



PARK AUDIO

DX1000T DSP

DX1400T DSP

DX2100T DSP

**PROFESSIONAL BUILT-IN
THREE-CHANNEL POWER AMPLIFIERS WITH DSP**

OWNER'S MANUAL



AVIS
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

CAUTION!

The amplifier runs on 230V AC voltage. Removing the cover will expose you to a potentially dangerous voltage! Do not use the unit if the electrical power cord is frayed or broken. Power is supplied from 230 V AC single-phase grounded 50/60 Hz source!

CAUTION!

The amplifier can yield dangerous output voltage! Do not install an energized unit into the speaker system. Do not touch the non-insulated cable parts connected to the unit in operation!

CAUTION!

The high sound pressure level of speaker systems generated by high output power delivered by the amplifier may be hazardous to your hearing. Please, take adequate safety precautions.

WARNING!

The amplifier yields high output power. The manufacturer shall not be held responsible for any damage to the speakers caused by excessive power from the unit.

WARNING SIGNS:



Important information! *Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the Owner's Manual accompanying the product.*



Hazardous voltage inside! *Intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.*

INTRODUCTION

The **DX1000T DSP**, **DX1400T DSP**, **DX2100T DSP** three-channel amplifiers are designed for installation inside subwoofer which is a part of the active set – subwoofer plus 2 satellites.

One amplifier channel is used to connect the subwoofer, the other two – for satellites.

To create the necessary signal processing path, including crossovers, EQ and dynamic processing, the **DSP** engine is used in the amplifier.

The digital power amplifier inside the **DX1000T DSP**, **DX1400T DSP**, **DX2100T DSP** amplifiers ensures high reliability and perfect sound both at the minimum level of the input signal and in the overload mode.

The full name of the model is on the label on the rear of the amplifier case.

ATTENTION! *Unless specified otherwise, the word «amplifier» hereinafter applies to any of the above models.*

UNPACKING

The manufacturer's quality control system provides for careful examination of each product before it leaves the factory to ensure its flawless appearance. After unpacking, please, check the unit for any physical damage. In case of damage, please, contact your local dealer. Keep the shipping carton and all packing material, as you may require them for reshipment of the unit.

ACCESSORIES:

1. Power cord
2. Software CD
3. Owner's Manual
4. Warranty

DESIGN AND FUNCTIONAL FEATURES

Design

The built-in power amplifier is designed as a mono-block unit. All its components are installed on a single bearing panel placed inside the case which protects the unit and ensures its deep placement into the body of a speaker system.

Power to the built-in power amplifier is supplied via a removable power cord.

Power Supply Unit

Switchable. Made to minimize the weight of the amplifier.

Power Factor Correction (*only in models with index «PFC»*)

The amplifier has power supply with Power Factor Corrector, which significantly reduces load to the mains and also reduces noise and distortion in the mains. What is more important, the amplifier output power is no longer rigorously dependent on the mains voltage.

The amplifier provides full power at the mains from ~160 to 280 V (with no need to use external AC voltage stabilizer).

Output Stage

The power amplifier is designed according to Class D technology to deliver high efficiency and least heat. The high switching rate ensures the high sound quality comparable with the best analogue amplifiers. The power amplifier is installed to the cooling radiator, common with the power supply.

Cooling System

The amplifier is cooled down with a fan. The cooling system ensures reliable cooling of the amplifier within the whole operating temperature range (5 to 35°C). The cooling system is a double-level system which ensures a smooth rise of the cooling intensity rate in the fan-ON mode. At a normal temperature and low output level the fan is OFF, thus generating no noise. When the amplifier is set to deliver a high output power, as well as when the ambient temperature is higher than normal and when the heat sink becomes too hot, the fan goes ON, and the cooling intensity rate changes smoothly as the temperature rises.

Input Section

The input section includes:

- Left and Right Channels line inputs (**XLR** female);
- Left and Right Channels line outputs (**XLR** female, parallel to the line inputs);
- Input Level Control Knob (one for both channels);
- Subwoofer Level Control Knob;
- **DSP** preset switch for the subwoofer channel;
- **DSP** preset switch for the satellites channel;
- **USB** port (USB B).

The amplifier inputs are balanced.

The line input and output connectors are parallel (connected in pairs), i.e. the contacts of the output connector match the respective contacts of the input connector.

The **DSP** preset switch enables choosing various settings for the subwoofer and satellite channel, created by the **DSP** sound proceeding.

USB interface enables changing the parameters and presets overwriting.

Overload and Short-Circuit Protection

This protective system becomes active in case of short-circuited output or overload caused by reduced load impedance. It disables the output signal of the respective channel for 0.5 second and then the amplifier gradually resumes its delivery.

DC Output Protection

The amplifier's schematic precludes transit of any clicks or noise during the power-on/off transition process. Moreover, the amplifier protects the speaker systems against damage by DC voltage or powerful LF fluctuations in case of their occurrence on the output of the amplifier. In this case its power supply unit goes OFF and all LEDs go OFF too, including the **POWERLED**.

The power amplifier can be restarted by consecutive switching OFF and ON with the **POWER** switch. If the DC is an occasional problem (which is unlikely) the amplifier goes ON and resumes its normal functioning. If, otherwise, the DC output problem persists through the fault of the amplifier, then upon switching, the amplifier goes ON but in a short while the DC output protection system disables the power supply unit.

Thermal Protection

The signal may be cut off only in case of the fan breakdown or blocked air flow. If this is the case, the thermal protection system disables the input signal when the heat sink temperature has reached 85°C, this fact being notified by the **CLIP/THERMAL** LED.

The amplifier resumes its operation in the reverse order as soon as it has cooled down, gradually regaining its gain rate level up to the set value.

DSP engine

Built-in **DSP** engine accurately handles the audio signal due to its functions of EQ, filtering, delay and limiter.

DSP enables users to choose between 3 presets for subwoofer and satellite channels (9 presets in total). Preset parameters are listed in the attachment in the Owner's Manual.

Any of presets can be modified, using a computer connected via USB interface (software – **SigmaStudio** by Analog Devices, Inc.).

The installation package of the **SigmaStudio** ver.3.10 software (32-bit and 64-bit program versions available) and user manual can be found on the disk or flash-drive, supplied with the amplifier.

The **SigmaStudio** ver.3.10 installation package can also be downloaded from the site parkaudio.ua (Download section on the pages of the corresponding amplifiers). Moreover, in the Download section you can find:

SigmaStudio User Manual – user guide on setting built-in amplifiers with **DSP** by **SigmaStudio** ([SigmaStudio_for_DF_dsp_UM_en.pdf](#)).

SigmaStudio Video Tutorial – video tutorial about setting amplifiers with **DSP** by SigmaStudio.

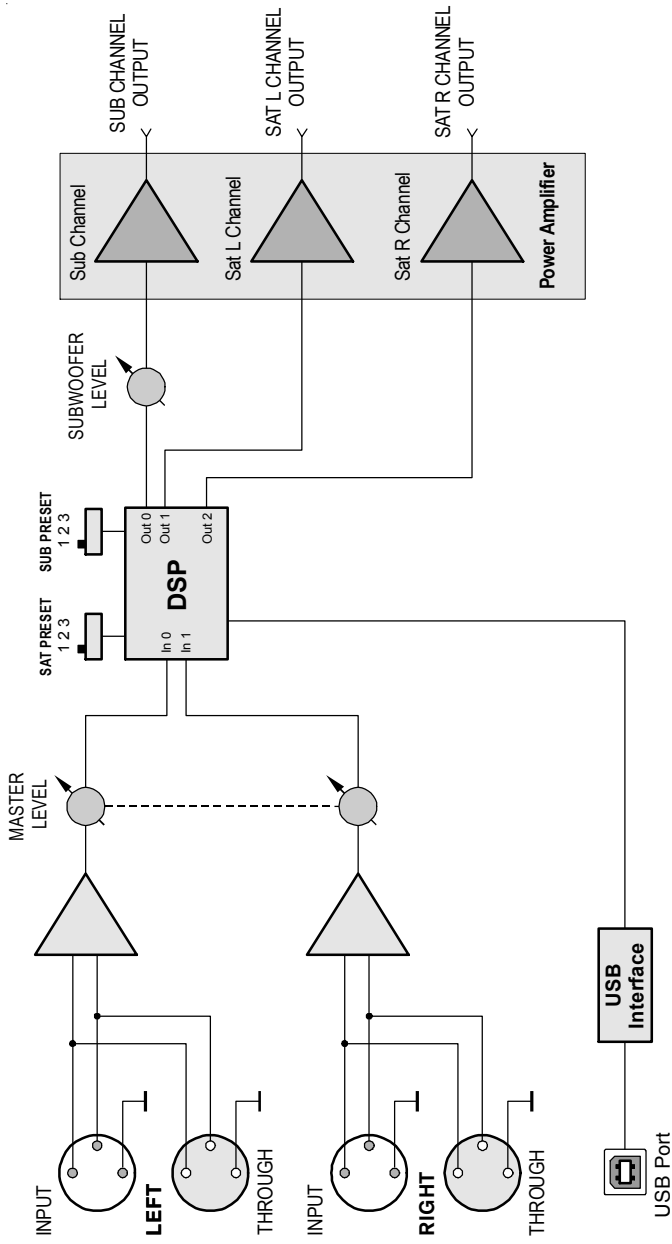
Limiter's User Manual – recommendations on limiters setting in signal processing tracts (Limiter_UM_en.pdf);

Project Templates – SigmaStudio project template for amplifiers with DSP (Project_DX_T_dsp.zip);

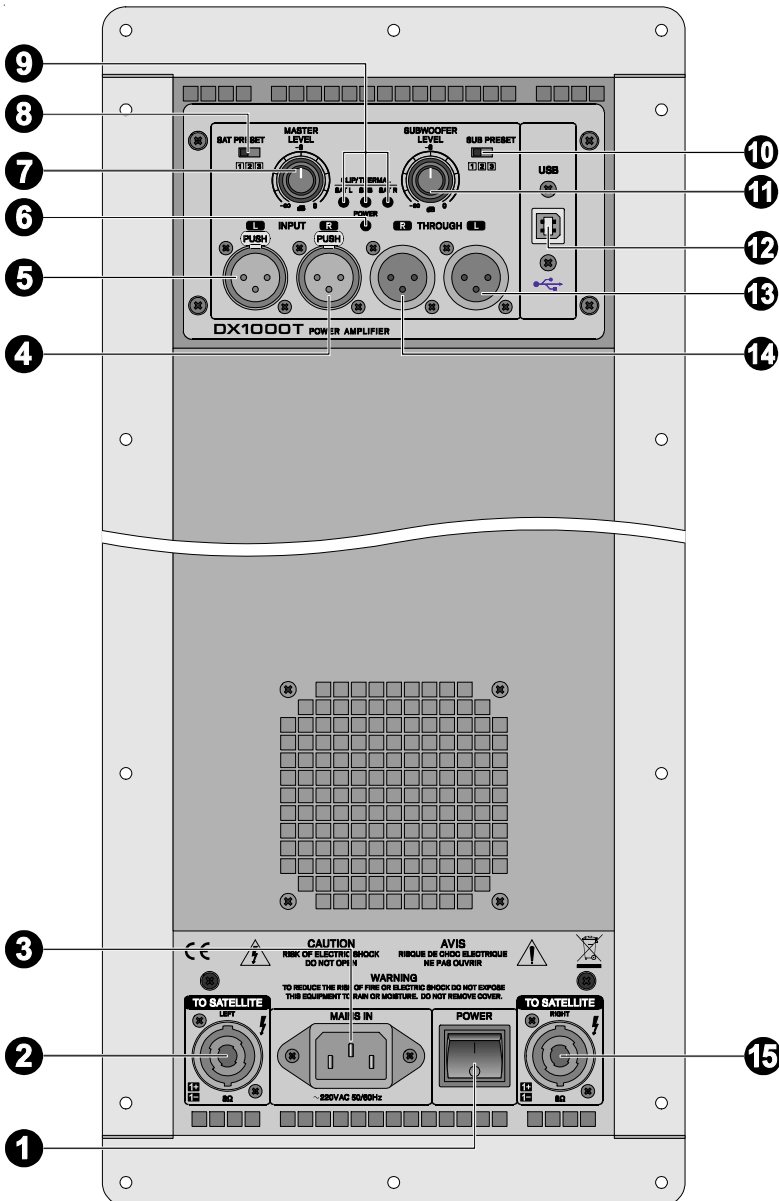
Factory DSP Presets – DSP preset settings description (DSP setting_DX_T_dsp.xls).

Limiter's Setting Calculations – simple calculator (Excel) to calculate the parameters of the limiter (Limiters_calculation.xls).

BLOCK DIAGRAM



CONTROLS AND CONNECTORS



- ❶ **POWER** – power switch.
- ❷ **TO SATELLITE LEFT** – left satellite channel output.
- ❸ **MAINS IN** – power cable socket.

ATTENTION! The mains parameters are indicated below the power cord socket:

– for the amplifiers without PFC: ~230V AC 50/60Hz;

– for the amplifiers with PFC: ~160-250V AC 50/60Hz.

ATTENTION! The power to the amplifier is supplied from single-phase AC power mains 230 V and ~50/60Hz with protective grounding. To connect the amplifier to a wall outlet, first insert the power cord into the power cord socket and then plug it into the wall outlet.

- ❹ **INPUT R** – Right Channel input (XLR, balanced).
- ❺ **INPUT L** – Left Channel input (XLR, balanced).
- ❻ **POWER LED**.
- ❼ **MASTER LEVEL** – input level control knob.
- ❽ **SAT PRESET** – DSP presets switch for satellites channels.
- ❾ **CLIP/THERMAL** – overload / thermal protection LED.
Indicating:
 - overload condition, characterized by sound distortion and optoelectronic clip-limiter active mode;
 - thermal protection active condition in case of overheating of the output section.
- ❿ **SUB PRESET** – DSP presets switch for subwoofer channels.
- ⓫ **SUBWOOFER LEVEL** – subwoofer level control knob.
- ⓬ **USB** – USB port for connection to the PC (personal computer).
- ⓭ **THROUGH L** – Left Channel line output (XLR male, parallel to Left Channel input).
- ⓮ **THROUGH R** – Right Channel line output (XLR male, parallel to Left Channel input).
- ⓯ **TO SATELLITE LEFT** – Right satellite channel output.

CABLE REQUIREMENTS

Input Cables

Make sure to use only shielded cables whether balanced or unbalanced. As a rule, unbalanced lines of over 3 meters long are not acceptable. Shielding, when properly grounded, protects a signal against external radio interference, interference generated by dimmers and other electric noise. Avoid placing input cables close to power cords or power transformers.

Output Cables

The amplifier is capable of delivering high level output current; therefore, the wire gauge used for speaker cables is particularly important. Inadequate wire gauge adds significant resistance to the speaker's own impedance, reducing the power which is actually delivered to the speaker. It will also result in a decreased damping factor and possible fire hazard.

Since the power applied to the loudspeaker is of primary concern in system design, we have included the table below to allow you determine the appropriate wire gauge for your application.

Power Loss in a 10-meter Cable

Wire Gauge, mm ²	Cable Resistance, Ohm	Cable Power Loss	
		4 Ohm Load	8 Ohm Load
0.50	0.72	15.4 %	8.3 %
0.75	0.49	10.9 %	5.8 %
1.00	0.36	8.3 %	4.3 %
1.50	0.24	5.7 %	2.9 %
2.00	0.18	4.3 %	2.2 %
2.50	0.15	3.6 %	1.8 %
4.00	0.09	2.3 %	1.1 %

The table shows the percentage of the power loss in a 10-meter 2-conductor copper cable. This table reflects the power loss as a percentage of the output power of the amplifier, applied to the load.

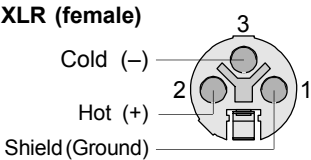
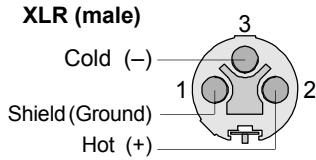
Use this table to determine the power loss to the load for other cable lengths. For example, if you plan to deliver 100 Watts to 8-Ohm load through 20-m cable of 0.75 mm² gauge, the power loss in the cable would be 5.8 % x 2=11.6 % of 100 W or 11.8 W lost in the cable.

CONNECTORS

Input Connectors

Use **XLR** (male) connectors to connect to the line inputs and **XLR** (female) connectors to the line outputs.

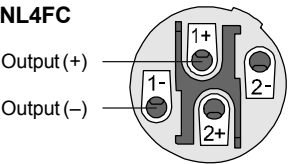
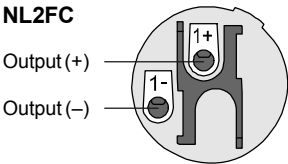
See the connectors wiring below.



Output connectors

Use SpeakON **NL2FC** or **NL4FC** connector to connect the loudspeaker-satellite to the amplifier output.

See the connector wiring below.



AC POWER REQUIREMENTS

The amplifier is supplied with a three-conductor grounded AC power cord, and should be plugged into a standard 3-wire grounded electrical outlet, which supplies 230 V AC 50/60 Hz.

The amplifier with PFC operates at the mains voltage range from 160 V to 280 V, giving the full rated output power.

In case of line voltage sag, the amplifier without **PFC** will continue to operate normally, albeit with less power. The amplifier retains its operability at the voltage not less than 160 V.

The amplifier is connected to the mains via cable, supplied with the amplifier. When connecting to mains, make sure that no other devices with high power consumption are connected to it, as the normal operation of several such devices may be impossible.

The actual AC current consumption depends on the audio signal level and the load impedance. For system design purposes it must be noted, that for typical audio program material the amplifiers, driving all channels at nominal impedance, just peaking at the clipping level, have the following average power consumption:

- 2.25 A* for amplifier **DX1000T DSP**;
- 3 A* for amplifier **DX1400T DSP**;
- 4.5 A* for amplifier **DX2100T DSP**.

** At the mains voltage 230 V AC. For the amplifiers with **PFC** in the low mains voltage, the current consumption increases.*

In order to reduce the AC hum, please, plug all sound equipment, interconnected with signal cables, into the same power mains outlet.

INSTALLATION INTO A LOUDSPEAKER

Insert the amplifier into a cutout in the rear panel of a loudspeaker.

For installation of the amplifier we recommend a cutout of the following size:

- for amplifiers **DX1000T DSP**, **DX1400T DSP**: width 158 mm, height 369 mm;
- for amplifier **DX2100T DSP**: width 158 mm, height 435 mm.

The amplifier is designed to be operated under permanent vibration conditions and does not require special tight sealing of the compartment where the unit is to be installed. However, to improve the sound quality of the speaker system and reliability, the manufacturer recommends to install the amplifier into a sealed compartment.

Polarity of the subwoofer speaker is on the label on the rear of the amplifier case.

SPECIFICATION

Output Power *:

– DX1000T DSP	350 W (subwoofer channel, 8 Ohms) 2 x 350 W (satellite channels, 8 Ohms)
–DX1400T DSP	700/380W (subwoofer channel, 4 / 8 Ohms) 2 x 350 W (satellite channels, 8 Ohms)
–DX2100T-4 DSP	1400 / 800W (subwoofer channel, 4 / 8 Ohms) 2 x 350/210 W (satellite channels, 4 / 8 Ohms)
– DX2100T-8 DSP	1400W (subwoofer channel, 8 Ohms) 2 x 350 W (satellite channels, 8 Ohms)

Frequency Response **::

– subwoofer channel	45– 140 W (Pnom., Rnom.)
– satellite channel	140 Hz – 20 kHz (Pnom., Rnom.)

Total

Harmonic Distortion ***	0.05% (Pnom., Rnom.)
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Slew Rate

20 V/μs

Damping Factor

200 (200 Hz, 8 Ohms)

Signal-to-Noise Ratio

98 dB (unweighted)

Sensitivity****

775mV

Power Requirements

~230 V, 50/60 Hz

Weight:

– DX1000T DSP, DX1400T DSP	4.3 kg
– DX1000T DSP PFC, DX1400T DSP PFC	4.6 kg
– DX2100T DSP	4.7 kg
– DX2100T DSP PFC	5 kg

Dimensions:

– DX1000T DSP, DX1400T DSP	198 mm (W), 438 mm (H), 104 mm (D)
– DX2100T DSP	198 mm (W), 474 mm (H), 104 mm (D)

Note.

* At mains:

- ~230 V for amplifiers without power factor correction (PFC);
- ~160-280 V for amplifiers with power factor correction (PFC).

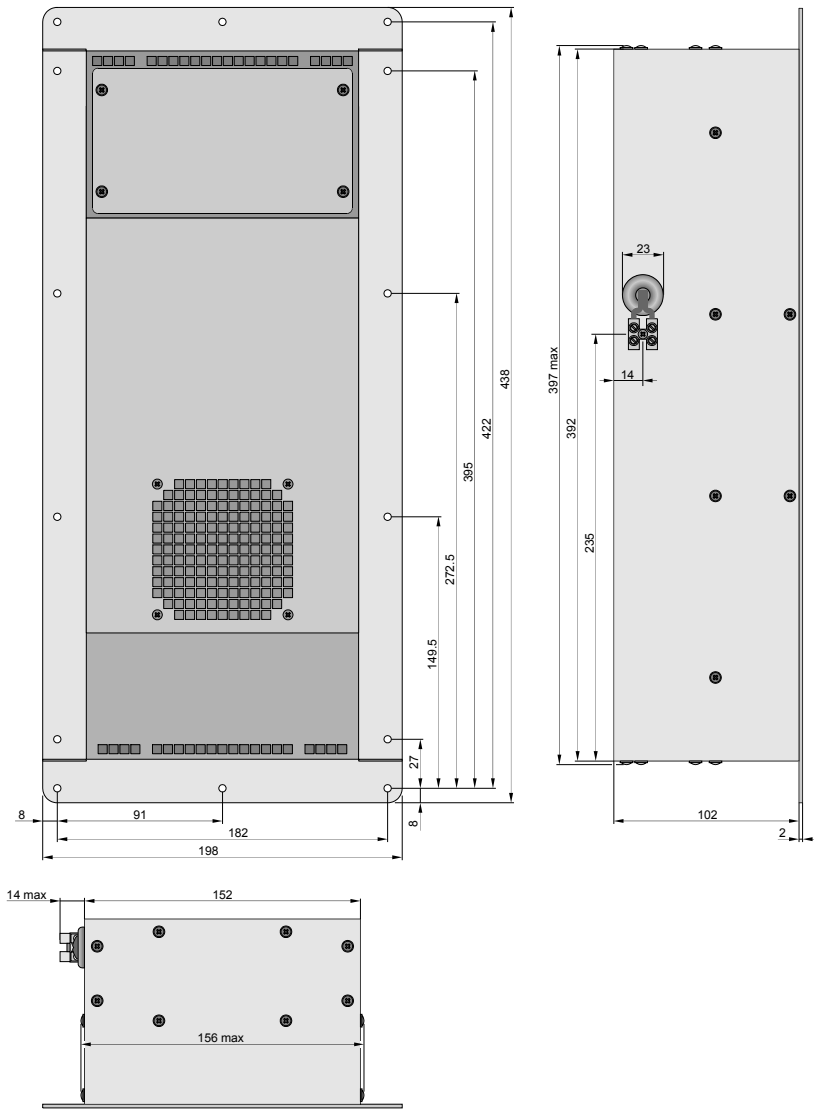
** The subwoofer and satellites channels range are determined by the DSP settings.

*** In the operating frequency range of the corresponding channels.

**** Basic setting. Can be changed by DSP.

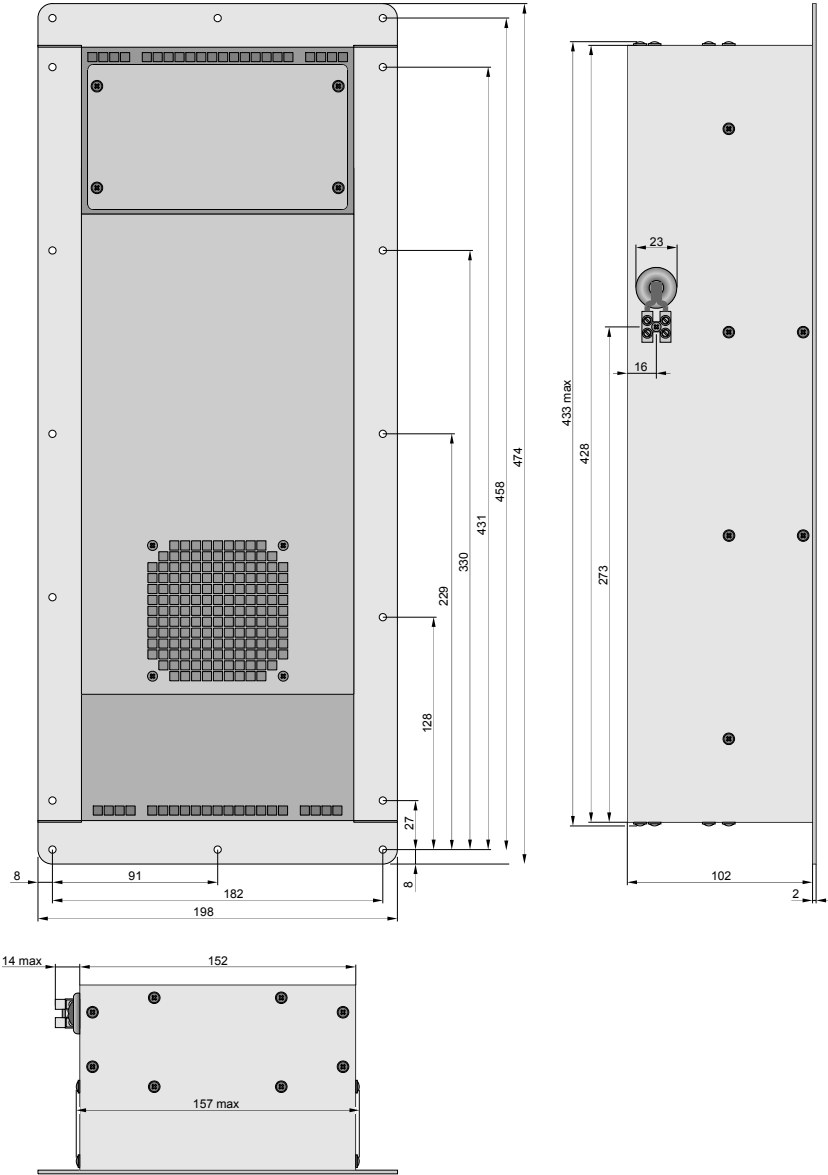
DIMENSIONS

DX1000T DSP, DX1400T DSP



DIMENSIONS

DX2100T DSP





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