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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Plasma display panels –
Part 1: Terminology and letter symbols

Panneaux d'affichage à plasma –
Partie 1: Terminologie et symboles littéraux

IEC 61988-1:2011

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FOREWORD

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International Standard IEC 61988-1 has been prepared by IEC technical committee 110: Flat panel display devices.

This second edition cancels and replaces the first edition published in 2003, and constitutes a technical revision. The main technical changes with regard to the previous edition are as follows:

– Additional terms were added in Clause 3.

The text of this standard is based on the following documents:

CDV	Report on voting
110/236/CDV	110/286/RVC

Full information on the voting for the approval on this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61988 series, under the general title *Plasma display panels*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

PLASMA DISPLAY PANELS –

Part 1: Terminology and letter symbols

1 Scope

This part of IEC 61988 gives the preferred terms, their definitions and symbols for colour AC plasma display panels (AC PDP); with the object of using the same terminology when publications are prepared in different countries. Guidance on the technology is provided in the annexes.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61988-2-1:–, *Plasma display panels – Part 2-1: Measuring methods – Optical and optoelectrical*[1]

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
AC PDP

NOTE See AC plasma display panel.

3.2
AC plasma display panel
AC PDP
plasma display panel in which the gas discharge region is insulated from the electrodes that are driven with AC voltage pulses

3.3
address bias
Vba
data bias
common voltage applied to all address electrodes during addressing

3.4
address cycle period
time interval between initiation of the closest spaced successive address pulses

3.5
address discharge
discharge that changes the state of a PDP subpixel

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1 Second edition, to be published.

3.6
address electrode
data electrode
electrode, orthogonal to the scan electrode, that is used in driving the subpixels with the image data

3.7
address period
time interval including the reset step and the address step

3.8
address pulse
data pulse
incremental voltage pulse applied to a single address (data) electrode for addressing, to select a subpixel according to an image to be displayed

NOTE See scan pulse.

3.9
address step
time interval needed to address all pixels in the panel in a given subfield as applied to the ADS method

3.10
address voltage
Va
data voltage
amplitude of the voltage pulses applied to the address (data) electrode during addressing (excludes the address bias on the electrode)

3.11
address while display method
AWD method
grey scale drive technique that addresses only a portion of the pixels of the panel in any time within a sustain period

NOTE See also ADS.

3.12
addressability
number of pixels in the horizontal and vertical directions, that can have their luminance changed

NOTE Usually expressed as the number of horizontal pixels by the number of vertical pixels. This term is not synonymous with resolution. See resolution.

3.13
addressing
setting or changing the state of a subpixel with an address pulse

3.14
ADS method
address, display-period separation method
grey scale drive technique that consists of addressing all the pixels in the panel in one time period and sustaining all the pixels in the panel in a separate time period

3.15
ageing
manufacturing process consisting of operating the panel under conditions that stabilize its performance

3.16
annealing
process of heating the glass above its annealing point and cooling at a controlled rate to minimize dimensional changes during subsequent high temperature cycles

3.17
anode
positively charged surface of a device that collects electrons from the discharge

NOTE In an AC PDP, the cathode and anode exchange their roles on alternate half-cycles.

3.18
APL
average picture level
time average of a video signal during the active scanning time integrated over a frame period, which is expressed as a percentage of the full white signal level while designating 0 % as the black signal level

NOTE There are two types of APL. See pre-gamma APL and post-gamma APL.

3.19
aspect ratio
ratio of screen width to screen height

3.20
auto power control
APC
circuit means to control the peak and/or average power of the display

3.21
auxiliary anode
anode in a DC PDP whose discharge contributes to supply priming particles to ignite a discharge in a cell

3.22
back plate
rear plate
plate furthest from the viewer

3.23
back-filling

NOTE See filling.

3.24
bake

NOTE See bakeout and baking.

3.25
bakeout
high temperature processing of a vacuum system and/or PDP to assist in achieving low pressures

3.26
baking
high temperature process used to evaporate water and decompose organic materials

NOTE Baking is used to clean the parts by dispersing unwanted material into the atmosphere.

3.27
barrier rib
rib that separates the cells of the panel, electrically, optically and physically

NOTE The barrier ribs may extend from the front plate to the back plate and control the spacing between the plates.

3.28
binder burnout
process during which organic binders are remove by decomposition and/or oxidation

3.29
black level luminance
luminance of the panel in its minimum luminance state in a dark ambient

NOTE See 6.3.3.3 of IEC 61988-2-1:– (Ed. 2).

3.30
black matrix
black material placed in the space between subpixel areas in order to improve contrast by reducing reflectivity

3.31
black stripe
black material placed in the space between subpixel areas in order to improve contrast by reducing reflectivity, having the form of stripes

NOTE Black stripe is a specific type of black matrix contrast enhancement.

3.32
black uniformity, sampled
uniformity of the black level luminance expressed in terms of the percentage non-uniformity (difference in luminance between measuring points divided by the average black level luminance) at the specified measuring points

3.33
***BRCR*-#/#**

NOTE See bright room contrast ratio #/#.

3.34
breakdown voltage
smallest voltage between the cathode and the anode causing a gas discharge to grow to a breakdown condition

3.35
bright defect
defect in the image reproduction that appears brighter than the correct image

3.36
bright room contrast ratio #/#
***BRCR*-#/#**
contrast ratio with ambient illumination on the screen other than the nominal 100/70 levels

NOTE The symbol #/# describes the ambient illumination on the vertical plane/horizontal plane (see 6.4 of IEC 61988-2-1:– (Ed. 2)).

3.37
bright room contrast ratio 100/70
***BRCR*-100/70**
contrast ratio with an ambient illumination on the screen of 100 lx on the vertical plane and 70 lx on the horizontal plane

NOTE See 6.4 of IEC 61988-2-1:– (Ed. 2).

3.38
brightness
visual and subjective quality of how bright an object appears, or how much visible light is coming off the object being perceived by the eye

NOTE See luminance.

3.39
bulk erase

NOTE See full-screen erase.

3.40
bulk write

NOTE See full-screen write.

3.41
burn-in
process of increasing the reliability performance of hardware employing functional operation of every item in a prescribed environment with successive corrective maintenance at every failure during the early failure period

3.42
bus electrode
high conductivity electrode intimately connected along its length to the transparent electrode in order to reduce total resistance

3.43
cathode
negatively charged surface of a device that emits secondary electrons to the discharge

NOTE In an AC PDP, the cathode and anode exchange their roles on alternate half-cycles.

3.44
cell
physical structure of a subpixel or a subpixel itself (adjective – referring to the characteristics of a single cell)

3.45
cell defect
cell showing a dark defect or a bright defect, or an unstable cell

3.46
cell pitch
subpixel pitch

3.47
cell voltage
Vc
time-dependent voltage across the gas in a plasma display cell

3.48
centre firing voltage
average of the first-on voltage and the last-on voltage

3.49
centre minimum sustain voltage
average of the first-off voltage and the last-off voltage

3.50
chromatic uniformity
uniformity of the chromaticity produced by different areas of the screen

3.51
closed rib
rib structure which has walls on all sides of the cell

NOTE Examples are box type, mesh type, waffle type, hexagonal type, honeycomb type, etc. It is permissible to have different rib heights on each side.

3.52
column electrode
address electrode

NOTE The column electrode was historically continuous in the vertical direction. When the panel is oriented in portrait orientation, the column electrode can be aligned horizontally. See row electrode.

3.53
contrast ratio
ratio of white luminance to black luminance of the image, including light reflected from the display

NOTE This ratio is strongly dependent on the ambient light and two forms are reported, bright room contrast ratio (BRCR) and dark room contrast ratio (DRCR). See 6.3 and 6.4 of IEC 61988-2-1:–, Ed. 2.

3.54
contrast ratio, sampled
CR
ratio of a white luminance to a black luminance at the specified measuring points

NOTE See 6.3 and 6.4 of IEC 61988-2-1:– (Ed. 2).

3.55
coplanar PDP

NOTE See surface discharge PDP.

3.56
crosstalk
phenomenon initiated by a discharge in one cell that causes an unwanted discharge in a neighbouring cell

3.57
dark defect
defect in the image reproduction that appears less bright than the correct image

3.58
dark room contrast ratio
DRCR
contrast ratio measured in a dark room ambient, typically less than 1 lx

NOTE See 6.3 of IEC 61988-2-1:– (Ed. 2).

3.59
data bias

NOTE See address bias.

3.60
data electrode

NOTE See address electrode.

3.61
data pulse

NOTE See address pulse.

3.62
data voltage

NOTE See address voltage.

3.63
DC PDP

NOTE See DC plasma display panel.

3.64
DC plasma display panel
DC PDP
plasma display panel in which the conductive electrodes are directly in contact with the gas discharge

3.65
dielectric layer
layer or layers of non-conductive material that cover the electrodes, on which charges are accumulated from the discharge

NOTE The accumulated charge allows the memory function in AC PDPs.

3.66
dielectric voltage
Vd
voltage across a dielectric layer due to the wall charge that usually varies with time

$$Vd = Qw/Cd$$

where Qw is the wall charge and Cd is the effective dielectric layer capacitance

NOTE Charges other than wall charges may also appear on the dielectric surfaces, so that the total voltage across a dielectric can be greater than its dielectric voltage.

3.67
diffuse reflection
diffusion by reflection in which, on the macroscopic scale, there is no regular reflection

3.68
direct laminated filter
front optical filter attached directly to the front of the panel

3.69
discharge current
component of current of a gas discharge resulting from the flow of electrons and ions in the gas

3.70
discharge delay time
formative delay plus statistical delay

NOTE When applying the addressing waveform, the peak of the discharge in an AC PDP generally occurs after the statistical delay plus the formative delay.

3.71
displacement current
current flowing through the capacitance of a plasma display panel resulting from the changing voltage applied to the electrodes

NOTE Does not include the discharge current.

3.72
display anode
anode electrode of a DC PDP that is driven with positive DC voltage for the display discharge

3.73
display diagonal
screen diagonal
diagonal dimension of the addressable screen area

3.74
display electrode
scan and/or sustain electrodes in a three-electrode type PDP that provide the principal power for the plasma discharge

3.75
display period
time interval of a subfield other than the address period where all of the sustain pulses in a given subfield are applied to the panel

NOTE This term is only used for the ADS method.

3.76
driving waveform
time-dependent voltage of a driving signal

3.77
drying process
manufacturing process that removes water and other volatile materials from the PDP sub-assemblies

NOTE This often involves heating in an oven.

3.78
dynamic false contour
phenomenon wherein moving images create false contours

3.79
dynamic margin
margin that remains when addressing is active

NOTE This term can be applied to various margins such as sustain margin or write margin, etc.

3.80
dynamic sustain range
sustain voltage range that allows proper addressing of all pixels over the entire range of write voltage

3.81
efficacy

NOTE See luminous efficacy.

3.82
energy recovery circuit
circuitry that recaptures the reactive power of the plasma display panel capacitance by means of an inductance

3.83
erase
operation that generates a discharge, generally between the address and scan electrodes, to set subpixels to an off state

3.84
erase margin
ΔVer
erase voltage range that allows proper addressing of all pixels at the specified operating conditions

3.85
erase pulse
voltage waveform applied to an electrode pair to selectively change the state of a subpixel from on to off

3.86
erase voltage
Ver
voltage of the erase waveform applied between the electrode pair that receives the erase pulse

3.87
erase waveform
time-dependent voltage signal applied to an electrode pair to selectively change the state of a subpixel from on to off

NOTE The erase wave form includes the address bias, the scan bias, the address pulse and the scan pulse.

3.88
evacuating
manufacturing process of removing the atmospheric gases by a vacuum process

3.89
exhaust tube
exhaust tubulation
exhaust pipe
tubular port in the device envelope that is connected to an external vacuum pump to evacuate the air from the device during processing

NOTE This is typically a glass tube that can be closed after filling with the appropriate gas by melting.

3.90
exoemission
delayed spontaneous emission of electrons from the cathode due to earlier excitation by the gas discharge particles such as electrons, ions and ultraviolet photons

NOTE Exoemission from the cathode surface such as MgO typically decays slowly after the excitation event and can continue at low current levels for times as long as seconds, minutes or even hours. The exoemission current also usually depends on the temperature of the cathode and the amount of initial gas discharge excitation.