PX314

AC+ Dimmer 24 x 3600W

MANUAL



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Manufacturer reserves the right to make modifications in order to improve device operation.

fax: 12 626 46 94

Rev. 1.0 e-mail: info@pxm.pl 30-701 Kraków Internet: www.pxm.pl

1. GENERAL DESCRIPTION

PX314 AC+ Dimmer 24x 3600 W can be powered by three phases, and has an integrated system fully protecting against the effects of reverse phases connection.

The device allows you to control 24 independent channels with a power of 3.6 kW each. The dimmer enables you to control input signals from 6 different sources simultaneously, including:

- 2 DMX-512 lines,
- 3 Art-Net lines.
- 24 analogue inputs (option available to order).

The device has an integrated merger system with a possibility to select one of 13 priorities. The advanced electronics allows you to address each output channel in any way, to select and edit the driving characteristics (5 factory characteristics, 5 user's characteristics), and to set limits for voltage and output current for each channel individually.

The device is equipped with the bulb heating system (10 levels) and control of the attached fuse and broken circuit / burnt bulb. In addition, the user can define the dimmer response to the lack of the driving signal. In addition to the basic options (ON, OFF, HOLD, SLOW TURN OFF), 64 stages and the program are available to be defined.

The integrated "PLL", "soft-start", "soft-on" and "even-off" systems assure reliable operation in the most extreme conditions.

Direct detection of zero of the network and optical insulation of DMX input guarantee high resistance to interference.

The device is equipped with an electronic measurement of current on each channel, current of the entire dimmer, voltage at individual phases of the power, voltage frequency, and temperature (separately for 2 groups of 12 channels). The dimmer is protected against reverse connection of phases, has thermal protection and temperature control fans inside. Each group (12 circuits) has a circuit breaker.

Each circuit has a16 A fuse breaker (characteristic C), circuit and overload protection. On request, each output circuit can be equipped with a fuse-breaker.

The dimmer is equipped with a touch screen, 4 keys and a knob with which you can define all the parameters of the device. In addition, there is available an application to Windows, OSX and Linux, which allows you to set all the parameters and monitor the status of multiple PX314 devices connected to one network.

The device is produced in the housing for wall mounting.

2. SAFETY CONDITIONS

PX314 dimmer is a device powered directly from the 230 V mains. Failure to observe safety instructions may result in electric shock and pose a threat to life. Therefore, you should strictly adhere to the rules outlined below:

- 1. Installation of the device, and in particular, connection of power, should be made by a suitably qualified person, as described in the manual.
- 2. The device can be connected only to 3- or 5-wire installation (with a separate protective conductor).
- 3. Protect all cables against mechanical and thermal damage.

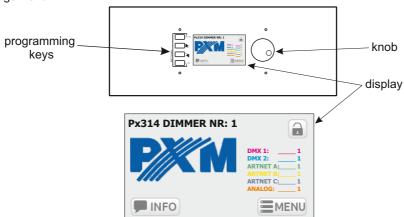
- 4. In case of failure of any of the cables, it must be replaced with a cable of the same technical parameters.
- 5. Use only 3-wire cables of not less than 2.5 mm² for connecting devices to the dimmer.
- 6. Each receiver should be powered by a separate cable.
- 7. After installation, test the effectiveness of resetting all the equipment controlled.
- All repairs that require the housing to be removed can only be carried out with power disconnected.
- 9. The dimmer must be strictly protected against contact with water or other liquids.
- 10. Avoid sudden shocks, particularly dropping.
- 11. Do not connect dimmer with damaged (dented) housing to the power supply.
- 12. Do not operate the device in rooms with humidity above 90%.
- 13. The device must not be used in rooms with a temperature below +2 °C or above +40 °C.
- 14. Clean only with a damp cloth the dimmer must be at this time completely disconnected from the power supply.

NOTE!!!

- Improper connection of the protective conductor (of yellow and green colour) creates the risk of electric shock.
- 2. Improper connection of the neutral wire (of blue colour) will automatically turn off the dimmer and start the buzzer.
- 3. It is also acceptable to power the dimmer with one or two phases.

3. FRONT PANEL / INTERFACE

The device is equipped with a colour touch display with a resolution of 480x272 px. During operation, it displays basic information and possible warnings and errors. The displays also allows you to set the parameters of the dimmer. You may be asked to give a password to enter the settings menu.



KNOB

It is used to quickly change the numerical values in the text boxes and switch between successive elements on the screen. Pressing the knob is equal to pressing the ENTER key.

KEYS

The four keys on the left side of the screen help navigate the menus.

- ENTER it activates the selected item. If the selected item is a key it presses this key, if a list
 – it expands this list, if a text box it starts to edit it.
- NEXT, PREV they are used to switch between successive items on the screen and select values from the list and numeric fields.
- ESC it allows you to cancel the changes.

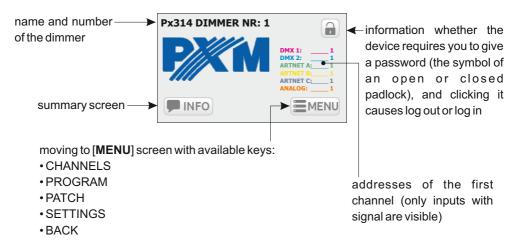
INTERFACE

During the preview of information and setting parameters on the screen, there are 3 types of interactive elements: keys, text boxes and selection lists. Items can be selected directly on the touch screen or by using the arrow keys. NEXT/PREV keys (or knob) are used to select the next/previous item on the screen (item envelope becomes orange), the ENTER key is used to activate the currently selected item (item envelope and background become orange). Activation of the key causes it to be pressed, activation of the text box allows you to enter a new value, activation of the selection list causes it to expand and display available options. When using the touch screen, numeric values in the text boxes are added using the onscreen keyboard, NEXT and PREV keys or the knob.



4. OPERATION

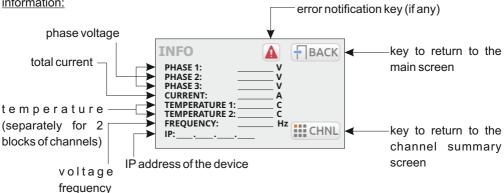
After starting the device, the display shows the start screen, including:



Start screen is visible to every user, without a password.

4.1 Summary screen

Pressing the [INFO] key takes you to the summary screen. This screen includes the following information:



Error notification key is displayed on the screen when one of <u>the following errors is detected in the dimmer:</u>

- DRIVER HIGH TEMPERATURE warning about exceeding the maximum temperature set in the FAN menu:
- PHASE LOSS error, no voltage on the phase (contact the service);
- PHASE ERROR 1 error, internal error (contact the service);
- MODULE NOT RESPONDING error, no communication with the unit (contact the service);
- DRIVER TERMISTOR MISSING error, thermistor damage (contact the service);
- DRIVER TERMISTOR SHORTED error, thermistor is shorted (contact the service);
- CHNL OUTPUT SHORTED error, channel is shorted (contact the service):
- CHNL FUSE MISSING warning, fuse is not enabled or one supply phase is missing
- CHNL OVERLOAD warning, channel overcurrent;
- CHNLTRIAC SHORTED error, triac is shorted (contact the service);
- CHNL OPEN CIRCUIT warning, open circuit or burnt bulb.

The messages are divided into errors and warnings – errors are shown in red and a warnings in orange.

NOTE: In the case of closing the output circuit, the dimmer automatically disconnects the circuit. In this case, disconnect device from the power supply and check the cause of short circuit.

4.2 Channel summary screen

The channel summary screen [CHANNELS INFO] shows keys corresponding to 25 output channels.

Each key shows:

channel number

current value on the channel

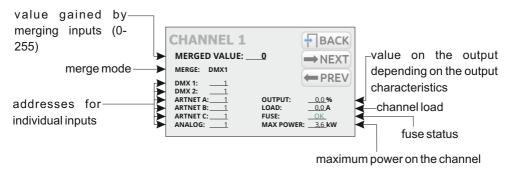
The colours of captions depend on the source of value on the channel:

- violet DMX 1
- blue DMX 2
- Dide DIVIA 2
- green Art.-Net 1

- orange Art.-Net 3
- brown analog input
- black no signal

• yellow - Art.-Net 2

Pressing one of the channel keys takes you to the corresponding channel summary screen. <u>This screen displays the following information:</u>



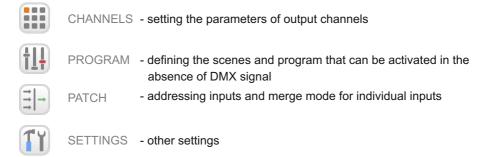
On this screen, there are also available the **[NEXT]** and **[PREV]** keys used to quickly navigate to the next/previous channel and the **[BACK]** key used to return to the list of channels.

If the dimmer is connected to the application on a PC – all the information is also available on an ongoing basis in the program.

5. PROGRAMMING

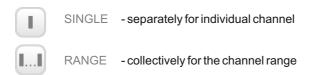
5.1 Menu

Pressing the [**MENU**] key on the main screen of the dimmer, <u>takes you to the screen with available keys:</u>

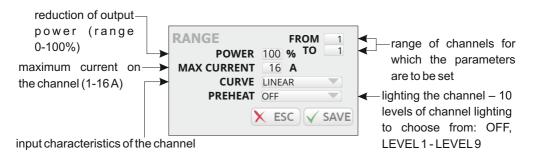


5.2 Setting the channel parameters

After selecting [CHANNELS PARAMETERS], you can set the parameters:



If you select [RANGE], the following fields will be available on the screen:



The user can select the following curves:

LINEAR — the value on the output is directly proportional to the input value,

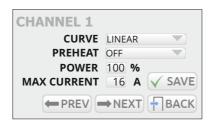
EXPONENTIAL – exponential characteristics, **LOGARITHMIC** – logarithmic characteristics, **ON/OFF** – two-level characteristics,

REVERSED — the value on the output is inversely proportional to the input value,

USER 1-5 – 5 curves to be defined by the user.

Pressing the [ESC] key exits the screen without saving your changes, press the [SAVE] key to exit the screen and save your settings for all channels in a given range.

If you select the **[SINGLE]** option, the screen will display the keys for all output channels. Pressing one of the channel keys takes you to <u>the corresponding channel parameter screen</u>:



[NEXT] and [PREV] keys allow you to quickly switch between successive channels. To save your parameters, press [SAVE] before switching to another channel.

5.3 Program

In the [PROGRAMMING] menu, you can program 128 scenes and a program that can be activated in the absence of DMX signal. Scene is a static adjustment of the value at the output channels. Program is a set of successive scenes.

The screen shows the following keys:



COPY – copying set values between the scenes

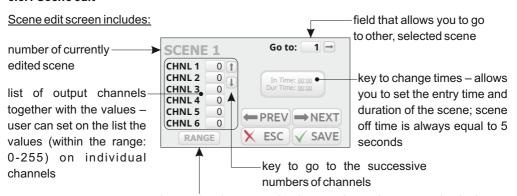
CAPTURE - capturing the current scene output status SCENE

EDIT — defining the order of scenes in the program PROGRAM

PLAY – scene or program preview

 $\ensuremath{\mathsf{NO}}$ SIGNAL – defining the dimmer operation in the absence of DMX signal

5.3.1 Scene edit



key makes it easy to simultaneously set the same value in the selected range of channels

When you select **[EDIT SCENE**], the application displays the screen for editing scene 1; in addition, scene 1 occurs on the outputs.

[NEXT] and [PREV] keys – allow you to switch between the scenes. Transitions are made in a linear way.

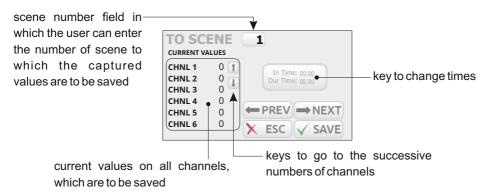
5.3.2 Scene copying

Scene copying screen contains 2 fields: [FROM] and [TO] which allow you to specify the source scene and the target scene between which the values are to be copied.

5.3.3 Scene capture

Scene capture option allows you to save current values on the output channels to the selected scene.

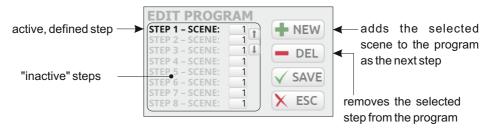
Scene capture screen includes:



[NEXT] / [PREV] keys – allow you to switch between the scenes.

5.3.4 Program edit

The program edit screen shows a list of 64 steps and scenes corresponding to these steps.



5.3.5 Playback

The playback screen [**PLAY**] allows you to preview the created scenes and program. On the screen, there are keys to play ightharpoonup and stop ightharpoonup the program and the field to select a scene, as well as play and stop keys for the selected scene. The [**BACK**] key which exits the screen.

5.3.6 No signal

By using the [NO DMX SIGNAL] screen, you can program the operation of the device in the absence of DMX signal.

Available options:

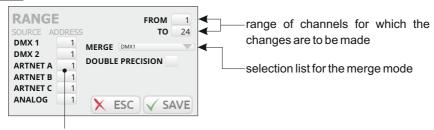
- ON all channels will be enabled at 100%;
- OFF all channels will be disabled:
- SLOW TURN OFF there will be a slow blanking of all channels;
- HOLD the last value present before the signal loss will be saved on the channels;
- SCENE the selected scene will be displayed;
- PROGRAM the program will be played.

5.4 Patch

The [PATCH] menu allows you to set the merge mode for inputs and DMX address on the various inputs, as well as to determine whether the channel is controlled with double-precision (using two DMX channels).

Settings can be changed separately for the selected channels [SINGLE] or in groups for a fixed range of channels [RANGE].

Selecting [RANGE] takes you to the screen for group settings. This screen includes the following fields:



starting address for each type of source (channels are addressed sequentially)

Available values of the merge mode:

- HIGH the highest of values;
- · LAST last value;
- DMX1 value from the DMX 1 input;
- DMX2 value from the DMX 2 input;
- UNIVERSE 1 value from the Art-Net 1 input;
- UNIVERSE 2 value from the Art-Net 2 input:
- UNIVERSE 3 value from the Art-Net 3 input;
- is DMX1/DMX2 value from the DMX 1 input, if there is a signal on it, if not DMX 2 input;
- is DMX1/DMX2 CAPTURE if DMX 1 and DMX 2 are enabled, value from the DMX 1 input is selected. If you disable DMX 1, value from the DMX 2 is selected only when it reaches the DMX 1 input value. This mode prevents abrupt changes in values.

- is DMX2/DMX1 value from the DMX 2 input, if there is a signal on it, if not DMX 1 input;
- is DMX2/DMX1 CAPTURE if DMX 1 and DMX 2 are enabled, value from the DMX 2 input is selected. If you disable DMX 2, value from the DMX 1 is selected only when it reaches the DMX 2 input value.
- is DMX1/UNVRS 1 value from the DMX 1 input, if there is a signal on it, if not UNIVERS 1 input;
- is DMX1/UNVRS 1 CAPT. if DMX 1 and UNIVERS 1 are enabled, value from the DMX 1 input is selected. If you disable DMX 1, value from the UNIVERS 1 is selected only when it reaches the DMX 1 input value.
- is UNVRS 1/DMX1 value from the UNIVERS 1 input, if there is a signal on it, if not DMX 1 input;
- is UNVRS 1/DMX1 CAPT.— if DMX 1 and UNIVERS 1 are enabled, value from the UNIVERS 1
 input is selected. If you disable UNIVERS 1, value from the DMX 1 is selected only when
 it reaches the UNIVERS 1 input value.
- ALWAYS ON channel is always enabled.

Selecting [SINGLE] allows you to set the same options for individual channels.

5.5 Settings

The [SETTINGS] menu includes the following categories:



CURVES - management of characteristics curves



ADMIN – administrator settings



ARTNET - Art-Net settings



FAN - fan settings



LCD – display settings



LAN - network settings

5.5.1 Curves

10 curves are available in the device: 5 preset and 5 user-definable. Preset curves can be previewed and copied. User's curves can be edited.

The [CURVES] screen includes 10 keys for all the curves:

- · LINEAR.
- · REVERSED,
- · SWITCHED.
- · LOGARITHMIC.
- EXPONENTIAL,
- USER 1 USER 5.

Clicking on one of the keys takes you to the preview of the curve.

For pre-set curves, [COPY] and [BACK] keys are displayed next to the preview.

For user's curves, [EDIT] and [BACK] keys are available.

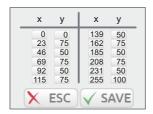
Pressing the **[COPY]** key displays the copy window, where you can determine to which user's curve, and to what extent, the selected curve will be copied.

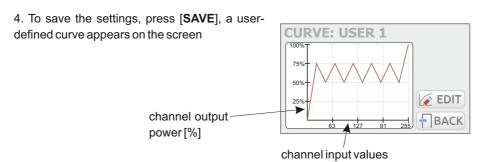
Pressing the **[EDIT]** key displays windows with 12 points for which you can enter values. The curve will be drawn between the designated points. The curve can be created from 2-12 points.

NOTE: The first point of the defined curve must always have the x coordinate equal to 0.

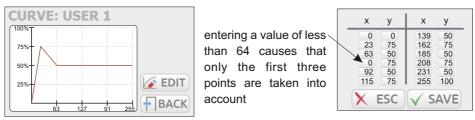
Sample configuration of the user's curve:

- 1. From the [CURVES] menu, select the user's curve key, for example, [USER 1]
- 2. Press [EDIT], the application displays a table of 12 coordinates of the points between which the new curve is drawn
- 3. Complete the table



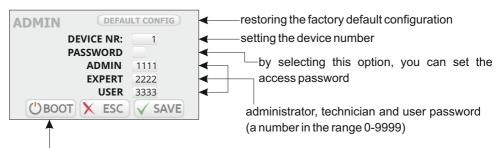


Only the points for which the values on the x-axis are given incrementally are taken into account, e.g.:



5.5.2 Admin

Category [ADMIN] contains the administrator settings:



device reset, the device stops in the bootloader and it is possible to upload new software To go to the program, click on any key.

NOTE: If an incorrect administrator password is entered ten times (in each case, the message "**NO ACCESS RIGHTS TO**" is displayed), the device will be blocked and you will need to contact customer service.

Switching between user accounts:

- 1. Click the button (located on the start screen of the panel, it will cause the user logout
- 2. Click again in the padlock key to display the login screen
- 3. Select the account that you want to log on and enter your password
- 4. Confirm

The device has 3 users whose access levels are shown in the table below:

	No logging	User	Technician	Administrator
Start screen	✓	✓	✓	✓
Summary screen	X	✓	✓	✓
Channel preview screen	X	✓	✓	✓
Scene /	X	Х	✓	✓
Program running				
Channel setting	X	X	✓	✓
Program / Scene edit	X	Х	✓	✓
Channel patch	Х	Х	✓	✓
Curve, fan,	Х	Х	✓	✓
display setting				
Ethernet,	Х	Х	Χ	✓
Art-Net settings				
User and password management	Х	Х	Х	✓

5.5.3 Art-Net

In the [ARTNET] menu, there are address settings [SUBNET] and [PORT] which allow you to select Univers for each of the three Art-Net input ports.

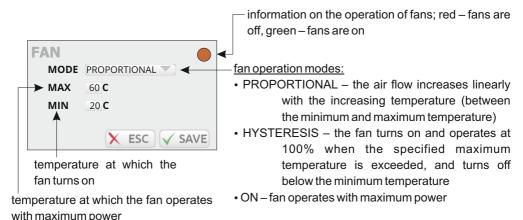
5.5.4 Fan

Thermal protection of the dimmer

The device is equipped with a built-in automatic power reduction system.

Dimmer monitors the temperature of channel groups; if the temperature of 65 $^{\circ}$ C is exceeded, the output power is automatically reduced. This reduction is linear over the range 65-80 $^{\circ}$ C, i.e., if the temperature of 80 $^{\circ}$ C is exceeded, the device will disable the channels.

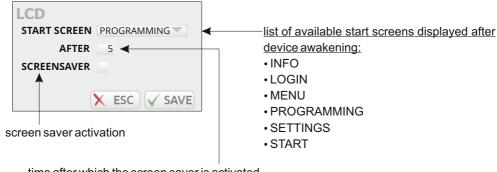
The following settings are available in the fan menu:



NOTE: The device has a safety feature that turns the fan on also when the load current of any output exceeds 5 A, or the total current exceeds 20 A.

5.5.5 LCD

The display menu includes the screen saver settings. You can determine whether the screen saver is to be run, and if so, after what idle time and which of the screens is to be displayed after the "awakening".



time after which the screen saver is activated (1-100 minutes)

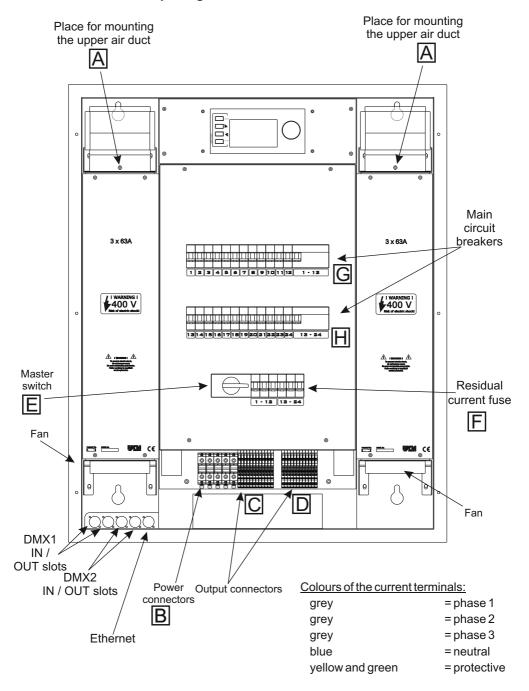
5.5.6 LAN

In the [LAN] menu, local network settings are available:

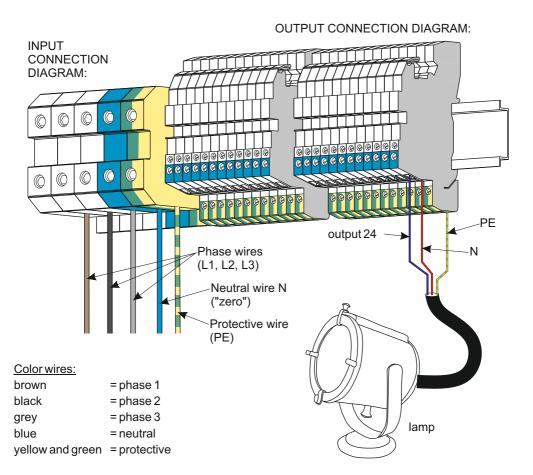
- IP
- MASK
- GATEWAY

6. INSTALLATION AND CONNECTION OF THE DIMMER

6.1 Dimmer view after opening the door



6.2 Connection scheme



The smallest cross section of an individual input cable is 25 mm².

The smallest cross section of an individual output cable is 3x2.5 mm².

6.3 Installation steps

All electrical connections must be performed only by adequately qualified personnel!!!

- 1. Install anchor bolts in the wall according to the dimensions given on page 20. The size and type of anchor bolts depend on the "quality" of the wall. They must be chosen taking into account the weight of the dimmer, so that they would provide a safe and permanent fixing thereof. Do not use anchor bolts with a diameter of less than 12 mm.
- 2. Remove the screws in the places marked with the letter "A" in the figure on page 17.
- 3. Pull out two upper ventilation ducts.
- 4. Attach the dimmer to the wall.
- 5. Insert the ventilation ducts.
- 6. Tighten screws securing the ducts "A".
- 7. Connect the power supply to the power connectors "B".

NOTE:

Pay special attention to the correct connection of the protective conductor.

8. Connect the receiver to the input connectors.

NOTE:

Phase and zero conductors of one receiver MUST be connected to the same group of terminals (marked with letters "C" or "D" in the figure on page 17). Do not connect the phase conductor of one receiver to the group "C", and zero conductor to the group "D" and vice versa..

- 9. Switch off all fuses and circuit breakers.
- 10. Turn on the external power switch.
- 11. Turn on the master switch "E", and the main circuit breakers "F". The control panel should turn on.

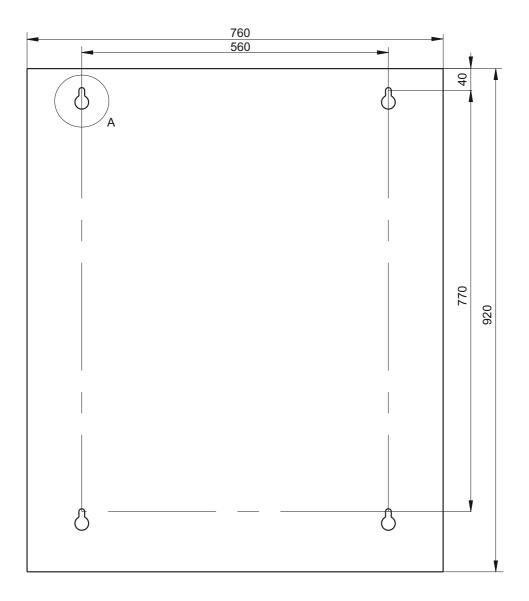
NOTE:

If the control panel does not turn on and an acoustic alarm is started, immediately turn off the power supply and check if the power cables are properly connected. An acoustic alarm informs about improper connection of phases.

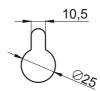
Turn on the two circuit breakers "G" and "H".

- 12. You can turn on the fuses for the output channels and check the operation of the dimmer.
- 13. Connect DMX cables.
- 14. Program the dimmer in accordance with the description in this manual.

6.4 External dimensions and arrangement of mounting holes

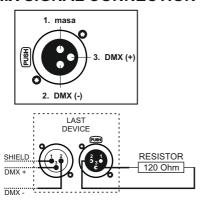


DETAIL A:



dimensions are given in millimetres

7. DMX SIGNAL CONNECTION



- The recommended cable for the connection is RS485 (two wires in a shield).
- Devices must always be connected in series.
- 3. To split the DMX line, use the DMX SPLITTER (PX094).
- In the case of a larger number of devices or long distances use the DMX REPEATER (PX097). It is a DMX signal amplifier.
- 5. It is necessary to install a terminator, i.e. 120 Ohm resistor, in the last device.

8. TECHNICAL DATA

- DMX lines: 2
- Art-Net Univers: 3
- optically insulated DMX line: y

optically insulated DMX line:
circuit break detection:
overvoltage protection:

- output carrying capacity: 24 x 3600 W continuous resistive load 24 x 2400 VA continuous inductive load (conventional and neon transformers)

- output protection: full electronic protection + automatic 16 A fuses

- built-in master switch ves

- fans: electronic control
- input slots: 35 mm² terminals
- output slots: 4 mm² terminals
- power supply: 3 x 230 V / 40 - 70 Hz

- power supply: 3 x 230 V / 40 - 70 Hz - current consumption: 3 x 128 A (at full load)

- weight: 70 kg

- dimensions: Width: 760 mm

Height: 920 mm Depth: 172 mm



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ul. Przemvsłowa 12 30-701 Kraków

tel: 12 626 46 92 fax: 12 626 46 94 e-mail: info@pxm.pl http://www.pxm.pl

DECLARATION OF CONFORMITY according to guide lines 2004/108/WE and 2006/95/WE

PXM Marek Żupnik sp. k. Name of producer:

Manufacturer's address: ul. Przemysłowa 12

30-701 Kraków

We declare that our product:

AC+ Dimmer 24 x 3600 W Product name:

Product code: PX314

complies with the following standards:

PN-EN 60065:2004 LVD:

PN-EN 61000-4-2:2011 EMC:

> PN-EN 61000-6-1:2008 PN-EN 61000-6-3:2008

Additional information:

1. PE terminal of the dimmer must be connected to a working protection system equipped with a differential switch.

2. The dimmer may only be installed in closed electrical switching stations.



Kraków. 07.09.2015

NIP 677-002-54-53

mar inż. Marek Żupnik.