

3ASSHABIT

THANK YOU!

Thank you for purchasing this SPL Elite DSP from Bass Habit. Please read this manual in order to fully understand how to get the best result from this product and ensure that the advice on how to look after the product and the safety precautions are followed. We hope you enjoy using the product as much as we enjoyed creating it.

The Bass Habit E28DSP is a digital audio processor that offers an enormous variety of high accuracy settings and configurations for improving your audio system's performance. The DSP provides real-time equalizing, filtering, balancing, gain, phase inversion, limiting, and digital output and input routing among other treatments.

Before mounting and installing your new DSP, please read through the whole user manual. If you have any questions concerning your DSP or any other Bass Habit products, contact your nearest Bass Habit dealer/distributor.

UNPACKING

INCLUDED IN THE PACKAGING

- Mono amplifier
- Bass level remote
- Bass level remote cable 5M
- Screws 6pcs
- Allen keys 2pcs
- User manual
- Bass Habit sticker

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SAFETY & WARRANTY

DO NOT EXPOSE THIS PRODUCT TO EXCESSIVE DAMP OR MOISTURE

- Doing so may result in shock or damage to the product.

BEFORE WIRING, DISCONNECT THE CABLE FROM THE NEGATIVE BATTERY TERMINAL

- Failure to do so may result in electric shock or injury.

ENSURE GOOD AND CORRECT CONNECTIONS

- Failure to make the correct connections may result in permanent damage to the product.

DO NOT USE ANY FUNCTIONS THAT MAY TAKE YOUR CONCENTRATION AWAY FROM DRIVING YOUR VEHICLE

- Do not set up your DSP whilst driving. Doing so may result in an accident. For prolonged interaction with the product, make sure that your vehicle is stationary and parked in a safe location.

CAUTION

Never connect any speaker leads to the car chassis. This can cause severe damage to your car audio setup. Before drilling or cutting any holes, investigate the layout of your vehicle thoroughly.

Use caution when working near the fuel/hydraulic lines and electrical wiring.

Observe the correct polarity when wiring. Improper phasing may cause a loss of bass response.

Ensure that no moving parts get caught on the subwoofer or grill.

WARRANTY

All Bass Habit products carry a full warranty depending on the conditions in the country where it is sold. The warranty is valid from the date of the original receipt as proof of purchase (warranty period differs depending on local warranty laws and policies). Contact your international Bass Habit dealer or distributor concerning specific procedures for your country's warranty policies.

WHAT IS NOT COVERED

- Damage to product due to improper installation.
- Subsequent damage to other components.
- Damage caused by exposure to moisture, excessive heat, chemical cleaners and/or UV radiation.
- Damage through negligence, misuse, accident or abuse. Repeated returns for the same fault may be considered as abuse.
- Any cost or expense related to the removal and/or abuse. Repeated returns for the same fault may be considered as abuse.
- Damage caused by amplifier clipping or distortion.
- Items repaired or modified by any unauthorized repair facility.
- · Return shipping on non-defective items.
- Products returned without a return authorization number.
- Damage to product due to use of sealant.

WARNING

Bass Habit equipment is capable of sound pressure levels that can cause permanent damage to your hearing and those around you. Please use common sense when listening to your audio system and practice safe sound. Keep the volume at a level so you can still hear outside noise. Failure to do this may result in an accident. Bass Habit recommends caution when listening at a high volume. For safety and enjoyable listening, the sound should be clear without distortion.

INTERNATIONAL TECHNICAL ENQUIRIES

For international technical support please contact the dealer/distribution agent for your country.

INSTRUCTIONS

INSTALLATION EXPERIENCE

Installation of Bass Habit E28DSP may require experience with a variety of mechanical procedures including cable wiring, drilling, etc. This manual only provides general installation and operation instructions. If you have any reservations about your installation skills, please contact your local authorized Bass Habit dealer for help.

CHOOSING DSP MOUNTING LOCATIONS

Choose a mounting location in an area where the DSP will not be damaged, and where the DSP is not covered up. Mount the DSP so that it remains dry - never mount an DSP outside the vehicle or in the engine compartment. If the DSP is to be installed in an enclosed space, make sure there is sufficient air circulation for the DSP to cool itself. When mounting the DPS under a seat, ensure that it is clear of all moving parts and does not affect the seat functionality. Make sure that the DPS is mounted securely using nuts and bolts or screws.

INSTALLATION PRECAUTIONS

NOTE! Proceed only if you are a qualified installer, otherwise let your dealer do it.

- Always wear protective eye-wear when using tools.
- Turn off all stereo and other electrical devices before you begin.
- Disconnect the (-) negative lead from your vehicle's battery.
- Keep the DSP in the package until final installation, and always rest it upwards.
- Never use force when installing a DSP.
- Locate all fuel lines, brake lines, oil lines and electrical cables when planning your installation.
- Check clearances on both sides of a planned mounting surface before drilling any holes or fixing screws.
- When routing cables, keep input-signal cables away from power cables and speaker wires.
- · When making connections, make certain all cables are secure and properly insulated.

POWER CONNECTIONS

To get the very best performance out of your Bass Habit Elite DSP, carefully follow the instructions below:

GROUND CONNECTION (GND):

Connect the DSP Ground (GND) terminal to a solid point on the vehicle's metal chassis, as close to the DPS as possible. Scrape away any paint from this location; use a star-type lock washer to secure the connection.

Ground wire:

Recommended size: 2.5 mm² (13 awg)

BATTERY CONNECTION (+BAT):

Connect a wire directly to the vehicle's 12V positive battery terminal, and install an appropriate fuse and holder within 30cm/12" from the battery terminal. Keep the fuse uninstalled at the time for routing and connecting the power wire. Be sure to use grommets whenever routing wires through the firewall or other metal parts. When routing/connecting is done, installation of the fuse into the fuse holder can be finalized.

+12V wire:

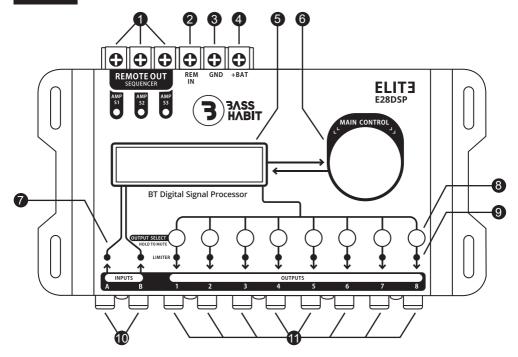
Recommended size: 2.5 mm² (13 awg) (Min. 1A fuse)

REMOTE CONNECTION (REM IN):

Connect the DSP Remote (REM IN) terminal to the source unit Remote turn on lead using a minimum of 1.5mm² (16 awg). If your source unit does not have a turn on connection, connect the DSP (REM IN) terminal through a power switch button which can provide a +12V signal.

CONTROL PANEL

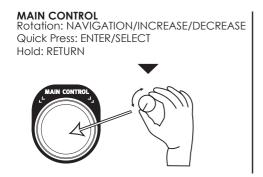
OVERVIEW

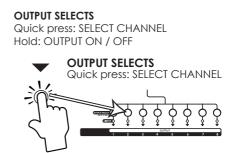


1	Remote out	Three different (with delay) remote out for amplifiers. Use 1.5mm² cable.
2	Remote in (REM IN)	Automatic start from source.
3	Negative ground (GND)	Connect to the vehicle chassis. Minimum 2.5mm² cable.
4	Positive battery (+BAT)	Connect to positive pole of battery (+12V). Minimum 2.5mm² cable.
5	Display	LCD display.
6	Main control	Navigation input, settings adjustments.
7	Input LED indicator	The LEDs will light indicating that the respective input signal has reached the maximum level allowed.
8	Output select	Quick press will take you to configuring output channels when changing settings. HOLD will turn specific output channels on or off. Blue light - channel output on. Red light - channel output off.
9	Output LED indicator	The LEDs will light when the "output limit" of the channel is reached.
10	Inputs (A B)	RCA input (Stereo).
11	Outputs	8 individual RCA outputs.

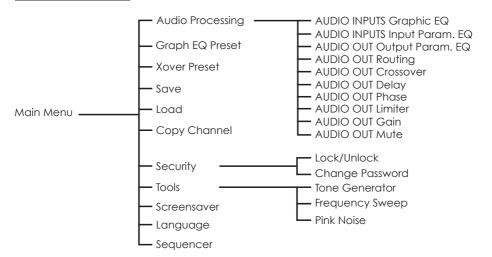
NAVIGATION AND CONTROL

Navigation and control of the Bass Habit E28DSP are made via the "MAIN CONTROL" knob and the "OUTPUT SELECTS" hotkeys.





MENU NAVIGATION



CONNECT BLUETOOTH

When "BT" is flashing in the display, the unit is ready for pairing. Connect to Bluetooth by finding "E28DSP" in the Bluetooth list on your mobil device. Bluetooth audio will override the RCA input audio.

Unpair Bluetooth connection with the "Load default" settings. Turning of Bluetooth mode on the mobile device enable RCA input.

Make sure to lower the source level connected to the A & B input, before turning off the Bluetooth, to avoid damaging the system.

AUDIO PROCESSING

AUDIO INPUTS - Graphic EQ

The input graphic equalizer has 15 bands: 25Hz, 40Hz, 63Hz, 10Hz, 160Hz, 250Hz, 40Hz, 63Hz, 16kHz, 2.5kHz, 4kHz, 6.3kHz, 10kHz, 16kHz

Each band has a variation of ±12 dB, with a pitch of 0.1 dB. The graphic equalizer acts on the two inputs simultaneously.

GRAPHIC EQ f: 63 Hz +2.6 dB

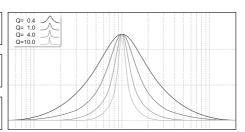
AUDIO INPUT- Input Param. EQ

The parametric equalizer allows you to choose a gain / attenuation at a specific frequency, as well as the bandwidth of that equalizer by means of the Q factor, the smaller the Q the greater the width of that equalization band, affecting to a greater extent the neighboring frequencies. Bass Habit E28DSP has 1 parametric equalizers for the inputs



PARAMETRIC EQ gain: +3.2 dB

PARAMETRIC EQ Q: 1.4



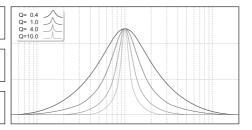
AUDIO OUT- Output Param. EQ

The parametric equalizer allows you to choose a gain / attenuation at a specific frequency, as well as the bandwidth of that equalizer by means of the Q factor, the smaller the Q the greater the width of that equalization band, affecting to a greater extent the neighboring frequencies. Bass Habit E28DSP has 8 parametric equalizers for the outputs (1 for each output)

PARAMETRIC EQ

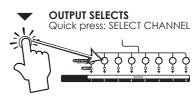
PARAMETRIC EQ 9ain: +3.2 dB

PARAMETRIC EQ Q: 1.4



To change the output channel, just press (quick) the output select.

OUT1, OUT2, OUT3, OUT4, OUT5, OUT6, OUT7, OUT8



AUDIO OUT- Routing

The purpose of the routing option allows you select the audio source A, B or A + B (sum) for each output. Turning the "MAIN CONTROL" dial moves the audio source to the selected route. To select another channel, quickly press the corresponding "OUTPUT SELECT".

ROUTING
IN A+B ---> OUT1

Example:

Selecting A for OUT1, OUT2 & OUT3 - and - Selecting B for OUT4, OUT5 & OUT6 gives you the option to run an active 3-way setup.

Selecting A for OUT1, OUT3 - and - Selecting B for OUT2, OUT4 gives you the option to run a front and back setup.

Selecting A+B for OUT7 & OUT8 gives you a subwoofer setup.

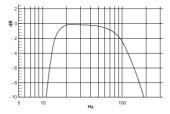
AUDIO OUT - Crossover

The crossover function allows precision definition of the cutoff frequencies for the high-pass filter and the low-pass filter, as well as filter attenuations and topology individually by output. Available filters and attenuators:

HPF: Butterworth	12/18/24/36/48 dB/Oct	LPF: Butterworth 12/18/24/36 dB/Oct
Linkwitz-Riley	/ 12/18/24/36/48 dB/Oct	Linkwitz-Riley 12/18/24/36 dB/Oct

HPF OUT1 f:12 Hz LR48

LPF OUT1 f:107 Hz BT12



In the "CROSSOVER" menu, each setting in the "MAIN CONTROL" changes the parameter in editing, between output, filter type, frequency and attenuation / topology.

To select another output channel for editing you can also quickly press the OUTPUT SELECT "OUTPUT SELECT" of the corresponding output.

AUDIO OUT- Phase

Use this function to resolve problems caused by canceling frequencies. From this screen you can reverse the phase of all outputs individually. Turning the "MAIN CONTROL" dial changes the phase (0° or 180°) of the corresponding output. To select another channel, quickly press the corresponding "OUTPUT SELECT" shortcut.

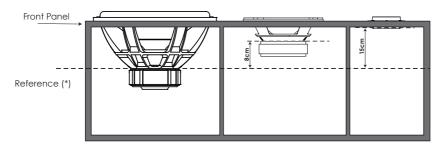
PHASE OUT1:180

AUDIO OUT- Delay

The Delay function allows for the digital alignment of transducers speakers via the time correction performed by the DSP, and ensures that the sound from all the speakers arrives at the listener with improved audio fidelity while avoiding frequency cancellations. See adjustment example below:

DELAY 12.0cm 0.349ms

- 1. Identify the coil farthest from the listener or the box. This coil will be used as a reference;
- 2. Measure the distance from the other coils to the reference coil. These are the distances used in configuring the delay of each output channel.



AUDIO OUT- Limiter

To protect your amplifiers and speakers, the E28DSP has a limiter with an integrated "Dynamic Attack-Release" system for each of the 8 outputs. Use this function to attenuate and prevent damage caused by signal peaks.

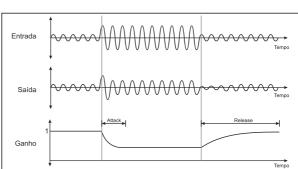
The Threshold (-24 to 0 dB) setting defines a threshold for the Limiter's activation: the Limiter kicks in when this threshold is exceeded.

The Attack parameter (0.1 to 100 ms) defines how fast the Limiter reacts / acts when the signal exceeds the Threshold.

The Release parameter (1 to 1600 ms) controls the recovery time elapsed between the time the signal falls below the Threshold and deactivation of the Limiter.

In addition to manual adjustments of Attack and Release values, it is possible to enable the "AUTO" mode, where the Attack and Release parameters are controlled in real time by the "Dynamic Attack-Release" system, providing ideal conditions for sound fidelity.





AUDIO OUT- Gain

This menu allows you to adjust the gains of the individual outputs within a range of -45 to +15 dB, as well as to increase the volume of the Bass Habit F28DSP from 0 to 100%

MASTER LVL: 82% OUT1 GAIN: +3 dB

AUDIO OUT- Mute

The outputs can be switched individually on and off quickly by holding down the OUTPUT SELECT that corre-sponds to the output.

The LED color indicates the status of the output.

- BLUE: Output ON.
- RED: Output OFF (MUTE).

In the "MUTE" screen, you can still turn off and on all the output channels simultaneously using the "MAIN CONTROL" go to the output field and select "ALL-ENTER" or "ALL-ENTER ON". Then fast touch on "MAIN CONTROL". You can also turn the input graphic equalizer on or off.

OUT1: ON GRAPH EQ: ON MUTE ALL (ENTER)
GRAPH EQ: ON

ON ALL CENTERS
GRAPH EQ: ON

FUNCTIONS

GRAPHIC EQ Preset

Bass Habit E28DSP has 12 graphic equalization presets to choose from.

- FLAT LOUDNESS BASS BOOST MID BASS
- TREBLE BOOST POWERFUL ELECTRONIC ROCK
- HIP HOP POP VOCAL PANCADAO (Heavy beat)

MAIN MENU Graph EQ Presets

GRAPH EQ PRESETS
Loudness

X-OVER Presets

The Bass Habit E28DSP offers 11 crossover presets. These can be selected from "XOVER Preset" in the menu. Each preset can be used for all outputs. Use HOTKEYS for output selection.

XOVER PRESETS

See all crossover preset options at the following page >>

X-OVER Presets

The crossover presets you can choose from is the following:

S	۱A	ı	D	M	u	1
J	A.	v	D	A.	v	ı

HPF	50Hz	BT12
LPF	150Hz	LR24

SWBW2

HPF	10Hz	OFF
iPE	ogu	1.004
III.L.	ounz	LRZH

SWBW3

HPF	30Hz	BT12
LPF	AAHZ	LR24

WOOFER1

HPF 100Hz	_R24
LPF 1000Hz	_R24

WOOFER2

HPF 60Hz	BT12
LPF 1000Hz	LR24

WOOFER3

DRIVER1

HPF	700Hz	LR24
LPF	7000Hz	LR24

DRIVER2

HPF	1000Hz	LR24
LPF	7000Hz	LR24

DRIVER3

HPF	1650Hz	BT12
LPF	22000Hz	OFF

TWEETER

HPF	7000Hz	LR24
LPF	22000Hz	LR24

CUSTOM

HPF	10Hz	OFF
LPF	22000Hz	OFF

SAVE / LOAD (factory reset)

The E28DSP has four memory slots available for saving personalized settings, accessed via the "SAVE" function. Saved settings can be named with titles up to 15-characters long. Besides the memory space available to the user, there is auto save, where all parameters and settings are saved in a separate working memory. Or rather, if there is a drop in power or the product is turned off during configuration, the settings will not be lost. This function cannot be disabled.

To load previously saved settings use the "LOAD" function. This function also allows the factory presents to be loaded via the "DEFAULT" memory.

SAVE MEMORY1 Memory1 LOAD Default

SECURITY

This function locks the ability to edit the E28DSP settings, including blocking the save and load settings. Via the "SECURITY" menu you can lock, unlock ("LOCK/UNLOCK") and change the password ("Change Password"). The on/off function for output channels is not blocked. **Default password: 1234.**

SECURITY Lock/Unlock ENTER PASSWORD

SECURITY Charge Password CHARGE PASSWORD
Current PW:____

COPY CHANNEL

This function allows you to copy all audio settings from one output channel to another. The copied functions are: parametric output equalizer, routing, crossover, alignment, phase inversion, limiter, gain and mute.

- Select an "SOURCE" output channel using the "OUTPUT SELECT" hotkeys or by turning the "MAIN CONTROL", fasten "MAIN CONTROL":
- Select a "DESTINATION" output channel using "OUTPUT SELECT" shortcut keys or by turning the "MAIN CONTROL", fasten "MAIN CONTROL";
- The confirmation message will appear. If confirmed, as output channels from "ORIGIN" to the "DESTINATION" output channel, overwriting as the "DESTINATION" output channel.

COPY CHANNEL Source: OUT1 COPY CHANNEL Destination: OUT2

COPY CHANNEL NO [YES]

SEQUENCER

The feature gives you the option of activating different products with delay. This function has three outputs (AMP S1, AMP S2 & AMP S3) and are activated and deactivated in a sequential order, according to the remote input (REM in)

The interval between each output is up to 4 sec. If configured to 0 sec, all three outputs will enable/disable at the same time (After 3 sec after "REM in" is active).

Use a 1.5mm2 cable from the outputs.

It's possible to turn off this function.

MAIN MENU Sequencer SEQUENCER Time

SEQUENCER
Time: 2.0 s

SEQUENCER ON/OFF SEQUENCER S1: ON

SCREENSAVER

The Bass Habit E28DSP has a screensaver function, which allows the user to define a 15-character scrolling text.

SCREENSAUER E280SP

LANGUAGE

You can select from the following operating languages: English, Spanish and Portuguese.

TOOLS

The Bass Habit E28DSP has tools to aid in the regulation of your sound system, TONE GENERATOR, FREQUENCY SWEEP and PINK NOISE GENERATOR. These tools are signal sources for all outputs, that is, during their use as inputs. Make sure to always start with gain: -60 dB due to a high output signal!

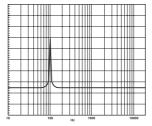
TONE GENERATOR

A tone Generator is used to generate a specific frequency with gain control. Each press on the "MAIN CONTROL" parameter is edited between frequency, gain and ON / OFF. With the generator on it is still possible to change the frequency and gain in real time, and even modify other audio parameters of the processor.

TONE GENERATOR frea: 100 Hz

TONE GENERATOR sain:-45.0 dB

TONE GENERATOR
OFF [ON]



FREQUENCY SWEEP

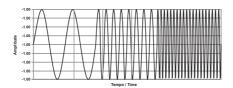
The frequency sleep allows you to perform a frequency scan, with the option of selecting the initial and final frequency, gain, scanning speed and ON / OFF. When activating the sweep enters a continuous cycle, to close it simply press any of the "OUTPUT SELECTS" or move the "MAIN CONTROL".

FREQUENCY SWEEP start: 10 Hz

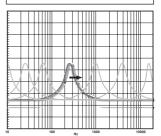
FREQUENCY SWEEP speed:medium

FREQUENCY SWEEP sain: -45.0 dB

FREQUENCY SWEEP
OFF [ON]



FREQUENCY SWEEP end: 22000 Hz



PINK SWEEP

The Pink Sweeå lets you generate a signal that maintains the same magnitude for the entire frequency range, generally used to calibrate audio systems in order to obtain flat response and due alignment between the tracks. Each press on the "MAIN CONTROL" parameter in editing is changed between gain and ON / OFF. With the pink noise on it is still possible to change the gain of noise in real time, and even modify other audio parameters of the processor.

PINK NOISE gain:-45.0 dB

PINK NOISE OFF CONI

SPECIFICATIONS

Number of Input Channels:	2, BT
Number of Output Channels:	8
Graphic Equalizer:	15 Bands, gain ± 12dB
Graphic Equalization Presets:	12
Parametric Equalizer:	1 Input + 1 per Output, Gain ± 12dB, Q Factor 0.4 to 10.0
Crossover with Variable Frequency:	Butterworth 12/18/24/36/48 dB / Oct
	Linkwitz-Riley 12/18/24/36/48 dB / Oct
Crossover Presets:	11
Routing between Inputs & Outputs:	A, B or A + B (Stereo/Mono)
Alignment:	0 to 8ms (275cm) - Step 0.0145ms (0.5cm)
Phase Inversion:	0° or 180°
Limiter:	Threshold -24 to 0dB / Attack 0.1 to 100.0ms
	Release 1 at 1600ms / Attack / Release
Output Gain:	-45 to + 15dB
Master Level:	0 to 100%
Memory Positions Save / Load:	Working memory (auto save) + 4 memory positions
Copy of Channels:	Copy settings between output channels
Safety:	4-digit security password
Frequency Generator:	10Hz to 22kHz
Frequency Sweep:	Freq. Start and end 10Hz at 22kHz
	Level -60 to 0dB / Speed control
Pink Noise Generator:	10Hz to 22kHz, Level -60 to 0dB
Screensaver:	Editable text with 15 positions
Languages:	English,Portuguese and Spanish
Latency:	1.08ms
Input Impedance:	10 kΩ
Output Impedance:	47 Ω
Max Input Voltage:	2V RMS (5.6 Vpp (+ 8.2 dBu))
Max Output Voltage:	2V RMS (5.6 Vpp (+ 8.2 dBu))
Input Saturation Indicator:	1 per Entry
Output Saturation Indicator:	1 per Output (with Limiter link)
Signal-to-noise ratio:	>94dB
Total Harmonic Distortion (T.H.D):	0.01%
Channel Separation:	>80dB
Frequency Response:	10Hz-23kHz @ -1dB
Power supply:	10V-16V DC
Max Current Consumption:	0.5A @ 14.4V DC
Dimensions (W x H x D):	37 x 200 x 101 mm
Weight:	475g

TROUBLESHOOTING

Symptom	Check / Control
No sound / No active unit	 Check and measure voltage at +12V and REM IN (Allowed working range is 10.0-16V DC). Check ground connections. Check the external fuse. Check input signal and cables from the source unit. Check if the output selector is in mute (RED) Check gain and settings in the menu on your E28DSP.
Noise or Distorted sound / Low output	 Check if the input indicator is RED. (Lower the input signal). Check crossover/input level/gain on E28DSP. Check gain settings on your amplifier. Check ground connections of all installed audio equipment (source unit, amplifier, etc).







The crossed-out wheelie bin symbol means that the product, literature and packaging included must be taken to a separate collection at the end of their working life. Do not dispose of these products as unsorted municipal waste: dispose of them at a recycling point. For info on your nearest recycling point, check with your local waste authority.

Products marked with the RoHS symbol complies with the relevant provisions of the RoHS Directive for the European Union. In common with all Electrical and Electronic Equipment (EEE) the product should not be disposed of as household waste. Alternative arrangements may apply in other jurisdictions.

The product with the CE mark indicates that it has passed the corresponding conformity assessment procedure and the manufacturer's declaration of conformity, and it complies with the relevant EU directives, and is used as a pass for the product to be allowed to enter the European Community market. Relevant directives require industrial products to be affixed with the CE mark. Those that do not have the CE mark shall not be marketed.

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