

TEST REPORT

Ecodesign requirements and energy labelling requirements for electronic displays

Report Reference No.: SHEE220900024551

Tested by (name + signature).....: Leo Wang *Leo Wang*

Approved by (+ signature): Sura Jiang *Sura Jiang*

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Testing Laboratory.....: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Address: 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China.

Applicant's name: ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD.

Address: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Test specification:

Test procedure.....: COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341

COMMISSION DELEGATED REGULATION (EU) 2019/2013 + (EU) 2021/340

Test method.....: Transitional testing method set out in point 3, 4 of Annex V of COMMISSION REGULATION (EU) 2021/341

EN IEC 62087-7: 2019 used in conjunction with EN 62087-1:2016


EN 50564:2011; EN 50563:2018+A1:2020

Non-standard test method.....: None



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Test item description	LED Monitor
Type of electronic displays	<input type="checkbox"/> Televisions; <input checked="" type="checkbox"/> Monitors; <input type="checkbox"/> Signage displays; <input type="checkbox"/> other
Trademark	
Model/Type reference	DHI-LM22-B200S, DH-LM22-B200S, LM22-B200S, ***-LM22-****, LM22-**** ("*"=A-Z, a-z, 0-9 or blank)
Ratings	Monitor: 12 V d. c., 2,0A, Class III Adaptor: 100-240V a.c.,50/60Hz,0,6A, Class II
Supplier's name and address	N/A
Manufacturer's name and address	Same as applicant
Factory's name and address	1. ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD. No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China 2. ZHEJIANG DAHUA ZHILIAN CO., LTD. No.28, Dongqiao Road, Dongzhou Street, Fuyang District, Hangzhou, P.R.China.
Test item particulars	
Classification of installation and use	<input checked="" type="checkbox"/> Desk-top; <input type="checkbox"/> Wall mounted;
Supply Connection	EU plug
Networked electronic displays	No
Availability of HiNA functionality.....	No
Availability of easily visible switch	Yes
Availability of off mode	Yes
Availability of standby mode	Yes
Availability of display function in standby mode	No
Availability of networked standby mode:	No
Availability of another condition which does not exceed the applicable power demand requirements respectively for standby or networked standby mode: ..	No
Availability of automatic power-down ...	Yes
Availability of forced menu	N/A



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Product information :	
Visible screen area (dm ²) (declared).... :	12,4 dm ²
Screen diagonal (cm) (declared)..... :	54,5 cm
Screen diagonal (inches) (declared) :	22 inches
Nominal aspect ratio	16:9
Resolution (H X V, pixels) (declared) ... :	1920 x 1080
Image refresh frequency rate (default) . :	60 Hz(VGA), 75 Hz(HDMI)
Screen technology	LED LCD
Availability of Automatic Brightness Control (ABC)..... :	No
ABC enabled by default	N/A
Availability of touch functionality	No
Availability of room presence sensor.... :	No
Availability of voice recognition sensor. :	No
Availability of High Dynamic Range (HDR)	No
Power supply type	<input type="checkbox"/> internal; <input checked="" type="checkbox"/> External; <input type="checkbox"/> Standardised external
Minimum guaranteed availability of software and firmware updates (from the date of end of the placement on the market)	8 years
Minimum guaranteed availability of spare parts (from the date of end of the placement on the market)	7 years
Minimum guaranteed product support (from the date of end of the placement on the market)	15 years
Minimum duration of the general guarantee offered by the supplier	3 years



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Summary of testing:

The sample(s) tested complies with the requirements of COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341;

The sample(s) tested complies with the requirements of COMMISSION DELEGATED REGULATION (EU) 2019/2013 + (EU) 2021/340

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

For On mode:

Measurements of power of 0.50 W or greater was made with an uncertainty of less than or equal to 2 % at the 95 % confidence level.

Measurements of power of less than 0.50 W was made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

For standby mode:

The maximum permitted uncertainty of measurement depends on the size of the load and the characteristics of the load. The key characteristic of the load used to determine the maximum permitted uncertainty is the Maximum Current Ratio (MCR), which is calculated as follows:

$$\text{Maximum Current Ratio (MCR)} = \frac{\text{Crest Factor (CF)}}{\text{Power Factor (PF)}}$$

where

- the Crest Factor (CF) is the measured peak current drawn by the product divided by the measured r.m.s. current drawn by the product;
- the Power Factor (PF) is a characteristic of the power consumed by the product. It is the ratio of the measured real power to the measured apparent power.

a) Permitted uncertainty for values of MCR ≤ 10

For measured power values of greater than or equal to 1.0 W, the maximum permitted relative uncertainty introduced by the power measurement equipment, U_{mr} , shall be equal to or less than 2 % of the measured power value at the 95 % confidence level.

For measured power values of less than 1.0 W, the maximum permitted absolute uncertainty introduced by the power measurement equipment, U_{ma} , shall be equal to or less than 0.02 W at the 95 % confidence level.

b) Permitted uncertainty for values of MCR > 10

The value of U_{pc} shall be determined using the following equation:

$$U_{pc} = 0,02 \times [1 + (0,08 \times \{MCR - 10\})]$$

where U_{pc} is the maximum permitted relative uncertainty for cases where the MCR is > 10.

For measured power values of greater than or equal to 1.0 W, the maximum permitted relative uncertainty introduced by the power measurement equipment shall be equal to or less than U_{pc} at the 95 % confidence level.

For measured power values of less than 1.0 W, the permitted absolute uncertainty shall be the greater of U_{ma} (0.02 W) or U_{pc} when expressed as an absolute uncertainty in W ($U_{pc} \cdot$ measured value) at the 95 %



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confidence level.

Copy of marking plate

Marking Plate

LED Monitor

DHI-LM22-B200S

DC12V=2A

P/N: 1.0.99.12.10178



S/N: XXXXX

MADE IN CHINA

ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

No.1199.Bin'an Road, Binjiang District, Hangzhou, P.R.China



Remark: the above marking plate is only a draft artwork to show the product ratings and model No. and the height of CE logo shall not be less than 5 mm, and the height of WEEE logo shall not be less than 7 mm. Marking plate for other list models is of the same pattern.



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Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A (Not Applicable)
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing:	
Date of receipt of test item.....:	2022-09-09
Date (s) of performance of tests.....:	2022-09-09 to 2022-10-27
General remarks:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p>	



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General product information:			
Power Source	Powered by external power supply		
Feature	22" LED monitor with interfaces as audio in, HDMI, VGA		
Power board / main board	M2513A-HVA3 / M2513AR-HVA3		
Panel	M21553***(where * represents A-Z, 0-9, -, ., or blank)		
Package	AC cable, HDMI cable, Power adaptor, Instruction manual		
Model difference (if applicable)	Except model reference due to market or customer propose, no affect to energy consumption.		
External power supply (non-standardised and include in the product box) (if applicable)			
Model name	YD-BE1200200EU-6A		
Input voltage	100-240V a.c.	Output voltage	12V
Input current (max)	0,6A	Output current (max)	2,0A
External standardized power supply (or suitable one if not include in the product box) (if applicable)			
Standard name or list	--		
Required output voltage	--		
Required delivered current (minimum)	--		
Required current frequency	--		



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
A. ENERGY EFFICIENCY REQUIREMENTS			
1.	Energy Efficiency Index limits for On-mode		--
	<p>Energy Efficiency Index (EEI):</p> $EEI = \frac{(P_{measured} + 1)}{(3 \times [90 \times \tanh(0,02 + 0,004 \times (A - 11)) + 4] + 3) + corr}$ <p>A represents the screen area in dm²;</p> <p>P_{measured} is the measured power in Watts in on mode in the normal configuration, in standard dynamic range (SDR);</p> <p>corr is a correction factor of 10 for OLED electronic displays that do not apply the ABC allowance in point B (1). This shall apply until 28 February 2023. corr shall be zero in all other cases.</p> <p>The declared values of the on mode power (P_{measured}) and screen area (A) as listed in Table 5 of Annex VI of delegated Regulation 2019/2013 shall be used for the calculation of EEI</p>	See appended table 4	--
	From 1 March 2021		--
	EEI _{max} for electronic displays with resolution up to 2 138 400 pixels (HD): EEI _{max} ≤ 0.90;	See appended table 4	P
	EEI _{max} for electronic displays with resolution above 2 138 400 pixels (HD) and up to 8 294 400 pixels (UHD): EEI _{max} ≤ 1.10		N/A
	From 1 March 2023		--
	EEI _{max} for electronic displays with resolution up to 2 138 400 pixels (HD): EEI _{max} ≤ 0.75;	See appended table 4	P
	EEI _{max} for electronic displays with resolution above 2 138 400 pixels (HD) and up to 8 294 400 pixels (UHD): EEI _{max} ≤ 0.90;		N/A
	EEI _{max} for electronic displays with resolution above 8 294 400 pixels (UHD) and for MicroLED displays: EEI _{max} ≤ 0.90		N/A
B. ALLOWANCES AND ADJUSTMENTS FOR THE PURPOSE OF THE EEI CALCULATION AND FUNCTIONAL REQUIREMENTS (From 1 March 2021)			
1.	Electronic displays with automatic brightness control (ABC)		--
	Electronic displays qualify for a 10 % reduction in P _{measured} , if they meet all of the following requirements:	Without ABC feature	--
1(a).	ABC is enabled in the normal configuration of the electronic display and persists in any other standard dynamic range configuration available to the end-user;		N/A



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
1(b).	the value of $P_{measured}$, in the normal configuration, is measured with ABC disabled or, if ABC cannot be disabled, in an ambient light condition of 100 lux measured at the ABC sensor;		N/A
1(c).	the value of $P_{measured}$ with ABC disabled, if applicable, shall be equal to or greater than the on mode power measured with ABC enabled in an ambient light condition of 100 lux measured at the ABC sensor		N/A
1(d).	with ABC enabled, the measured value of the on mode power must decrease by 20 % or more when the ambient light condition, measured at the ABC sensor, is reduced from 100 lux to 12 lux; and		N/A
1(e).	the ABC control of the display screen luminance meets all of the following characteristics when the ambient light condition measured at the ABC sensor changes: <ul style="list-style-type: none"> - the measured screen luminance at 60 lux is between 65 % and 95 % of the screen luminance measured at 100 lux; - the measured screen luminance at 35 lux is between 50 % and 80 % of the screen luminance measured at 100 lux; and - the measured screen luminance at 12 lux is between 35 % and 70 % of the screen luminance measured at 100 lux. 		N/A
2.	Forced menu and set up menu		--
	Electronic displays may be placed on the market with a forced menu on initial activation proposing alternative settings. Where a forced menu is provided, the normal configuration shall be set as default choice, otherwise the normal configuration shall be the out-of-the-box setting.	<input type="checkbox"/> Default choice of forced menu. <input checked="" type="checkbox"/> Out-of-the-box setting	--
	If the user selects a configuration other than the normal configuration and this configuration results in a higher power demand than the normal configuration, a warning message about the likely increase in energy use shall appear and confirmation of the action shall be explicitly requested.		N/A
	If the user selects a setting other than those that are part of the normal configuration and this setting results in a higher energy consumption than the normal configuration, a warning message about the likely increase in energy consumption shall appear and confirmation of the action explicitly requested.	Warning message: "This change will result in a higher energy consumption, do you want to set it"	P



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341																											
ANNEX II Ecodesign requirements																											
Cl.	Requirement-Test	Result-Remark	Verdict																								
	A change by the user in a single parameter in any setting shall not trigger any change in any other energy-relevant parameter, unless unavoidable. In such a case a warning message shall appear about the change of other parameters and the confirmation of the change shall be explicitly requested.	Or equivalent text																									
3.	Peak white luminance ratio		--																								
	In the normal configuration, the peak white luminance of the electronic display in a 100 lux ambient light viewing environment shall not be less than 220 cd/m ² or, if the electronic display is primarily intended for close viewing by a single user, not less than 150 cd/m ² . If the electronic display's peak white luminance in the normal configuration is set to lower values, it shall not be less than 65 % of the peak white luminance of the display, in a 100 lux ambient light viewing environment in the brightest on mode configuration.	See appended table 4	P																								
C. OFF MODE, STANDBY MODE AND NETWORKED STANDBY MODE REQUIREMENTS (From 1 March 2021)																											
1.	Power demand limits other than on-mode		--																								
	Power consumption in any off-mode condition shall not exceed 0.30 Watts	See appended table 4	P																								
	Electronic displays shall not exceed power demand limits in standby/networked standby modes and conditions listed in Table 2		P																								
	<table border="1"> <thead> <tr> <th></th> <th>Standby mode (W)</th> <th>Networked standby mode (W)</th> </tr> </thead> <tbody> <tr> <td>Maximum limit</td> <td>0.50</td> <td>2.00</td> </tr> <tr> <td>Allowances for additional functions when present and enable</td> <td></td> <td></td> </tr> <tr> <td>Status display</td> <td>0.20</td> <td>0.20</td> </tr> <tr> <td>Deactivation using room presence detection</td> <td>0.50</td> <td>0.50</td> </tr> <tr> <td>Touch functionality, if usable for activation</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>HiNA function</td> <td>00</td> <td>4.00</td> </tr> <tr> <td>Total maximum power demand with all additional functions when present and enable</td> <td>2.20</td> <td>7.70</td> </tr> </tbody> </table>		Standby mode (W)	Networked standby mode (W)	Maximum limit	0.50	2.00	Allowances for additional functions when present and enable			Status display	0.20	0.20	Deactivation using room presence detection	0.50	0.50	Touch functionality, if usable for activation	1.00	1.00	HiNA function	00	4.00	Total maximum power demand with all additional functions when present and enable	2.20	7.70		
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2.	Availability of off, standby and networked standby mode		--																								



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
	<p>Electronic displays shall provide off mode or standby mode or a networked standby mode or other modes which do not exceed the applicable power demand requirements for standby mode</p> <p>The configuration menu, instruction manuals and other documentation, if any, shall refer to off mode, standby mode or networked standby mode using those terms</p>	<p>Off mode</p> <p>Standby mode</p>	P
	<p>Automatic switch to off mode and/or standby mode and/or another mode which does not exceed the applicable power demand requirements for standby mode shall be set as default, including for networked displays where the network interface is enabled when in on mode</p>	See appended table 4	P
	<p>Networked standby mode shall be disabled in 'normal configuration' of a networked television. The end user shall be prompted to confirm the activation of networked standby, if it is needed for a chosen remotely activated function, and must be able to disable it</p>	Not applicable to monitor	N/A
	<p>Networked electronic displays shall comply with the requirements for networked standby mode with the reactivation trigger device connected to the network and ready to activate a trigger instruction when required to.</p> <p>With networked standby mode disabled, networked electronic displays shall comply with the requirements of standby mode</p>		N/A
3.	Automatic standby in televisions		--
	<p>Televisions shall provide a power management function, enabled as delivered by the manufacturer that, within 4 hours following the last user interaction, shall switch the television from on mode into standby mode or networked standby mode or another mode which does not exceed the applicable power demand requirements respectively for standby or networked standby mode. Before such automatic switch, televisions shall show, for at least 20 seconds, an alert message warning the user of the impending switch, with possibility of delaying or temporarily cancelling it.</p>	Not applicable to monitor	N/A
	<p>If the television provides a function allowing the user to shorten, extend or disable the 4-hour period for automatic mode transitions detailed in (a), a warning message shall appear about a potential increase in energy use and a confirmation of the new setting must be requested when an extension beyond the 4-hour period or disabling is selected.</p>	Not applicable to monitor	N/A



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
	If the television is equipped with a room presence sensor, the automatic transition from on mode into any mode as detailed in (a) applies if no presence is detected for no more than 1 hour.	Not applicable to monitor	N/A
	Televisions with various selectable input sources shall prioritise the power management protocols of the signal source selected and displayed over those default power management mechanisms described in the paragraphs (a) to (c) above.	Not applicable to monitor	N/A
4.	Automatic standby in displays other than televisions		--
	Electronic displays other than televisions, with various selectable input sources shall switch, as configured in the normal configuration, into standby mode, networked standby mode or another mode which does not exceed the applicable power demand requirements respectively for standby or networked standby mode when no input is detected by any input source for over 10 seconds and, for digital interactive whiteboards and for broadcast displays, for over 60 minutes.	See appended table 4	P
	Before triggering such a switch, a warning message shall be display and the switch completed within 10 minutes.	Warning message: "No signal" Or equivalent text	P
	For electronic displays with a designated computer signal interface, the electronic display prioritises the computer display power management protocols set out in point 6.2.3 of Annex II of Commission Regulation (EU) No 617/2013. 6.2.3. The computer shall be placed on the market with the display sleep mode set to activate within 10 minutes of user inactivity.		P
D. MATERIAL EFFICIENCY REQUIREMENTS (From 1 March 2021)			
1.	Design for dismantling, recycling and recovery		--
	Manufacturers, importers or their authorised representatives shall ensure that joining, fastening or sealing techniques do not prevent the removal, using commonly available tools, of the components indicated in point 1 of Annex VII of Directive 2012/19/EU on WEEE or in Article 11 of Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators, when present. The derogations indicated in Article 11 of 2006/66/EC about permanent connection between the electronic display and the battery or accumulator apply.	Refer to guaranteed letter provided by applicant	P



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
	Manufacturers, importers or their authorised representatives shall, without prejudice to point 1 of Article 15 of Directive 2012/19/EU, make available, on a free-access website, the dismantling information needed to access any of the products components referred to in point 1 of Annex VII of Directive 2012/19/EU. This dismantling information shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.	Refer to guaranteed letter provided by applicant	P
	This end of life information shall be available until at least 15 years after the placing on the market of the last unit of a product model.	Refer to guaranteed letter provided by applicant	P
2.	Marking of plastic components		--
	Plastic components heavier than 50g.		--
2.(a)	Shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms set between the punctuation marks '>' and '<' as specified in available standards. The marking shall be legible.	Refer to guaranteed letter provided by applicant	P
	Plastic components are exempt from marking requirements in the following circumstances: 1) The marking is not possible because of the shape or size; 2) The marking would impact on the performance or functionality of the plastic component; and 3) Marking is technically not possible because of the molding method.		--
	For the following plastic components no marking is required: 1) Packaging, tape, labels and stretch wraps; 2) Wiring, cables and connectors, rubber parts and anywhere not enough appropriate surface area is available for the marking to be of a legible size; 3) PCB assemblies, PMMA boards, optical components, electrostatic discharge components, electromagnetic interference components, speakers; 4) Transparent parts where the marking would obstruct the function of the part in question.		--
2.(b)	Components containing flame retardants shall additionally be marked with the abbreviated term of the polymer followed by hyphen, then the symbol 'FR' followed by the code number of the flame retardant in parentheses. The marking on the enclosure and stand components shall be clearly visible and readable.	Refer to guaranteed letter provided by applicant	P
3.	Cadmium logo		--



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
	<p>Electronic displays with a screen panel in which concentration values of Cadmium (Cd) by weight in homogeneous materials exceed 0,01 % as defined in Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, shall be labelled with the 'Cadmium inside' logo. The logo shall be clearly visible durable, legible and indelible. The logo shall be in the form of the following graphic:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Cadmium inside</p> </div> <div style="text-align: center;"> <p>Cadmium free</p> </div> </div> <p>The dimension of 'a' shall be greater than 9 mm and the typeface to be used is 'Gill Sans'.</p>		P
	An additional 'Cadmium inside' logo shall be firmly attached internally on the display panel or molded in a position clearly visible to workers once the external back cover bearing the external logo is removed.		
	A 'Cadmium free' logo shall be used if concentration values of Cadmium (Cd) by weight in any homogeneous material part of the display do not exceed 0,01 % as defined in Directive 2011/65/EU.		
4.	Halogenated flame retardants		--
	The use of halogenated flame retardants is not allowed in the enclosure and stand of electronic displays.	Refer to guaranteed letter provided by applicant	P
5.	Design for repair and reuse		--



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
5.(a)	<p>Availability of spare parts:</p> <ol style="list-style-type: none"> 1) Manufacturers, importers or authorised representatives of electronic displays shall make available to professional repairers at least the following spare parts: internal power supply, connectors to connect external equipment (cable, antenna, USB, DVD and Blu-Ray), capacitors above 400 microfarads, batteries and accumulators, DVD/Blu-Ray module if applicable and HD/SSD module if applicable for a minimum period of seven years after placing the last unit of the model on the market; 2) Manufacturers, importers or authorised representatives of electronic displays shall make available to professional repairers and end-users at least the following spare parts: external power supply and remote control for a minimum period of seven years after placing the last unit of the model on the market; 3) Manufacturers shall ensure that these spare parts can be replaced with the use of commonly available tools and without permanent damage to the appliance; 4) The list of spare parts concerned by point 1 and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at the latest two years after the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts; and 5) The list of spare parts concerned by point 2 and the procedure for ordering them and the repair instructions shall be publicly available on the manufacturer's, the importer's or authorised representative's free access website, at the moment of the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts. 	Refer to guaranteed letter provided by applicant	P



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
5.(b)	<p>Access to repair and maintenance information</p> <p>After a period of two years after the placing on the market of the first unit of a model or of an equivalent model, and until the end of the period mentioned under (a), the manufacturer, importer or authorised representative shall provide access to the appliance repair and maintenance information to professional repairers in the following conditions:</p> <ol style="list-style-type: none"> 1) The manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, manufacturers, importers or authorised representative may require the professional repairer to demonstrate that: <ol style="list-style-type: none"> a) The professional repairer has the technical competence to repair electronic displays and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point; b) The professional repairer is covered by insurance covering liabilities resulting from its activity, regardless of whether this is required by the Member State; 2) The manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request by the professional repairer; 3) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information. 	Refer to guaranteed letter provided by applicant	P



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COMMISSION REGULATION (EU) 2019/2021 + (EU) 2021/341			
ANNEX II Ecodesign requirements			
Cl.	Requirement-Test	Result-Remark	Verdict
	Once registered, a professional repairer shall have access to the requested repair and maintenance information within one working day after requesting it. The available repair and maintenance information shall include: 1) The unequivocal appliance identification; 2) A disassembly map or exploded view; 3) List of necessary repair and test equipment; 4) Component and diagnosis information (such as minimum and maximum theoretical values for measurements); 5) Wiring and connection diagrams; 6) Diagnostic fault and error codes (including manufacturer-specific codes, where applicable); and 7) Data records of reported failure incidents stored on the electronic display (where applicable).	Refer to guaranteed letter provided by applicant	P
5.(c)	Maximum delivery time of spare parts 1) during the period mentioned under point 5(a)(1) and point 5(a)(2), the manufacturer, importer or authorised representatives shall ensure the delivery of the spare parts for electronic displays within 15 working days after having received the order; 2) in the case of spare parts available only to professional repairers, this availability may be limited to professional repairers registered in accordance with point (b).	Refer to guaranteed letter provided by applicant	P
E. INFORMATION AVAILABILITY REQUIREMENTS (From 1 March 2021)			
	The product manufacturer, importer or authorised representative shall make available the information set out below when placing on the market the first unit of a model or of an equivalent model. The information shall be provided free of charge to third parties dealing with professional repair and reuse of electronic displays (including third party maintenance actors, brokers and spare parts providers).	Refer to guaranteed letter provided by applicant	P
1.	Availability of software and firmware updates		--
1.(a)	The latest available version of the firmware shall be made available for a minimum period of eight years after the placing on the market of the last unit of a certain product model, free of charge or at a fair, transparent and non-discriminatory cost. The latest available security update to the firmware shall be made available until at least eight years after the placing on the market of the last product of a certain product model, free of charge.	Refer to guaranteed letter provided by applicant	P
1.(b)	Information on the minimum guaranteed availability of software and firmware updates, availability of spare parts and product support shall be indicated in the product information sheet as from Annex V of Regulation (EU) 2019/2013.	See product information sheet	P



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COMMISSION DELEGATED REGULATION (EU) 2019/2013 + (EU) 2021/340 ANNEX II Energy labelling requirements																		
Cl.	Requirement	Result-Remark																
A. Energy efficiency classes																		
1.	<p>The energy efficiency class of an electronic display shall be determined on the basis of its energy efficiency index for labelling (EEI_{label}) as set out in Table 1. The EEI_{label} of an electronic display shall be determined in accordance with part B of this Annex.</p> <p style="text-align: center;">Table 1 Energy efficiency classes of electronic displays</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Energy Efficiency Class</th> <th style="width: 60%;">Energy Efficiency Index (EEI_{label})</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$EEI_{label} < 0,30$</td> </tr> <tr> <td>B</td> <td>$0,30 \leq EEI_{label} < 0,40$</td> </tr> <tr> <td>C</td> <td>$0,40 \leq EEI_{label} < 0,50$</td> </tr> <tr> <td>D</td> <td>$0,50 \leq EEI_{label} < 0,60$</td> </tr> <tr> <td>E</td> <td>$0,60 \leq EEI_{label} < 0,75$</td> </tr> <tr> <td>F</td> <td>$0,75 \leq EEI_{label} < 0,90$</td> </tr> <tr> <td>G</td> <td>$0,90 \leq EEI_{label}$</td> </tr> </tbody> </table>	Energy Efficiency Class	Energy Efficiency Index (EEI_{label})	A	$EEI_{label} < 0,30$	B	$0,30 \leq EEI_{label} < 0,40$	C	$0,40 \leq EEI_{label} < 0,50$	D	$0,50 \leq EEI_{label} < 0,60$	E	$0,60 \leq EEI_{label} < 0,75$	F	$0,75 \leq EEI_{label} < 0,90$	G	$0,90 \leq EEI_{label}$	--
Energy Efficiency Class	Energy Efficiency Index (EEI_{label})																	
A	$EEI_{label} < 0,30$																	
B	$0,30 \leq EEI_{label} < 0,40$																	
C	$0,40 \leq EEI_{label} < 0,50$																	
D	$0,50 \leq EEI_{label} < 0,60$																	
E	$0,60 \leq EEI_{label} < 0,75$																	
F	$0,75 \leq EEI_{label} < 0,90$																	
G	$0,90 \leq EEI_{label}$																	
B. Energy Efficiency Index (EEI_{label})																		
1	<p>The Energy Efficiency Index (EEI_{label}) shall be calculated using the following equation:</p> $EEI_{label} = \frac{(P_{measured} + 1)}{(3 \times [90 \times \tanh(0,025 + 0,0035 \times (A - 11)) + 4] + 3) + corr_1}$ <p>A represents the screen area in dm^2;</p> <p>$P_{measured}$ is the measured power in on mode in Watts in the normal configuration and set as indicated in table 2</p> <p>corr is a correction factor set as indicated in table 3</p> <p style="text-align: center;">Table 2 Measurement of $P_{measured}$</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Dynamic Range level</th> <th style="width: 60%;">P_{measured}</th> </tr> </thead> <tbody> <tr> <td>Standard Dynamic Range (SDR): $P_{measured_{SDR}}$</td> <td>Power demand in Watts (W) in on mode, measured when displaying standardised test sequences of moving picture from dynamic broadcast content. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.</td> </tr> <tr> <td>High Dynamic Range (HDR) $P_{measured_{HDR}}$</td> <td>Power demand in Watts (W) in on mode, measured as for $P_{measured_{SDR}}$ but with the HDR functionality activated by metadata in the standardised HDR test sequences. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.</td> </tr> </tbody> </table>	Dynamic Range level	P _{measured}	Standard Dynamic Range (SDR): $P_{measured_{SDR}}$	Power demand in Watts (W) in on mode, measured when displaying standardised test sequences of moving picture from dynamic broadcast content. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.	High Dynamic Range (HDR) $P_{measured_{HDR}}$	Power demand in Watts (W) in on mode, measured as for $P_{measured_{SDR}}$ but with the HDR functionality activated by metadata in the standardised HDR test sequences. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.	<p>Calculation base on measured value: SDR mode : E EEI = 0,684</p> <p>Calculation base on declared value: SDR mode : E EEI = 0,650</p>										
Dynamic Range level	P _{measured}																	
Standard Dynamic Range (SDR): $P_{measured_{SDR}}$	Power demand in Watts (W) in on mode, measured when displaying standardised test sequences of moving picture from dynamic broadcast content. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.																	
High Dynamic Range (HDR) $P_{measured_{HDR}}$	Power demand in Watts (W) in on mode, measured as for $P_{measured_{SDR}}$ but with the HDR functionality activated by metadata in the standardised HDR test sequences. Where allowances are applicable according to part C of this Annex, they should be deducted from $P_{measured}$.																	



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Table 3 corr ₁ value		Corr =0
Electronic Display type	corr ₁ value	
Television	0,0	
Monitor	0,0	
Digital signage	0,00062*(lum-500)*A where 'lum' is the peak white luminance, in cd/m ² , of the brightest on mode configuration of the electronic display and A is the screen area in dm ²	

C. Allowances and adjustments for the purpose of the EEL_{label} calculation

1.	Electronic displays with automatic brightness control (ABC) shall qualify for a 10 % reduction in P _{measured} , if they meet all of the following requirements:	N/A
1.(a)	ABC is enabled in the normal configuration of the electronic display and persists in any other standard dynamic range configuration available to the end-user;	N/A
1.(b)	the value of P _{measured} , in the normal configuration, is measured, with ABC disabled or if ABC cannot be disabled, in an ambient light condition of 100 lux measured at the ABC sensor;	N/A
1.(c)	if applicable, the value of P _{measured} with ABC disabled shall be equal to or greater than the on mode power measured with ABC enabled in an ambient light condition of 100 lux measured at the ABC sensor	N/A
1.(d)	with ABC enabled, the measured value of the on mode power must decrease by 20 % or more when the ambient light condition, measured at the ABC sensor, is reduced from 100 lux to 12 lux; and	N/A
1.(e)	the ABC control of the display screen luminance meets all of the following characteristics when the ambient light condition measured at the ABC sensor changes: <ul style="list-style-type: none"> - the measured screen luminance at 60 lux is between 65 % and 95 % of the screen luminance measured at 100 lux; - the measured screen luminance at 35 lux is between 50 % and 80 % of the screen luminance measured at 100 lux; and - the measured screen luminance at 12 lux is between 35 % and 70 % of the screen luminance measured at 100 lux. 	N/A



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Table 1 Test parameters for measurements	
Ambient temperature (°C):	22,5
Air speed (m/s):	0,1
Test voltage in V:	230V
Test frequency in Hz:	50Hz
Total harmonic distortion (THD) of the electricity supply system:	V: 1,193 % A: 147,84%
Screen area A (dm ²) :	12,35dm ² (4,77 dm X 2,59 dm)
Input terminal for the audio and video test signals:	<input checked="" type="checkbox"/> HDMI terminal; <input type="checkbox"/> DisplayPort; <input checked="" type="checkbox"/> VGA; <input type="checkbox"/> SCART; <input checked="" type="checkbox"/> Audio-Video in; <input type="checkbox"/> RF in; <input type="checkbox"/> Thunderbolt; <input type="checkbox"/> Others:
Audio and video signals for test:	For on mode power test: <input checked="" type="checkbox"/> SDR Dynamic test sequences (“HD Dynamic Video Power.mp4”) according to table 3a in Annex V of the COMMISSION REGULATION (EU) 2021/341 (Resolution: 1920 x 1080); <input type="checkbox"/> HDR Dynamic test sequences (HDR-HLG power.mp4 & HDR-HDR10 power.mp4) according to table 3a in Annex V of the COMMISSION REGULATION (EU) 2021/341 (Resolution: 1920 x 1080); For peak luminance test: <input checked="" type="checkbox"/> A new variant of the “box and outline” dynamic test pattern providing a dynamic format with colour according to table 3a in Annex V of the COMMISSION REGULATION (EU) 2021/341.
Standby/Off/Network standby/another mode power consumption was determined by:	<input type="checkbox"/> Sampling method; <input checked="" type="checkbox"/> Average reading method
Electronic displays setting selected:	<input type="checkbox"/> Normal configuration: default choice of Forced menu <input checked="" type="checkbox"/> Normal configuration: Out-of-the-box setting
Picture settings used for brightest peak white luminance measurement	Brightest pre-set setting: standard Brightness: 50, Contrast: 50

Table 2 Set-up and circuits used for electrical testing in accordance with EN 50564:2011 Annex B.4:	
---	--



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Where the connection arrangement can be configured, it is selected as below:

- 1, Lower powers: $I_m \leq V_s \times \sqrt{1/(R_a \times R_v)}$, then use the connection arrangement in B.1;
- 2, Higher powers: $I_m > V_s \times \sqrt{1/(R_a \times R_v)}$, then use the connection arrangement in B.2;

where

- I_m is the measured r.m.s. current of the load in amps (A);
- V_s is the supply voltage (V);
- R_a is the resistance of the current shunt for the selected current range (in ohm);
- R_v is the resistance of the voltmeter (in ohm);

Rating parameter for WT3000 power analyzer as below:

- Voltage input resistance R_v 10 MOhm (10 000 000 ohm)
- Current shunt resistance R_a 500 MOhm (0,500 ohm) is for channel 1, Max. 2 A

$\frac{V_s}{\sqrt{1/(R_a \times R_v)}}$	100 (V)	115 (V)	230 (V)
0,500 (ohm)	0,0447 (A)	0,0514 (A)	0,1029 (A)

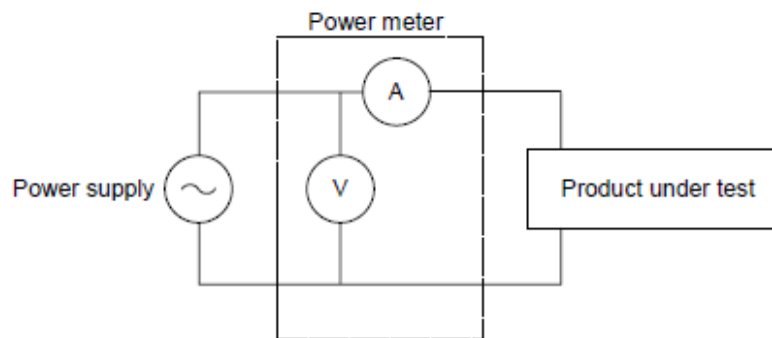


Figure B.1 – Connection arrangement for lower power loads

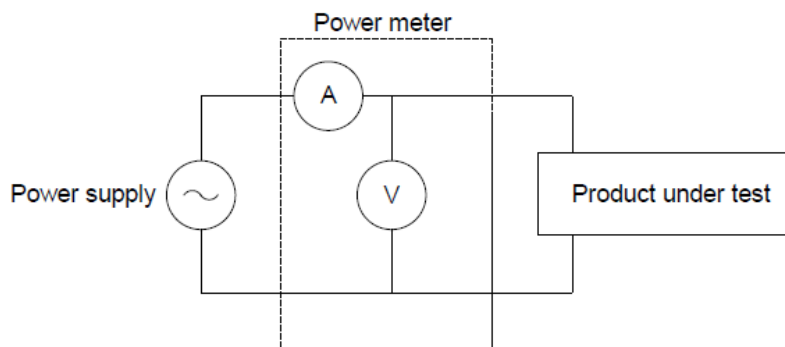


Figure B.2 – Connection arrangement for higher power loads.



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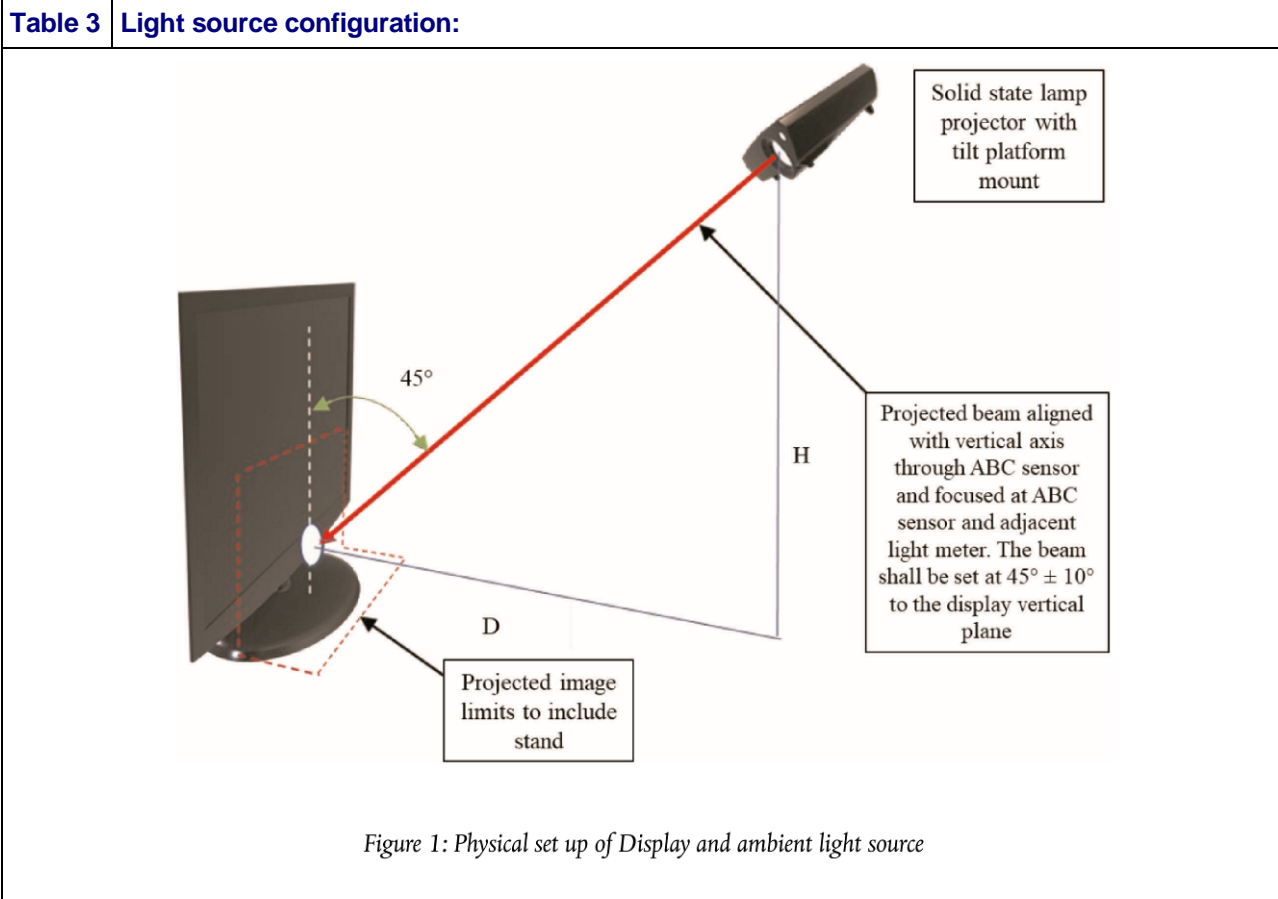


Table 4 Test result				P	
Test item(s)	Measured (W)	Declared (W)	Limit (W)		
Off-mode condition:	0,14	0,30	0,30		
			Max.	Allowance	total
Standby-mode condition:	0,15	0,50	0.50	--	0,50
Network standby-mode condition:	--	--	--	--	--
Another condition which does not exceed the applicable power demand requirements respectively for standby or networked standby mode:	--	--	--	--	--



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Test item(s)	Measured (W)	Declared (W)	Limit (W)
Description of how the appliance mode was selected or programmed including any enhanced reactivation functions:	<p>Connected to mains and turn on the display by pressing the “switch” button on the product</p> <p>Select the Out-of-the-box default setting;</p> <p>Input the test video signal by HDMI terminal and measured the on-mode power consumption and peak luminance;</p> <p>Change to “Brightest pre-set setting” to measure the peak luminance.</p> <p>The monitor will automatically switch into standby mode when no input is detected by any input source for over 60s</p> <p>By switching the switch can turn off the display, measured the OFF-mode power consumption.</p>		
Sequence of events to reach the mode where the equipment automatically changes modes:	The display will automatically switch into standby mode when no input is detected by any input source for over 60 seconds		

For the networked electronic displays only:

The number and type of network interfaces and, except for wireless network interfaces, their position in the electronic displays, the trigger to be used to reactivate the electronic display:	No.	Type	Location	Trigger
	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
the default time after which the power management function, switches the display into a condition providing networked standby				N/A
whether networked electronic display provides functionality allowing the power management function and/or the end-user to switch the electronic display from networked standby mode into standby mode, or off mode or another condition:				N/A

Test item(s)	Measured	Declared
Electronic displays without automatic brightness control (ABC)		
On-mode (HDR) power $P_{measured}$ (W) :	--	--
On-mode (SDR) power $P_{measured}$ (W) :	14,74	14
Peak luminance in normal configuration L_{normal} (cd/m ²) :	165,8	--
	> 220 / 150 cd/m ²	
Peak luminance in brightest on mode configuration $L_{brightest}$ (cd/m ²) :	234,2	--
Ratio of the peak luminance $L_{normal} / L_{brightest}$	--	--
	> 65%	

Test item(s)	Measured	Declared
Electronic displays with automatic brightness control (ABC)		
On-mode (SDR) power $P_{measured}$ (W) :	--	



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On-mode power (SDR) at ABC disabled $P_{\text{measured_ABC_disabled}}$:	--	
On-mode power (SDR) at 100 lux ambient light at the ABC sensor $P_{\text{measured_ABC_100}}$:	--	
On-mode power (SDR) at 12 lux ambient light at the ABC sensor $P_{\text{measured_ABC_12}}$:	--	
Percentage of power reduction due to ABC action between the 100 lux and 12 lux ambient light conditions	--	
	> 20%	
Peak luminance in normal configuration at 100 lux ambient light at the ABC sensor $L_{\text{normal_ABC_100}}$:	--	--
	> 220 / 150 cd/m ²	
Peak luminance in normal configuration at 60 lux ambient light at the ABC sensor $L_{\text{normal_ABC_60}}$:	--	
	$\geq 65\% L_{\text{normal_ABC_100}}$ and $\leq 95\% L_{\text{normal_ABC_100}}$	
Peak luminance in normal configuration at 35 lux ambient light at the ABC sensor $L_{\text{normal_ABC_35}}$:	--	
	$\geq 50\% L_{\text{normal_ABC_100}}$ and $\leq 80\% L_{\text{normal_ABC_100}}$	
Peak luminance in normal configuration at 12 lux ambient light at the ABC sensor $L_{\text{normal_ABC_12}}$:	--	
	$\geq 35\% L_{\text{normal_ABC_100}}$ and $\leq 70\% L_{\text{normal_ABC_100}}$	
Peak luminance in brightest on mode configuration at 100 lux ambient light at the ABC sensor $L_{\text{brightest_ABC_100}}$:	--	--
Ratio of the peak luminance $L_{\text{normal_ABC_100}} / L_{\text{brightest_ABC_100}}$	--	--
	> 65%	
Sequence of steps for achieving a stable condition with respect to power consumption:	The product has been in the off mode or, if an off-mode is not available, in standby mode, for a minimum of 1 hour immediately followed by a minimum of 1 hour in the on mode and shall be completed before a maximum of 3 hours in on-mode. The relevant video signal shall be displayed during the entire on mode duration.	

Test item(s)	Calculation base on measured value	Calculation base on declared value	Limit
Energy Efficiency Index (EEI):	0,720	0,685	0,9 (from 1 March 2021)
	0,720	0,685	0,75 (from 1 March 2023)
Power management			
The default period of time after which the power management function, or a similar function, switches the equipment automatically into off mode or standby mode or networked standby mode(minutes)	Measured	Declared	Limit(mins)
	--	--	240 for TV
	--	--	60 for digital interactive whiteboards or broadcast displays
	1min	--	10 for other electronic displays



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Table 5		Test instruments		
Name	Brand	Model	Last cal. date	Next cal. date
Power meter	Henghe	WT310E/C2-H/G5	2021-12-26	2022-12-25
AC Power Supply	Yuanfang	PCR-1000WH_V200	2022-07-25	2023-07-24
Illuminance meter	Yuanfang	V-08001	2022-10-26	2023-10-25
Spectroradiometer	KONICA MINOLTA, INC.	CS-2000A	2022-10-25	2023-10-24
Digital temperature & humidity recorder	testo	175H1	2021/12/14	2022/12/13



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