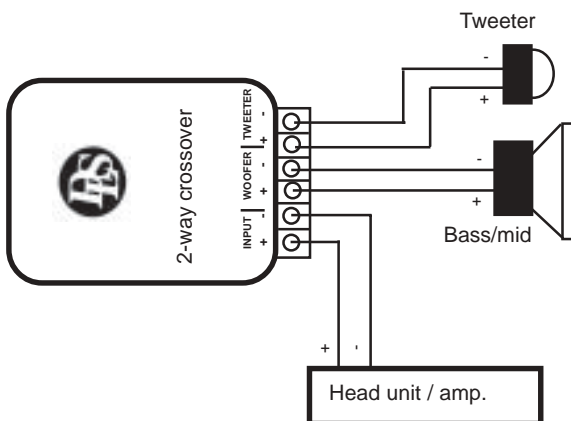
## CONNECTION OF SPEAKERS

Make sure you connect the cables with correct polarity to the speakers. Observe the markings on the terminal. The small terminal is minus.



## FILTER/CROSSOVER INSTALLATIONS

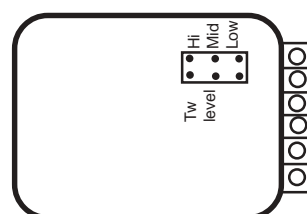
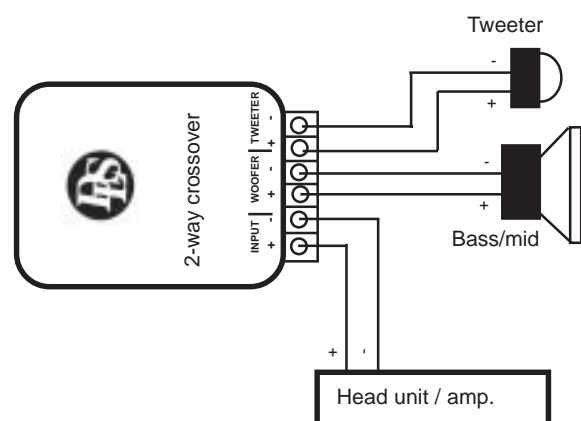
### Filter installation and connection of PS4 & R4



### Tweeter level select:

Select tweeter level by moving the jumper inside the filter box between high or low. Make your own tests for best result.

### Filter installation and connection of PS5 & PS6, R5A & R6A

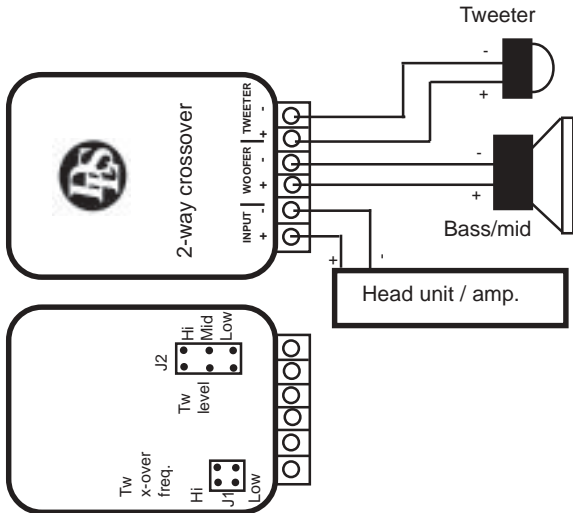


### Tweeter level select:

Select tweeter level by moving the jumper inside the filter box between high, mid or low. Make your own tests for best result.

# FILTER/CROSSOVER INSTALLATIONS

## Filter installation and connection of MS5 & MS6



### THE JUMPERS INSIDE THE FILTER: JUMPER J1

Jumper J1 is used for lowering the x-over frequency to the tweeter.

**J1 position Low:** When the tweeter is mounted apart from the bass element (for example on the dashboard), use this position .

**J1 position Hi:** When both tweeter and bass elements are mounted close together (for example in the door side), use this position .

### TWEETER LEVEL: JUMPER J2

Select tweeter level by moving the small jumper J2 inside the filter box.

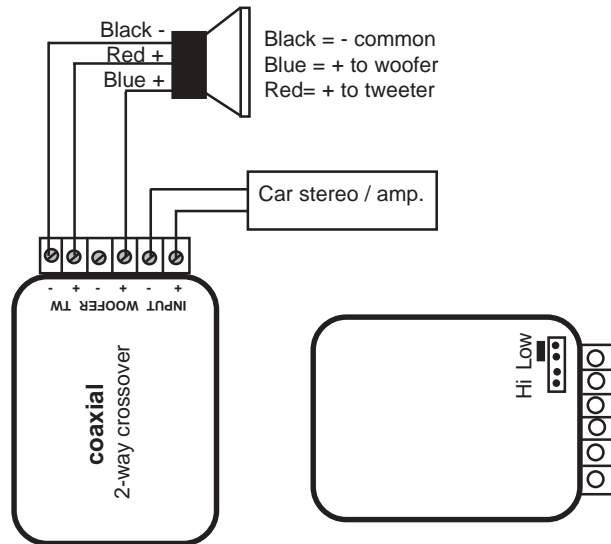
High level      Mid level      Low level

## Filter installation and connection of R1070

### Connection and tweeter level select R1070:

Use the red, blue and black cables to connect between the filter box and speaker terminal. Note the speaker terminal colour marking.

Select tweeter level by moving the jumper inside the filter box between high / low. Make your own tests for best result.



## Filter installation and connection of R964

### How to connect R964:

#### 1. Normal mode.

In normal use (not Bi-wiring) connect the input from head unit or amplifier to the woofer input.

**Jumper J1 and J2 must be in position IN.**

#### 2. Bi-wiring mode.

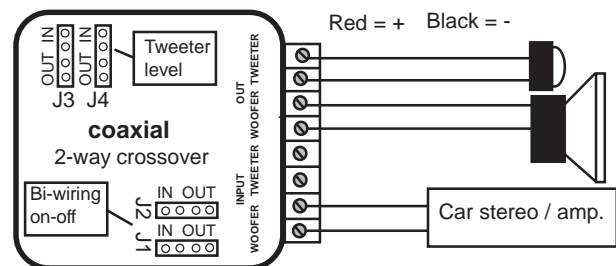
Bi-wiring means that the signal is separated to the woofer and the tweeter. For example, when using separate amplifiers for woofer and tweeter. Both filter inputs are used. **Set jumper J1 and J2 in position OUT to separate the filters + and ground.** If you connect the speaker element with active crossover, using the amplifiers internal filters, you don't need the filter boxes. Use 3,5 kHz as X-over point.

### Tweeter level: jumper J3 and J4

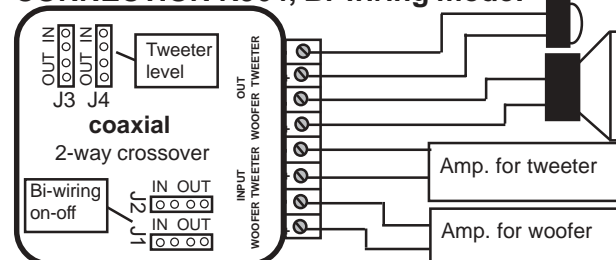
The tweeter level can be adjusted in three steps by moving the small jumpers (J2 and J3) inside the filter box.

High level:    J3: IN            J4: IN  
Mid level:     J3: IN            J4: OUT  
Low level:    J3: OUT          J4: OUT

### CONNECTION R964, normal mode:



### CONNECTION R964, Bi-wiring mode:



## TWEETER INSTALLATION T20

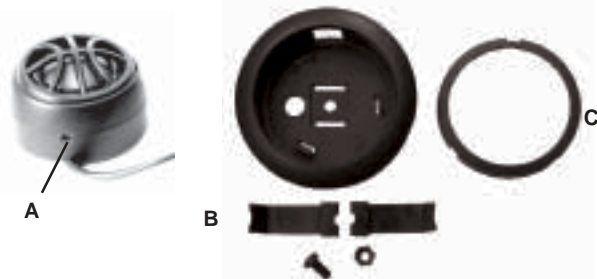
T20 can be mounted on the dashboard with the plain cup (1), the angled cup (2), or recessed in a doorside. These tweeters are included in the R4 and PS4 speaker kits.



### SURFACE MOUNTING:

Plain mounting: Use only the plain mounting cup (1) (it's normally mounted at delivery). Attach to surface with the two screws or double adhesive tape.

Angled mounting: Remove the plain mounting cup by bending with a small screw driver in the gap (A). Attach the tweeter element to the angled cup (2) as shown on picture 3. Pull the cable through the center hole. Now the tweeter can be mounted in two different angles. Attach to the surface with the two screws or double adhesive tape.



### RECESSED MOUNTING:

Drill a hole in the door side with a diameter of 48 mm / 1,89". The installation becomes easier if the door side is removed from the door. Put the two metal wings through the two tracks in the center of the cup, just as the picture shows, and attach them with the M4 screw and nut through the center hole. Put the tweeter element into the cup with the cable going out through the bottom hole. Attach the tweeter element to the plain cup using the mounting ring (C) attached between the cup and the tweeter element. The metal wings (B) should be on the back side of the door panel, holding the cup in place.

#### FACTS ABOUT DLS T20 TWEETER

Size	20 mm / 0,8"
Nom. power (RMS)	50 Watts, 80 Watts max
Freq. range	1,5 kHz-20 kHz
Sensitivity	93 dB
Magnet diameter	20 mm / 0,8" neodymium magnet
Mounting depth	20 mm / 0,8" (recessed mounting)
Mounting hole	48 mm / 1,89" (recessed mounting)
Cone material	Silk

### 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.



DLS Svenska AB  
P.O. Box 13029  
SE-40251 Göteborg, Sweden  
Tel: +46 31 840060  
Fax: +46 31 844021  
E-mail: info@dls.se  
www.dls.se

## TWEETER INSTALLATION T25/ UP1C

T25 /UP1C can be installed on the dashboard with the angled cup or recessed in a doorside.

T25 are included in the DLS REFERENCE speaker kits PS5, PS6, R5A and R6A. UP1C are included in the MS5 and MS6 speaker kits.

### SURFACE MOUNTING:

For angled surface mount together with the angled cup:

The tweeter element is attached to the cup by fitting the three wings on the angled cup into the tracks of the element and then turn it clockwise. When removing the element from the cup, turn it ccw and lift it up.



### RECESSED MOUNTING:

You need a hole with a diameter of 46 mm / 1,81" in the door side (for UP1C 48 mm / 1,89"). Put the two metal wings through the two tracks in the center of the cup, just as the picture shows, and attach them with the M4 screw and nut through the center hole. The cup is attached to the door side when the metal wings is pressed to the back side of the door.

Put the tweeter element into the cup with the cable going out through the bottom hole. Then attach the element into the cup and turn it clockwise to attach to the cup. When removing the element from the cup, turn it ccw and lift it out.



#### FACTS ABOUT DLS T25 TWEETER

Size	25 mm / 1"
Nom. power (RMS)	50 Watts (80 Watts max)
Freq. range	1,5 kHz-20 kHz
Sensitivity	93 dB
Magnet diameter	28 mm / 1,1"
Mounting depth	18 mm / 0,71"
Mounting hole	46 mm / 1,81"
Cone material	Hand treated fabric

#### FACTS ABOUT DLS UP1C TWEETER

Size	28 mm / 1,1"
Nom. power (RMS)	50 Watts (80 Watts max)
Freq. range	1,5 kHz-20 kHz
Sensitivity	93 dB
Magnet diameter	28 mm / 1,1"
Mounting depth	18 mm / 0,71"
Mounting hole	48 mm / 1,89"
Cone material	Hand treated fabric



### Technical Assistance

For technical assistance ask the shop where the product was sold or the distributor in your very country. You can always phone the DLS Helpdesk in Sweden + 46 31 840060 or send an e-mail to info@dls.se

Information can also be found on our WEB-site 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.