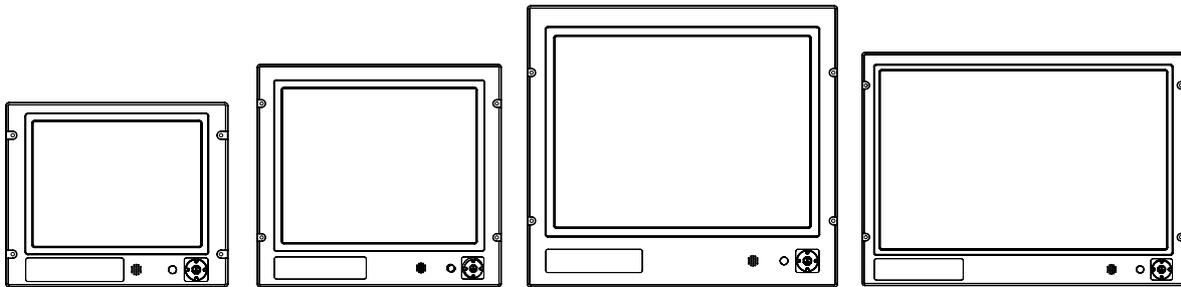


# USER MANUAL



## Series 1 - Maritime Multi Display Models

- JH 15T17 MMD-xxx-Axxx - 15.0 inch Maritime Multi Display
- JH 19T14 MMD-xxx-Sxxx - 19.0 inch Maritime Multi Display (Slim Frame)
- JH 19T14 MMD-xxx-Axxx - 19.0 inch Maritime Multi Display
- JH 20T17 MMD-xxx-Axxx - 20.1 inch Maritime Multi Display
- JH 22T11 MMD-xxx-Axxx - 22.0 inch Maritime Multi Display Widescreen
- JH 23T14 MMD-xxx-Axxx - 23.1 inch Maritime Multi Display

User Manual MMD Series 1	
Updated: 14 Jun 2021	Doc Id: INB100036-1 (Rev 38)
Created: 363	Approved: 6674

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Eikeskogvegen 52, N-5570 Aksdal, Norway.

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**All other product names or trademarks are properties of their respective owners !**

WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Statement above last revised 31 Jul. 2019

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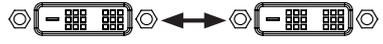
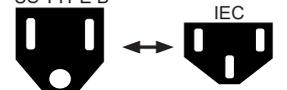
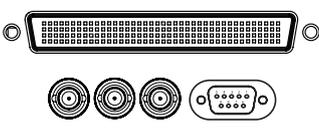
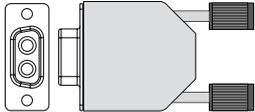
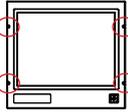
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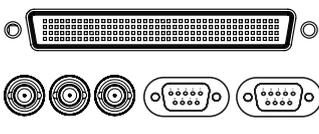
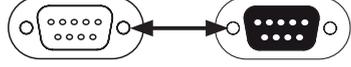
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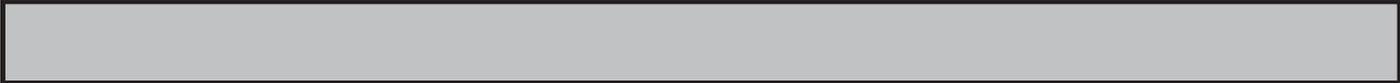
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# Contents of package

Item	Description	Illustration
 HA-SDM-2M	1 x Standard DVI Signal Cable. DVI-D 18+1P Male to DVI-D 18+1P Male Single Link - Length 2.0m	
 HA-VGA-2M-32	1 x Standard VGA Signal Cable. DSUB 15P Male to DSUB 15P Male - Length 2.0m	
 TP52/TC01-1,8M	1 x power cable European Type F "Schuko" to IEC. Length 1.8m  <i>Note: Included in package for models with AC input.</i>	EUR TYPE F 
 TP11/TC01-1,8M	1 x power cable US Type B plug to IEC. Length 1.8m  <i>Note: Included in package for models with AC input.</i>	US TYPE B 
 VSD100692-1 or VSD100692-4	1 x Standard 160p Multifunction Cable #1 - Length: 30cm Connectors from the 160pin (male) are: - 3 x BNC Video IN (female) (certain deliveries only) - 1 x 9p D-SUB (female) RS-232 COM I/O  <i>Note: This cable is only included with a product WITHOUT factory mounted touchscreen.</i>	
 DVI-4	1 x DVI-I > RGB/VGA adapter DVI-I 24+5P (Dual Link) Male to DSUB 15P Female	
 FCE17-E2W2SS-2N0 & L17DPPK09JSU (cover)	1 x DC Power Input housing with internal cable screw terminal.  <i>Note: Included in package for models with DC input.</i>	
 1P06025 (screw) & 16M06012150 (washer)	4 x M6X25 pan screws. Suitable for securing the display unit into a console cut-out. See illustration to the right.  <b>DO NOT USE THESE TO MOUNT BRACKETS ONTO THE UNIT.</b> Use the provided and dedicated screws for accessories (see next table below)	

## Package may also include:

Item	Description	Illustration
 VSD100692-3	1 x Standard Multifunction Cable #2 - Length: 30cm Connectors from the 160pin (male) are: - 3 x BNC Video IN (female) - 1 x 9p D-SUB (female) RS-232 COM I/O - 1 x 9p D-SUB (female) TOUCH COM I/O  <i>Note: This cable is only included with a product with factory mounted touchscreen.</i>	
 EK131.2	1 x Standard RS-232 Serial Extension Cable DB9M-DB9F - Length: 200cm  <i>Note: This cable is only included with a product with factory mounted touchscreen.</i>	
	4 x M6X12 Unbraco bolts. These are included with mounting bracket, if ordered (review technical drawings chapter).  <b>Should only be used to secure the bracket onto display.</b> <i>If you prefer your own bolts, make sure they do not exceed 12mm in length. Use any longer is not possible due to mechanical limits.</i>	



# General

# IEC62368 policy - Introduction

## Safety Instructions

Please read and understand the material in the manual in its entirety before doing any installation/servicing/upgrades. Personnel who are allowed to do work on the unit is detailed in the “**IEC62368 policy for Hatteland Technology product**” section later in this manual. Symbols pertaining to different personnel in regard to operations is described in the user manual.

### Based on requirements EN 62368-1:2014 and IEC 62368-1:2018

Authority	Description
<b>Children</b> 	This equipment is not suitable for use in locations where children are likely to be present.
<b>Ordinary person/ Sailor/End-User</b> 	Not allowed to open unit. Not allowed to install the unit. Not allowed to terminate/connect cables to the unit.
<b>Instructed person</b> 	Allowed to open hatches/latches which does not require tools, such as Disktrays. Allowed to open "battery-hatch" to change the battery even if tools are required. Allowed to install the unit. Allowed to terminate/connect cables to the unit indoors.
<b>Skilled person</b> 	Allowed to open and disassemble the unit.  Allowed to install the unit. Allowed to terminate/connect cables to the unit indoors and outdoors. Allowed to terminate/connect earth/ground wire.  Note: Be aware that additional definition for “skilled person” may apply, country dependent.

## About this manual

The manual contains electrical, mechanical and input/output signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. However, the last updated and revision date of this manual are shown both on the frontpage and also in the "Revision History" chapter. This user manual is a standard/general manual that applies to all variations of its product family, i.e. deviation from actual configuration may exist.

## About Hatteland Technology

Hatteland Technology is the leading technology provider of specialized display and computer products, delivering high quality, unique and customized solutions to the international maritime, naval and industrial markets.

The company represents innovation and quality to the system integrators worldwide. Effective quality assurance and investment in sophisticated in-house manufacturing methods and facilities enable us to deliver Type Approved and Mil tested products. Our customer-oriented approach, technical knowledge and dedication to R&D, makes us a trusted and preferred supplier of approved solutions, which are backed up by a strong service network.

## www.hattelandtechnology.com

You will find our website full of useful information to help you make an informed choice as to the right product for your needs. You will find detailed product descriptions and specifications for the entire range on Displays, Computers and Panel Computers, Military solutions as well as the range of supporting accessories. The site carries a wealth of information regarding our product testing and approvals in addition to company contact information for our various offices around the world, the global service locations and the technical help desk, all ensuring the best possible support wherever you, or your vessel, may be in the world.

## Contact Information

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<p><b>Sales office, Vista / USA:</b> Hatteland Technology Inc 450 South Melrose Drive, Suite #107 Vista, CA 92081 USA</p> <p>Donna Pallonetti: Tel: +1 858-282-0659 Fax: +1 858-408-1834</p>	

For an up-2-date list, please visit <https://www.hattelandtechnology.com/contact>

## Maritime Multi Display (MMD) - Introduction

With our dedication to innovation, we took our de facto industry standard Series 1 displays and set about improving them. The result is the Series 1 redesign, a new generation of innovative, rugged marine displays designed for any navigation and automation application, including ECDIS.

Although the new Series 1 offers a clear improvement on performance, functionality and value, we have ensured that it adheres to the Hatteland Technology ethos of Form, Fit, Function, so you can harness the many innovative features, without making changes to your existing solutions.

Series 1 displays feature 0-100% dimming, and can provide unmatched sun and night vision. All sizes can benefit from Hatteland Technology's sophisticated Optical Bonding, which eliminates condensation and dust, and reduces reflection by over 90%.

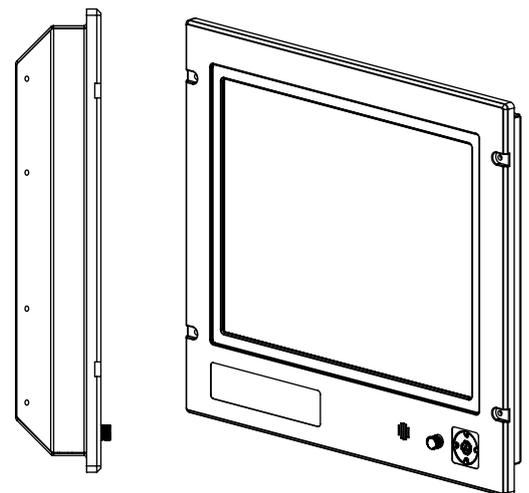
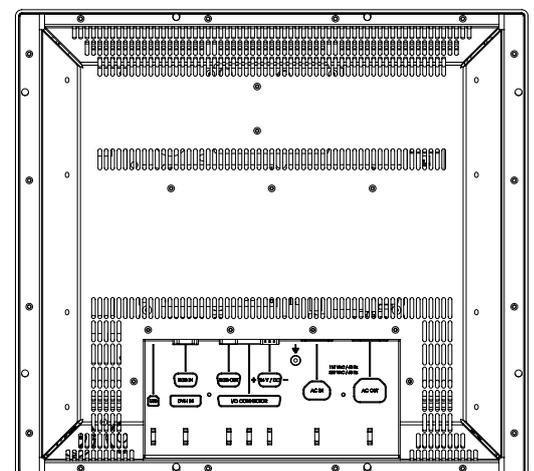
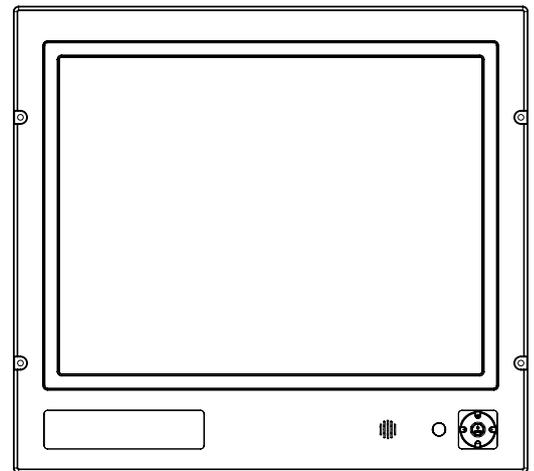
Together with advanced anti-glare coatings, bonding enables you to see your display in bright sunlight without the need for extensive backlighting, which can cause overheating and a shorter product life cycle.

Series 1 introduces a number of signal input/output options, which can be increased by using the Multifunction Cable. Further customized cables are available to ensure that you can interface everything you need to with the greatest of ease.

All Series 1 models are built to last and designed to be reliable in harsh environments, while providing the performance and flexibility you expect. They are perfectly suited to use aboard a wide range of vessels including commercial ships, workboats, coast guard boats and navy ships.

## A new generation of innovative, rugged marine displays.....

- TYPE APPROVED
- ECDIS COMPLIANT
- NEW CONNECTIVITY
- NEW FUNCTIONALITY
- FORM, FIT AND FUNCTION
- SUPERIOR BONDING TECHNOLOGY

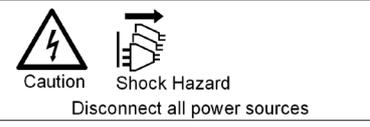


# Product Labeling

## Introduction

This section details the locations, content details and specifications for factory mounted labels for all currently available standard Hatteland Technology Maritime Multi Display (MMD) - Series 1 models. This information will in most cases also apply for most Customized Models as well, but may differ based on customer requirements, in that case, please refer to the customized User Manual (paper or electronic version, dependent on customer requirements).

## Label Size and Types

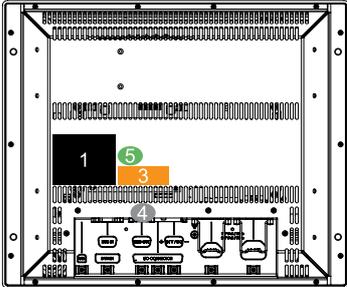
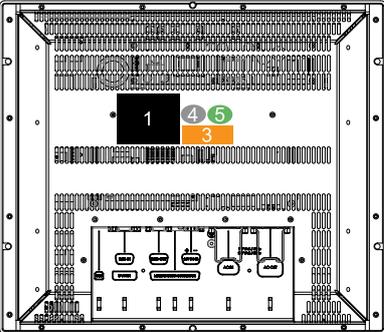
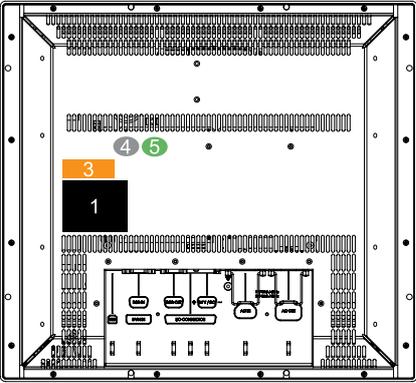
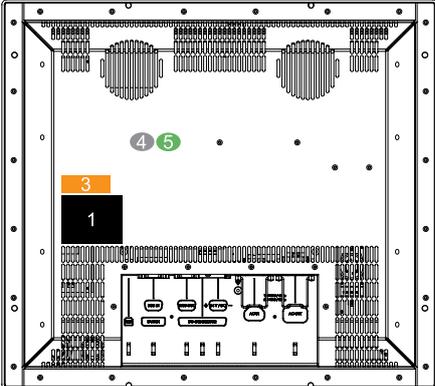
ID	Label Layout	Description	Specification
1		<p><b>Type</b> : Serial Number Label  <b>Name</b> : Label D  <b>Size</b> : 75mm wide x 60mm high (square size)            Note: Text content of label will match specifications derived from Data Sheet.</p> <p><b>Barcode type:</b> CODE128 (used extensively world wide in shipping and packaging industries. The symbology was formerly defined as ISO/IEC 15417:2007.)</p>	Silver with glue on back, non-tearable and made for thermal transfer printing.
3		<p><b>Type</b> : Touch Screen Label  <b>Name</b> : Label B  <b>Size</b> : 60mm wide x 20mm high (rectangle size)            Note: Only present if Touch Screen was part of factory option order.</p> <p><b>Note:</b> Content on label will vary based on Touch Screen type and/or Touch Screen Controller. Label shown to the right is for illustration purposes only!</p>	Silver with glue on back, non-tearable and made for thermal transfer printing.
4		<p><b>Type</b> : Warranty Label  <b>Size</b> : 30mm wide x 23mm high (oval size)</p>	Tamper-proof sticker with glue on back.
5		<p><b>Type</b> : Quality Control (QC) Label  <b>Size</b> : 30mm wide x 23mm high (oval size)</p>	Ordinary sticker with glue on back.
7		<p><b>Type</b> : Handling Symbols Label  <b>Size</b> : 16mm wide x 8mm high (rectangle size)            Symbols indicate Cadmium Free product and proper waste handling required.</p>	FLEXcon@PHARMcal@V 400 F WhiteTC-848V-23 TRACrite™ 150
8		<p><b>Type</b> : Shock Hazard Caution Label  <b>Name</b> : Label B  <b>Size</b> : 60mm wide x 20mm high (rectangle size)</p> <p>Rules specified in IEC62368-1:2018 chapter 5.7.6. Applies for units with Dual/Multi-Power inputs only (more than 1 Power Input).</p>	Silver with glue on back, non-tearable and made for thermal transfer printing.

Please note that typenumber shown above is a generic sample only. May not reflect products mentioned in this manual. Please review actual product S/N label.

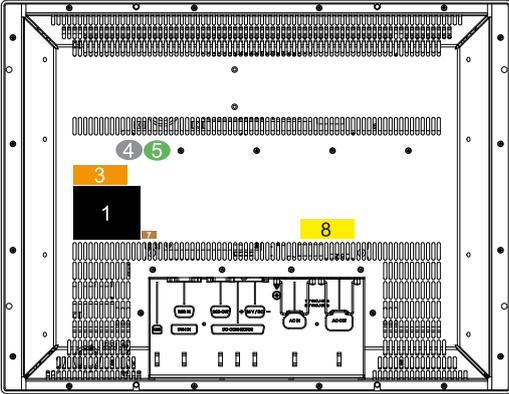
# Product Labeling

## Label Locations

Number ID and coloring based on “Label Size and Types” table from previous page. All illustrations below are seen from rear (and side where needed) with connectors facing down. Actual labels regarding its size and text orientation vs product size is drawn in. Due to space restrictions on selected units, some labels will be rotated 90 degrees to fit properly. The arrangement of labels may be shifted/stacked differently as it is based on factory options, such as; Touch Screen, but they will be grouped together where possible.

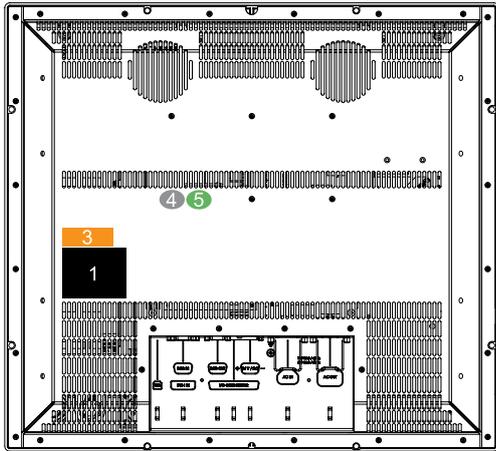
Label Positions	Notes	Applies for Product Range
	<p>Warranty label covers screw and are bent over edge onto terminal connector plate (due to space restrictions). Labels placed on rear.</p>	<p><b>JH 15T17 MMD-xxx-Axxx</b></p>
	<p>Warranty label covers screw. Labels placed on rear.</p>	<p><b>JH 19T14 MMD-xxx-Sxxx</b> (Slim frame)</p>
	<p>Warranty label covers screw. Labels placed on rear.</p>	<p><b>JH 19T14 MMD-xxx-Axxx</b></p>
	<p>Warranty label covers screw. Labels placed on rear.</p>	<p><b>JH 20T17 MMD-xxx-Axxx</b></p>

# Product Labeling



Warranty label covers screw.  
Labels placed on rear.

**JH 22T11 MMD-xxx-Axxx**



Warranty label covers screw.  
Labels placed on rear.

**JH 23T14 MMD-xxx-Axxx**

# Product Labeling

## Warranty Label

If you are to perform service on a unit still under warranty, any warranty will be void if this label shows signs of removal attempts or damaged by screw driver. This label is located on the back of the product and covers a key screw. This is to aid service departments in determining if there has been any unauthorized service on a unit still under warranty.

## Quality Control (QC) Label

This label indicates that the unit is produced, tested and packed according to the manufacturer's QA specifications. It will include a Personal ID and signature by the personnel responsible for approving the unit in production, testing and warehouse departments.

## Handling Symbols Label

Ecodesign Requirements for Electronic Displays. The European Union published the Regulation 2019/2021 with specific environmental ecodesign requirements for various types of electronic displays, such as TVs, monitors, and digital signage displays.

Reference: <https://www.enviropass.ca/2021/03/01/5-ecodesign-requirements-for-electronic-displays/>

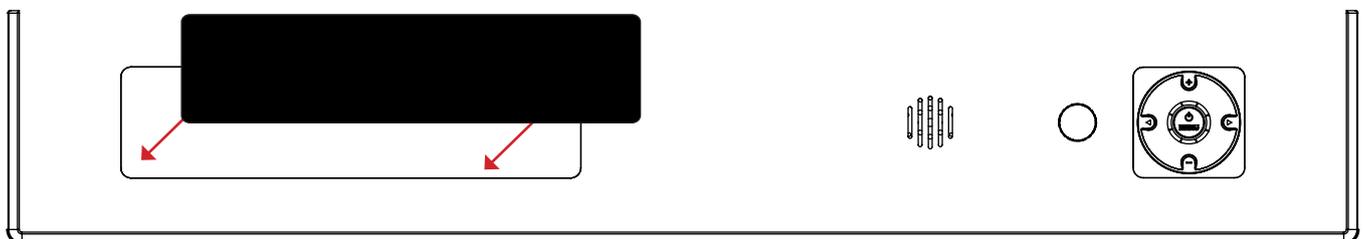
## Serial Number Label Layout (example)



Please note that typenumber shown above is a generic sample only. May not reflect products mentioned in this manual. Please review actual product S/N label.

## Front Logo Label

The front frame bezel design offers an area for customized logo label. These labels can be ordered and customized with your own logo delivered from us. The measurements are as follows.



WxH = 181.66 x 44.16mm / 7.15" x 1.74". R4.10 - 4 places in each corner. Depth of area is 0.5mm.

# Touch Screen products

## Introduction to products with Touch Screen

Both Resistive and Capacitive touch screen solutions are used for our products. Please review specifications found in this manual or our website to find your exact type number and then determine if it uses Resistive or Capacitive.

### Capacitive Touch screen

The glass overlay has a coating that stores the charge deposited over its surface electrically. It will not operate with either a gloved hand or with a mechanical stylus. Capacitive touch screens operate by applying a small amount of voltage to each corner of the touch screen. When the screen is touched by a human finger it draws a minute amount of current to the X,Y point of contact. This location is calculated by the touch screen controller and transmitted back to the computer connected to the touch screen controller.

### CAPACITIVE - Brief Specifications

Subject	Details
Construction	<b>Top:</b> ClearTek protective overcoat protects the sensors and increase durability. <b>Inside:</b> Electrode X/Y grid pattern and conductive coating. <b>Bottom:</b> Glass and conductive coating. Small amount of voltage is applied to the four corners for measuring X and Y coordinates of the touch point.
Positional Accuracy	Reported touch coordinates are within 1.0% of true position. (Based on viewing area dimensions)
Touch Contact Requirements	3 ms for finger input.
Endurance Tested	More than 225 million touches in one location without noticeable degradation to the surface.
Cleaning	Water, isopropyl, alcohol, and similar non-abrasive cleaners.
Liquid Resistance	Liquids on screen does not impede touchscreen performance.
Light Transmission	Up to 88% at 550 nm; dependant on specific surface finish chosen.

### Resistive Touch screen

It generally uses a display overlay composed of layers, each with a conductive coating on the interior surface. Special separator "dots" are distributed evenly across the active area and separate the conductive interior layers. The pressure from using either a mechanical stylus or finger produces an internal electrical contact at the "action point" which supplies the controller with vertical and horizontal analog voltages for data input. The resistive touch screens are anti-glare to reduce reflective shine intensity, which will slightly diffuse the light output throughout the screen. Resistive technology activation can be initiated by; a gloved hand, fingernail, mechanical stylus or an ungloved finger.

### RESISTIVE - Brief Specifications

Subject	Details
Construction	<b>Top:</b> Polyester with outside hard-surface coating with clear or anti-glare finish. <b>Inside:</b> Transparent conductive coating. <b>Bottom:</b> Glass substrate with uniform conductive coating. Top and bottom layers separated by separator dots.
Positional Accuracy	Standard deviation of error is less than +/- 0.080-inch (2mm).
Touch Activation Force	Typically 57 to 133 g
Expected Life Performance	More than 35 million touches in one location without failure, using a stylus similar to a finger.
Cleaning	Water, isopropyl, alcohol, and similar non-abrasive cleaners.
Chemical Resistance (Exposed for one hour)	Acetone, Common food and beverages, Hexane, Isopropyl alcohol, Methylene chloride, Methyl ethyl ketone, Mineral spirits, Turpentine
Light Transmission	Typically 75% over visible light spectrum.

## Touch Screen products

### Touch Screen Drivers and Documentation

For products manufactured and delivered with Touch Screen, suitable drivers are available on our website:

For current products:

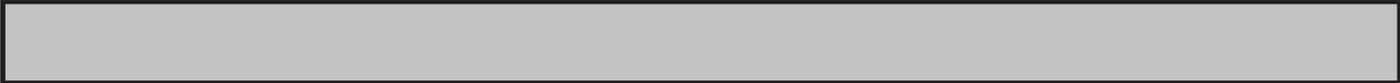
[https://www.hattelandtechnology.com/Series1\\_MMD\\_G1](https://www.hattelandtechnology.com/Series1_MMD_G1)

For Obsoleted products:

[https://www.hattelandtechnology.com/Series1\\_MMD\\_G1-Obsolete](https://www.hattelandtechnology.com/Series1_MMD_G1-Obsolete)

Choose model from the list presented. Once on a specific product, click the “Downloads” tab and scroll to find suitable drivers. Before using the touch screen, it should be calibrated for your system. Please install the 3rd party software and use the Calibrate function.

For additional touch controller/screen documentation and updated drivers, please review documents and material stored inside the 3rd party manufacturer driver packages.



# Installation

# General Installation Recommendations

## Installation and mounting

1. Most of our products are intended for various methods of installation or mounting (panel mounting, bracket mounting, ceiling/wall mounting etc.); for details, please see the relevant mechanical drawings.
2. Adequate ventilation is a necessary prerequisite for the life of the product. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.
3. Generally, do not install the unit in a horizontal position (laying down), as this will cause heat to build up inside the unit which will damage the LCD Panel. To prevent this problem we recommend installing the unit in a vertical position ( $\pm 30$  degrees) to improve the airflow through the unit.
4. To further improve the cooling of the unit we recommend installing Cooling Fans underneath blowing upwards into the unit air inlet. This may be required in high temperature applications and also when there is reason to expect temperature problems due to non-optimal way of mounting.
5. Exposure to extreme direct sunlight can cause a considerable increase in the temperature of the unit, and might under certain circumstances lead to excessive temperature. This point should already be taken into consideration when the bridge equipment is being planned (sun shades, distance from the windows, ventilation, etc.)
6. Space necessary for ventilation, for cable inlets, for the operating procedures and for maintenance, must be provided.
7. If the push buttons of the product are not illuminated, an external, dimmable illumination (IEC 60945 Ed. 4, 4.2.2.3, e.g. Goose neck light) is required for navigational use. The illumination should be free from glare and adjustable to extinction.
8. Information about necessary pull-relievers for cables is indicated in the Physical Connection section of this manual. Attention must be paid to this information so that cable breaks will not occur, e.g. during service work.
9. Do not paint the product. The surface treatment influences the excess heat transfer. Painting, labels or other surface treatments that differ from the factory default, might cause overheating.
10. Exposure to heavy vibration and acoustic noise might under certain circumstances affect functionality and expected lifetime. This must be considered during system assembly and installation. Mounting position must be carefully selected to avoid any exposure of amplified vibration.

## General mounting instructions

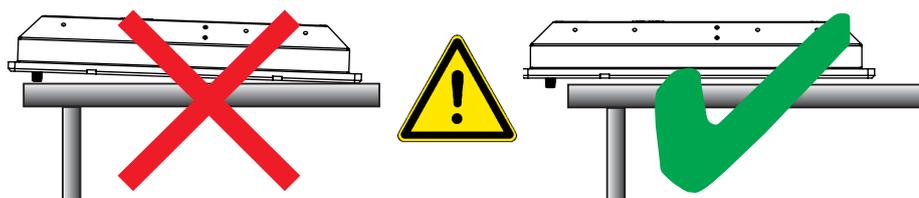
1. The useful life of the components of all Electronics Units generally decreases with increasing ambient temperature; it is therefore advisable to install such units in air-conditioned rooms. If there are no such facilities these rooms must at least be dry, adequately ventilated and kept at a suitable temperature in order to prevent the formation of condensation inside the display unit.
2. With most Electronic Units, cooling takes place via the surface of the casing. The cooling must not be impaired by partial covering of the unit or by installation of the unit in a confined cabinet.
3. In the area of the wheel house, the distance of each electronics unit from the magnetic standard compass or the magnetic steering compass must not be less than the permitted magnetic protection distance. This distance is measured from the centre of the magnetic system of the compass to the nearest point on the corresponding unit concerned.
4. Units which are to be used on the bridge wing must be installed inside the "wing control console" protected against the weather. In order to avoid misting of the viewing screen, a 25 ... 50 W console-heating (power depending on the volume) is recommended.
5. When selecting the site of a display unit, the maximum cable lengths have to be considered.

## General Installation Recommendations

- When a product is being installed, the surface base or bulkhead must be checked to ensure that it is flat in order to avoid twisting of the unit when the fixing screws are tightened, because such twisting would impair mechanical functions. Any unevenness should be compensated for by means of spacing-washers.
- Products with AC input must be grounded to protective Earth (Safety Ground) when necessary via the bolt (usually on terminal plate) available on the product.  
Products with DC input must be grounded to protective Earth (Safety Ground) via the bolt (usually on terminal plate) available on the product.  
A shorter and thicker cable gives better grounding. A 6mm<sup>2</sup> is recommended, but a 4mm<sup>2</sup> or even 2.5mm<sup>2</sup> can be used for this purpose.
- Transportation damage, even if apparently insignificant at first glance, must immediately be examined and be reported to the freight carrier. The moment of setting-to-work of the equipment is too late, not only for reporting the damage but also for the supply of replacements.
- The classification is only valid for approved mounting brackets provided by Hatteland Technology. The unit shall be mounted stand-alone without any devices or loose parts placed at or nearby the unit. Any other type of mounting might require test and re-classification.

### Brightness knob precaution

Applies for models with potmeter knob. Please be aware of the risk of breaking or bending the brightness knob. The brightness knob should be free of any obstruction.



### Ergonomics

- Adjust the unit height so that the top of the screen is at or below eye level. Your eyes should look slightly downwards when viewing the middle of the screen.
- Adjust screen inclination to allow the angle of gaze to remain at the centre of the screen approximately perpendicular to the line of gaze.
- When products are to be operated both from a sitting position and from a standing position, a screen inclination of about 30° to 40° (from a vertical plane) has turned out to be favourable.
- The brightness of displays is limited. Sunlight passing directly through the bridge windows - or its reflection - which falls upon the screen workplaces must be reduced by suitable means (negatively inclined window surfaces, benetian blinds, distance from the windows, dark colouring of the deckhead). However, Series 1 can be offered with optical enhanced technology to reduce reflections and are viewable in direct sun light, but as a general rule the units at the bridge wing area are recommended to be installed or mounted by suitable alignment or bulkhead / deckhead mounting in such a way that reflections of light from the front pane of the display are not directed into the observer's viewing direction.
- The use of ordinary commercial filter plates or filter films is not permitted for items of equipment that require approval (by optical effects, "aids" of that kind can suppress small radar targets, for example).
- For ECDIS applications, the minimum recommended viewing distance are as follows:  
(IEC62288, Part 7.5 Screen resolution)

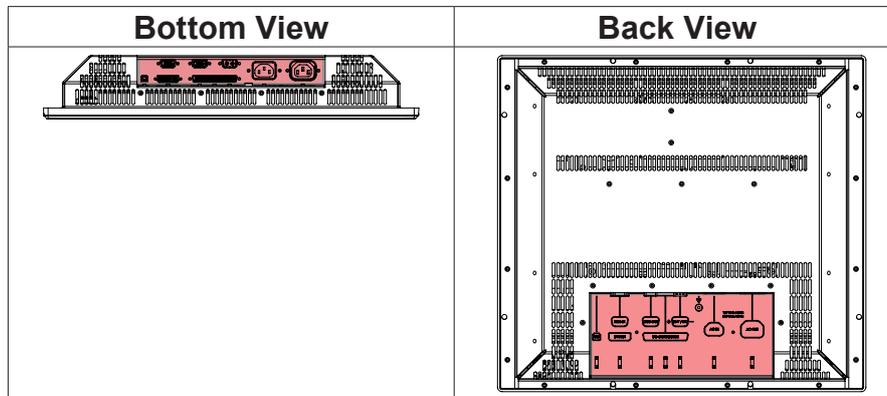
19 inch = 1011mm	20 inch = 878mm	22 inch = 1011mm	23 inch = 1011mm		
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# General Installation Recommendations

## Cables

Use only high quality shielded signal cables and the provided Multifunction Cable.

### Cable Entries & Connectors (Marked area) - Illustration only



The cable should generally be kept as short as possible to provide a high quality input/output. The maximum signal cable length will depend not only on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar. Recommended refresh rate is 60Hz. Cables up to 10 meters generally provides good picture quality even with a 1600x1200 (UXGA) 60Hz signal. In most cases (especially with lower resolutions) even longer cables will provide a satisfactory result. This should however be tested in advance before making the decision on how far the unit can be placed from the signal source.

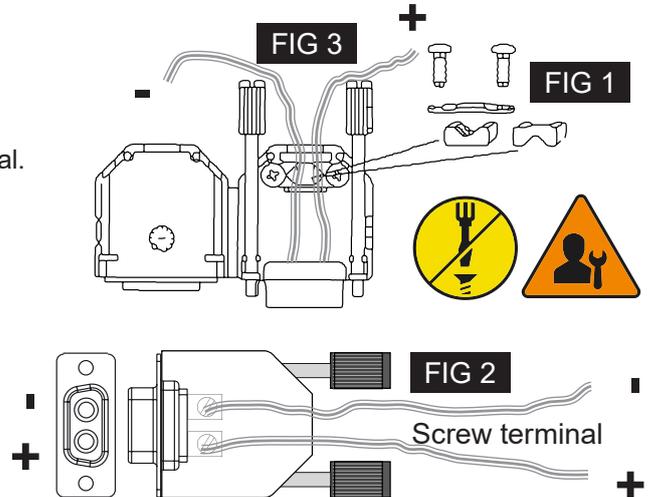
### Configuring DC power input housing connector

**Note: Only applicable for certain models!**

For installations that require DC power input, use the provided 2-pin DC Power Input housing with internal cable screw terminal.

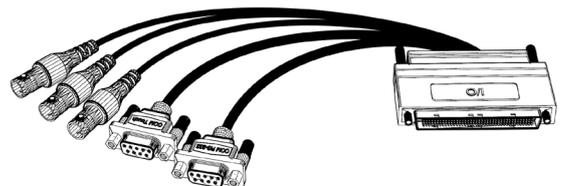
- 1: Open the housing
- 2: Unmount the fasteners. (FIG 1)
- 3: Mount power cables to screw terminal (FIG 2). Note polarity!
- 4: Secure the cable tightly with fasteners (FIG 3, FIG 1)
- 5: Close the housing

Note: Please check polarity before connecting any cables to the screw terminal.



## Multifunction Cables

This custom Multifunction Cable with its 160 pins offers a wide range of additional signal types to be used together with the display units. Please refer to the Contents of Package in this manual to determine which cable and connector functionality you received.



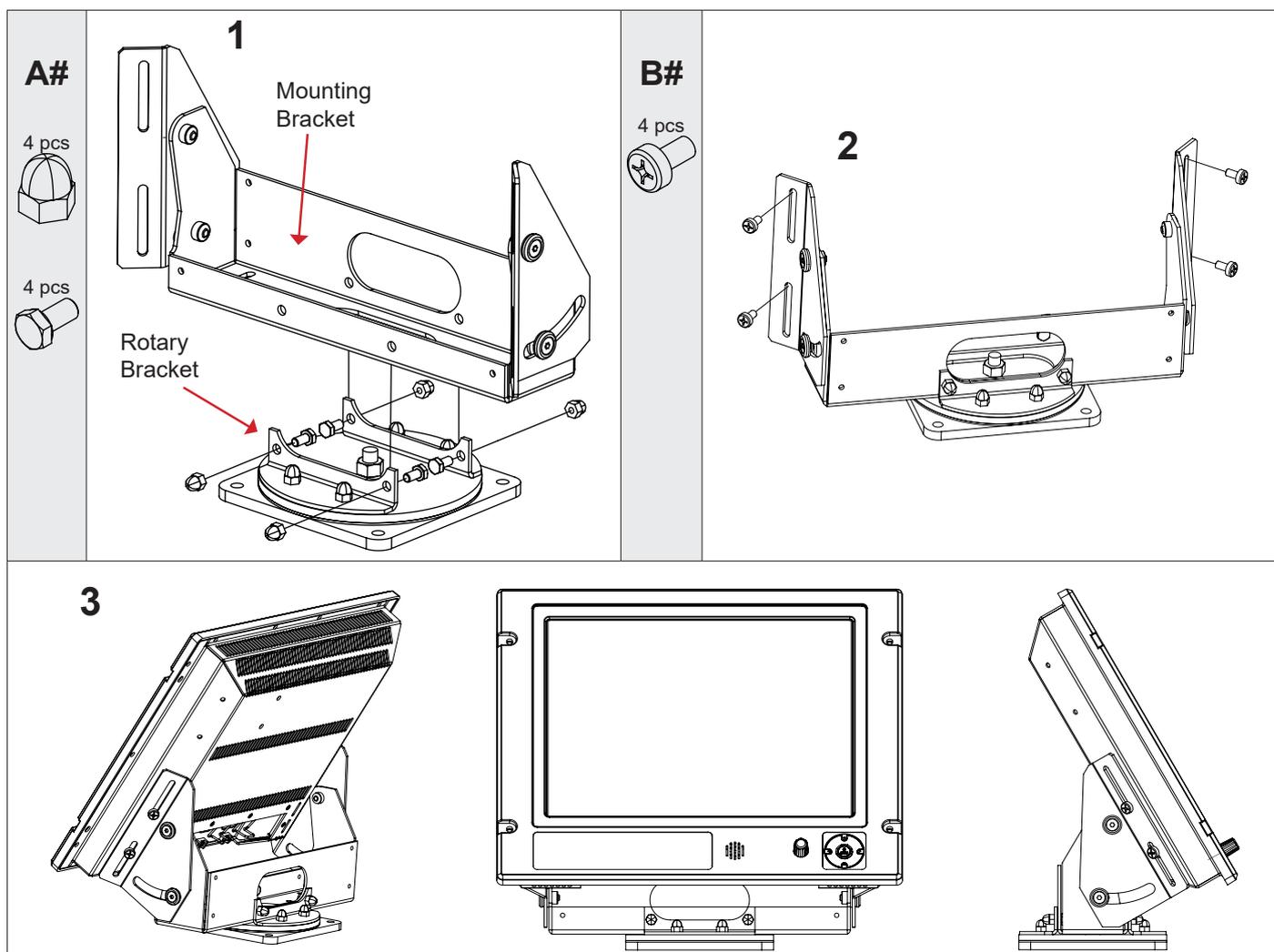
The cable could also be customized upon customer request for length or to support other signal types and connectors. Using any other cable/housing design to connect to the display units could result in severe damage to components!



## Rotary Bracket and Mounting Bracket (15 inch) combined assembling

Illustration shows "Mounting Bracket JH 15TBR STD-A1" and "Rotary Bracket JH 15TRO STD-A1" combined. The brackets are available separately and are delivered in parts. Some disassembly/assembly is required. Use the provided screws/bolts/nuts included in the package. A stand-alone "Rotary Bracket" can not be mounted to a Display or Panel Computer unit without the "Mounting Bracket" as base first. For alternative drawings/measurements of the brackets, review sales drawing (available on internet or inside user manual).

You must provide your own bolts to secure the completed unit (FIG 3) to the mounting location. Recommended size to mount complete unit is: M10 and minimum 30mm in length. If no Rotary Bracket is present or needed, the Mounting Bracket should be mounted at location with M6 >20mm in length depending on material of table/desktop etc.

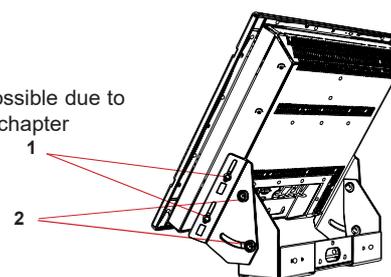


<b>A#</b>	4 pcs: Dome Nut M6, ISO7043, Black + Screw M6x12mm Din933 Black 145 060x012 ZBA
<b>B#</b>	4 pcs: M6 x 1 x 12mm Cross Head Screw (to mount bracket to product)

## Securing Mounting Bracket without Rotary Bracket

Note that the length of bolts should not exceed 12mm (ref: #2 in table above). Using any longer is not possible due to mechanical design inside which are designed to protect the electronics. Review also technical drawings chapter in the user manual for measurements and dimensions of brackets.

- # 1: Mount bolts on each side. Make adjustments before securing the bolts.
- # 2: Adjust the tilting angle and secure the bolts.



# General Installation Recommendations

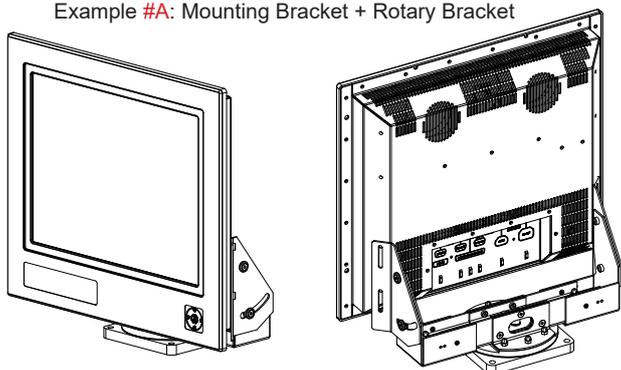


## Rotary Bracket and Mounting Bracket - assembling/finalization

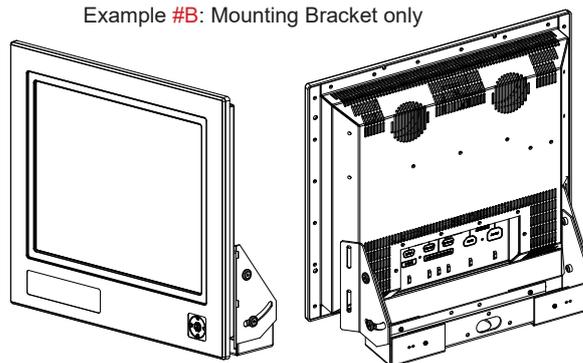
Illustration shows Mounting Bracket "JH MMDBR STD-A1" / "JH 23TBR T01" and "Rotary Bracket JH MMDRO STD-A1" combined and not combined. The brackets are available separately and may be delivered in parts. Some disassembly/assembly is required. Use the provided screws/bolts/nuts included in the package. A stand-alone "Rotary Bracket" can not be mounted to a Display or Panel Computer unit without the "Mounting Bracket" as base first. For alternative drawings / measurements of the brackets, review sales drawing (available on internet or inside user manual). The procedure applies for Display and Panel Computers of sizes: 17, 18, 19, 20 and 23 inch.

You must provide your own bolts to secure the completed unit (#A) to the mounting location. Recommended size to mount complete unit is: M10 and minimum 30mm in length. If no Rotary Bracket is present or needed, the completed unit (#B) should be mounted at location with M6 >20mm in length depending on material of table/desktop etc.

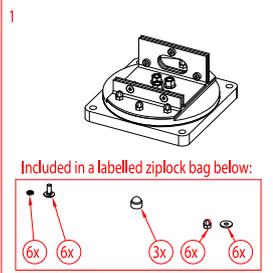
Example #A: Mounting Bracket + Rotary Bracket



Example #B: Mounting Bracket only



### Contents of kit JH MMDRO STD-A1



### JH MMDBR STD-A1

Fasteners in JH MMDBR STD-A1 Kit Included in a labelled ziplock bag. Should be used to mount display using cutouts as shown.



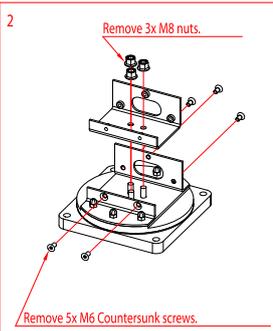
All fasteners are black RAL9011 or equivalent.

ID Refer.	Description	Type/number	Note
1+5	4 x DIN 7980 M6x1,6mm	PO21744	
1+5	4 x DIN603 M6x1,6	PO21676	
1+7	3 x ISO7043 M8 SW13 Plastic Cap (Dust Caps)	PO21748	
1+5	4 x DIN1587 M6	PO21644	
1+5	4 x DIN9021 Washer 6,4mm	PO21743	
2+7	5 x DIN 7991 M6x12 - Countersunk Screws	PO21673	
3+4+5	4 x DIN 7985A M4x10	PO21662	
2+4	3 x ISO7043 M8 Nut	PO21645	
8	4 x DIN7985A M6x12	PO21660	Comes with JH MMDBR STD-A1 Kit

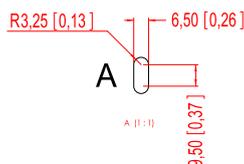
Fastener Size	Torque to be used
M4	1.8 ± 0.2Nm (16 ± 2 lbf-in)
M6	7.5 ± 1.0Nm (66 ± 9 lbf-in)
M8	15.3 ± 1.7Nm (135 ± 15 lbf-in)

Creation date / by:  
Last rev date / by:

### Pre-assembly:

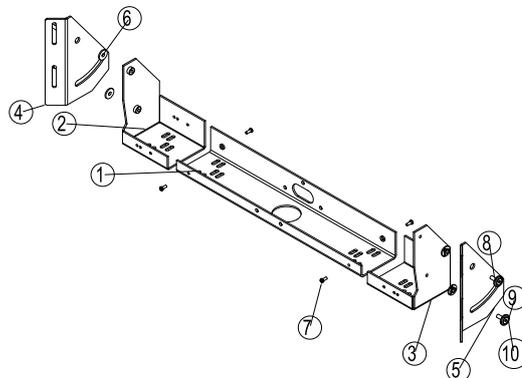


### JH 23TBR T01

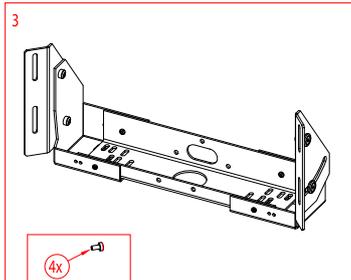


Mounting screws through 6 x holes as indicated above. M6 x >20mm is suggested based on material. Screws not included.

Pos.nr	Antal	Beskrivelse	ID	Materiale
1	1	Bracket skinne	3D004BRS-A2	Aluminium 3mm
2	1	brakettfeste høyre	P000175-1	Aluminium
3	1	brakettfeste venstre	P000175-2	Aluminium
4	1	brakett høyre	P000180-1	Aluminium
5	1	brakett venstre	P000180-2	Aluminium
6	4	Skive mellom brakett og brakettfeste	P000202-1	
7	4	DIN 7985A M4 X 0,7 10 NONE	M4 X 0,7 X 10	
8	4	Flatskive 17W07191	P000197-1	
9	4	underlagsskive M6x1,5mm 48506	P000200-1	
10	4	DIN 7981 M6 X 1 20 NONE	M6 X 1 X 20 HEX	



### Contents of kit JH MMDBR STD-A1



### Tip:

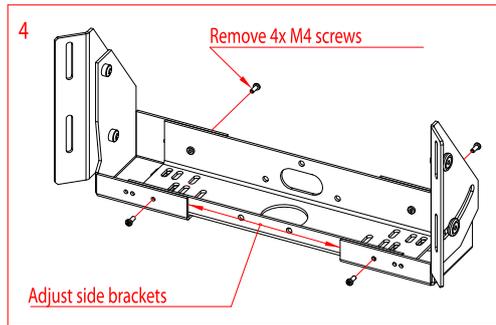
If you need to combine Mounting Bracket "JH MMDBR STD-A1" / "JH 23TBR T01" with Rotary Bracket "JH MMDRO STD-A1" onto Display or Panel Computer unit, please follow Step 1 to 8.

If you need to mount only Mounting Bracket "JH MMDBR STD-A1" to unit, please follow Step 3-4 and Step 5 (re-attach 4 x screws after adjustment based on product size).

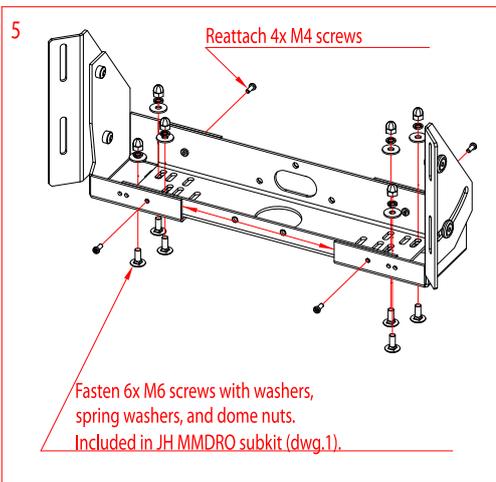
# General Installation Recommendations



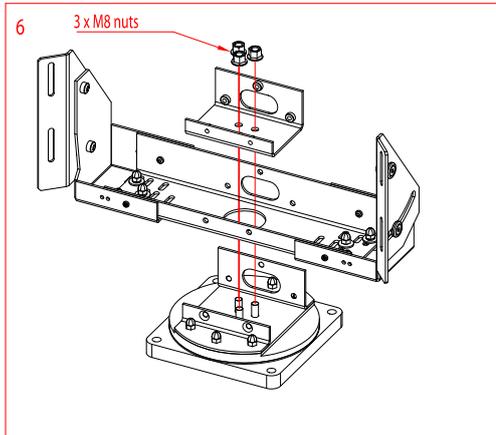
Width adjustment (17"-20"):



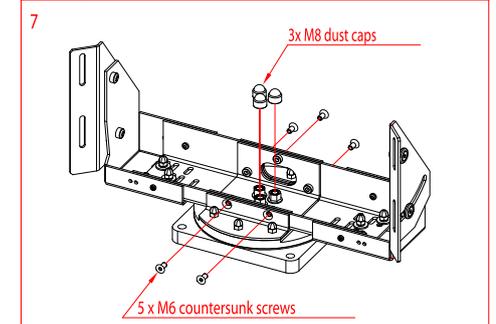
Fastening after width adjustment:



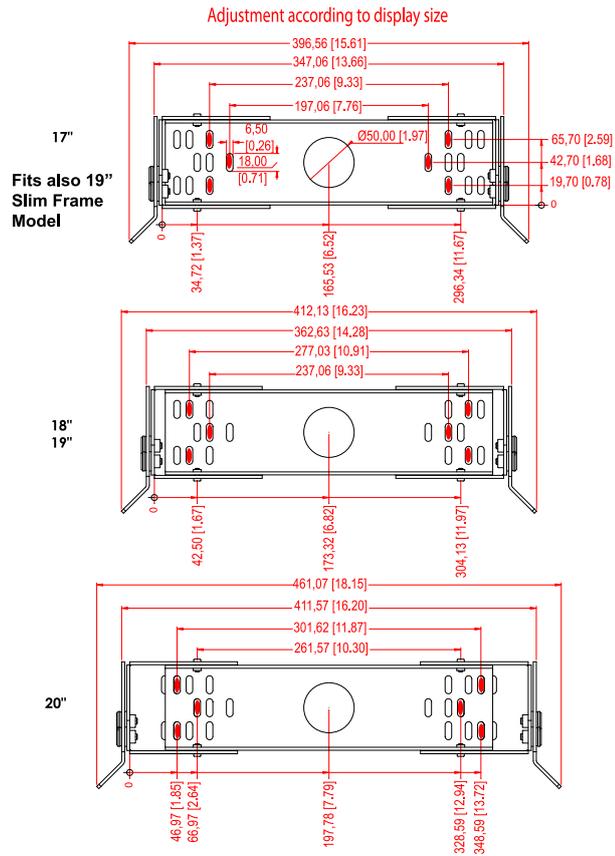
Assembly MMDRO and MMDBR:



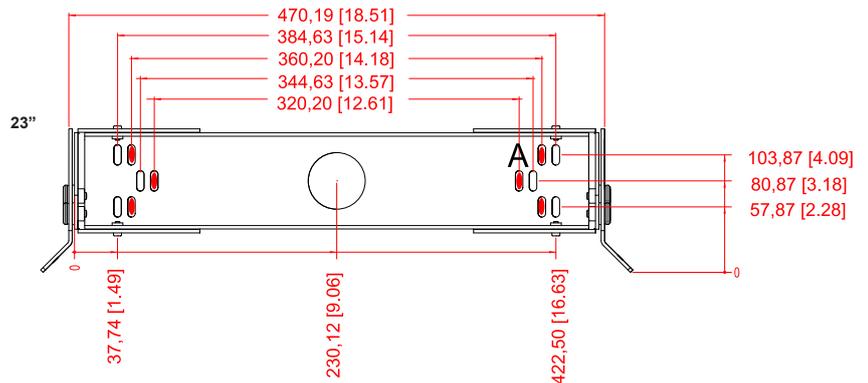
Assembly MMDRO and MMDBR continued:



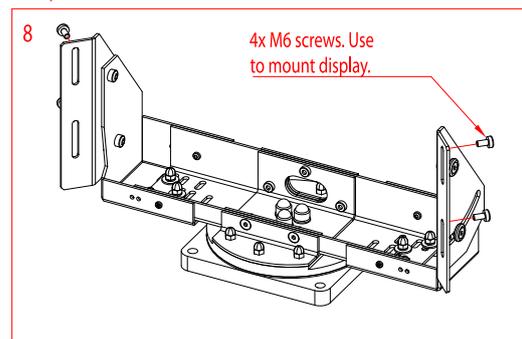
## JH MMDBR STD-A1



## JH 23TBR T01

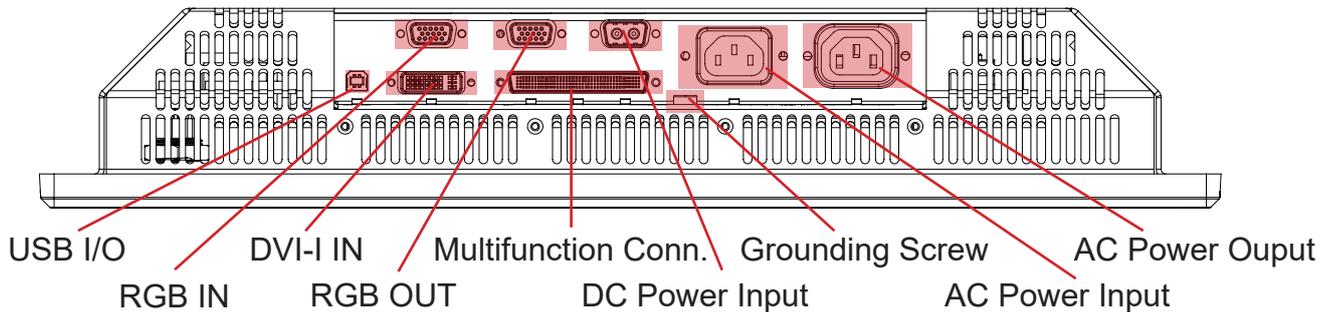


Completed JH MMDRO STD-A1.



# Physical Connections

## Connection area of unit (illustration)



### Cable Tension

To reduce tension on the cables you connect, secure them with a cable tie to the base mounted clamp or to the chassis hinges.

For certain units a base mounted clamp is available (FIG 1). For other models a hinge in the chassis is available (FIG 2).

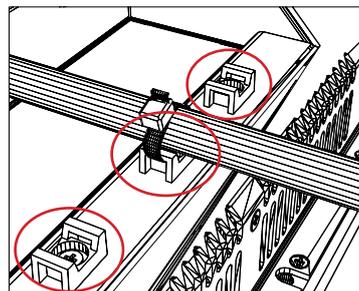


FIG 1

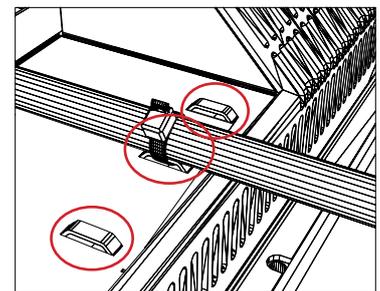


FIG 2



### GROUNDING SCREW:

Please review "General Installation Chapter", pt. 7 for more information.

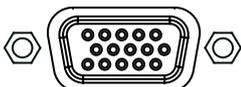
Note for Grounding Screws:

Standard Grounding Screw/Bolt provided by Hatteland Technology is "Pan head screws M4x8mm w/spring and plain washer".



### USB I/O:

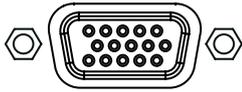
This USB TYPE B connector is reserved for customized solutions. One customized example could be to connect it to a computer USB connection via a TYPE B-A cable and then accessing it via a front USB TYPE A connector on the front frame bezel to utilize a mouse or other control device.



### RGB IN:

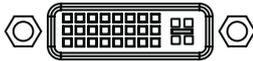
Connect the VGA cable to the D-SUB 15P Connector (female). Secure the VGA cable to the hex spacers provided on the unit and make sure you do not bend any of the pins inside the connector when connecting. Connect the other end of the cable to the VGA connector on your equipment and secure it.

## Physical Connections



### RGB OUT:

RGB OUT enables a direct clone of the incoming VGA (RGB1) signal. Connect the cable to the D-SUB 15P Connector (female) and secure it to the hex spacers provided on the unit. Connect the other end to your equipment and secure it. Note that DVI inputs is NOT cloned, even though if the DVI-I connector has been configured with the DVI-I > RGB adapter to use a RGB signal as input.

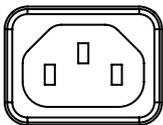


### DVI-I IN:

Connect your DVI cable to the DVI-I 29P Connector (female). The DVI-I connector can function as regular RGB IN by using a DVI-I > RGB/VGA adapter. Secure the DVI cable to the hex spacers provided on the unit and make sure you do not bend any of the pins inside the connector. Connect the other end of the cable to the DVI connector on your equipment and secure it.

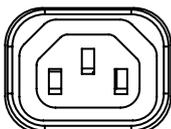
### Important note for DVI signal detection:

*Please note that for the operating system to detect DVI signals correctly, the DVI cable MUST be connected physically to the unit during boot up otherwise you may experience a black image. Furthermore certain graphics drivers may need to refresh their device list (often done manually by user - detect devices), while in some cases the Plug-n-Play will automatically detect the DVI signal correctly. Please consult your local technician if you have this behavior of detection problems when using DVI. In all cases the problem can be solved in the operating system, and this is not a malfunction in the graphic controller for units.*



### POWER INPUT: (For units supporting AC input)

The internal AC power module supports both 115VAC/60Hz and 230VAC/50Hz power input. Please check specifications for your unit.



### POWER OUTPUT: (For units supporting AC output)

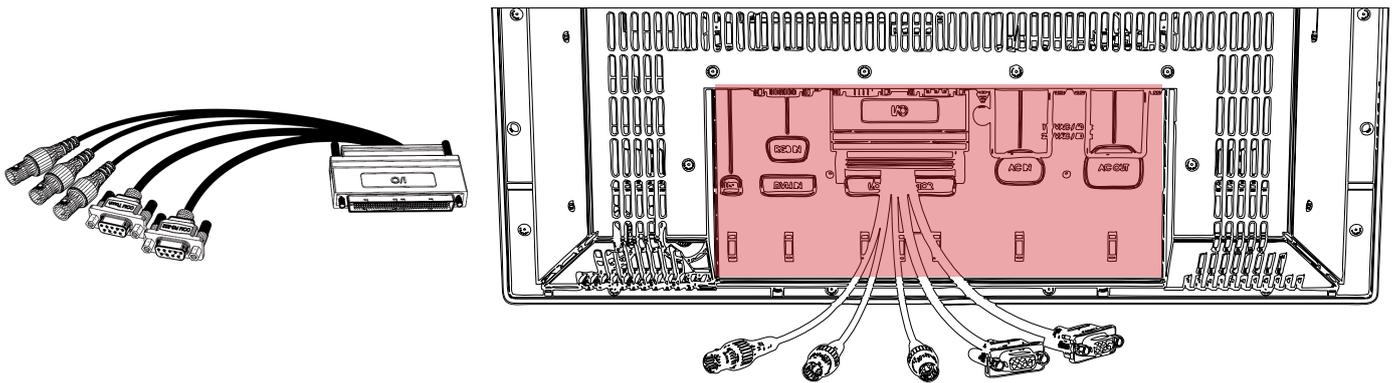
The internal AC power module supports both 115VAC/60Hz and 230VAC/50Hz power input. Please check specifications for your unit.



### POWER INPUT: (For units supporting DC input)

Connect your DC power cable to the 2P Amphenol FCC17 D-SUB Connector (male). Secure the cable to the hex spacers provided on the unit, and secure the other end to your power supply. The internal DC power module supports 24VDC. Please check specifications for your unit.

## Physical Connections



Note: Other Multifunction Cables may include other connections based on a customized solution.

### **Multi-power note:** (For units supporting AC & DC input simultaneously)

The unit has a dual input power supply which will accept both AC and DC input. If both inputs are connected, the unit will be powered by AC. If AC is disconnected it will automatically switch over to DC without affecting the operation of the unit. This makes it possible to use AC power as primary power and a 24V battery as secondary power, eliminating the need for expensive UPS systems.

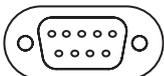
### **MULTIFUNCTION CONNECTOR:**

Mount the 160 PIN cable connector (male) to the 160 PIN connector (female) on the back of the unit as indicated above. Make sure you fasten it firmly with the provided housing screws to the hex spacers provided on the unit. By using this cable you can access more signal types than already present by the factory mounted connectors. By factory standards two cables are available. One for non-touch screen based unit and one for units with factory mounted touch screen. From this cable you can now have access to the following signal types described below.



### **3 x COMPOSITE IN/VIDEO IN (if present):**

Connect your BNC cable connector (male) to any of the 3 available BNC Connectors (female) on the unit. This will allow 3 different video signals from i.e. cameras & dvd players to be visible on screen either as full screen video or Picture-In-Picture/Picture-By-Picture. To activate any of these functionalities, the unit must be configured via the OSD menu (see own chapter). PAL / NTSC / SECAM VIDEO signal formats supported.

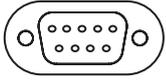


### **COM RS-232 (if present):**

This 9P COM connector provides additional functionality for the unit. The Serial Remote Control features a RS232 interface for controlling internal MMD parameters like brightness. You can access most of the parameters available in the OSD menu and with special commands control the unit externally.

An in-depth manual is available at <https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-3.htm>. This COM can also be used to upgrade the firmware for the graphic controller inside the unit which is available on request and through service channels (for qualified personell only).

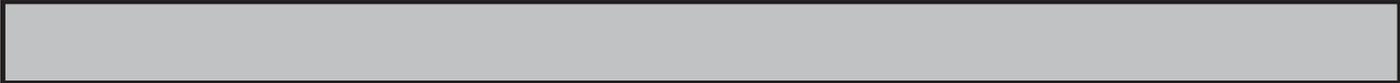
## Physical Connections



### **COM TOUCH** (if present):

This 9P COM connector provides touch screen communication for units that have been equipped with a factory mounted touch screen. It should be connected to a computer with touch screen drivers installed. See the touch screen chapter in this manual for more information.

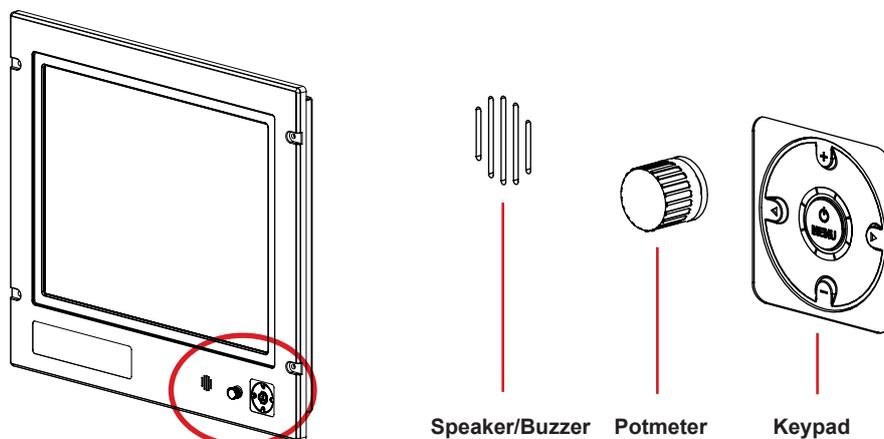
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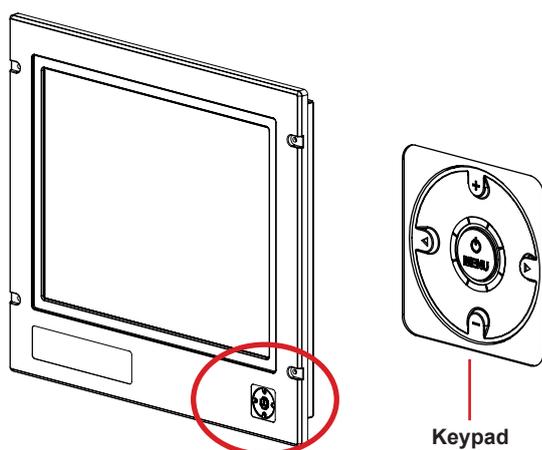
# Operation

## USER CONTROLS OVERVIEW

The units are available in two different factory user control configurations as illustrated below.



#1: Potmeter & buzzer (introduced Q4 2008) including keypad controls with its Status LED Ring. Brightness for the unit is adjusted by using the potmeter. The tactile keypad control provide access to the configuration menu and Direct Access / Hotkeys functionality. The speaker/buzzer function provide audible alarm functionality routed via the Multifunction Cable.



#2: The tactile only keypad controls with 5 push buttons (introduced Q2 2007) and the Status LED Ring. The keypad provide the user to control brightness, access the configuration menu and use the Direct Access / Hotkeys functionality. The LED ring will provide feedback for various status or modes that the unit can or currently operates in.

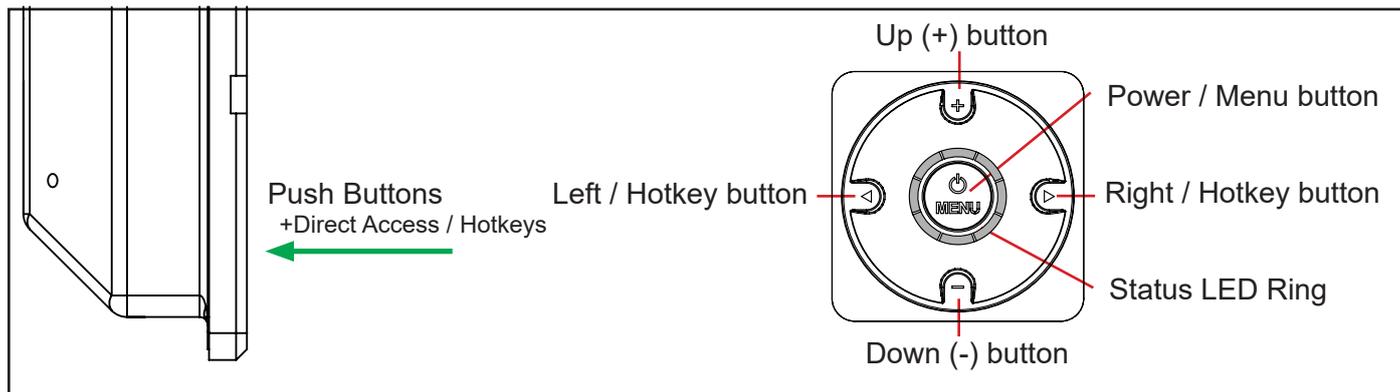
### **Power ON:**

To turn the unit on, push the navigator MENU button inwards and release it instantly. The unit will start searching for signal sources. A green led will move around the led ring to indicate the search procedure. Please consult the STATUS LED overview later in this chapter for the various LED patterns that can occur.

### **Power OFF:**

To turn the unit off, push the navigator MENU button inwards and hold it down for 6 seconds. After the first 3 seconds the menu will appear. 3 seconds later the unit is turned off and all LED indicators will turn red. You can now release the power button. Please consult the STATUS LED overview on the next page for the various LED patterns that can occur.

## KEYPAD FUNCTIONALITY



### **MENU** function as:

Power On/Off & On Screen Display (OSD) menu access.

### **LEFT (◀)** function as:

Direct Access / Hotkey, exit the current function and navigate to the previous OSD menu.

### **RIGHT (▶)** function as:

Direct Access / Hotkey, enter sub-menu & execute/set selected function.

### **UP (+)** function as:

Increase brightness, adjust positive values, visual movement, OSD menu navigating upwards & confirm.

### **DOWN (-)** function as:

Decrease brightness, adjust negative values, visual movement, OSD menu navigating downwards & confirm.

## **DIRECT ACCESS / HOTKEY FUNCTION**

You can access a number of functions from within the OSD Menu which is normally only accessible by browsing through the OSD Menu and locate the function manually. The Direct Access function are assigned to the Left and Right buttons to function as hotkeys. Note that some functions are dual (increase/decrease) or just single (swap/next). Those with single functionality both the left and right keypad button will perform the same action.

To configure the Direct Access / Hotkeys functionality, just press one of the buttons inwards and release it instantly, detection time is immediate.

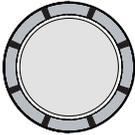
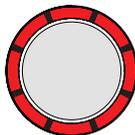
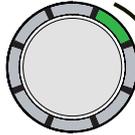
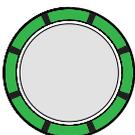
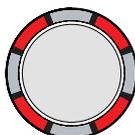
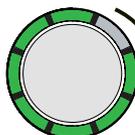
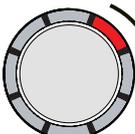
Available assigned functions for Direct Access are: **Brightness, PIP Size, Main Source, Second Source, Alpha Blend, Video Scaling, Swap Source, Test Pattern and No Function.**

Please review the "OSD Menu Function" chapter for configuring the direct access / hotkeys functionality.

# Status LED Overview

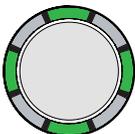
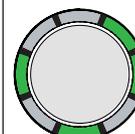
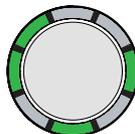
## Status LED Overview

The unit features a multi purpose indicator LED status ring which through different patterns. Realtime activity gives back the status of the signal detected, power on/off, calibration, menu activity and more. The LEDs are multicolored which either illuminate green or red, based on the activity.

<p><b>OFF (No power connected)</b></p>  <p>8 LED OFF</p>	<p><b>OFF (Standby, power detected)</b></p>  <p>8 RED LED STATIC ON</p>	<p><b>ON (Signal Search)</b></p>  <p>1 GREEN LED MOVEMENT looping.</p>
<p><b>ON (Signal OK)</b></p>  <p>8 GREEN LED STATIC ON</p>	<p><b>ON (No Signal)</b></p>  <p>4 RED LED STATIC ON</p>	<p><b>ON (Menu Delay)</b></p>  <p>7 GREEN LED STATIC + 1 LED OFF MOVEMENT doing 1 loop.</p>
<p><b>OFF (Shutdown)</b></p>  <p>1 RED LED MOVES for 3 sec. After additional 3 secs, all leds turns RED.</p>		

## For ECDIS Calibrated Products

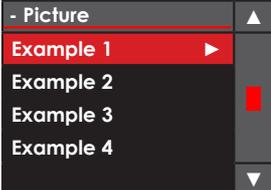
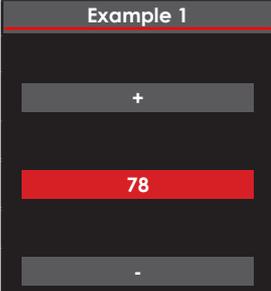
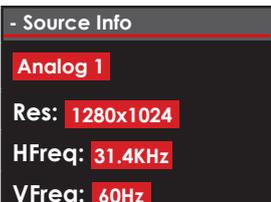
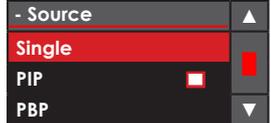
For units that are ECDIS calibrated from factory, the following LED pattern (Calibrated) indicates that the backlight/brightness is at calibrated level. **(Calibrated +)** or **(Calibrated -)** means that the brightness adjustment value is above or below the calibrated brightness level. Fine adjust the brightness in terms of decreasing or increasing the value until the pattern for **(Calibrated)** is reached.

<p><b>ON (Calibrated)</b></p>  <p>4 GREEN LED STATIC ON</p>	<p><b>ON (Calibrated +)</b></p>  <p>4 GREEN LED STATIC ON + where 1 show BRIGHTNESS INDICATION POSITION</p>	<p><b>ON (Calibrated -)</b></p>  <p>4 GREEN LED STATIC ON + where 1 show BRIGHTNESS INDICATION POSITION</p>
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# OSD Menu Overview

## OSD Menu Quick Start

To understand the workflow of the OSD menu, follow these steps for a quick start. The table shows the various OSD overlays you might encounter while navigating, adjusting parameters or when text messages are displayed. The OSD menu always remembers its last position which is indicated by the red bar.

<p><b>1</b> Press the <b>physical MENU</b> button for 3 sec. The OSD menu will pop-up as an overlay over the existing image on screen. All the available functions you can adjust or control are now available as an easy understandable menu structure.</p> <p>The current choice will be marked with a red selection bar.</p> <p>You can now navigate up or down in the menu with the <b>physical up/down buttons</b> (indicated as +/- symbols on the user control).</p> <p>To select a function, press the <b>physical right arrow button</b>. You will now enter the sub menu of that function or execute it (if its available).</p>	  <p>The arrow indicates either a sub-menu or function is available. It is now required to press the <b>physical right button</b> to access the function / sub-menu.</p>
<p><b>2</b> The top header will indicate what the contents of the menu group consists of. In this example “-Picture”. The previous menu will not be visible. To navigate to the previous menu, press the <b>physical left arrow button</b>.</p> <p>The first choice in the sub-menu will be marked with a red bar. Navigate with the <b>physical up/down buttons</b> (indicated as +/- symbols on the user control).</p> <p>To select a function, press the <b>physical right arrow button</b>. You will now enter the sub menu for that function or execute it (if its available).</p>	
<p><b>3</b> <i>Example of the adjust parameter OSD overlay:</i></p> <p>Use the <b>physical up/down</b> (indicated as +/- on the user control) buttons to adjust the value. All changes happen in real-time while adjusting these parameters and the number in the middle of the OSD will also change real-time.</p> <p>After you are satisfied with the value, press the <b>physical left arrow button</b> to store the parameter. Depending on the function, you will now either enter the previous menu or exit from it completely.</p>	
<p><b>4</b> <i>Example of the text information OSD overlay:</i></p> <p>After you have read the information displayed, press the <b>physical left arrow buttons</b> to enter the previous menu and exit the information displayed.</p>	
<p><b>5</b> <i>Example of the indicator symbol (white box):</i></p> <p>When you have several parameters to choose from, the white box will indicate which parameter are now currently activated. In this example; The “PIP” function is configured to be active.</p> <p>To activate any other function, just navigate to it press the <b>physical right arrow button</b>. The box will appear next to the text indicating it is activated.</p>	
<p><b>6</b> <i>Example of a non active function (greyed out text):</i></p> <p>Please note that certain functions may be disabled by factory default or by means of customized menu structure/product setup. These functions cannot be accessed or executed when they appear in gray text color. In this illustration the S-Video inputs are disabled in the OSD menu as the product does not have any physical S-Video input connectors.</p>	
<p><b>7</b> To exit from the OSD menu at any menu level or in any other OSD overlay, just press the <b>physical MENU button</b>. The menu will disappear, and the last setting adjusted will be stored. Alternatively you can wait for the OSD to reach time-out and exit automatically without user interaction. Parameters will be saved.</p>	

# OSD Menu Overview

## OSD Functions Map

The OSD menu consists of main function groups with sub menu groups. On the following pages a complete map of the available functions is shown. The following section should be viewed in color. Please note that the red selection bar is not indicated in any of the following illustrations.



**Please note: Factory default illustrations only! Available functions, icons and text may deviate slightly from actual OSD menu on your product due to different OSD software configurations and customized solutions.**

## OSD Passwords / Keycodes

If a requester appear asking for a password during entering the OSD menu, please use keycode: **3 2 1**  
This feature is required for ECDIS Compliance and may be factory default.

A different code may also be entered to enable the Full Menu mode, please use keycode: **1 5 8**  
Review the menu descriptions later in this manual for complete details for both the 321 and 158 codes.

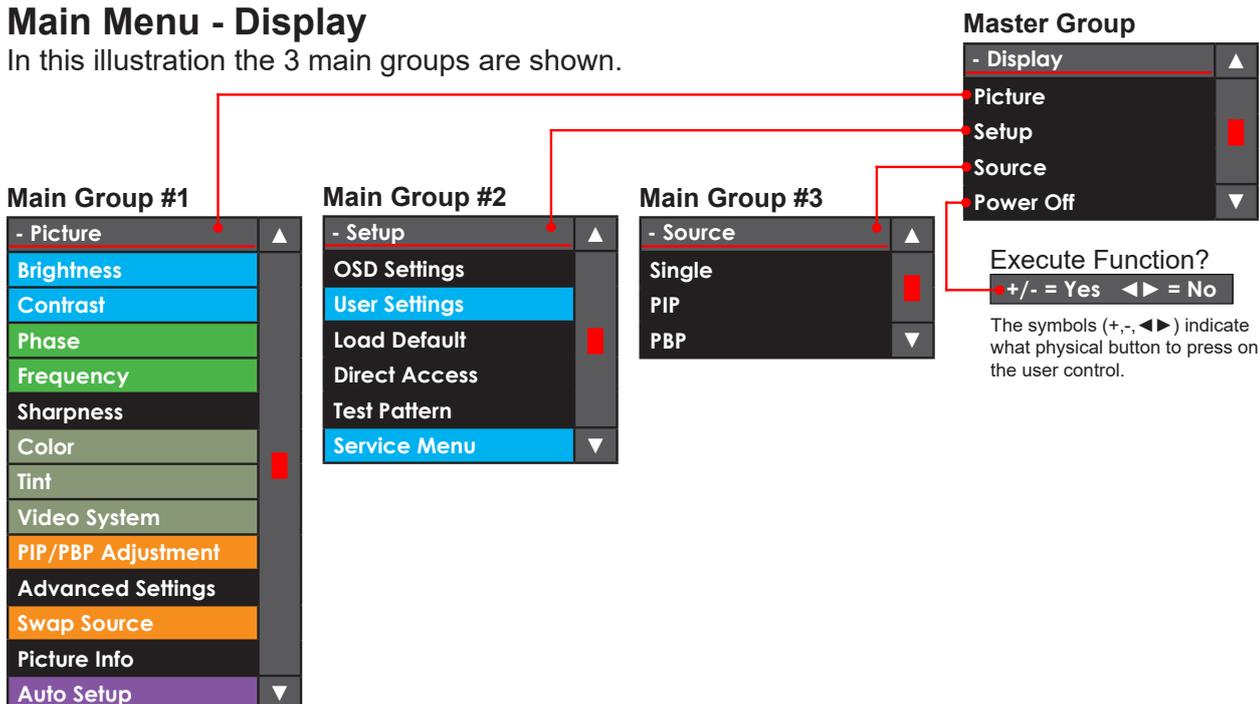
## Legend Map

The OSD menu have functions that are specific for RGB mode, DVI mode or when using the "Full" or "Simplified" menu structure. This means that not all functions shown in the menu structure is available in all modes. To easier identify which function is available in what mode, the illustrations in this section is marked with different colors (legends). These colors are not visible in the real OSD menu.

	= Always available for all modes.
	= Always available for all modes.
	= Only available in "Full" menu mode.
	= Only available in RGB mode, i.e. VGA/RGB signal input is shown full screen.
	= Only available in "Full" and RGB modes.
	= Only available in DVI/RGB mode.
	= Only available in Comp/S-VHS mode, i.e. Video Signal is shown full screen.
	= Only available if Picture-In-Picture (PIP) or Picture-By-Picture (PBP) is on.

## Main Menu - Display

In this illustration the 3 main groups are shown.



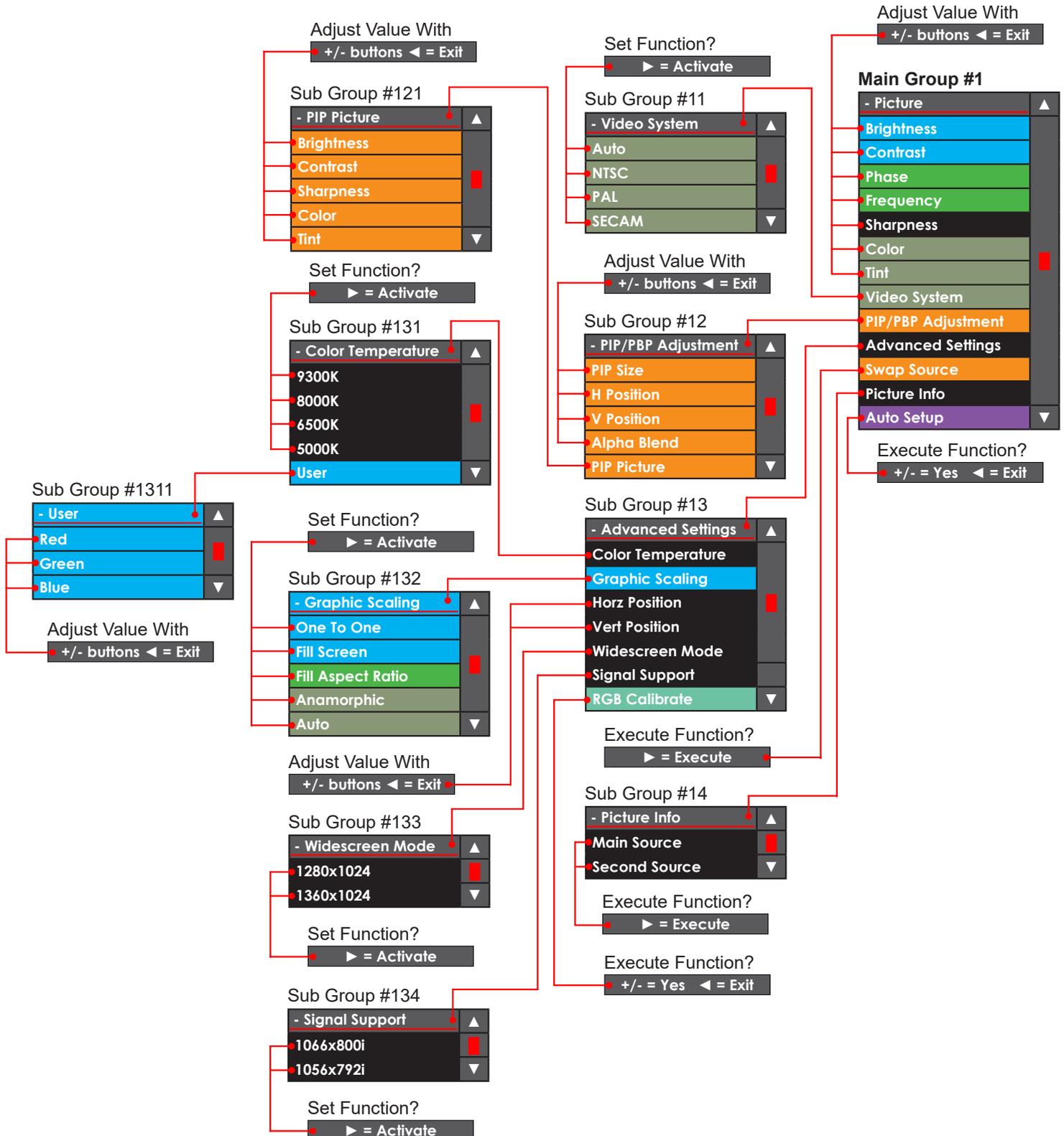
# OSD Menu Overview

## Main Group #1 - Picture

In this group (with its sub groups) the user can adjust parameters that directly impact the picture visually for all incoming signal sources. Some of these Sub Groups have more options, please review this map to quickly determine the location of your desired function/option. For detailed information, please review the "OSD Menu Functions" later in this section.



**Please note: Factory default illustrations only! Available functions, icons and text may deviate slightly from actual OSD menu on your product due to different OSD software configurations and customized solutions.**



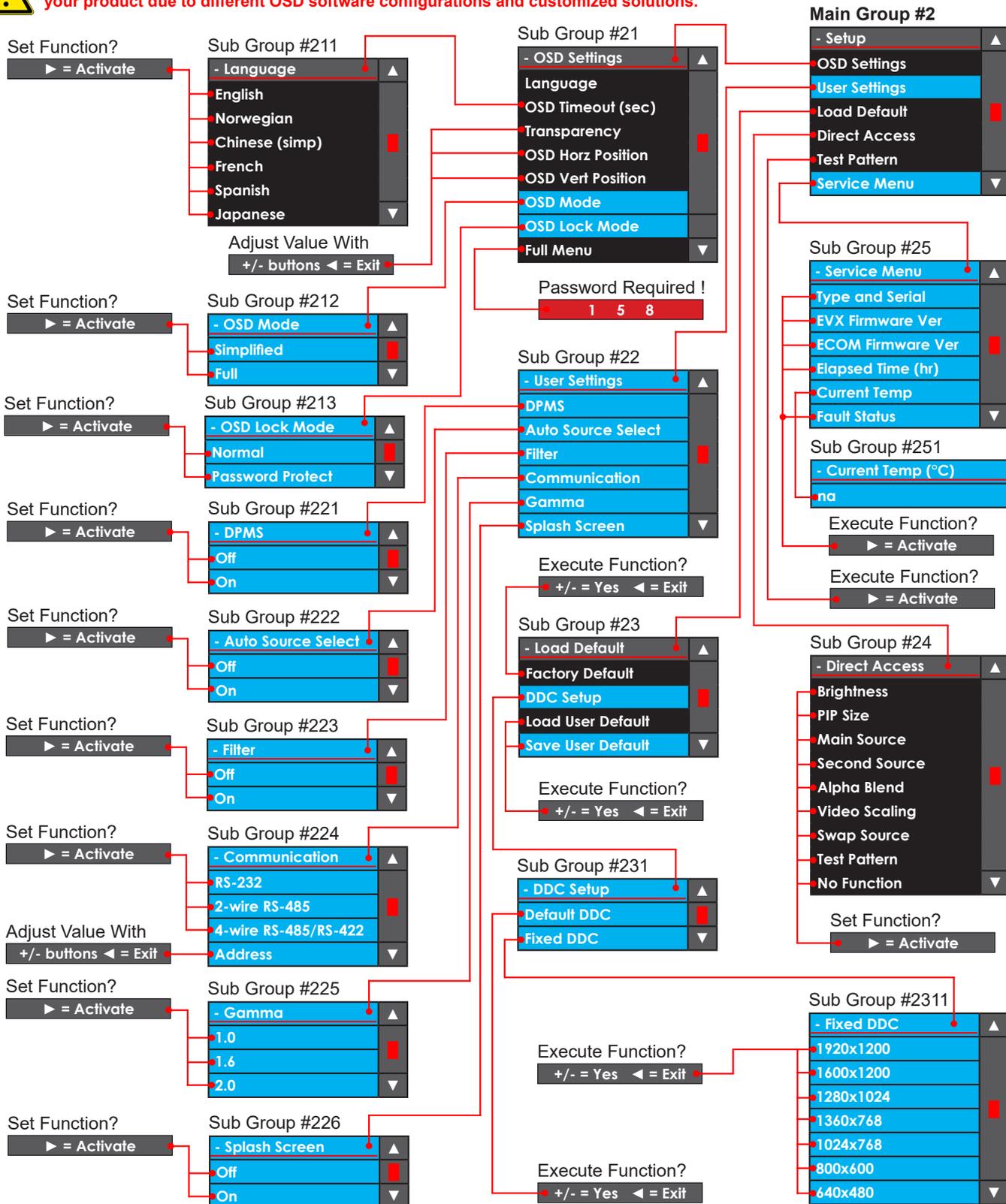
# OSD Menu Overview

## Main Group #2 - Setup

In this group (with its sub groups) the user can adjust parameters that directly impact settings for the video controller software, OSD settings and gain access to settings that are physically accessible for the user. None of these settings will impact on the picture visually for the incoming signal sources. Some of these Sub Groups have more options, please review this map to quickly determine the location of your desired function/option. For detailed information, please review the "OSD Menu Functions" later in this section.



**Please note: Factory default illustrations only! Available functions, icons and text may deviate slightly from actual OSD menu on your product due to different OSD software configurations and customized solutions.**



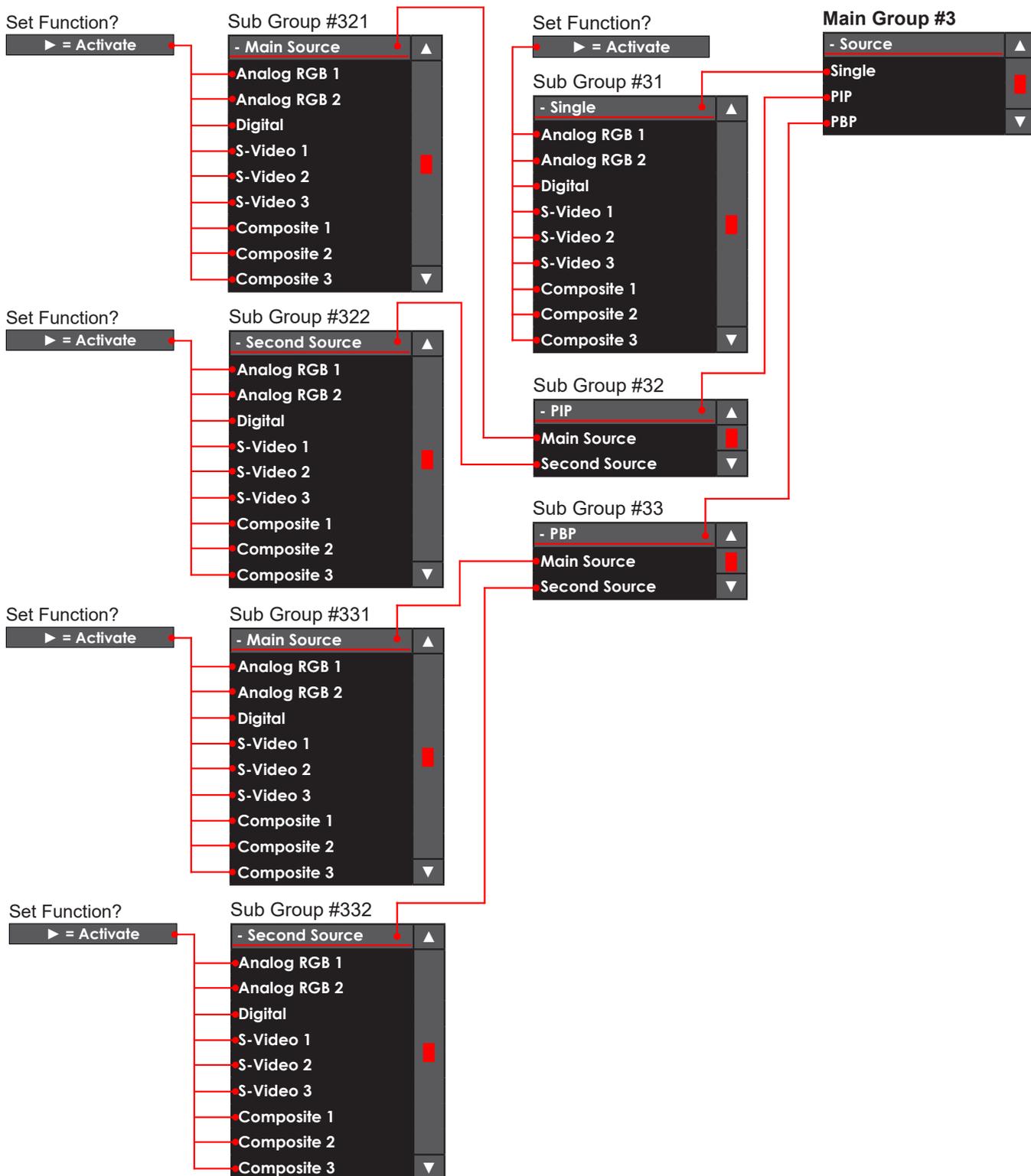
# OSD Menu Overview

## Main Group #3 - Source

In this group (with its sub groups) the user can change the signal input source and setup the Picture-In-Picture views or Picture-By-Picture views which both take advantage of the Maritime Multi Display functionality. Some of these Sub Groups have more options, please review this map to quickly determine the location of your desired function/option. For detailed information, please review the "OSD Menu Functions" later in this section.



**Please note: Factory default illustrations only! Available functions, icons and text may deviate slightly from actual OSD menu on your product due to different OSD software configurations and customized solutions.**



# OSD Menu Functions

## OSD Menu Functions

The following section covers all possible settings that the user can (in a certain mode) encounter or needs to adjust. The structure of these commands are identified as paths. Please review the "OSD Menu Overview Map" earlier in this manual to see the different paths if you have not already made yourselves familiar with the OSD Menu structure. Most functions are performed in real time so you do not have to exit the OSD menu to see the results.



**Please note: Available functions described may deviate slightly from actual OSD menu on your product. This is due to different OSD software configurations and customized solutions.**

### Display / Picture / Brightness

*Function only available in "Full" menu mode.*

Increase/decrease the overall brightness of the panel electronically by controlling the voltage level. This applies to the Main Source signal. Window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected. This will be independent of the actual adjustment done by the front user controls like potmeters or buttons.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Contrast

*Function only available in "Full" menu mode.*

Increase/decrease the overall contrast of the panel electronically by controlling the voltage level. This applies to the Main Source signal. Window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected. This will be independent of the actual adjustment done by the front user controls like potmeters or buttons.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Phase

*This function only apply for analog VGA/RGB signals.*

Fine tune the data sampling position of the signal (impacts on image quality). This function will remove small transparent defects in typical characters where a portion seems to be more faint than the nearby black pixels. The faint pixels are always visible as a line from top to bottom (vertically).

- Level adjusts from 0-100 steps. Default is based on signal source.

### Display / Picture / Frequency

*This function only apply for analog VGA/RGB signals.*

Adjust the horizontal frequency of the analog signal to improve visibility of the entire image. When it is adjusted, you will notice that the image will appear to be stretched and might in some situations start to flicker/scroll, at which point you must reverse the last adjustment to stop it from flickering/scrolling anymore. This function can be used for older signals that is not automatically detected by the internal display controller.

- Level adjusts from 0-200 steps. Default is based on signal source.

### Display / Picture / Sharpness

Increase/decrease the overall image sharpness. This affects the whole panel, and applies to all signal inputs and window overlays (PIP/PBP). Use it to increase the visual quality of signals from older equipment or electronically weak signals.

- Level adjusts from 0-15 steps. 7 is default.

## OSD Menu Functions

### Display / Picture / Color

*This function only apply for analog Composite/S-VHS video signals when set as Main Source.*

Increase/decrease the overall video color saturation/color amount. Can be used if the incoming signal from older equipment or bad cables appear to have a lack of strong colors. Note that this function can also make noisy color signals appear crisper/clearer if adjusted to grayscales. Recommended is to use factory setting which is set to a neutral and a normalized level and use high quality cables.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Tint

*This function only apply for analog Composite/S-VHS NTSC video signals when set as Main Source.*

Increase/decrease the overall video tint. This will adjust all colors brighter or darker which makes the image more "washed out" or stronger in terms of color intensity. Can be used if the incoming signal from older equipment or bad cables appear to have a lack of strong colors. Recommended is to use factory setting which is set to a neutral and a normalized level.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Video System / Auto - DEFAULT

*This function only apply for analog Composite/S-VHS video signals when set as Main Source.*

Force automatic detection of video system format (factory default). Does not auto detect SECAM.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Picture / Video System / NTSC

*This function only apply for analog Composite/S-VHS video signals when set as Main Source.*

Force the video system format to NTSC for all video inputs. If you feed the product with another video format expect flickering, missing colors or other visual deviations. If this happens either change to AUTO or change the video out settings on your external peripheral if possible.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Picture / Video System / PAL

*This function only apply for analog Composite/S-VHS video signals when set as Main Source.*

Force the video system format to PAL for all video inputs. If you feed the product with another video format expect flickering, missing colors or other visual deviations. If this happens either change to AUTO or change the video out settings on your external peripheral if possible.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Picture / Video System / SECAM

*This function only apply for analog Composite/S-VHS video signals when set as Main Source.*

Force the video system format to SECAM for all video inputs. If you feed the product with another video format expect flickering, missing colors or other visual deviations. If this happens either change to AUTO or change the video out settings on your external peripheral if possible.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Picture / PIP-PBP Adjustment / PIP Size

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Increase/decrease the Picture-In-Picture and Picture-By-Picture window sizes. These functions will allow any of the signal inputs to be placed as a real time window overlay (or side by side if using PBP) on top of the current Main Source signal enabling the main feature of the Maritime Multi Display functionality.

- Max PIP H size = 656 pixel
- Max PIP V size = Max PIP H size x Panel V resolution / Panel H resolution
- Min PIP H size = 256 pixel
- Min PIP V size = Min PIP H size x Panel V resolution / Panel H resolution
- 40 pixel each step.

### Display / Picture / PIP-PBP Adjustment / H Position

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Move the horizontal (left/right) position of the real time window overlay.

- Level adjusts from 0-100 steps. 0 is default.

### Display / Picture / PIP-PBP Adjustment / V Position

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Move the vertical (up/down) position of the real time window overlay.

- Level adjusts from 0-100 steps. 0 is default.

### Display / Picture / PIP-PBP Adjustment / Alpha Blend

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Increase/decrease the alpha blend also known as transparency of the real time window overlay. It means that the Main Source signal will show through the PIP image. It is used when important information in the Main Source signal behind the window overlay is necessary to be visible at all times.

- Level adjusts from 0-100 steps. 100 is default.

### Display / Picture / PIP-PBP Adjustment / PIP Picture / Brightness

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Increase/decrease the overall brightness of the window overlay. This will not change the brightness of the Main Source signal behind the window overlay. It can be used for situations where the incoming video signal from CCTV or other video sources appear to dark in comparison to the Main Source signal.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / PIP-PBP Adjustment / PIP Picture / Contrast

To enable this function, please see [ **Display / Source / xxx / xxx** ] later in this section of the manual. Increase/decrease the overall contrast of the window overlay. This will not change the contrast of the Main Source signal behind the window overlay. It can be used for situations where the incoming video signal from CCTV or other video sources appear to "washed out" in comparison to the Main Source signal.

- Level adjusts from 0-100 steps. 50 is default.

## OSD Menu Functions

### Display / Picture / PIP-PBP Adjustment / PIP Picture / Sharpness

To enable this function, please see [ Display / Source / xxx / xxx ] later in this section of the manual.

Increase/decrease the overall image sharpness. This will not change the sharpness of the Main Source signal behind the window overlay. Use it to increase the visual quality of signals from older equipment or electronically weak signals.

- Level adjusts from 0-15 steps. 7 is default.

### Display / Picture / PIP-PBP Adjustment / PIP Picture / Color

This function only apply for analog VIDEO IN signals.

To enable this function, please see [ Display / Source / xxx / xxx ] later in this section of the manual.

Increase/decrease the overall video color saturation/color amount. Can be used if the incoming signal from older equipment or bad cables appear to have a lack of strong colors. This will not change the color saturation/intensity of the Main Source signal behind the window overlay. Note that this function can also make noisy color signals appear crisper/clearer if adjusted to grayscales.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / PIP-PBP Adjustment / PIP Picture / Tint

This function only apply for analog VIDEO IN signals.

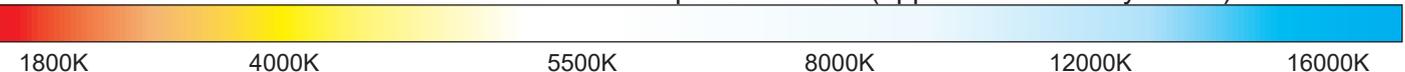
To enable this function, please see [ Display / Source / xxx / xxx ] later in this section of the manual.

Increase/decrease the overall video tint (applies only for NTSC video signals.). This will adjust all colors brighter or darker which makes the image more "washed out" or stronger in terms of color intensity. Can be used if the incoming signal from older equipment or bad cables appear to have a lack of strong colors. This will not change the color tint of the Main Source signal behind the window overlay.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Advanced Settings / Color Temperature / xx00K

Adjust the color temperature measured in Kelvin degrees. You can choose between 9300K, 8000K, 6500K and 5000K. This applies to the Main Source signal. Window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected. Lower values make the image appear warmer, while higher values will make it appear cooler. Default is set to 8000K. The Kelvin color temperature scale (approximate and symbolic):



- When selected, a box icon (■) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Color Temperature / User / RGB

Function only available in "Full" menu mode.

Adjust the color temperature manually. You can adjust the R(red), G(green) and B(blue) levels. This applies to Main Source signal. The window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected.

- Press the right (▶) button to activate each R,G,B level and adjust them separately.

## OSD Menu Functions

### Display / Picture / Advanced Settings / Graphic Scaling / One to One

Function only available in "Full" menu mode & when analog DVI/VGA/RGB signal are set as Main Source. Set the image scaling to 1:1. This means that the incoming signal is shown as is (with correct aspect ratio) and without any scaling to fit the display area. If the image appears to have black bars at top/bottom or/and left/right area, the external signal source is the cause of this. It does not support the signal in respect of what the native TFTs panel resolution requires.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Graphic Scaling / Fill Screen

Function only available in "Full" menu mode & when analog DVI/VGA/RGB signal are set as Main Source. Set the image scaling to fit the entire native TFT panel resolution. This means that the incoming signal is shown (without correct aspect ratio) and with scaling to fit the entire display area. The result is that the image will appear stretched. The external signal source is the cause of this. It does not support the signal in respect of what the native TFTs panel resolution requires.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Graphic Scaling / Fill Aspect Ratio - DEFAULT

Function only available in "Full" menu mode & when analog DVI/VGA/RGB signal are set as Main Source. Set the image scaling to fit the entire native TFTs panel resolution based on correct aspect ratio (factory default). This means that the incoming signal is scaled to best possible fit within the entire display area. The result is that black bars might be visible in top/bottom and/or left/right area. The external signal source is the cause of this. It does not support the signal in respect of what the native TFT panel resolution requires.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Graphic Scaling / Anamorphic

Function only available in "Full" menu mode & when analog Comp/S-VHS signals are set as Main Source. Will scale the widescreen image to fit a 4:3 or 5:4 native TFTs panel resolution. Anamorphic widescreen is a video technique that utilizes rectangular (wide) pixels to store a widescreen picture into standard 4:3 format. The result is that black bars will be visible in top/bottom area. The external signal source is the cause of this. It does not support the signal in respect of what the native TFT panel resolution requires. If the TFT panel is not of a widescreen type, this option must be selected to prevent the widescreen signal for being scaled in height and appear very stretched.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Graphic Scaling / Auto

Function only available in "Full" menu mode & when analog Comp/S-VHS signals are set as Main Source. The display controller will automatically try to identify the incoming signal and scale the image with respect of the aspect ratio and the TFTs native resolution to best possible fit the image on the entire display area. Since this is a automatic and electronically intelligent function it may not work correctly with all signal types. You may have to choose one of the other graphic scaling techniques above to get the correct/desired image appearance.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Picture / Advanced Settings / Horz Position

Move the horizontal (left/right) position of the entire display area. This applies to the Main Source signal. Please note that this function can move information in the image outside the visible display area, so use caution when modifying this parameter.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Advanced Settings / Vert Position

Move the vertical (up/down) position of the entire display area. This applies to the Main Source signal. Please note that this function can move information in the image outside the visible display area, so use caution when modifying this parameter.

- Level adjusts from 0-100 steps. 50 is default.

### Display / Picture / Advanced Settings / Widescreen Mode

This will force the display controller to scale the image to match the incoming signal from typical radar systems with a custom resolution of 1360x1024. Since the display controller are unable to automatically detect the difference between this resolution and 1280x1024, the user has the option to manually set the display to the required resolution. Setting the resolution to 1280x1024 will only use the native TFTs panel resolution (for 19inch only). For other TFT sizes it will use the native TFT panel resolution instead (1:1).

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / Signal Support

This will force the display controller to scale the image to match the incoming signal from typical radar systems with a custom resolution of 1066x800i (default setting) and 1056x792i.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Advanced Settings / RGB Calibrate



**Warning! The displayed image MUST be a black/white image (color/gray scale image not usable). If not, the calibration will produce wrong color values!**

*Function only available in "Full" menu mode and when analog VGA/RGB signal are set as Main Source.* This function will automatically calibrate the R(red), G(green), B(blue) signal gain values, also known as the color intensity to a neutral and a normalized level. This function will also override any previous color adjustments done by user in the OSD menu. It will also override the Kelvin color temperature setting and affects the Main Source signal.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

### Display / Picture / Swap Source

*This function will be available if PIP/PBP is on, please see [ Display / Source / xxx / xxx ].*

This function will swap the image in fullscreen and the window overlay. It will choose whatever signal inputs set in the [ Display / Source / xxx / xxx ] setting as Main Source and Second Source.

- Press the right (▶) button to activate in real-time. The OSD menu will still be visible.

## OSD Menu Functions

### Display / Picture / Picture Info / Main Source

*Please note that a valid input signal must be present for this function to work.*

This function will show the picture information as detected by the display controller such as Physical Port Input Name, Current Signal Resolution, H-Freq. (horizontal frequency) and V-Freq. (vertical frequency). It will not perform any changes or adjustments to the display settings and signals.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Picture Info / Second Source

*Please note that a valid input signal must be present for this function to work.*

This function will show the picture information as detected by the display controller such as Physical Port Input Name, Current Signal Resolution, H-Freq. (horizontal frequency) and V-Freq. (vertical frequency). It will not perform any changes or adjustments to the display settings and signals.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Picture / Auto Setup

*Function only available when analog VGA/RGB signal are set as Main Source.*

This function will try to re-negotiate with the current signal input and its specifications like frequency etc. to perform an auto-adjusting on screen to correct aspect ratio, centered on screen, re-negotiate phase/frequency (for analog signals). All signal inputs and image adjustments will be reset. It will not reset any configuration done for the OSD Menu overlay and various other user settings. This function can be used in cases where you suspect a faulty or unsuitable configuration of the unit is present. It can also be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.

- Press the right ( ► ) button to activate. A confirmation requester will appear. Use +/- to confirm.

### Display / Setup / OSD Settings / Language

This function will choose the default language to use in all OSD menu/text/messages for the entire display controller software. Available languages may be: English (default), Norwegian, Chinese (simplified), French, Spanish and Japanese. Please note that the manufacturer's user manual is currently only in English.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Setup / OSD Settings / OSD Timeout (sec)

Increase/decrease the timeout period in seconds for the OSD Menu overlay to automatically disappear without the user having to manually exit from the OSD menu.

- Level adjusts from 5-30 seconds. 20 is default.

### Display / Setup / OSD Settings / Transparency

Increase/decrease the alpha blend also known as transparency of the OSD Menu overlay. It means that all signals inputs and PIP/PBP images show through the OSD Menu. It is used when important information on the display is necessary to be visible at all times. A black border around the OSD menu layout will always be black and is not affected by this adjustment.

- Level adjusts from 0-100 steps. 50 is default.

## OSD Menu Functions

### Display / Setup / OSD Settings / OSD Horz Position

Move the horizontal (left/right) position of the OSD Menu overlay. The OSD Menu can only be moved within the max display area available.

- Level adjusts from 0-100 steps. 100 is default.

### Display / Setup / OSD Settings / OSD Vert Position

Move the vertical (left/right) position of the OSD Menu overlay. The OSD Menu can only be moved within the max display area available.

- Level adjusts from 0-100 steps. 100 is default.

### Display / Setup / OSD Settings / Full Menu

*Function only available through password protection.*

If the current OSD Menu is in Simplified mode, you may gain access to all the functions again with the following procedure: Press the right (▶) to activate the function, now a requester will appear with 3 digits shown as: **0 0 0**.

To enable the OSD Menu to appear in Full Menu mode, please change the 3 digits to: **1 5 8** and press the right (▶) to confirm. Now all the Menu functions will be accessible. When you power off the product, this setting will be reverted back to Simplified mode.

*Note: To force the OSD Menu to appear in Full Menu Mode always, you must first unlock the OSD Menu with the procedure as described and then go to the [ Display / Setup / OSD Settings / OSD Mode / Full ] and make sure that setting is activated, see below.*

### Display / Setup / OSD Settings / OSD Mode / Simplified - May be set as factory default

*Function only available in "Full" menu mode.*

Force the OSD Menu to always appear in Simplified Mode (even after power shutdown of the unit). This means that a lot of advanced functions is not accessible from the OSD Menu. This is to prevent changes to the display that could impact on display functionality and image quality. Only experienced and qualified personnel should access and change this OSD Mode setting.

- When selected, a box icon (■) will indicate that the selected function has been activated.

### Display / Setup / OSD Settings / OSD Mode / Full - May be set as factory default

*Function only available in "Full" menu mode.*

Force the OSD Menu to always appear in Full Mode (even after power shutdown of the unit). This means that a lot of advanced functions is accessible from the OSD Menu. Only experienced and qualified personnel should access and change this OSD Mode setting. This is the factory default setting.

- When selected, a box icon (■) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Setup / OSD Settings / OSD Lock Mode / Normal - May be set as factory default

*Function only available in "Full" menu mode.*

Enables the user to enter OSD without any password protection. For Non-ECDIS Compliant usage.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / OSD Settings / OSD Lock Mode / Password Protect - May be set as factory default

*Function only available in "Full" menu mode.*

Enables a password protection before getting access to the OSD menu. Required for ECDIS Compliance.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

When user now presses MENU, a requester will appear with 3 digits shown as: 

To enter the OSD Menu, please change the 3 digits to:  and press the right (  ) to confirm. If you cut power to the product, the password protection will still be active and the same password must be entered again to gain access.

### Display / Setup / User Settings / DPMS

Enable/disable the DPMS (VESA Display Power Management Signaling) function. DPMS is a standard from the VESA consortium for managing the power supply of display units for computers through the graphics card e.g; shut off the unit after the computer has been unused for some time (idle) to save power. Default is set to Enable (On).

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / User Settings / Auto Source Select

Enable/disable the automatic detection and selection of any signal input and show it full screen. If you have a external unit that switches between several other external signal inputs of different signal origins, this function will be helpful and switch to the signal that appears to be valid since the last detection was made. If for instance a Composite Video Signal was terminated, the display controller would automatically scan the other available signal inputs and show that signal full screen instead. If that too is lost, it will continue to scan the other signal inputs. If no signal inputs were in the end found to be valid, the unit would eventually only show a black image and automatically power off (standby) due to inactivity (idle) in the signal streams. Default is set to Disable (Off).

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / User Settings / Filter - Only available in customized solutions.

*Function only available in "Full" menu mode and when analog VGA/RGB signal are set as Main Source.*

Enable/disable the ARGB filter (Analog RGB) which is a Signal Noise Reduction technique to enhance a possible weak or bad RGB/VGA signal. It will remove certain types of noise patterns typically apparent in close proximity of other electronic equipment with less or lack of proper shielding to prevent interference. Default is set to Disable (Off).

- When selected, a box icon (  ) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Setup / User Settings / Communication / RS-232 - May be factory default.

*Function only available in "Full" menu mode.*

Configure the built-in SCOM (Serial Remote Control Interface) to RS-232 protocol which enable software/remote control of a single unit.

The SCOM will enable operators to modify a wide range of parameters available inside the display controller. Most of the functions described in this section is available, but also additional parameters can be inspected or adjusted with dedicated software connected to the unit's serial ports (COM). Daisy-chain operation is also possible by using a second COM port.

More in-depth information and usage about the SCOM, please visit:

<https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-3.htm>

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / User Settings / Communication / 2-wire RS-485 - May be factory default.

*Function only available in "Full" menu mode.*

Configure the built-in SCOM (Serial Remote Control Interface) to RS-485 protocol which enable software/remote control of one or several other units simultaneously.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / User Settings / Communication / 4-wire RS-485/RS-422 - May be factory default.

*Function only available in "Full" menu mode.*

Configure the built-in SCOM (Serial Remote Control Interface) to RS-485/RS-422 protocol which enable software/remote control of one or several other units simultaneously.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

### Display / Setup / User Settings / Communication / Address

*Function only available in "Full" menu mode.*

Configure the address which the current unit shall be identified as in a SCOM system. Whenever you communicate with the unit or units, the system will accept parameters or adjustments for that ID alone.

- Level adjust from 0-15 and reflects a unique ID number. Default is 0.

### Display / Setup / User Settings / Gamma / x.x

*Function only available in "Full" menu mode.*

Adjust the overall gamma intensity. You can choose 1.0 (default), 1.6 or 2.0. Higher values will give a much more brighter/washed out picture even in the darkest areas, i.e. black becomes faint grey. This affects the whole panel, and all applies to all signal inputs and window overlays (PIP/PBP) including the OSD Menu overlay. This will be independent of the actual brightness/contrast adjustment done by the front user controls like potmeters or buttons.

- When selected, a box icon (  ) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Setup / User Settings / Splash Screen

*Function only available in "Full" menu mode.*

Enable/disable the Splash Screen logo upon power on for the unit and while the display controller is initializing. It will be gone as soon as the signal input appear on screen. This is by factory default shown as manufacturer's brand logo. This can also be customized to show customer logo.

### Display / Setup / Load Default / Factory Default

This function will reset everything to factory default settings. It will not revert back to a possible set of saved user defaults stored in the display controller software. All signal inputs and image adjustments will be reset. This function can be used in cases where you suspect a faulty or unsuitable configuration of the display is present. It can also be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

### Display / Setup / Load Default / DDC Setup / Default DDC

*Function only available in "Full" menu mode.*

This function will detect the TFT panel specifications (EDID data) and update it via the DDC (Display Data Channel) to the display controller. It is to make sure the TFT panel's specifications can be detected successfully by the display controller software. This can be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

### Display / Setup / Load Default / DDC Setup / Fixed DDC

*Function only available in "Full" menu mode.*

This function will force the TFT panel specifications (EDID data) and update it via the DDC (Display Data Channel) to the display controller with the choice selected regardless of the original TFT panel's preferred specifications. This can be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.

Available choices are: 1920x1200, 1600x1200, 1280x1024, 1360x768, 1024x768, 800x600, 640x480.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

### Display / Setup / Load Default / Load User Default

This function will restore any User Default settings that have been saved previously. If no User Defaults was found, nothing will be re-configured. The User Defaults consists of custom settings and all parameters adjusted in the entire OSD Menu by user. This can be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

# OSD Menu Functions

## Display / Setup / Load Default / Save User Default

Function only available in "Full" menu mode.

This function will create and save a own custom User Default based on what settings and parameters the user has edited in the OSD Menu. It will never save over the Factory Default, and it completely independent. This can also be useful for customers who want to specifically preset the OSD Menu after a certain company or usage/operation policy.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.

## Display / Setup / Direct Access (also known as hotkey)

This function will configure the hotkey functionality. It means that the user can access a function that is normally only accessible by browsing through the OSD Menu and locate the function. Available assigned hotkey functions are:

**"Brightness"** = Increase/Decrease Brightness of the TFT panel (not backlight).  
Reference in user manual: "Display / Picture / Brightness"

**"PIP Size"** = Increase/Decrease the size of the Picture-In-Picture overlay.  
Reference in user manual: "Display / Picture / PIP-PBP Adjustment / PIP Size"

**"Main Source"** = Flip up/down through the available signal sources (to full screen).  
Reference in user manual: "Display / Source / Single / xxx"

**"Second Source"** = Flip up/down through the available signal sources (to PIP/PBP).  
Reference in user manual: "Display / Source / PIP / xxx"

**"Alpha Blend"** = Increase/Decrease the transparency of PIP overlay into Main Source.  
Reference in user manual: "Display / Picture / PIP-PBP Adjustment / Alpha Blend"

**"Video Scaling"** = Flip up/down through the scaling methods available.  
Reference in user manual: "Display / Picture / Advanced Settings / Graphic Scaling"

**"Swap Source"** = Switches between Full Screen and PIP/PBP.  
Reference in user manual: "Display / Picture / Swap Source"

**"Test Pattern"** = Display the internal test image overriding any signal inputs. Both Hot Keys performs the same action.  
Reference in user manual: "Display / Setup / Test Pattern"

**"No Function"** = Nothing will be activated when user touches Hot Keys. Both Hot Keys performs the same action.

- When selected, a box icon (■) will indicate that the selected function has been activated.

\* NOTE: When assigning "Swap Source" to hot key function, it is advised to set the "Auto Source Select" to Enable.

## OSD Menu Functions

### Display / Setup / Test Pattern

This function will show a typical test pattern with greyscales, colors and raster patterned boxes to check for deviations in the TFT panel/display controller behaviour. It is independent of any current resolution or specifications found in the signal inputs. The test pattern is generated internally in the display controller and is sent 1:1 directly to the TFT panel. It can be therefore be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment. Also, this function will be handy to check the display quality without having any signal input available to test with.

- Press the right (▶) button to activate the function, and hold "MENU" key for 3 seconds exit the test.

### Display / Setup / Service Menu / Type and Serial

*Function only available in "Full" menu mode.*

This function will show the unit's Type Number and Serial Number. This information is stored electronically on a board chip component. Example: "JH 23T14 MMD-AA1-AAAA-000001"

### Display / Setup / Service Menu / EVX Firmware Ver

*Function only available in "Full" menu mode.*

This function will show the firmware version (software OSD) of the display controller. This information is stored electronically on the EVX component board.

Example: "E0.30.00 1".

### Display / Setup / Service Menu / ECOM Firmware Ver

*Function only available in "Full" menu mode.*

This will show the firmware version on the internal micro controller. This information is stored electronically on a board chip component. Example: "SW100062-1E5".

### Display / Setup / Service Menu / Elapsed Time (hr)

*Function only available in "Full" menu mode.*

This function will show the current elapsed running time for the unit in hours. It is based on that the display has actually shown a valid image on screen during that time and not just how long the product has been powered on. It can be used to determine the life span in respect of what the MTBF for the display or backlight is specified to. This information is stored electronically on the EVX component board.

Example: "452"

### Display / Setup / Service Menu / Current Temp

*Function only available in "Full" menu mode.*

This function will show the current temperature measured by the Video Controller EVX Component board. The value is displayed in degree Celcius. Note: Pr. revision 15 of this manual the temperature function is not implemented and will display "na" instead (not available).

## OSD Menu Functions

### Display / Setup / Service Menu / Fault Status

Function only available in "Full" menu mode.

This function will show the last recorded fault message detected by the display controller. This information is stored electronically on the EVX component board. Example: "Video Chip, DVI Chip, NVRAM, DDC"

### Display / Source / Single / xxx

This function will indicate what physical signal inputs is considered to be detectable by the OSD Menu and the display controller. The amount of signal inputs available will depend on the physical Multifunction Cable you have installed in the system. You can choose what sources are to be detectable and a icon next to each source will indicate its activity. When you for instance use the Swap Source function it will swap between all the indicated ones. Possible sources might include: **Analog RGB 1, Analog RGB 2, Digital (DVI), S-Video 1, S-Video 2, S-Video 3, Composite 1, Composite 2 and Composite 3.**

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Source / PIP / xxx

This function will indicate what physical signal inputs is considered to be detectable by the OSD Menu, the display controller and what is visible in the window overlay (Picture-In-Picture). The amount of signal inputs available will depend on the physical Multifunction Cable you have connected to the unit.

You can choose what sources are to be detectable and a icon next to each source will indicate its activity. When you for instance use the Swap Source/PIP function it will swap between all the indicated ones. Possible sources might include: **Analog RGB 1, Analog RGB 2, Digital (DVI), S-Video 1, S-Video 2, S-Video 3, Composite 1, Composite 2 and Composite 3.**

Note: This function is by factory default set to auto detect the signal source automatically. It means if you have **Composite 1** and **Composite 2** set as sources and you loose signal on Composite 1, the function will automatically switch to the next signal detectable, which in this example is **Composite 2**. If no signals are detectable the image will be black.

- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

### Display / Source / PBP / xxx

This function will indicate what physical signal inputs is considered to be detectable by the OSD Menu, the display controller and what is visible in the window overlay (Picture-By-Picture). The amount of signal inputs available will depend on the physical Multifunction Cable you have connected to the unit. In PBP mode, both inputs will share same hardware for video signal processing. In some cases (depending of signal quality and content) there might be minor image quality degradation in PBP mode.

You can choose what sources are to be detectable and a icon next to each source will indicate its activity. When you for instance use the Swap Source/PBP function it will show two window overlays at the same time next to eachother. Possible sources might include: **Analog RGB 1, Analog RGB 2, Digital (DVI), S-Video 1, S-Video 2, S-Video 3, Composite 1, Composite 2 and Composite 3.**

Note: This function is by factory default set to auto detect the signal source automatically. It means if you have **Composite 1** and **Composite 2** set as sources and you loose signal on Composite 1, the function will automatically switch to the next signal detectable, which in this example is **Composite 2**. If no signals are detectable the image will be black.

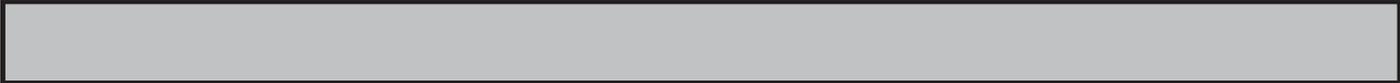
- When selected, a box icon ( ■ ) will indicate that the selected function has been activated.

## OSD Menu Functions

### Display / Power Off

This function will turn off the unit (soft power off) and shut down the display controller and cut internal power to all components except the power module. The LED indicator ring/power leds will all illuminate red. The unit will enter standby mode. It does the same function as pressing the power button located on the user controls/front bezel. Please note that the power will still be present inside the unit because of the power cable is still physically connected to the power module.

- Press the right (▶) button to activate. A confirmation requester will appear. Use +/- to confirm.



# Specifications

# Specifications - JH 15T17 MMD-xxx-Axxx (LED version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 15.0 inch viewable image size, Aspect Ratio 4:3
- TFT active-matrix liquid crystal panel

## TFT Characteristics:

- Native Resolution : 1024 x 768
- Pixel Pitch (RGB) : 0.297 (H) x 0.297 (V) mm
- Response Time Standard : 8ms (typical), black to white
- Contrast Ratio Standard : 1500:1 (typical)
- Light Intensity Standard : 400 cd/m<sup>2</sup> (typical)
- Viewable Angle Standard : +/- 85 deg. (Up/Down/Left/Right) (typical)
- Active Display Area : 304.1 (H) x 228.1 (V) mm
- Max Colors : 16.7 million

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768\*
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Power Supply Options:

- 115&230VAC - 50/60Hz - JH 15T17 MMD-Axx-xxxx
- 24 VDC - JH 15T17 MMD-Dxx-xxxx

### Power Consumption:

- Operating AC : TBDW (typ) - 100W (max)
- Operating DC : 21.5W (typ) - 100W (max)
- Tested w/Max Backlight, Normal Room Temperature, Test Pattern

## Typical Type Numbers:

- JH 15T17 MMD-AA1-AAAA = Standard AC, Keypad controls only
- JH 15T17 MMD-DA1-AAAC = Standard DC & Capacitive Touch Screen
- JH 15T17 MMD-AA1-AOBA = Standard AC, Bonded, Potmeter Controls, Buzzer

### Buzzer-Potmeter-Keypad



MMD-xxx-xxBx

### Keypad



MMD-xxx-xxAx

## Physical Considerations:

- 412.00 (W) x 345.00 (H) x 73.00 (D) mm
- 16.22" (W) x 13.58" (H) x 2.87" (D) inch
- Weight: 7 kg (approx)

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- AC Power OUT : 1 x Std IEC Outlet (5A Max)
- DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- VSD100692-1 : 1 x 9P D-SUB (female) - RS-232 (COM1)
- VSD100692-3 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)  
: 3 x BNC (female) (Composite Video in)
- VSD100692-4 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 3 x BNC (female) (Composite Video in)

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : JH15T17MMD-xxx-xxxx Std: 130cm Steering: 100cm

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = VSD100692-3, VSD100692-4 or customized cables.
- JH 15TBR STD-B1 = Mounting Bracket (See user manual)
- JH 15TRO STD-A1 = Rotary Bracket (See user manual)
- JH 15TSV STD-A1 = Sun Visor (See user manual)
- JH 15VED STD-A1 = Vesa Bracket (See user manual)
- JH 15TAP STD-A1 = 15" Adapter Frame to 19" Rack (See user manual)
- JH 15TAP STD-B1 = 15" Adapter Frame to 17" CRT cut out (See manual)
- JH 15TWC STD-A1 = Water Cover (See user manual)

## Factory Options:

- Resistive\* or Capacitive Touch Screen / Optical Bonding Technology\*

\*Note that all 15 inch with resistive touch screens can not be combined with bonding.

# TESTING/APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

**IEC 60945 4th** (EN 60945:2002)  
**ABS** - American Bureau of Shipping  
**EU RO MR** - Mutual Recognition

**ClassNK** - Nippon Kaiji Kyokai  
**BV** - Bureau Veritas

**GL** - Germanischer Lloyd  
**CCS** - China Classification Society

**DNV** - Det Norske Veritas  
**LRS** - Lloyd's Register of Shipping

# Specifications - JH 19T14 MMD-xxx-Sxxx (LED, Slim version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 19.0 inch viewable image size, Aspect Ratio 5:4
- TFT active-matrix liquid crystal panel
- MVA (Multi-domain Vertical Alignment) LCD Technology

## TFT Characteristics:

- Native Resolution : 1280 x 1024
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 35ms (typical), "black" to "white"
- Contrast Ratio : 1500:1 (typical)
- Light Intensity Standard : 350 cd/m<sup>2</sup> (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 376.32 (H) x 301.056 (V) mm
- Max Colors : 16.7 million

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024\*
- UXGA : 1600 x 1200
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Multi-Power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - JH 19T14 MMD-Mxx-Sxxx

You may connect either AC power or DC power or both. In case both sources are connected, power will be sourced from the AC input. If AC input is lost, there will be a uninterrupted switch-over to DC input.

### Power Consumption:

- Operating : 50W (TYP) - 60W (MAX)

## Physical Considerations:

- 460.00 (W) x 400.00 (H) x 82.00 (D) mm
- 18.11" (W) x 15.75" (H) x 3.23" (D)
- Weight: Approx. 7.0 kg / 15.4lbs

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as RGB IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- AC Power OUT : 1 x Std IEC Outlet (5A Max)
- DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- VSD100692-1 : 1 x 9P D-SUB (female) - RS-232 (COM1)
- VSD100692-3 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)  
: 3 x BNC (female) (Composite Video in)
- VSD100692-4 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 3 x BNC (female) (Composite Video in)

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control) and Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist.: JH 19T14 MMD-xxx-Sxxx Std: 65cm Steering: 35cm

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = Custom Multifunction Cable to support more signals
  - JH 19TWC STD-C1= Water Cover
  - JH 19TBR STD-B1 = Mounting Bracket
  - JH MMDBR STD-A1 = Mounting Bracket
  - JH MMDROSTD-A1= Rotary Bracket
  - JH 19VED STD-B1 = VESA Bracket
  - JH 19TSV STD-B1 = Sun Visor
  - JH 17TAP STD-A1 = Adapter frame for 19" RACK
- \*Please see user manual for drawings/measurements.

## Factory Options:

- Resistive\* or Capacitive Touch Screen / Optical Bonding Technology\*
- Color Calibrated models (ECDIS)

\*Note that all 19 inch with resistive touch screens can not be combined with bonding.

## TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

**IEC 60945 4th** (EN 60945:2002)  
**ABS** - American Bureau of Shipping  
**EU RO MR** - Mutual Recognition

**ClassNK** - Nippon Kaiji Kyokai  
**BV** - Bureau Veritas

**GL** - Germanischer Lloyd  
**CCS** - China Classification Society

**DNV** - Det Norske Veritas  
**LRS** - Lloyd's Register of Shipping

# Specifications - JH 19T14 MMD-xxx-Axxx (LED version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 19.0 inch viewable image size, Aspect Ratio 5:4
- TFT active-matrix liquid crystal panel
- MVA (Multi-domain Vertical Alignment) LCD Technology

## TFT Characteristics:

- Native Resolution : 1280 x 1024
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 35ms (typical), "black" to "white"
- Contrast Ratio : 1500:1 (typical)
- Light Intensity Standard : 350 cd/m<sup>2</sup> (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 376.32 (H) x 301.056 (V) mm
- Max Colors : 16.7 million

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024\*
- UXGA : 1600 x 1200
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Power Supply options:

- 115&230VAC - 50/60Hz + 24 VDC - JH 19T14 MMD-Mxx-Axxx\*
- 115&230VAC - 50/60Hz - JH 19T14 MMD-Axx-Axxx

\*Multi-Power: You may connect either AC power or DC power or both. In case both sources are connected, power will be sourced from the AC input. If AC input is lost, there will be a uninterrupted switch-over to DC input.

### Power Consumption:

Operating: 50W (TYP) - 60W (MAX)

## Physical Considerations:

- 483 (W) x 444 (H) x 82 (D) mm / 19.02" (W) x 17.48" (H) x 3.23" (D)
- Weight: Approx. 7.3 kg / 16.1lbs

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- If AC Power OUT : 1 x Std IEC Outlet (5A Max)
- If DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- |               |   |
|---------------|---|
| • VSD100692-1 | : 1 x 9P D-SUB (female) - RS-232 (COM1)   |
| • VSD100692-3 | : 1 x 9P D-SUB (female) - RS-232 (COM1)<br>: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)<br>: 3 x BNC (female) (Composite Video in) |
| • VSD100692-4 | : 1 x 9P D-SUB (female) - RS-232 (COM1)<br>: 3 x BNC (female) (Composite Video in)  |

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : JH19T14MMD-xxx-xxxx - Std: 1.60m Steering: 1.05m

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = VSD100692-3, VSD100692-4 or customized cables.
  - JH MMDBR STD-A1 = Bracket
  - JH 19BRD STD-A1 = Mounting Bracket EN60945 Tested
  - JH MMDRO STD-A1 = Rotary Bracket
  - JH 19TSV STD-A1 = Sun Visor
  - JH 19VED STD-A1 = Vesa Bracket
  - JH 19TAP STD-A1 = 21" CRT Adapter frame
  - JH 19TAP STD-B1 = 21" CRT Custom Adapter frame
  - JH 19TAP STD-A2 = 20" TFT Adapter frame
  - JH 19TWC STD-B1 = Water Cover
- \*Please see user manual for drawings/measurements.

## Factory Options:

- Resistive\* or Capacitive Touch Screen / Optical Bonding Technology\*
- Color Calibrated models (ECDIS)

\*Note that all 19 inch with resistive touch screens can not be combined with bonding.

## TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

IEC 60945 4th (EN 60945:2002)

ClassNK - Nippon Kaiji Kyokai

GL - Germanischer Lloyd

DNV - Det Norske Veritas

ABS - American Bureau of Shipping

BV - Bureau Veritas

CCS - China Classification Society

LRS - Lloyd's Register of Shipping

EU RO MR - Mutual Recognition

# Specifications - JH 20T17 MMD-xxx-Axxx (LED version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 20.1 inch viewable image size
- a-Si TFT (Thin Film Transistor) Active Matrix, RGB Vertical Stripe

## TFT Characteristics:

- Pixel Number : 1600 x 1200
- Pixel Pitch (RGB) : 0.255 (H) x 0.255 (V) mm
- Response Time : 30 ms (typical), rise + fall
- Contrast Ratio : 1000:1 (typical)
- Light Intensity : 260 cd/m<sup>2</sup> (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 408.0 (H) x 306.0 (V) mm
- Max Colors : 16.7 millions

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200\*
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Power Supply Options:

- 115&230VAC - 50/60Hz - JH 20T17 MMD-Axx-xxxx
- 24 VDC - JH 20T17 MMD-Dxx-xxxx

### Power Consumption:

Operating : 100 W (max)

## Typical Type Numbers:

- JH 20T17 MMD-AA1-AAAA = Standard AC, Keypad controls only
- JH 20T17 MMD-DA1-AAAC = Standard DC & Capacitive Touch Screen
- JH 20T17 MMD-AA1-AOBA = Standard AC, Bonded, Potmeter Controls, Buzzer

### Buzzer-Potmeter-Keypad



MMD-xxx-xxBx

### Keypad



MMD-xxx-xxAx

## Physical Considerations:

- W:534.00 [21.02"] x H:481.00 [18.94"] x D:87.00 [3.43"] mm [inch]
- Weight: 13.50 kg (approx)

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- AC Power OUT : 1 x Std IEC Outlet (5A max)
- DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- VSD100692-1 : 1 x 9P D-SUB (female) - RS-232 (COM1)
- VSD100692-3 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)  
: 3 x BNC (female) (Composite Video in)
- VSD100692-4 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 3 x BNC (female) (Composite Video in)

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : JH20T17MMD-xxx-xxxx - Std: 75cm Steering: 35cm

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = Custom Multifunction Cable to support more signals
- JH MMDBR STD-A1 = Bracket (See user manual)
- JH MMDRO STD-A1 = Rotary Bracket (See user manual)
- JH 20TSV STD-B1 = Sun Visor (See user manual)
- JH 20VED STD-A1 = Vesa Bracket (See user manual)
- JH 20TWC STD-B1 = Water Cover (See user manual)

## Factory Options:

- Capacitive Touch Screen / Optical Bonding Technology
- Color Calibrated models (ECDIS)

## TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

IEC 60945 4th (EN 60945:2002)  
CCS - China Classification Society

IACS E10

IP66

EU RO MR - Mutual Recognition

ClassNK - Nippon Kaiji Kyokai

# Specifications - JH 22T11 MMD-xxx-Axxx (CCFL version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality AU Optronics TFT
- 22.0 inch viewable image size. Widescreen, Aspect ratio 16:10.
- Active Matrix, Thin Film Transistor (TFT)
- RGB Vertical Stripe

## TFT Characteristics:

- Native Resolution : 1680 x 1050
- Pixel Pitch (RGB) : 0.282 (H) x 0.282 (V) mm
- Response Time : 20 ms (typical), "black" to "white"
- Contrast Ratio : 1000:1 (typical)
- Light Intensity : 300 cd/m2 (typical)
- Viewable Angle : +/- 89 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 473.76 (H) x 296.1 (V) mm
- Max Colors : 16.7 millions

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200
- WSXGA : 1680 x 1050\*

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Power Supply Options:

- 100-240V AC - 50/60Hz + 24 VDC - JH 22T11 MMD-Mxx-Axxx\*
- 100-240V AC - 50/60Hz - JH 22T11 MMD-Axx-Axxx

\*Multi-Power: You may connect either AC power or DC power or both. In case both sources are connected, power will be sourced from the AC input. If AC input is lost, there will be a uninterrupted switch-over to DC input.

### Power Consumption:

Operating - 85W (TYP) - 156W (MAX)

## Physical Considerations:

- 572.50 (W) x 444.00 (H) x 82.00 (D) mm
- 22.54" (W) x 17.48" (H) x 3.23" (D)
- Weight: 14.50 kg (approx)

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- If AC Power OUT : 1 x Std IEC Outlet (5A Max)
- If DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- |               |   |
|---------------|---|
| • VSD100692-1 | : 1 x 9P D-SUB (female) - RS-232 (COM1)   |
| • VSD100692-3 | : 1 x 9P D-SUB (female) - RS-232 (COM1)<br>: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)<br>: 3 x BNC (female) (Composite Video in) |
| • VSD100692-4 | : 1 x 9P D-SUB (female) - RS-232 (COM1)<br>: 3 x BNC (female) (Composite Video in)  |

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : JH22T11MMD-xxx-xxxx - Std: 160cm Steering: 90cm

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = Custom Multifunction Cable to support more signals
- JH 22BRD STD-A1 = Mounting Bracket EN60945 Tested
- JH 22TBR STD-A1 = Mounting Bracket
- JH MMDRO STD-A1 = Rotary Bracket
- JH 22VED STD-A1 = VESA Bracket
- JH 22TSV STD-A1 = Sun Visor

\*Please see user manual for drawings/measurements.

## Factory Options:

- Capacitive Touch Screen (requires Bonding) / Optical Bonding Technology
- Color Calibrated models (ECDIS)

## TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

**IEC 60945 4th** (EN 60945:2002)  
**ABS** - American Bureau of Shipping  
**CCS** - China Classification Society

**ClassNK** - Nippon Kaiji Kyokai  
**BV** - Bureau Veritas

**GL** - Germanischer Lloyd  
**LRS** - Lloyd's Register of Shipping

**DNV** - Det Norske Veritas  
**EU RO MR** - Mutual Recognition

# Specifications - JH 23T14 MMD-xxx-Axxx (LED version)

All specifications are subject to change without prior notice!

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 23.1 inch viewable image size
- TFT active-matrix liquid crystal panel
- MVA (Multi-domain Vertical Alignment) LCD Technology

## TFT Characteristics:

- Pixel Number : 1600 x 1200
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 12ms (typ) black-white-black or 8ms gray to gray
- Contrast Ratio : 600:1 (typical)
- Light Intensity : 400 cd/m2 (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 470.4 (H) x 352.8 (V) mm
- Max Colors : 16.7 millions

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200\*
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - JH 23T14 MMD-Mxx-xxxx

Note: You may connect either AC power or DC power or both. In case both sources are connected, power will be sourced from the AC input. If AC input is lost, there will be a uninterrupted switch-over to DC input.

### Power Consumption:

- Operating : 95W (TYP) - 125W (MAX)

## Physical Considerations:

- W: 584.00 [22.99] x H: 534.00 [21.02] x D: 85.00 [3.35] mm [inch]
- Weight: 18.0 kg / 39.6lbs

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17
- AC Power OUT : 1 x Std IEC Outlet (5A Max)

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

- VSD100692-1 : 1 x 9P D-SUB (female) - RS-232 (COM1)
- VSD100692-3 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen)  
: 3 x BNC (female) (Composite Video in)
- VSD100692-4 : 1 x 9P D-SUB (female) - RS-232 (COM1)  
: 3 x BNC (female) (Composite Video in)

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : Standard: 1.60m - Steering: 1.05m
- Rear Chassis Fans : 2x80mm, provides cooling. Auto-activates @ >31°C and Auto-Throttle if needed.

### Lifetime Considerations:

Even though the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = Custom Multifunction Cable to support more signals
- JH 23TBR T01-A1 = Bracket (See user manual)
- JH 23BRD STD-A1 = Mounting Bracket EN6095 Tested (See manual)
- JH MMDRO STD-A1 = Rotary Bracket (See user manual)
- JH 23TSV STD-A1 = Sun Visor (See user manual)
- JH 23VED STD-A1 = Vesa Bracket (See user manual)
- JH 23TWC STD-A1 = Water Cover (See user manual)

## Factory Options:

- Capacitive Touch Screen / Optical Bonding Technology
- Color Calibrated models (ECDIS)

\*Note that all 23 inch with touch screens are by factory default delivered with bonding.

## TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

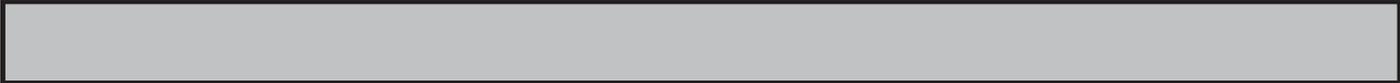
**IEC 60945 4th** (EN 60945:2002)  
**ABS** - American Bureau of Shipping  
**CCS** - China Classification Society

**ClassNK** - Nippon Kaiji Kyokai  
**BV** - Bureau Veritas

**GL** - Germanischer Lloyd  
**LRS** - Lloyd's Register of Shipping

**DNV** - Det Norske Veritas  
**EU RO MR** - Mutual Recognition

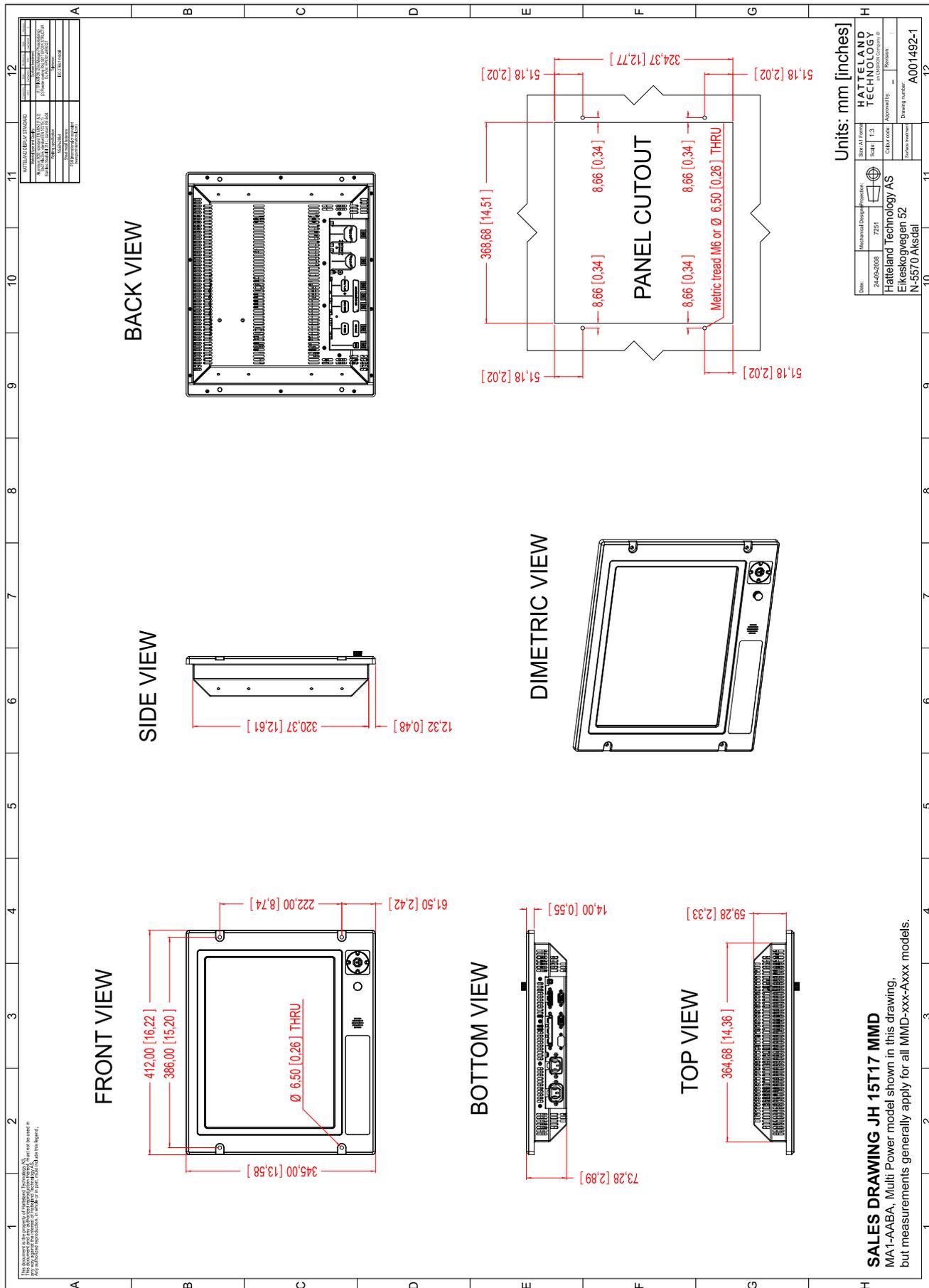
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# Technical Drawings

# Technical Drawings - JH 15T17 MMD-xxx-Axxx

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

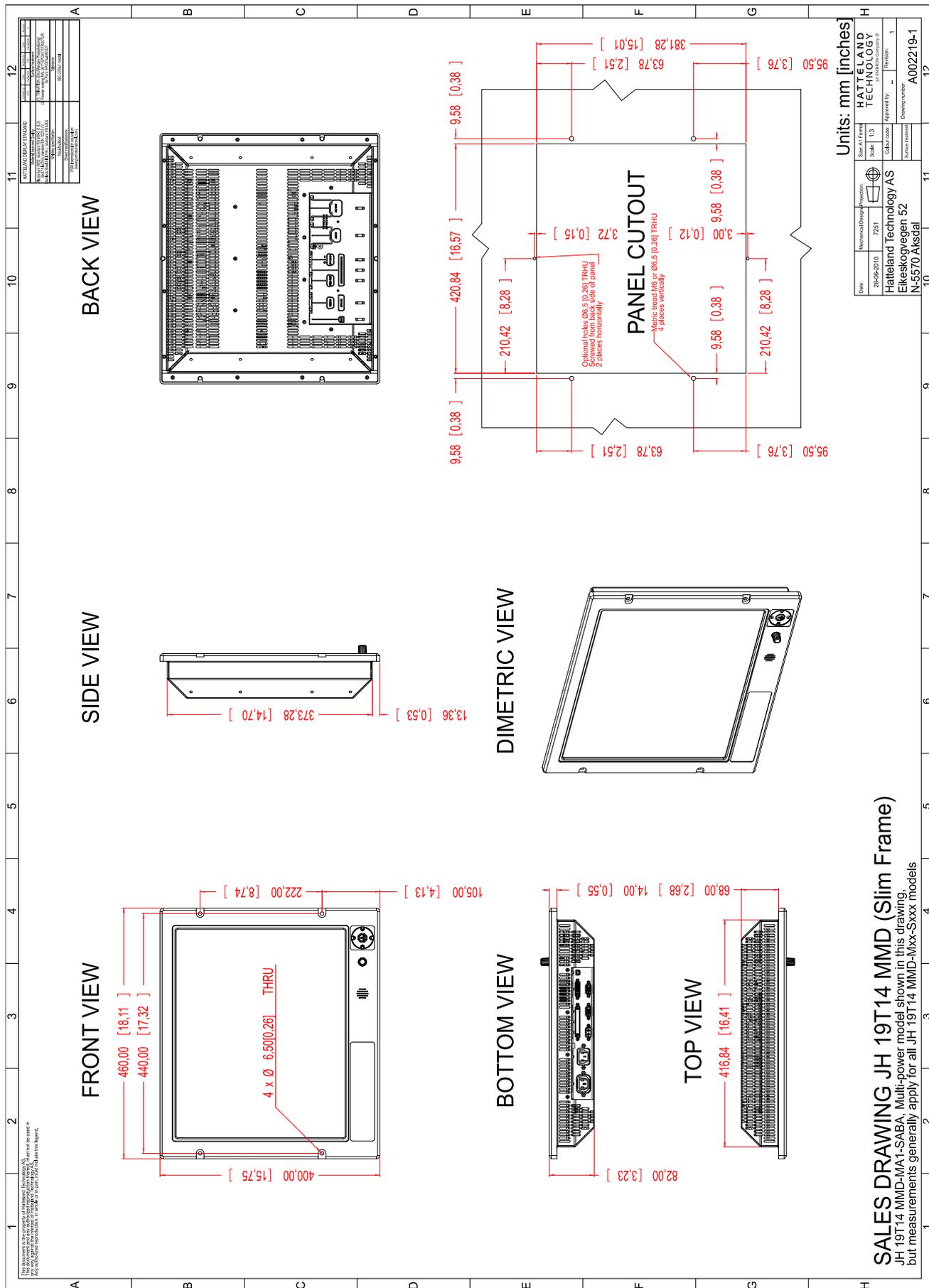


**SALES DRAWING JH 15T17 MMD**  
 MA1-AA8A. Multi Power model shown in this drawing.  
 but measurements generally apply for all MMD-xxx-Axxx models.

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# Technical Drawings - JH 19T14 MMD-xxx-Sxxx

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## SALES DRAWING JH 19T14 MMD (Slim Frame)

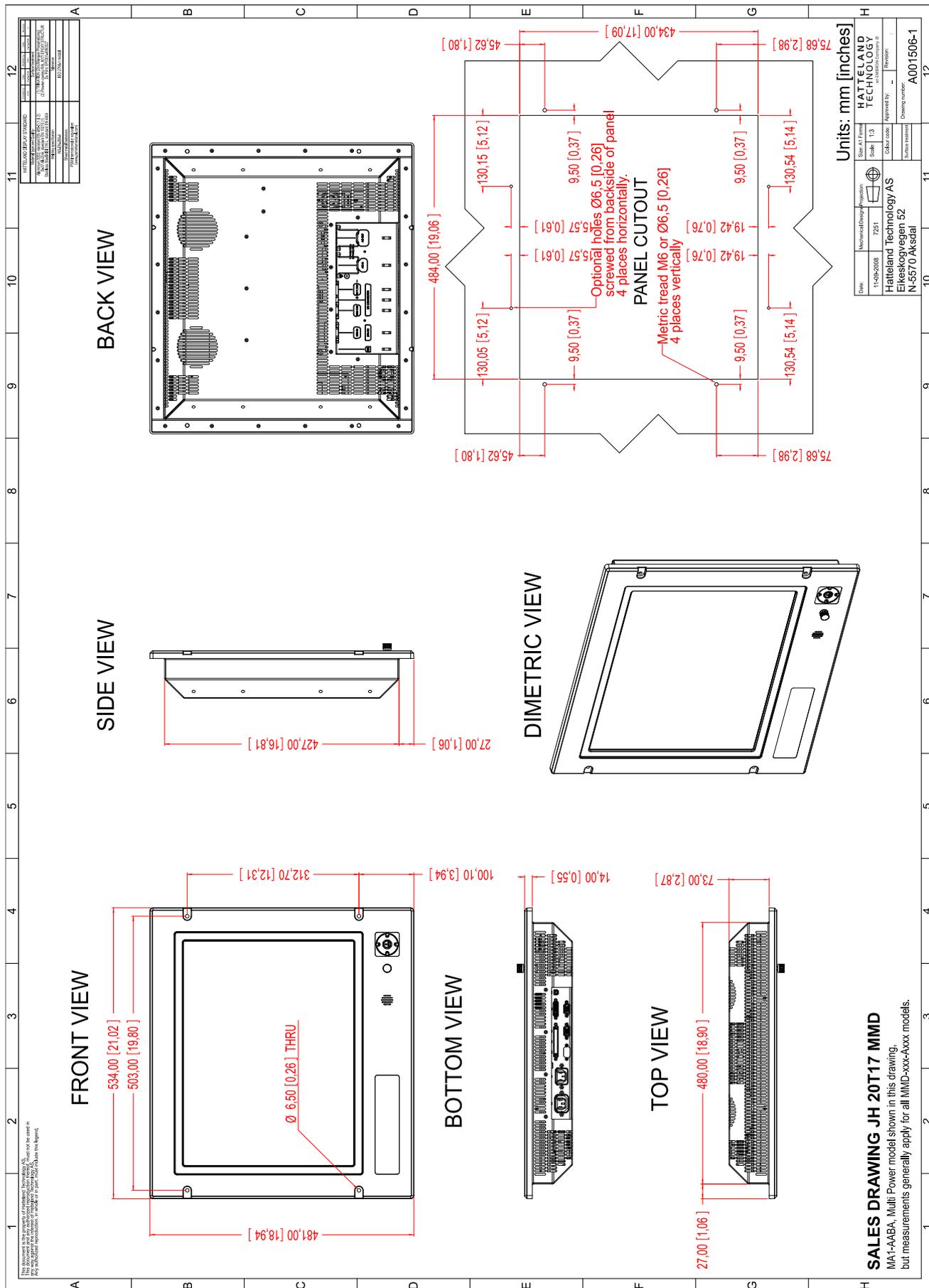
JH 19T14 MMD-MA1-SABA Multi-power model shown in this drawing, but measurements generally apply for all JH 19T14 MMD-MAx-Sxxx models

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# Technical Drawings - JH 20T17 MMD-xxx-Axxx

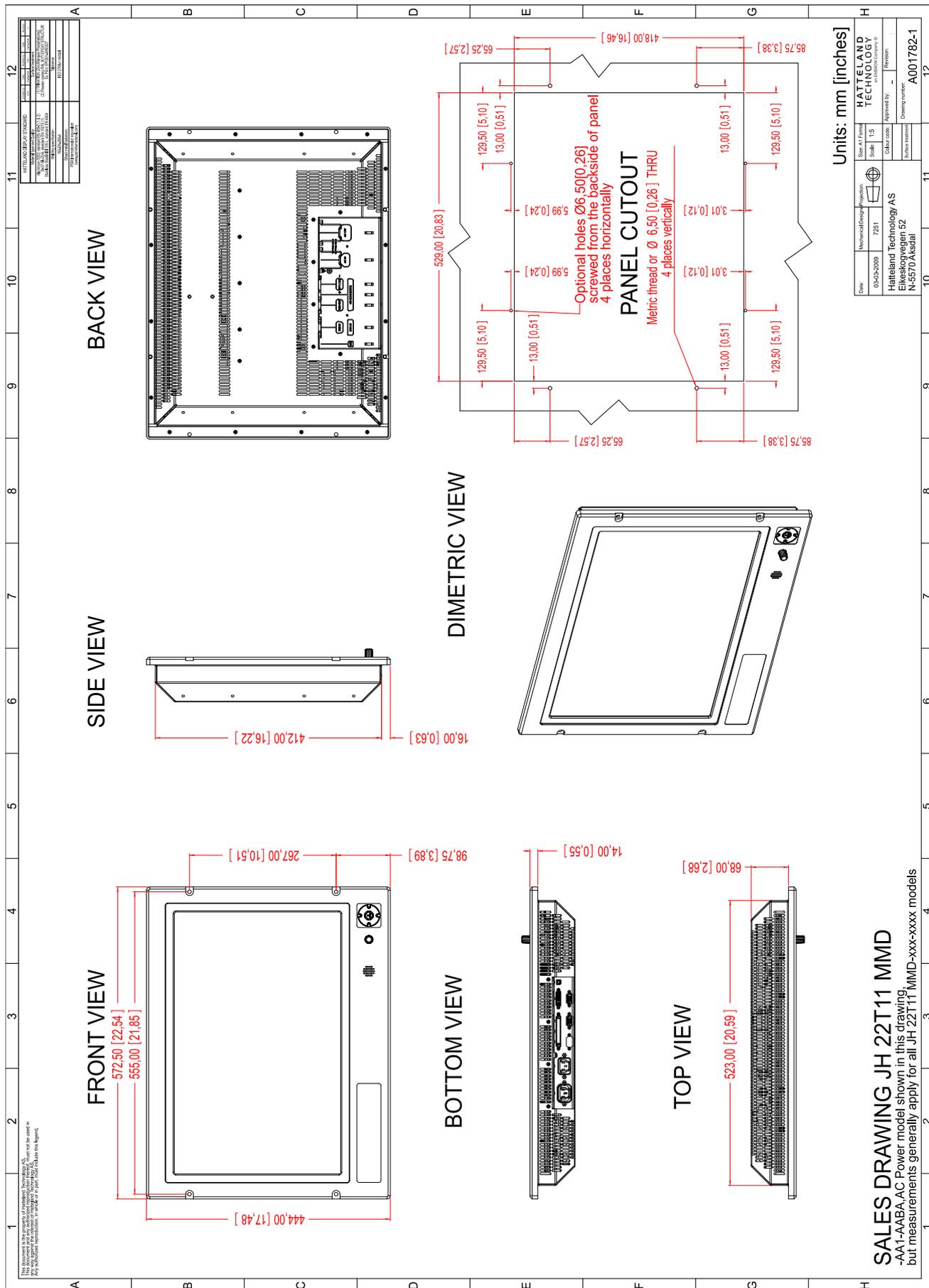
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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# Technical Drawings - JH 22T11 MMD-xxx-Axxx

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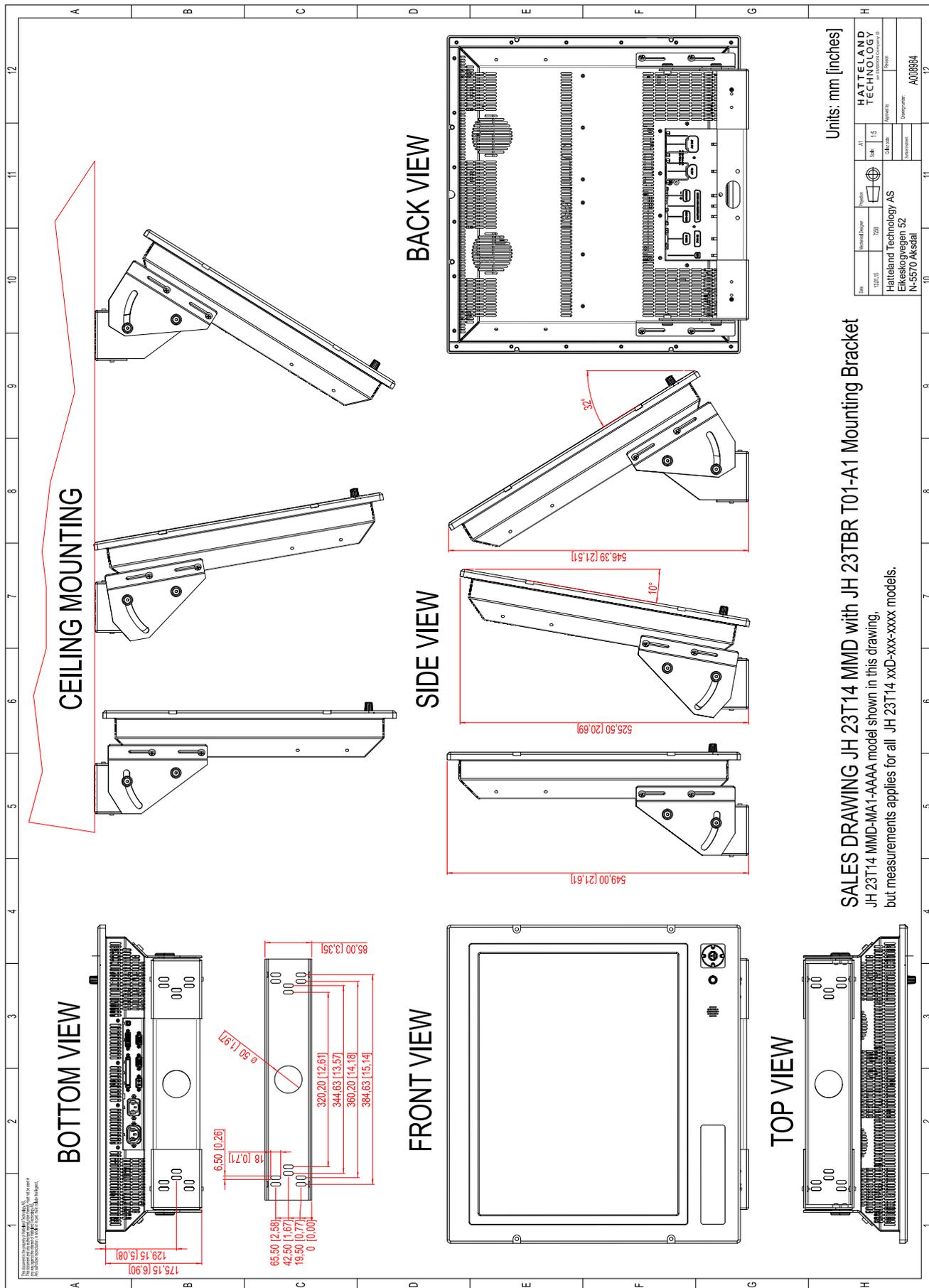
**SALES DRAWING JH 22T11 MMD**  
 -AA1-AABA AC Power model shown in this drawing,  
 but measurements generally apply for all JH 22T11 MMD-xxx-xxxx models

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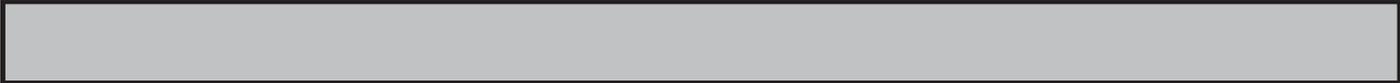


# Technical Drawings - JH 23T14 MMD-xxx-Axxx

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



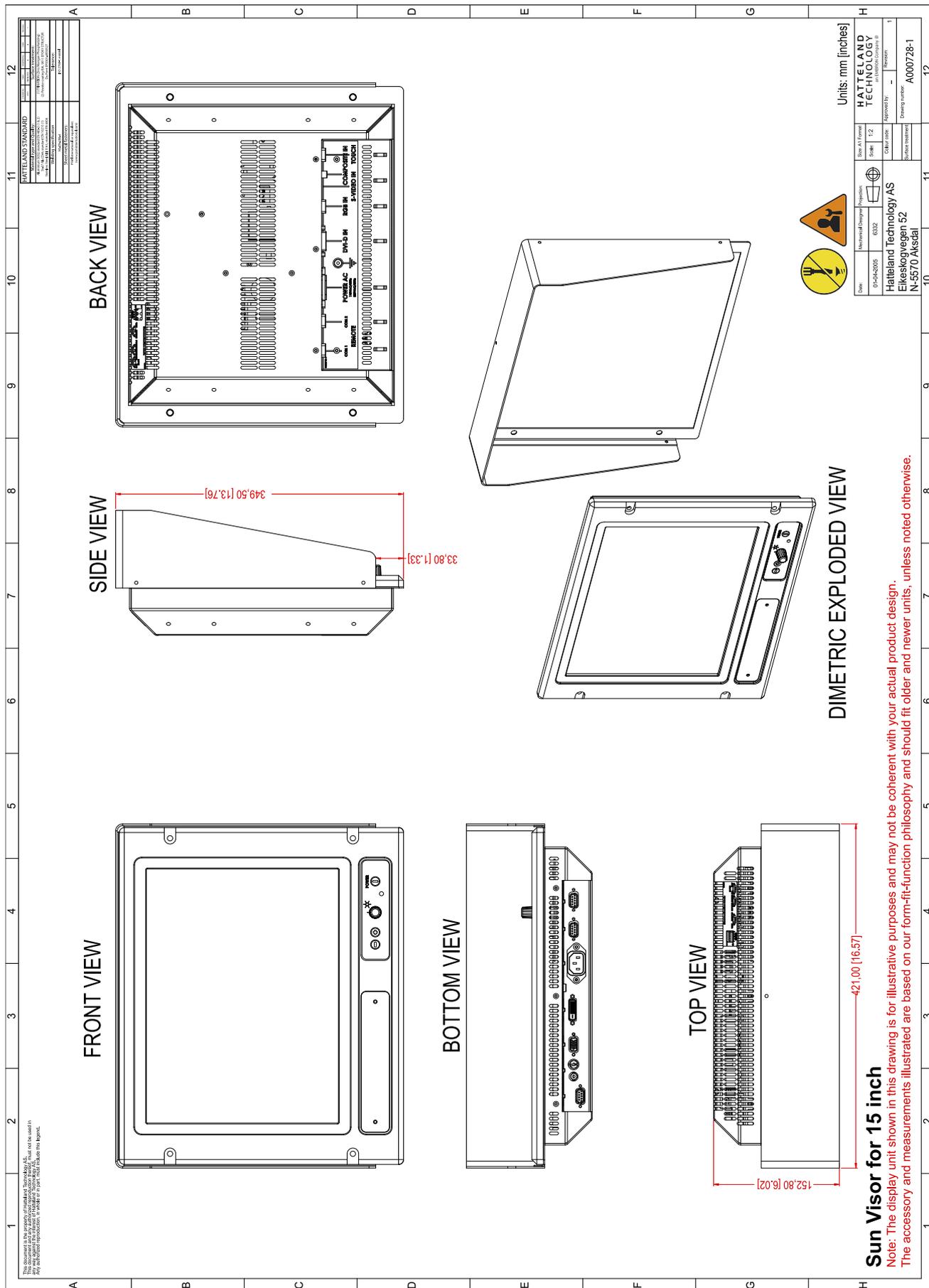
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# **Technical Drawings - Accessories**

# Technical Drawings - JH 15TSV STD-A1

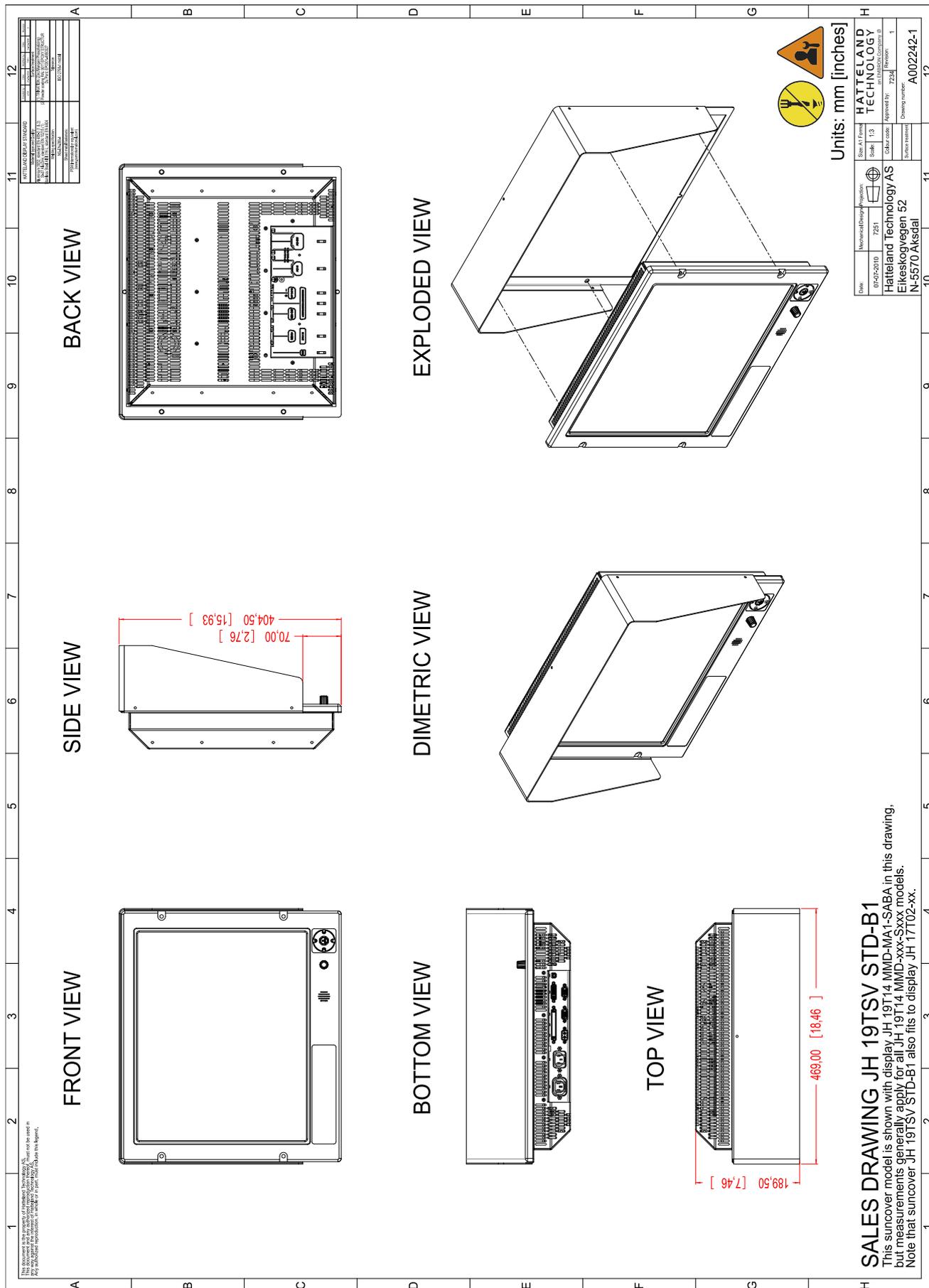
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# Technical Drawings - JH 19TSV STD-B1

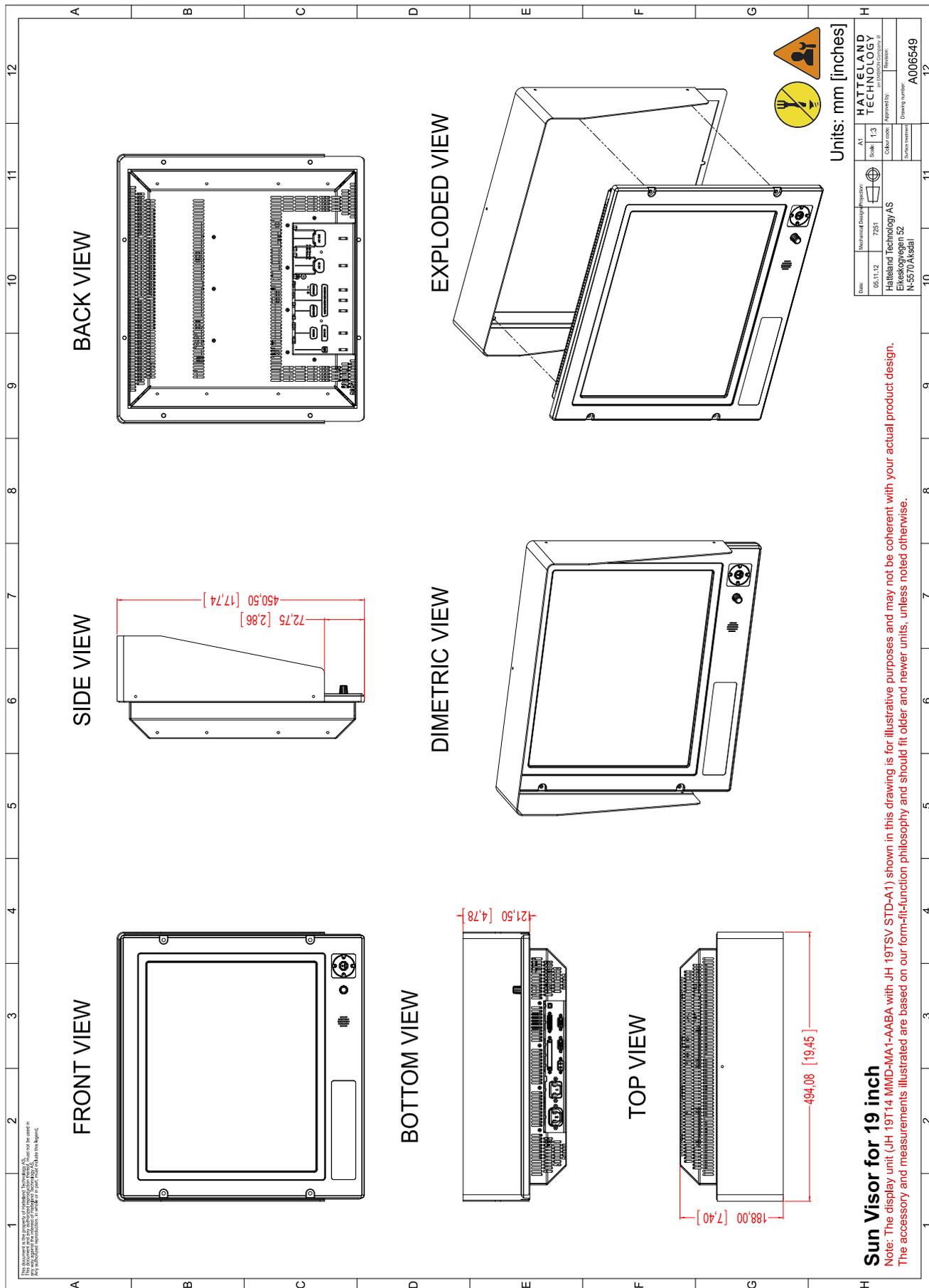
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# Technical Drawings - JH 19TSV STD-A1

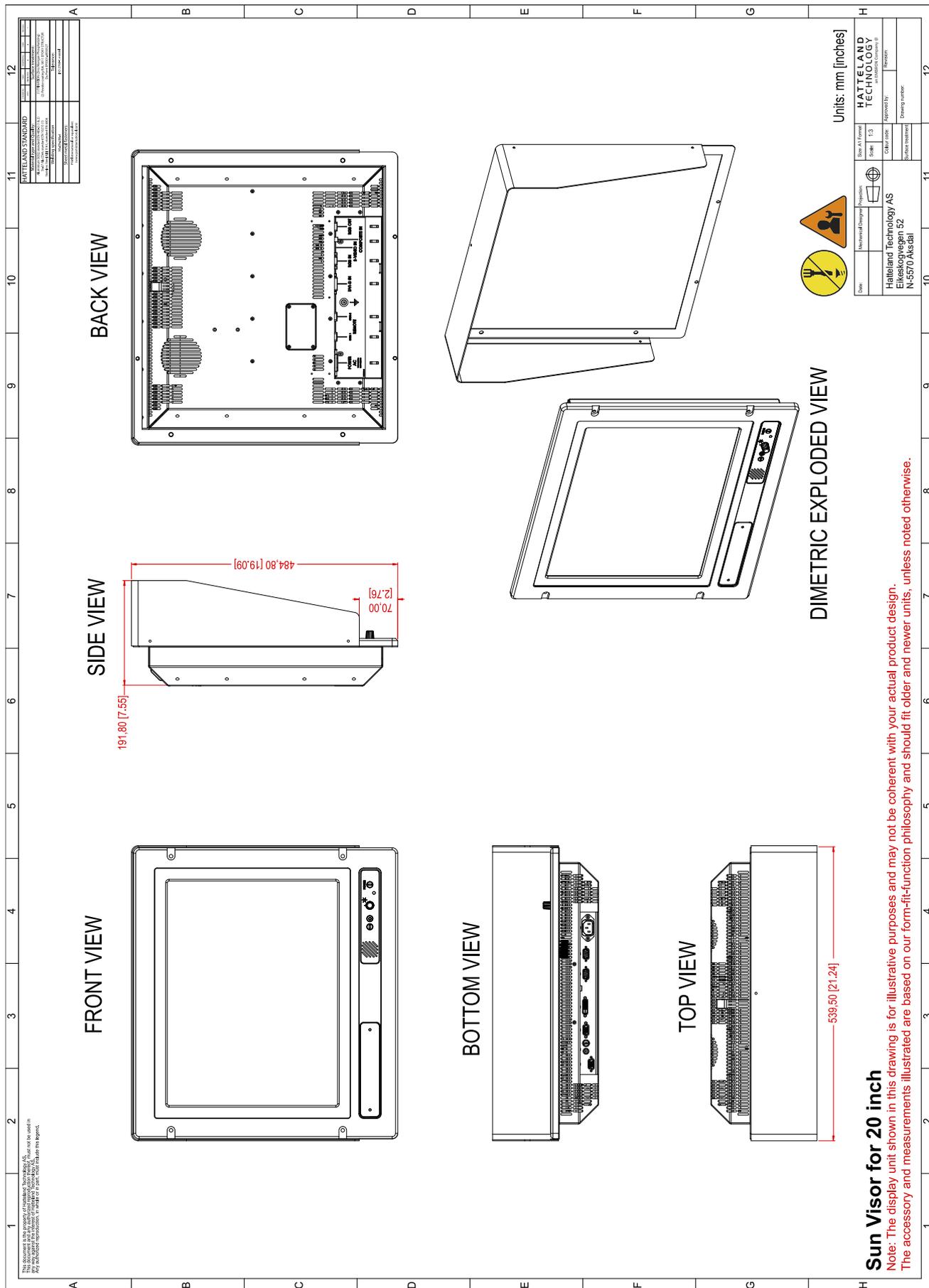
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# Technical Drawings - JH 20TSV STD-B1

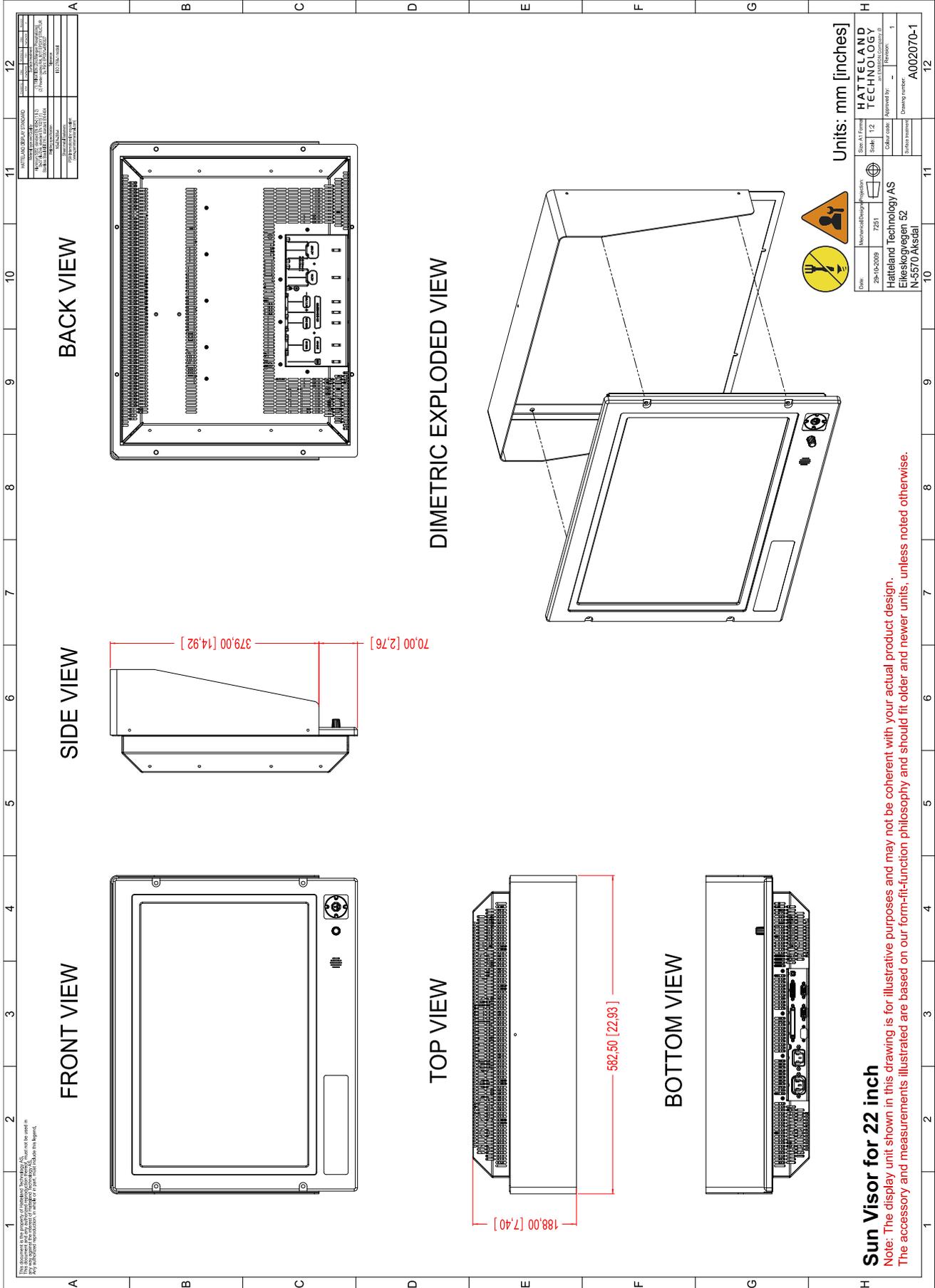
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# Technical Drawings - Accessories

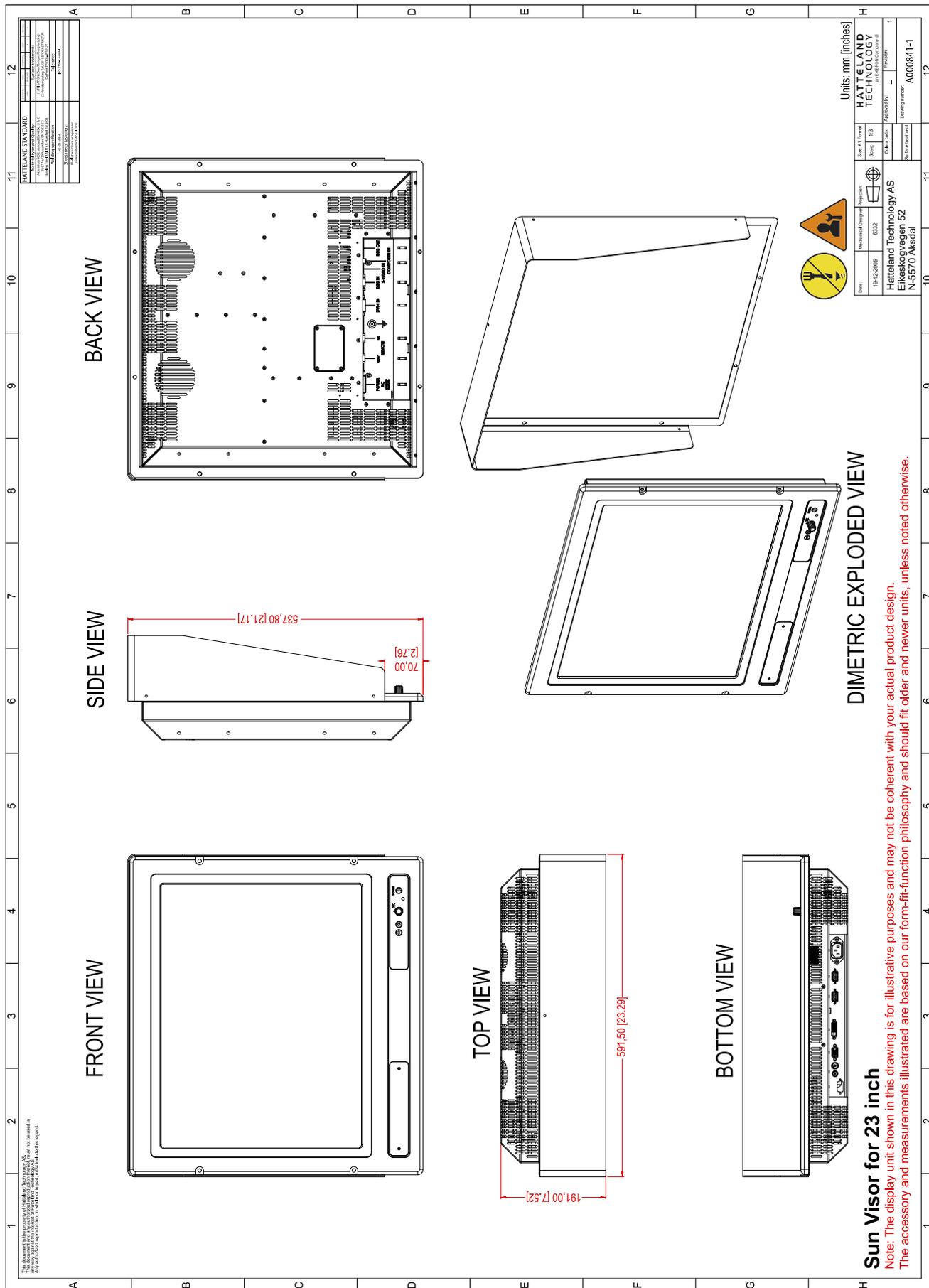
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# Technical Drawings - JH 23TSV STD-A1

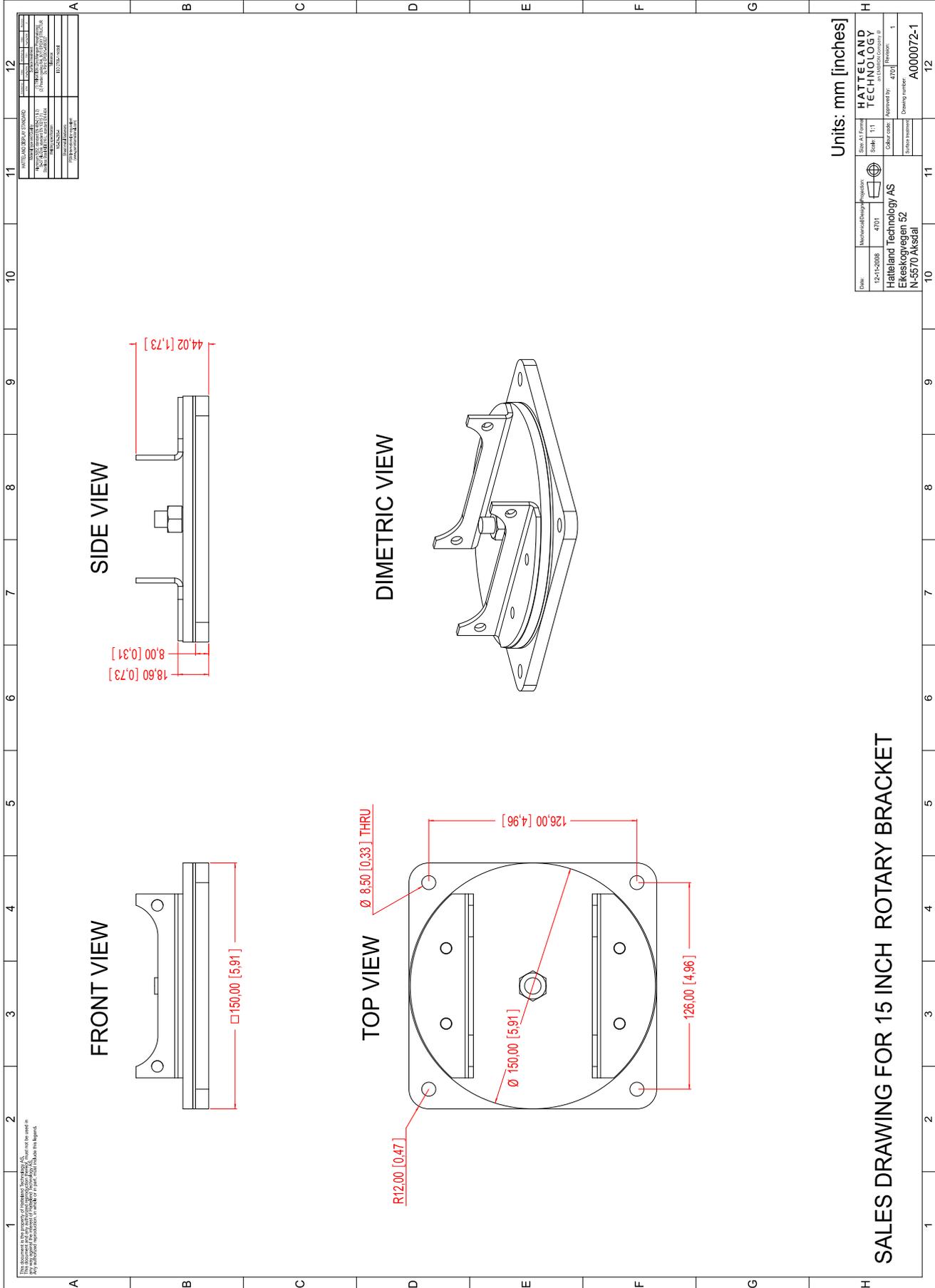
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# Technical Drawings - JH 15TRO STD-A1

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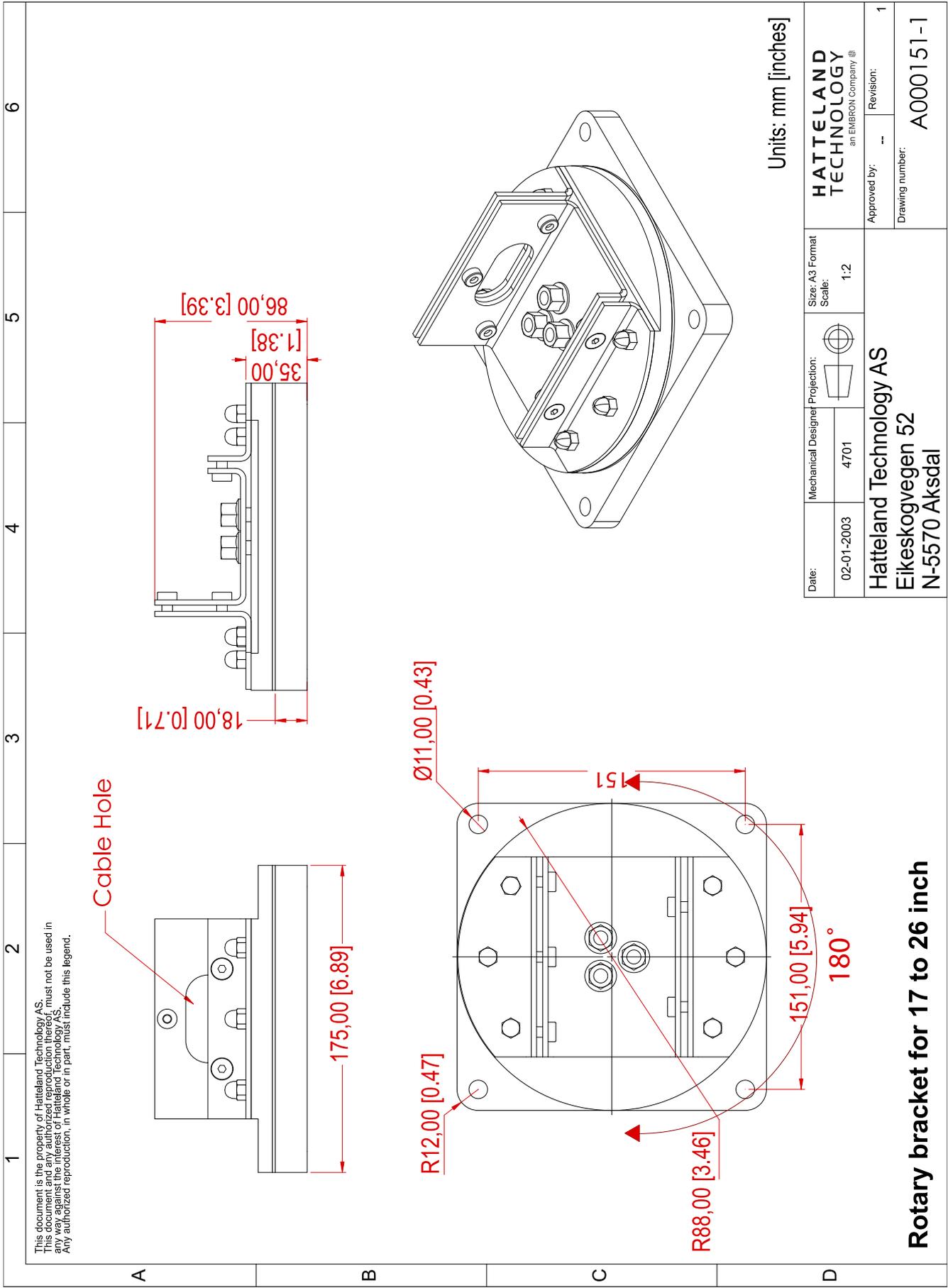


## SALES DRAWING FOR 15 INCH ROTARY BRACKET

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# Technical Drawings - JH MMDRO STD-A1

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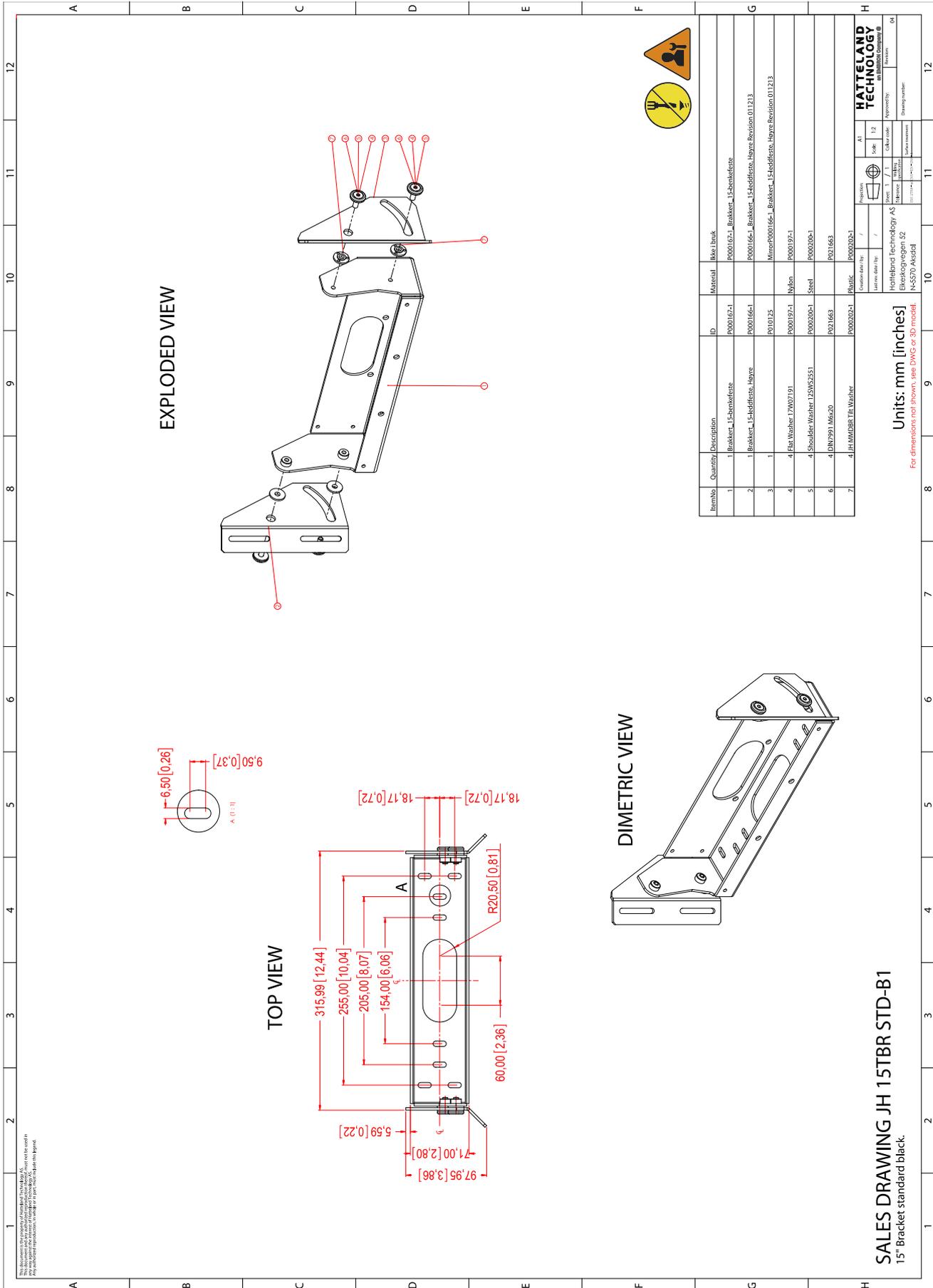


**Rotary bracket for 17 to 26 inch**

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# Technical Drawings - JH 15TBR STD-B1

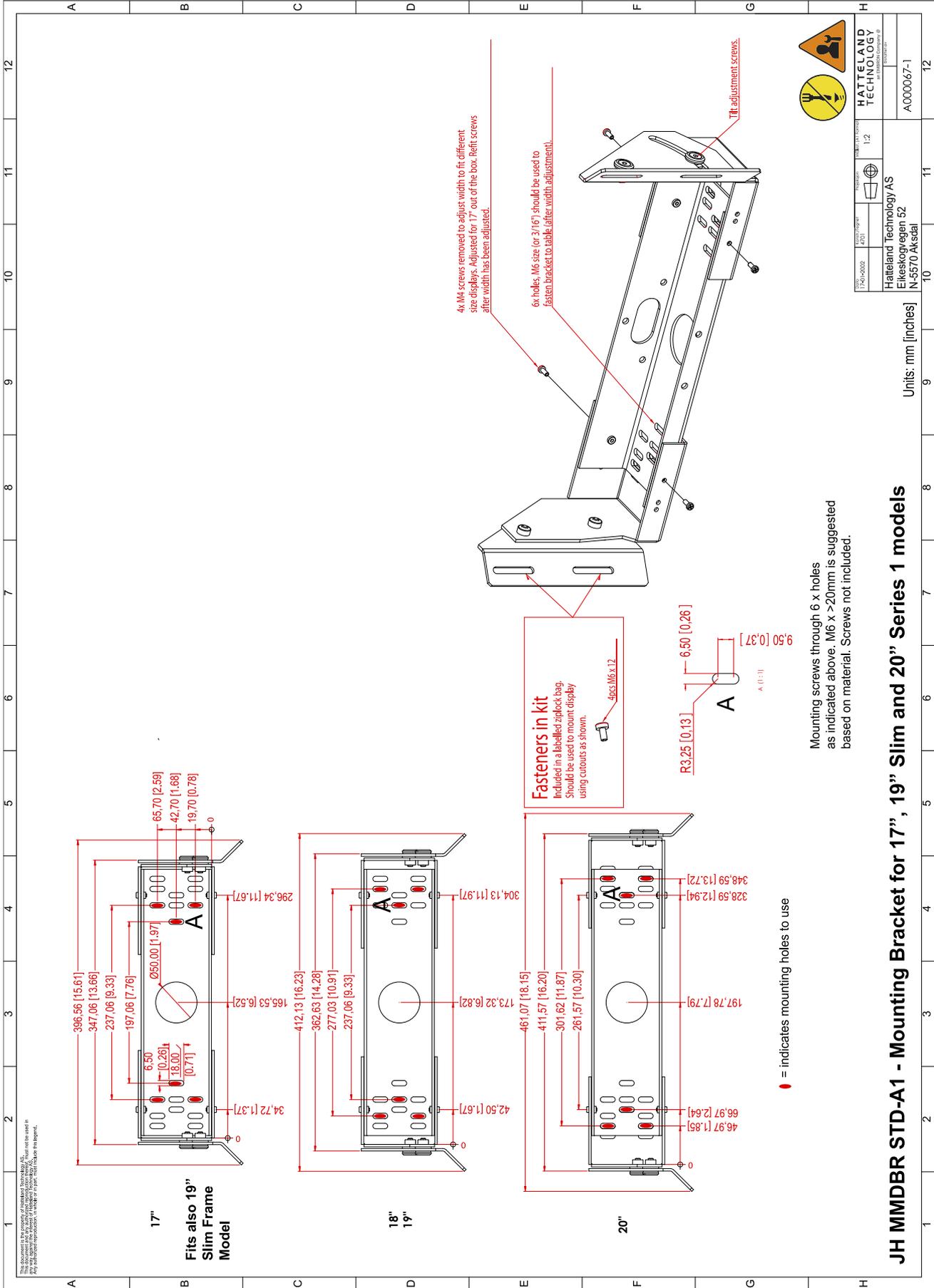
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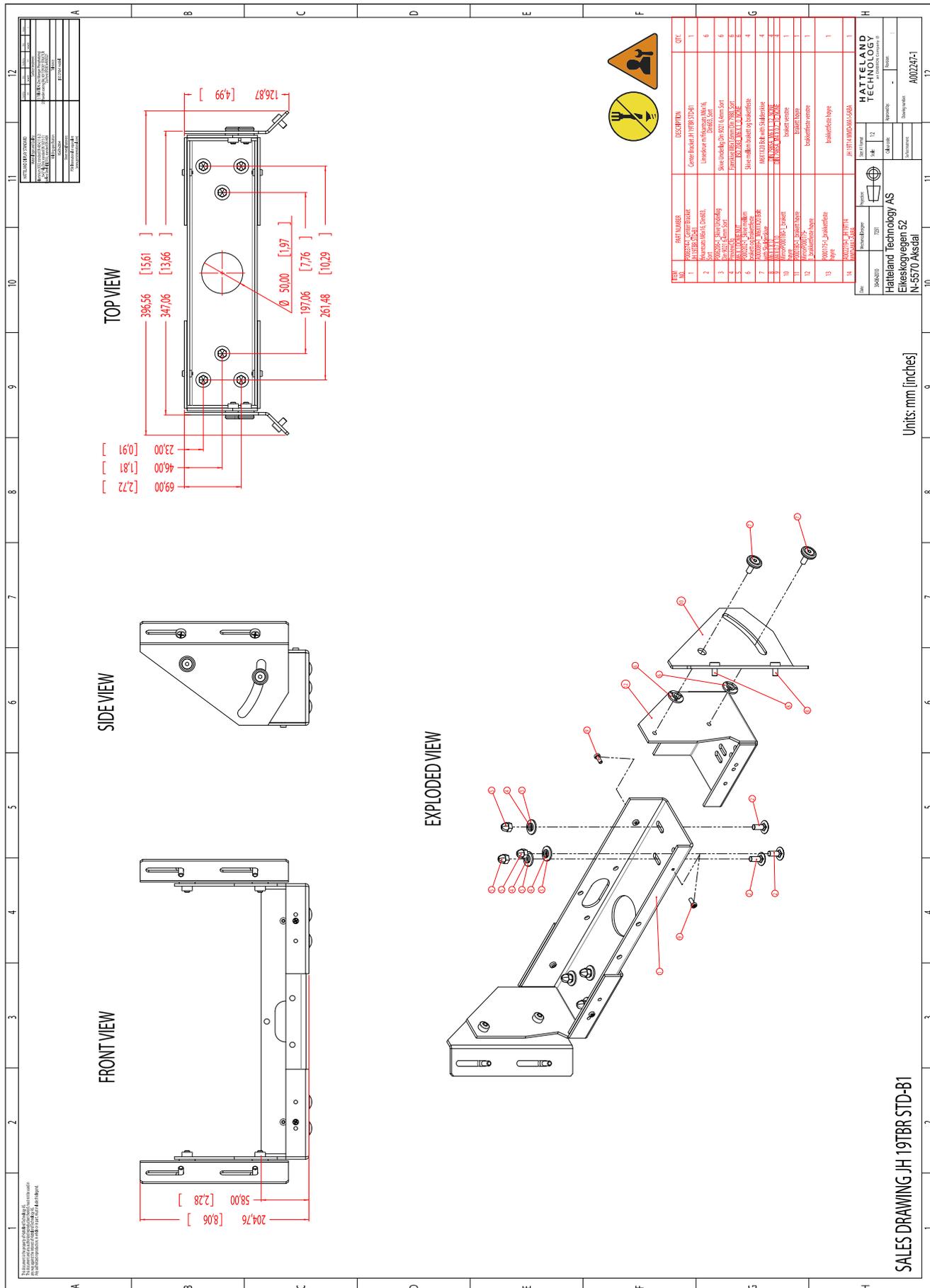
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# Technical Drawings - JH 19TBR STD-B1

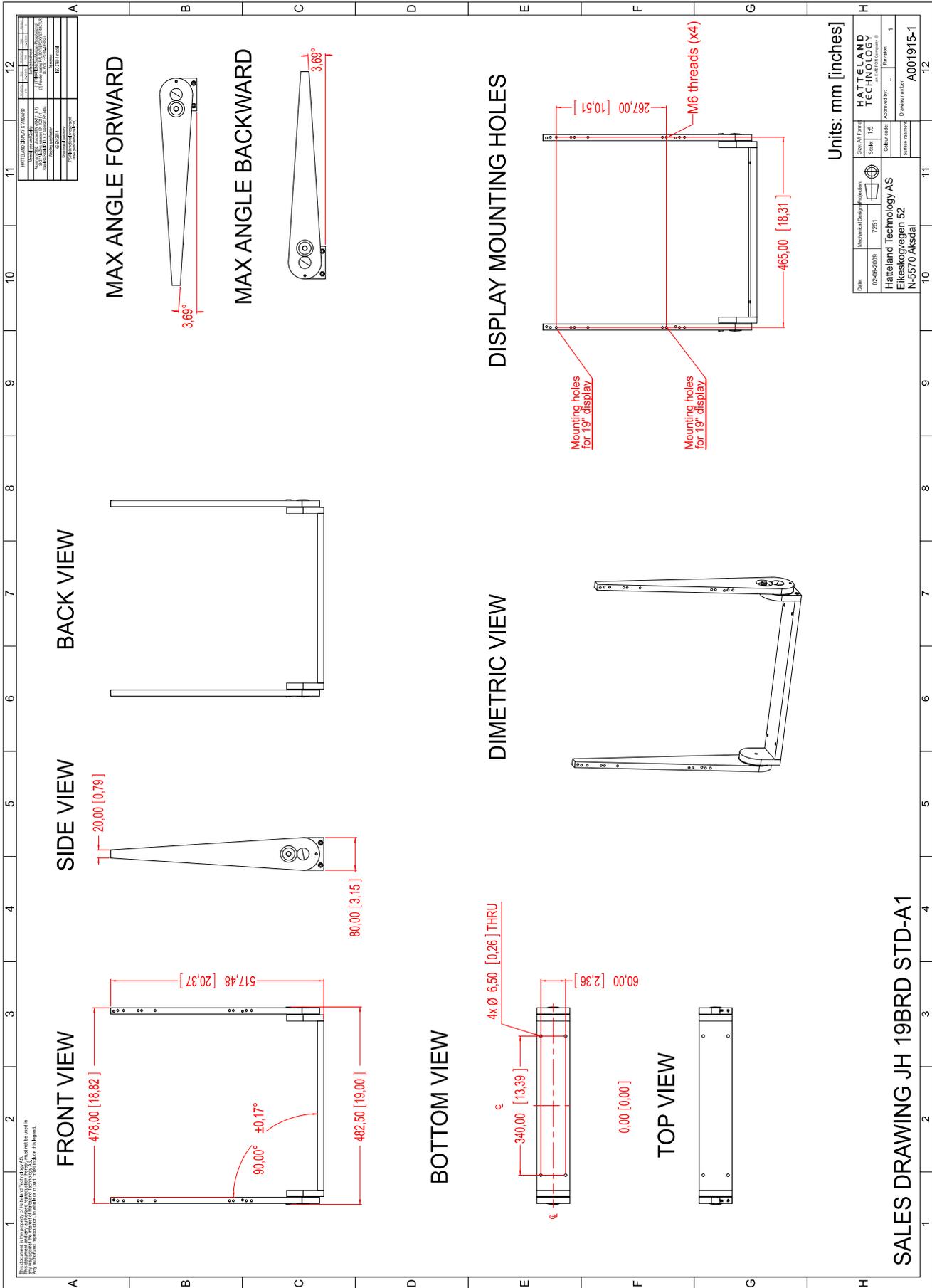
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# Technical Drawings - JH 19BRD STD-A1

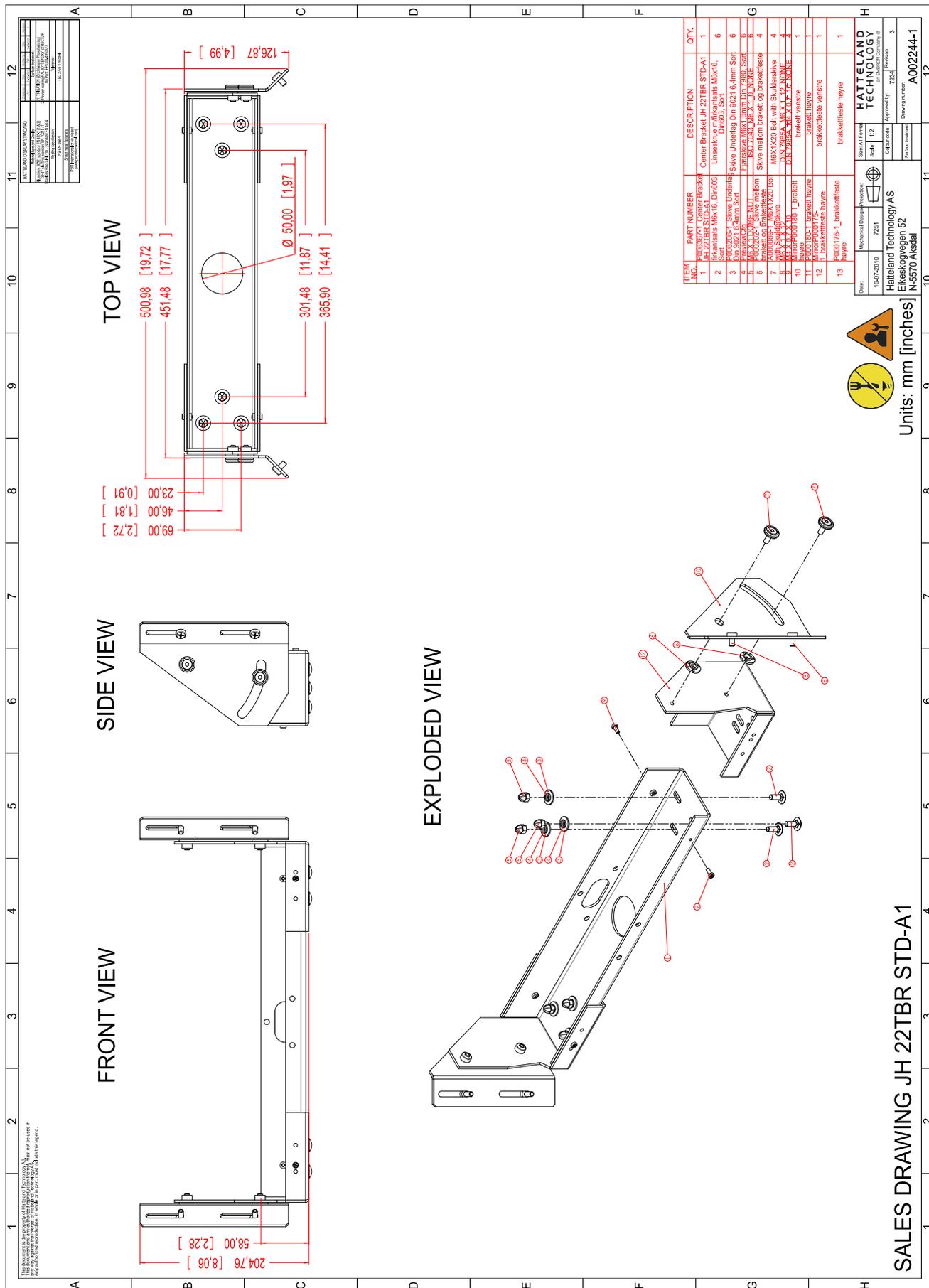
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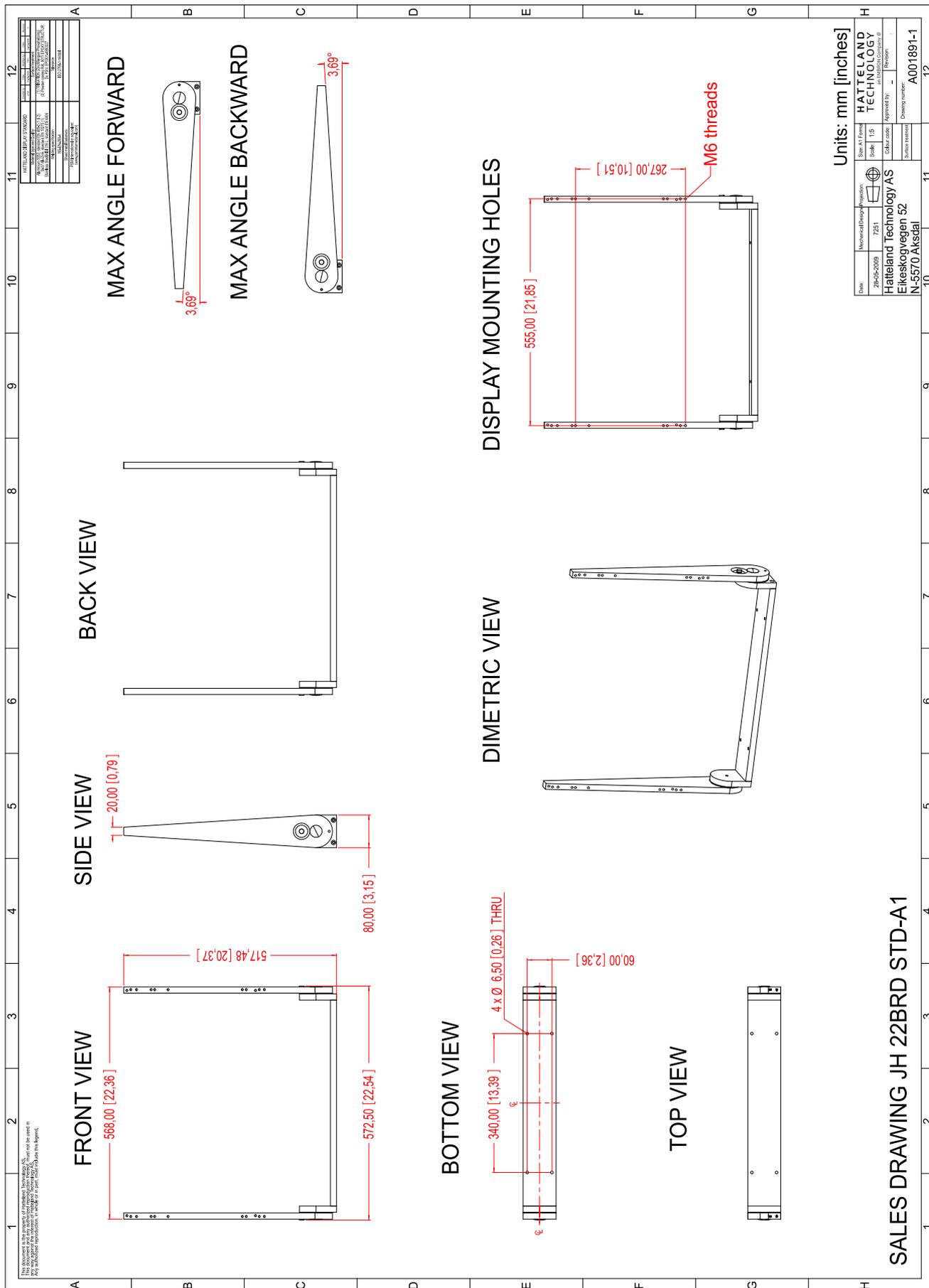
# Technical Drawings - Accessories

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

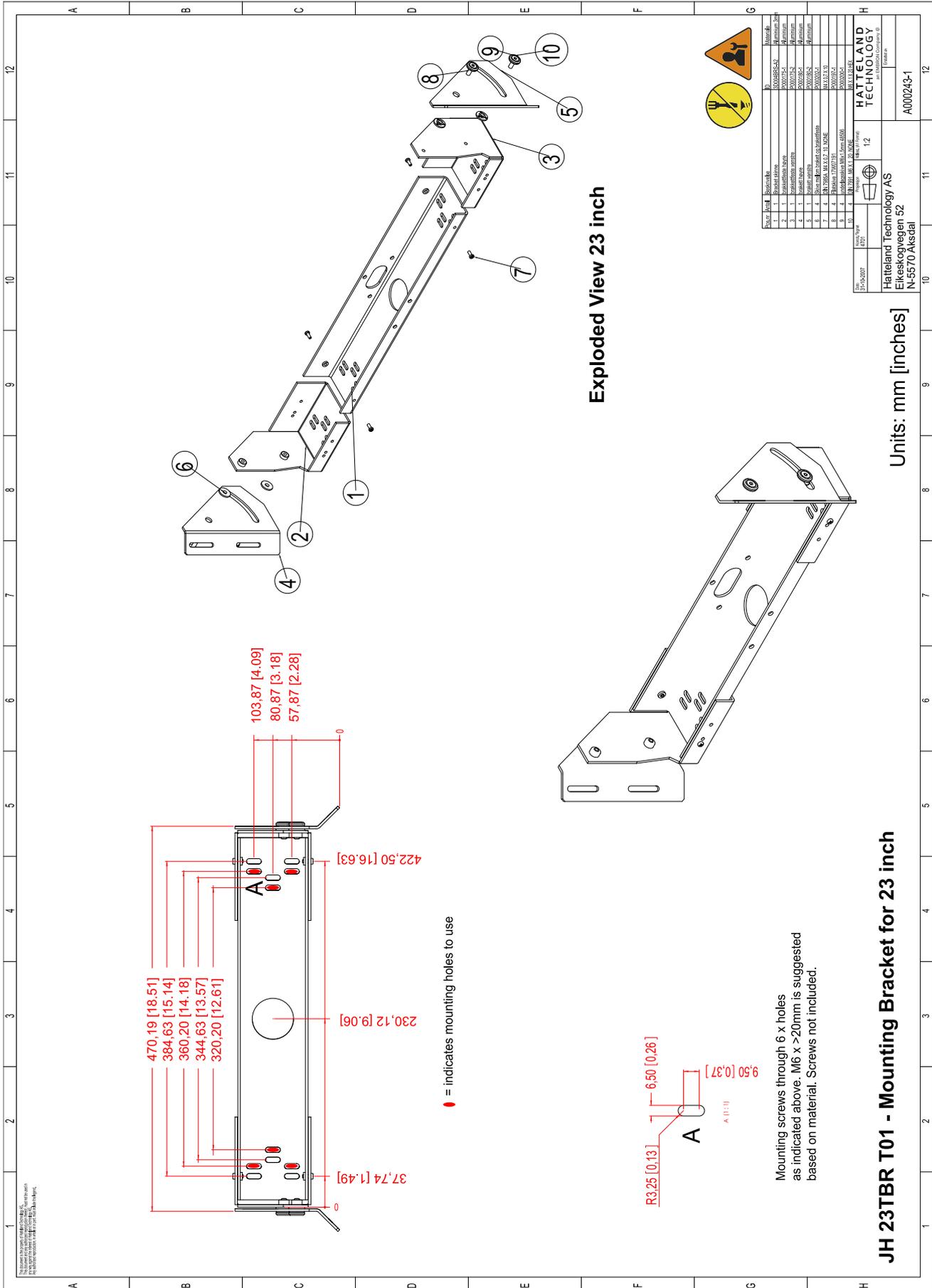


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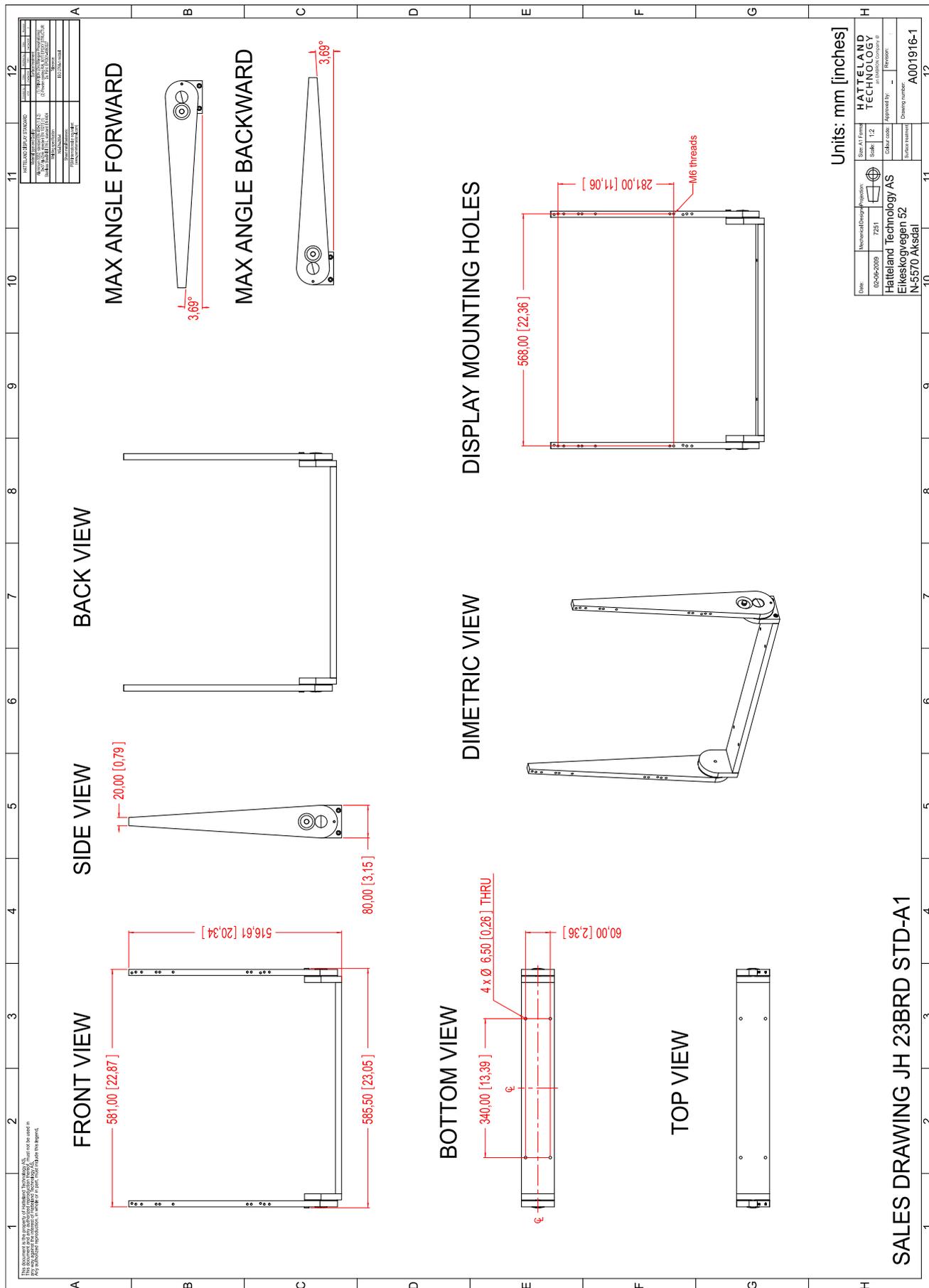
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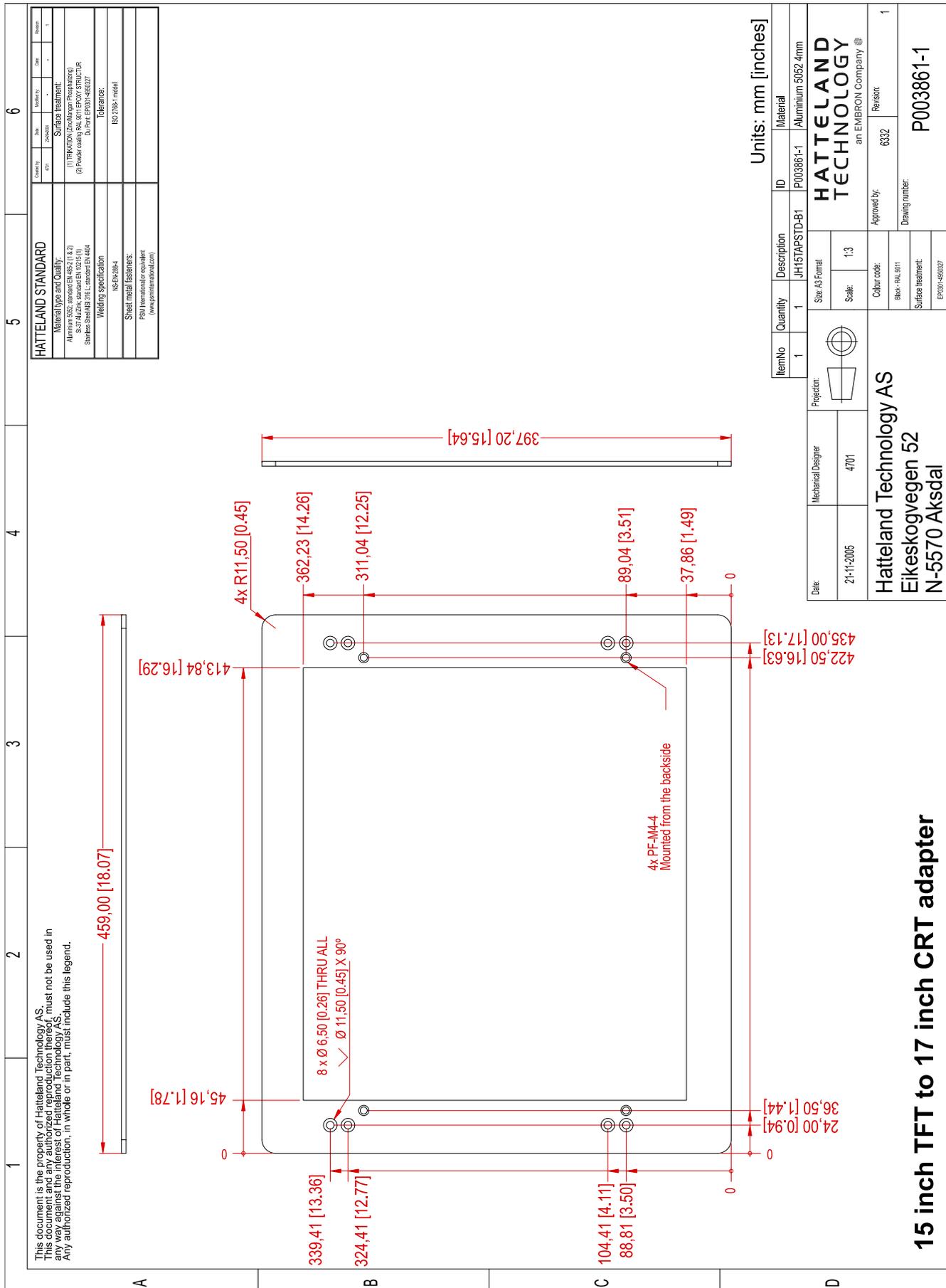
# Technical Drawings - JH 23BRD STD-A1

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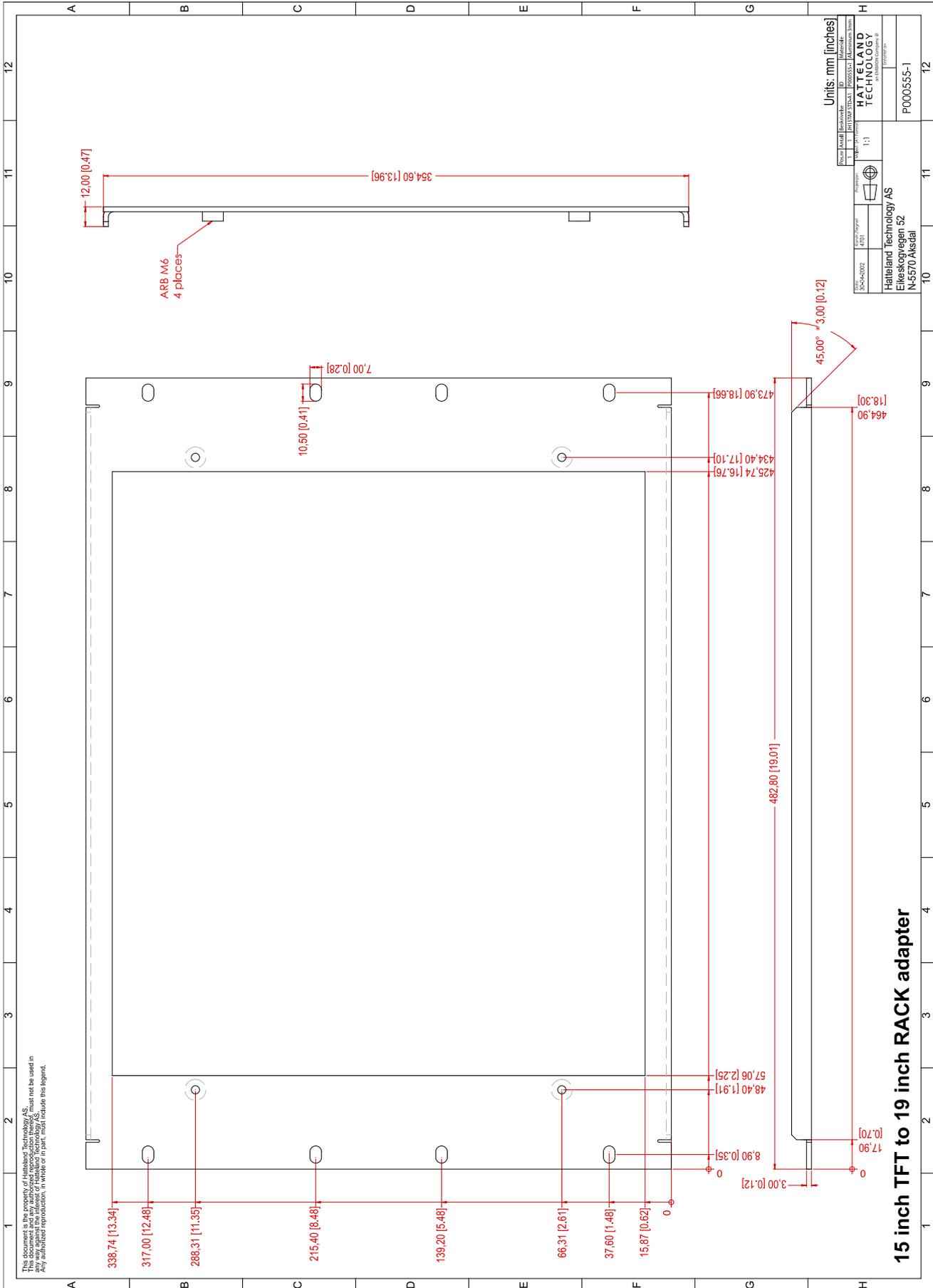
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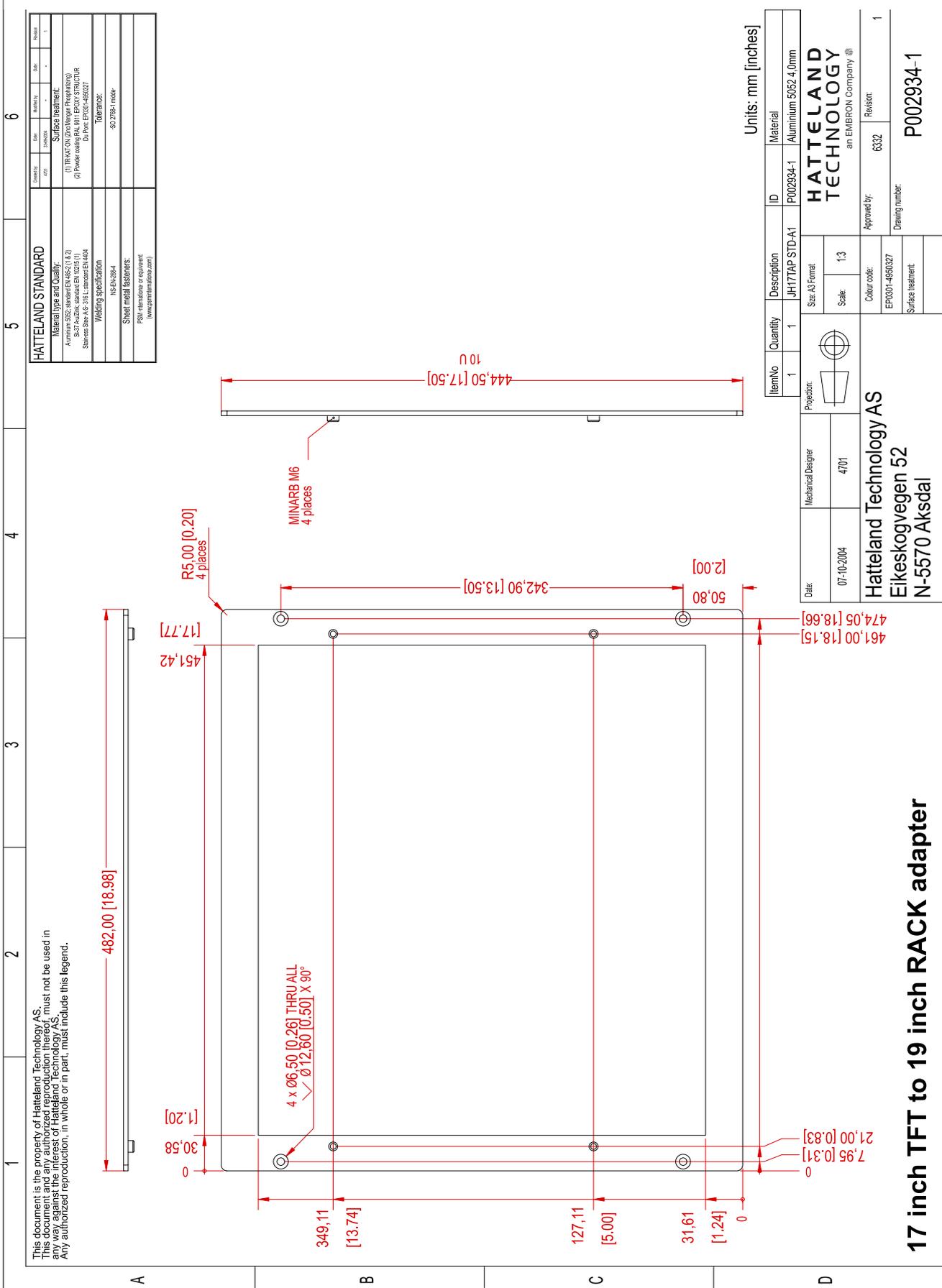
# Technical Drawings - JH 15TAP STD-A1

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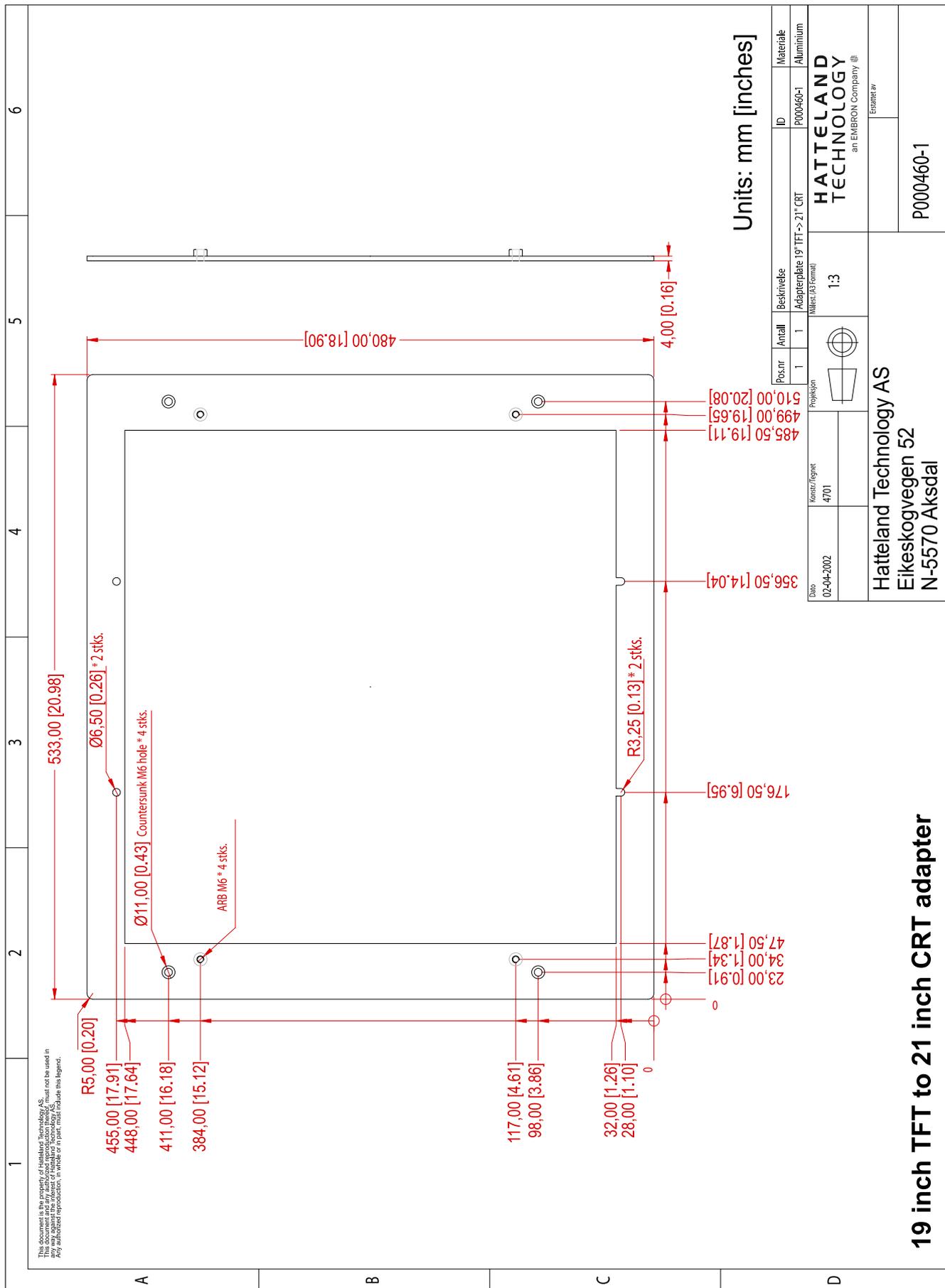
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# Technical Drawings - JH 19TAP STD-A1

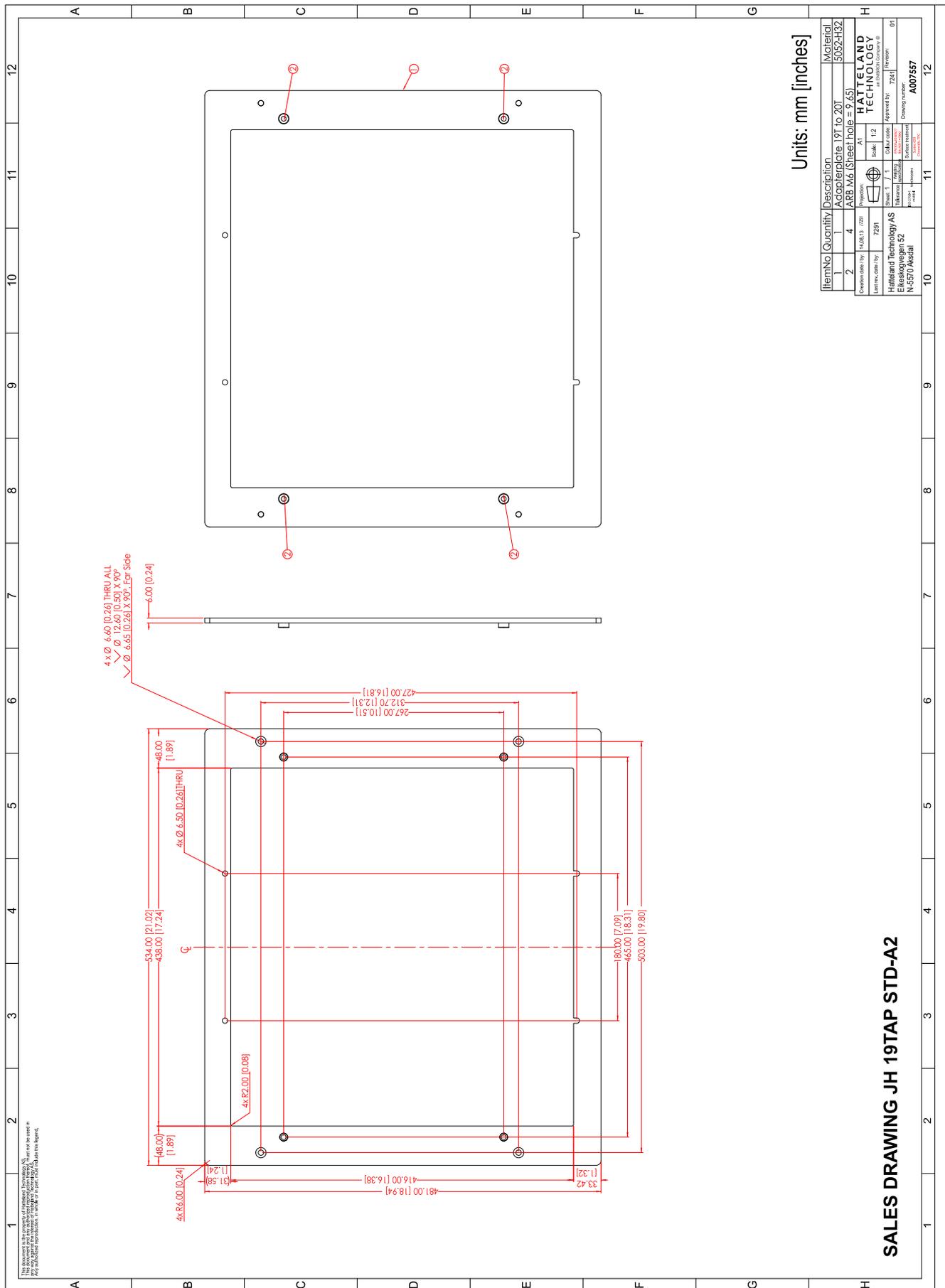
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# Technical Drawings - JH 19TAP STD-A2

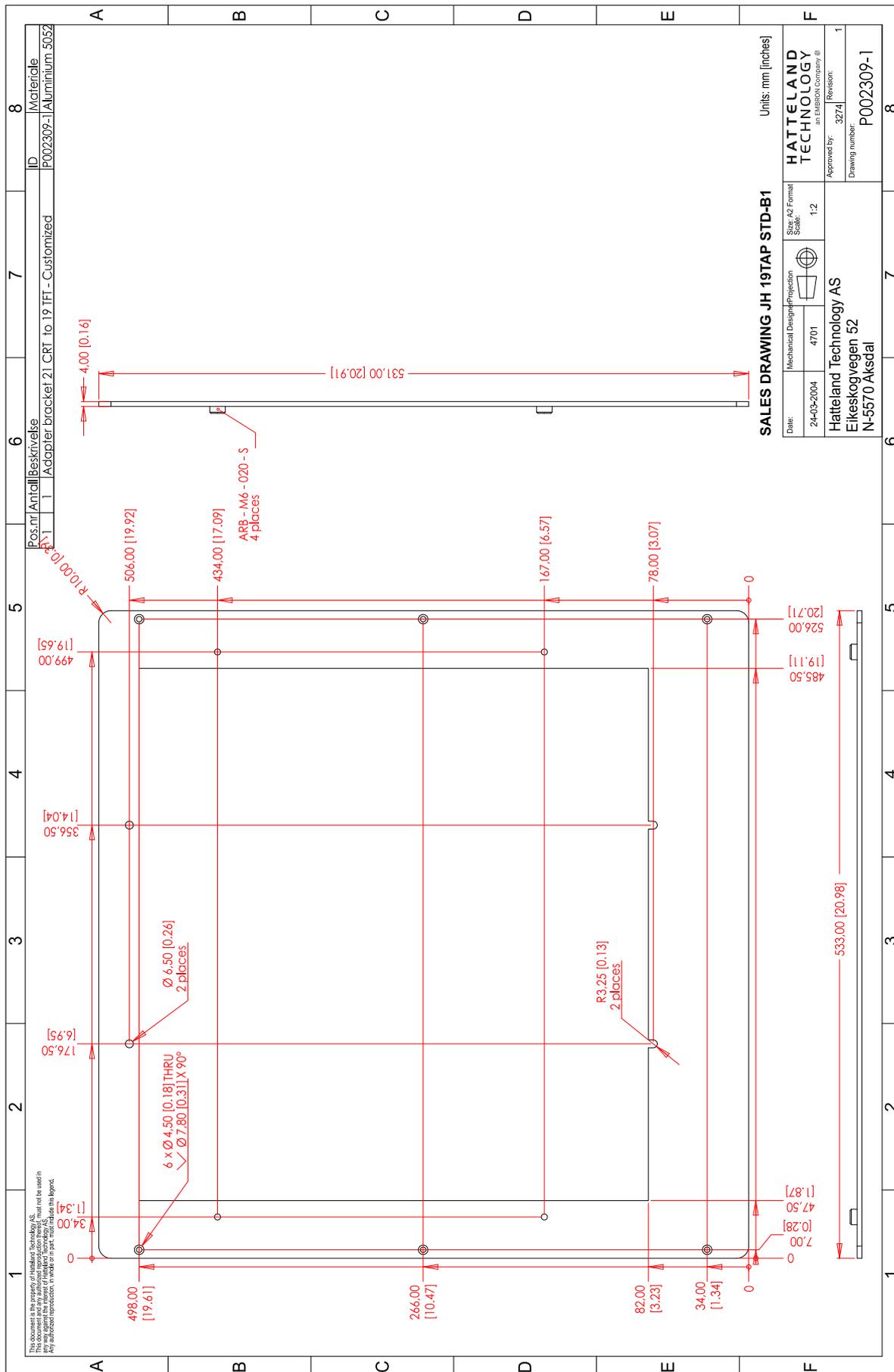
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# Technical Drawings - JH 19TAP STD-B1

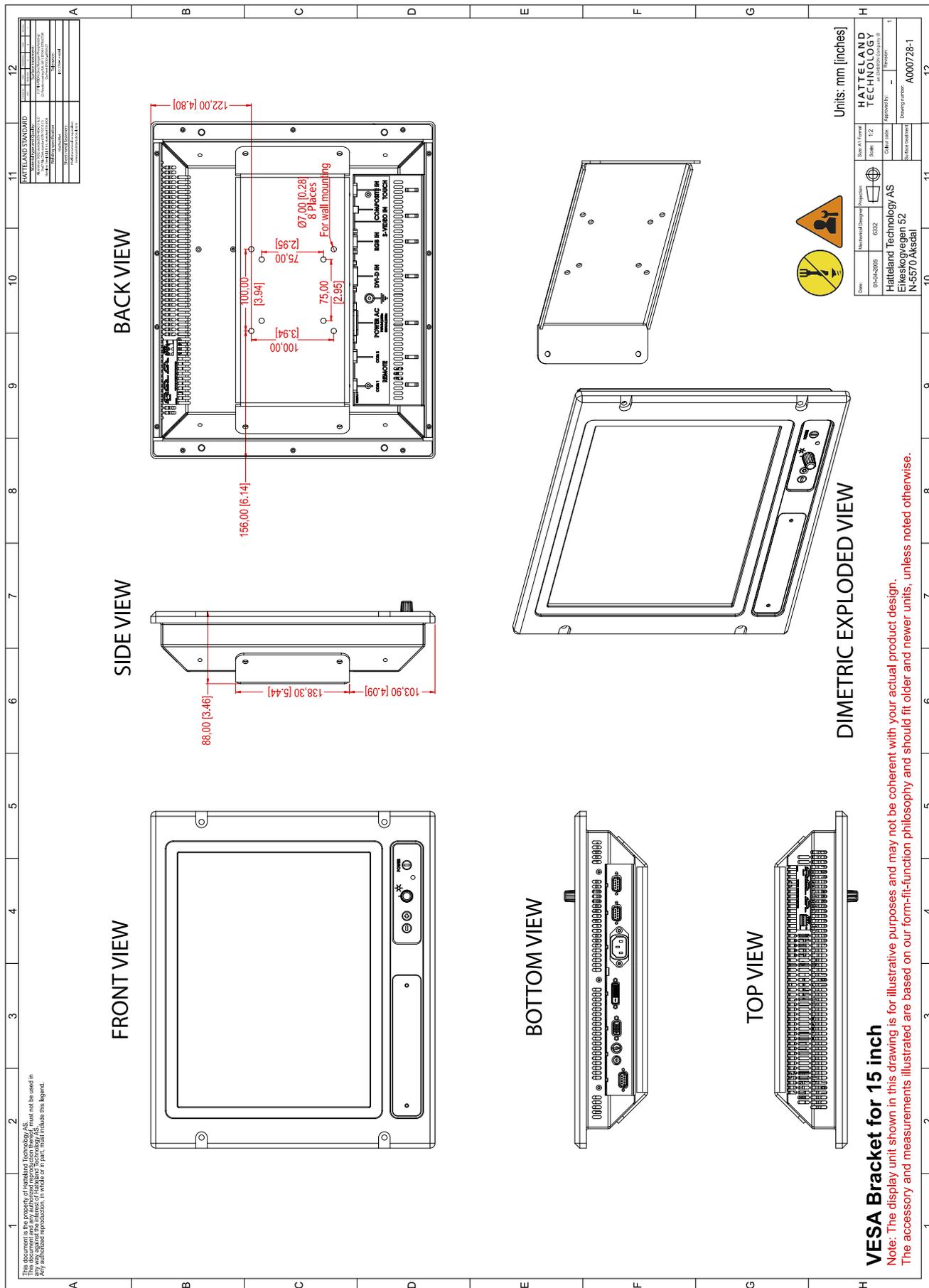
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# Technical Drawings - JH 15VED STD-A1

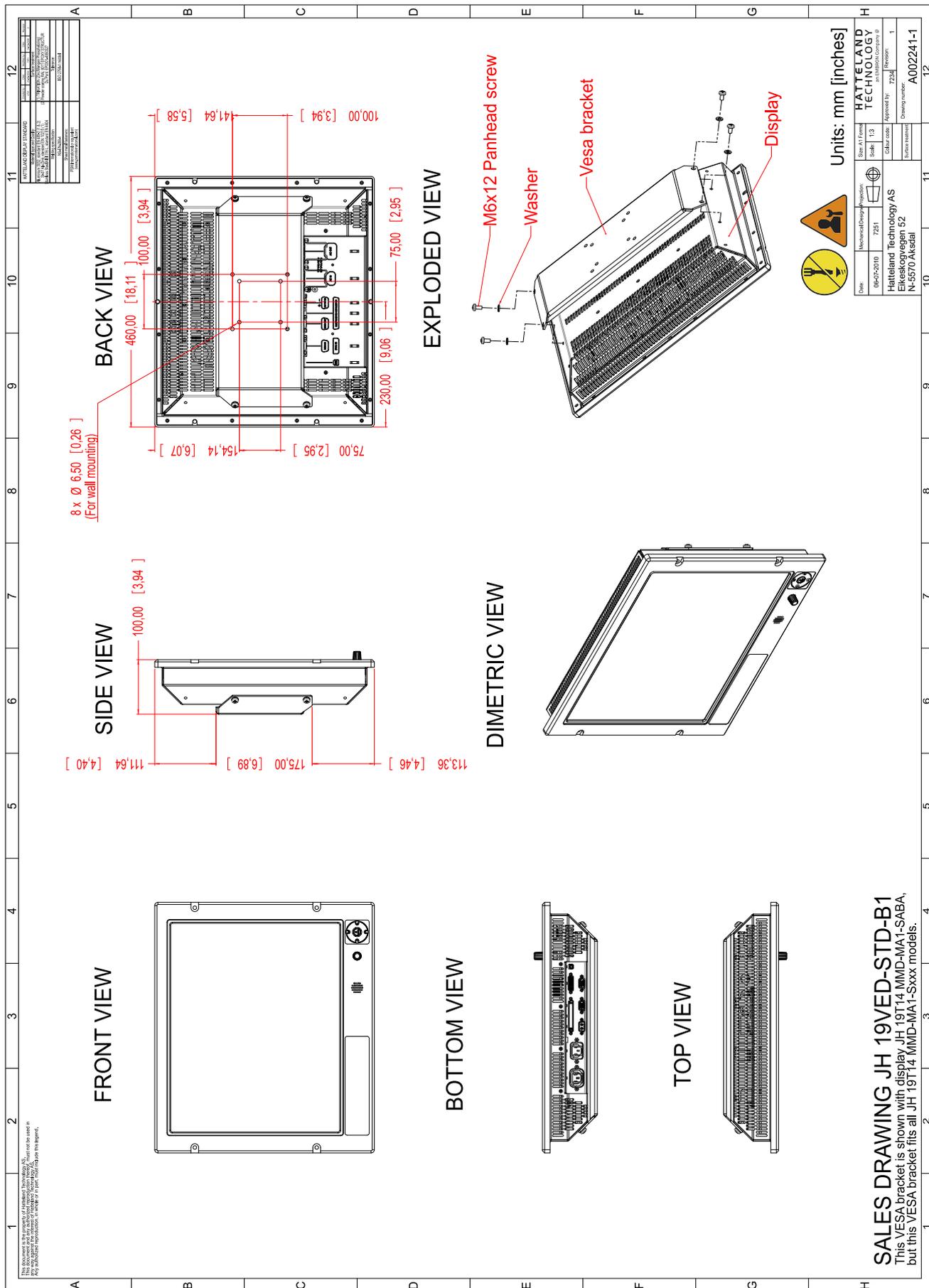
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# Technical Drawings - JH 19VED STD-B1

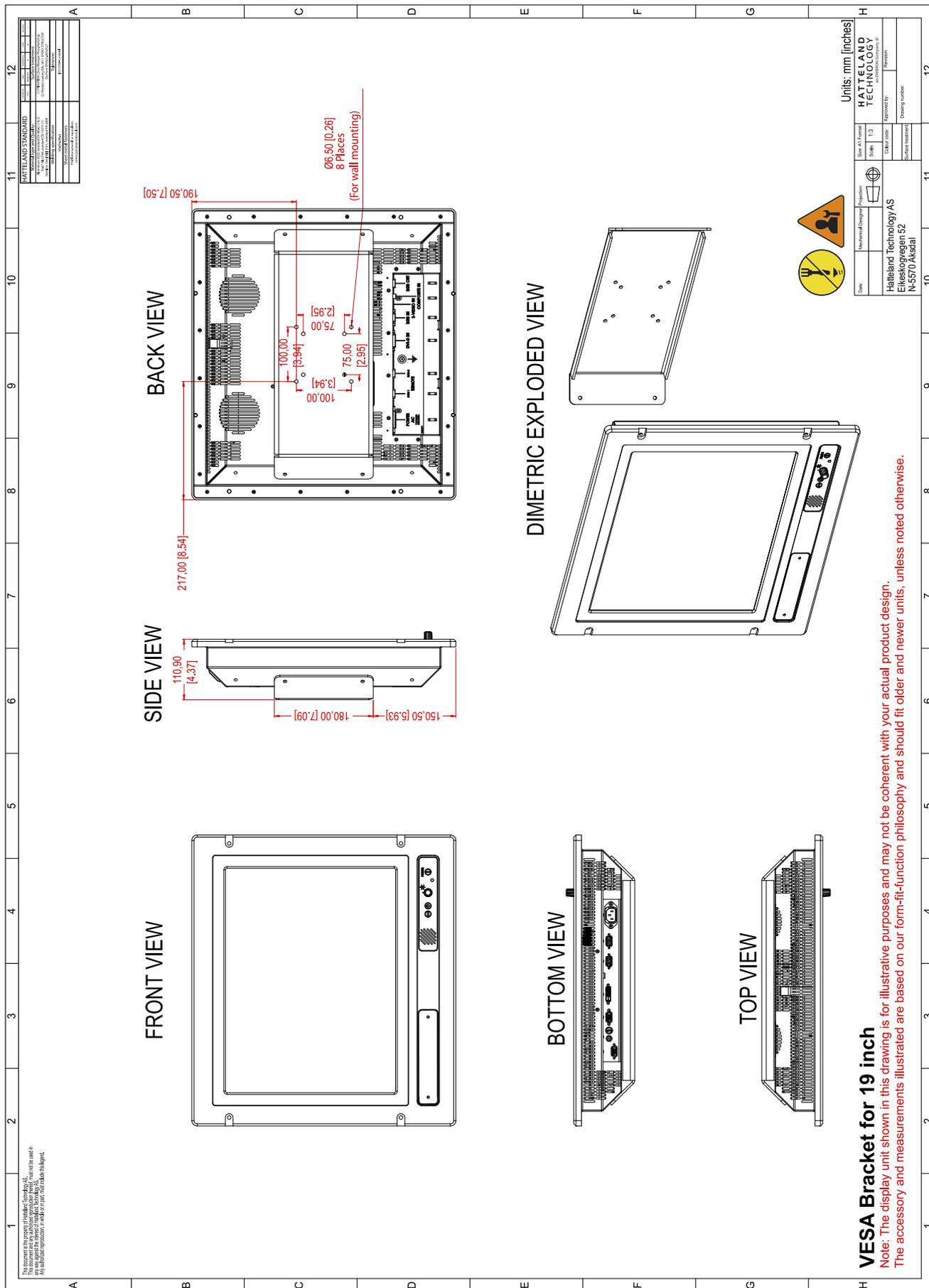
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# Technical Drawings - JH 19VED STD-A1

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2	Approved
3	Approved
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5	Approved
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8	Approved
9	Approved
10	Approved
11	Approved
12	Approved

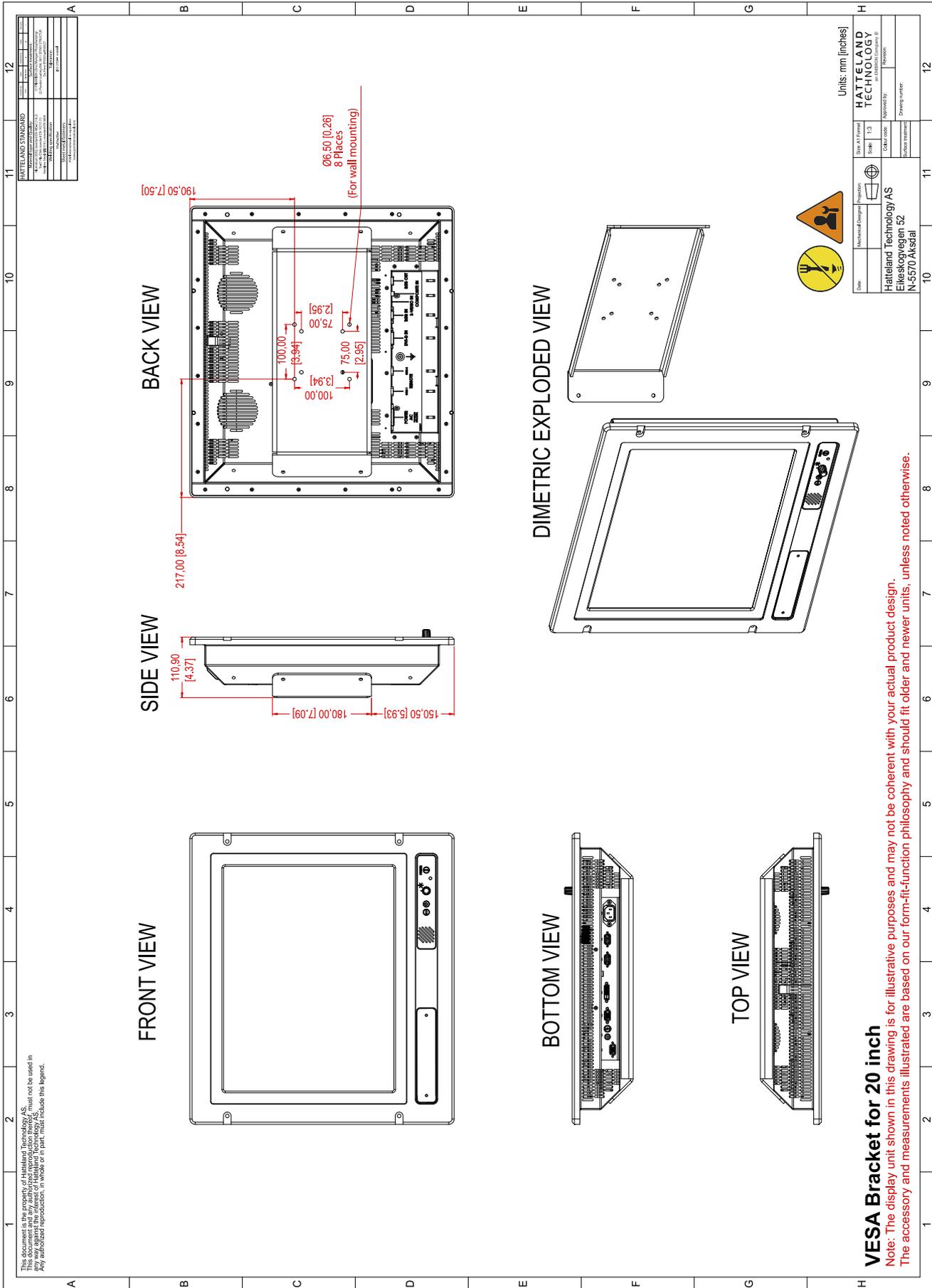
HATTELAND TECHNOLOGY	
Date:	Revised/Designer/Revision
Size A1 Format:	Scale: 1:3
Color code:	Approved By:
Drawing number:	Revision:
Hatteland Technology AS	
Elektronvegen 52	
N-5370 Alstadal	



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# Technical Drawings - JH 20VED STD-A1

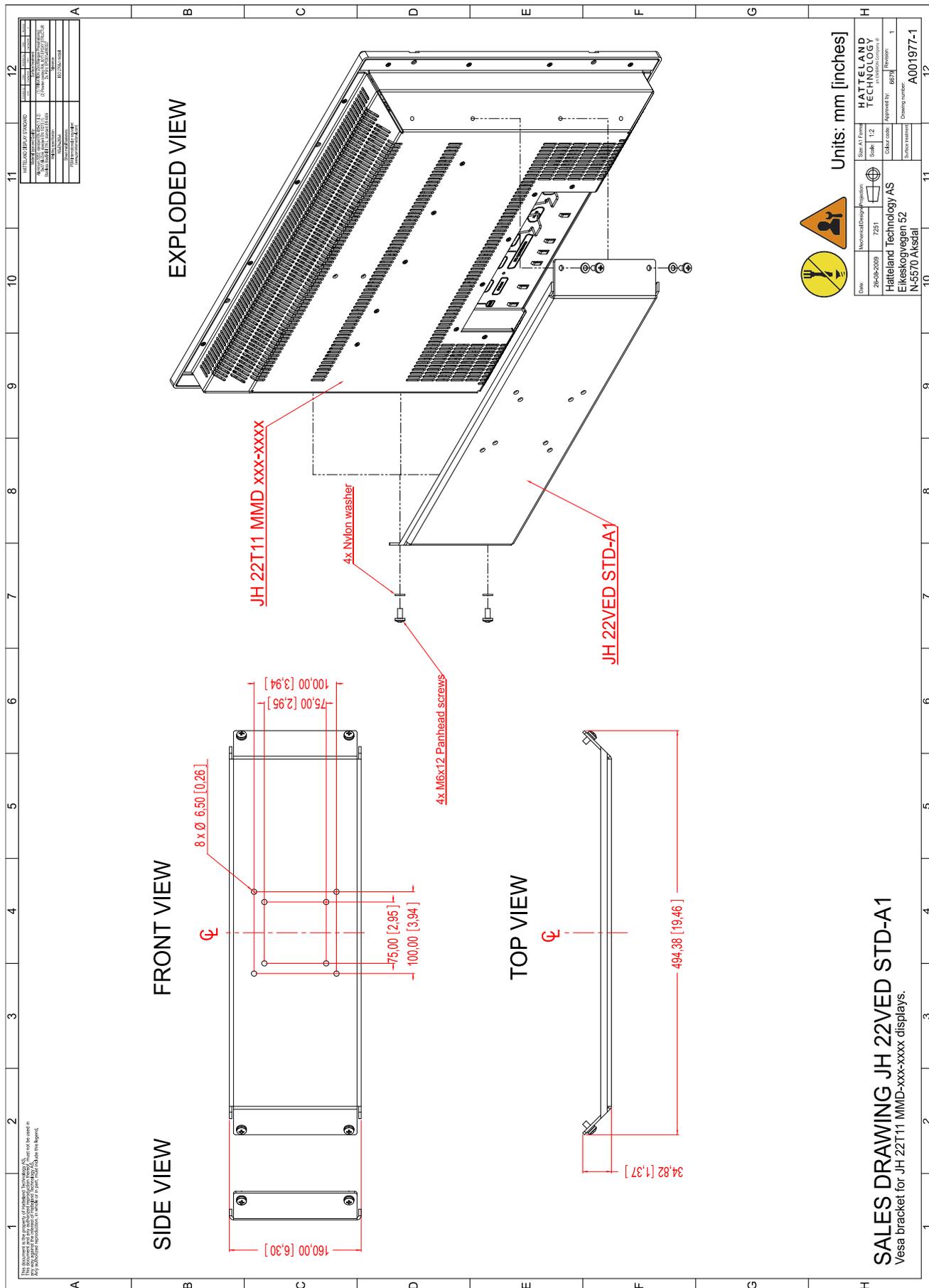
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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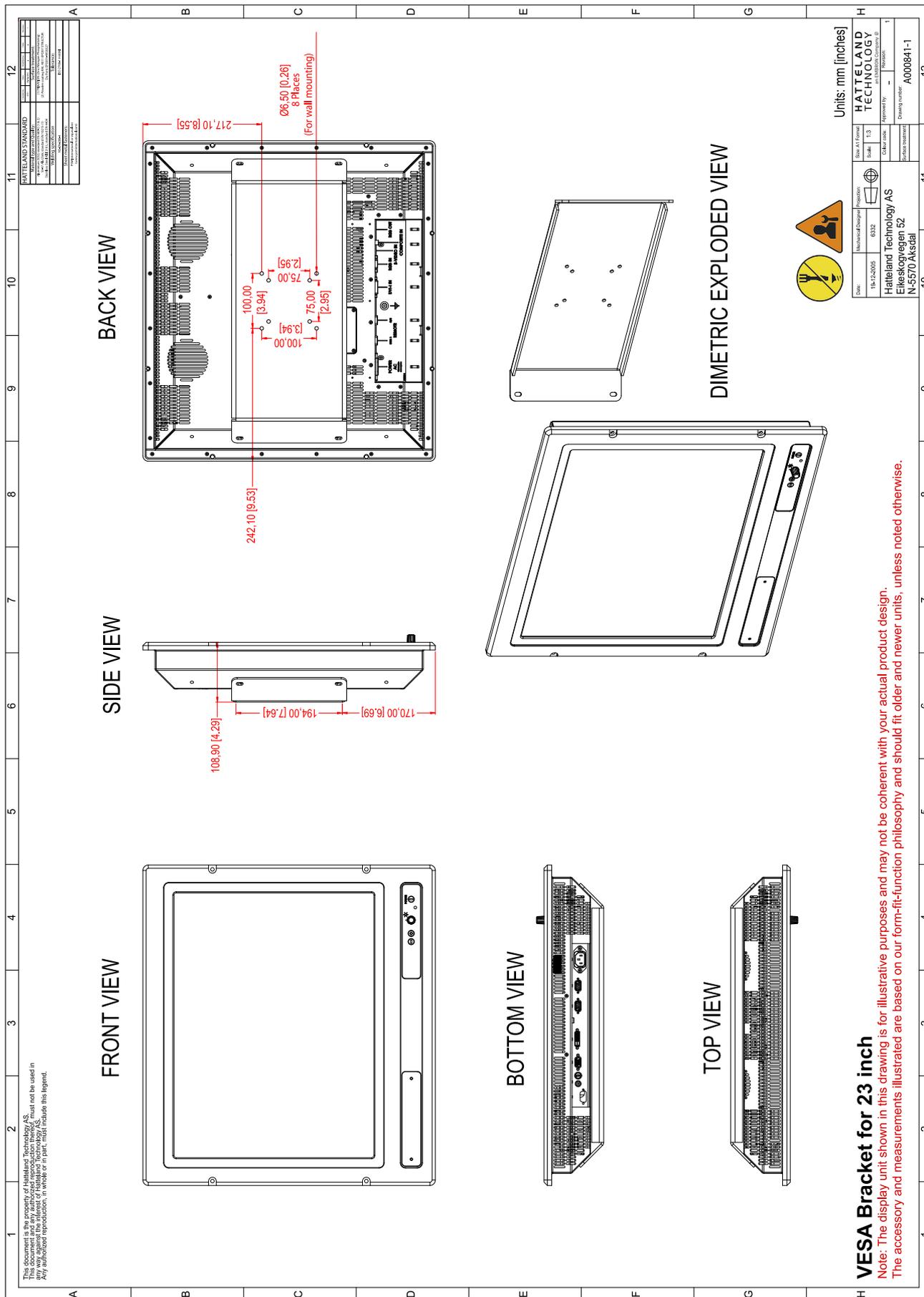
# Technical Drawings - Accessories

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



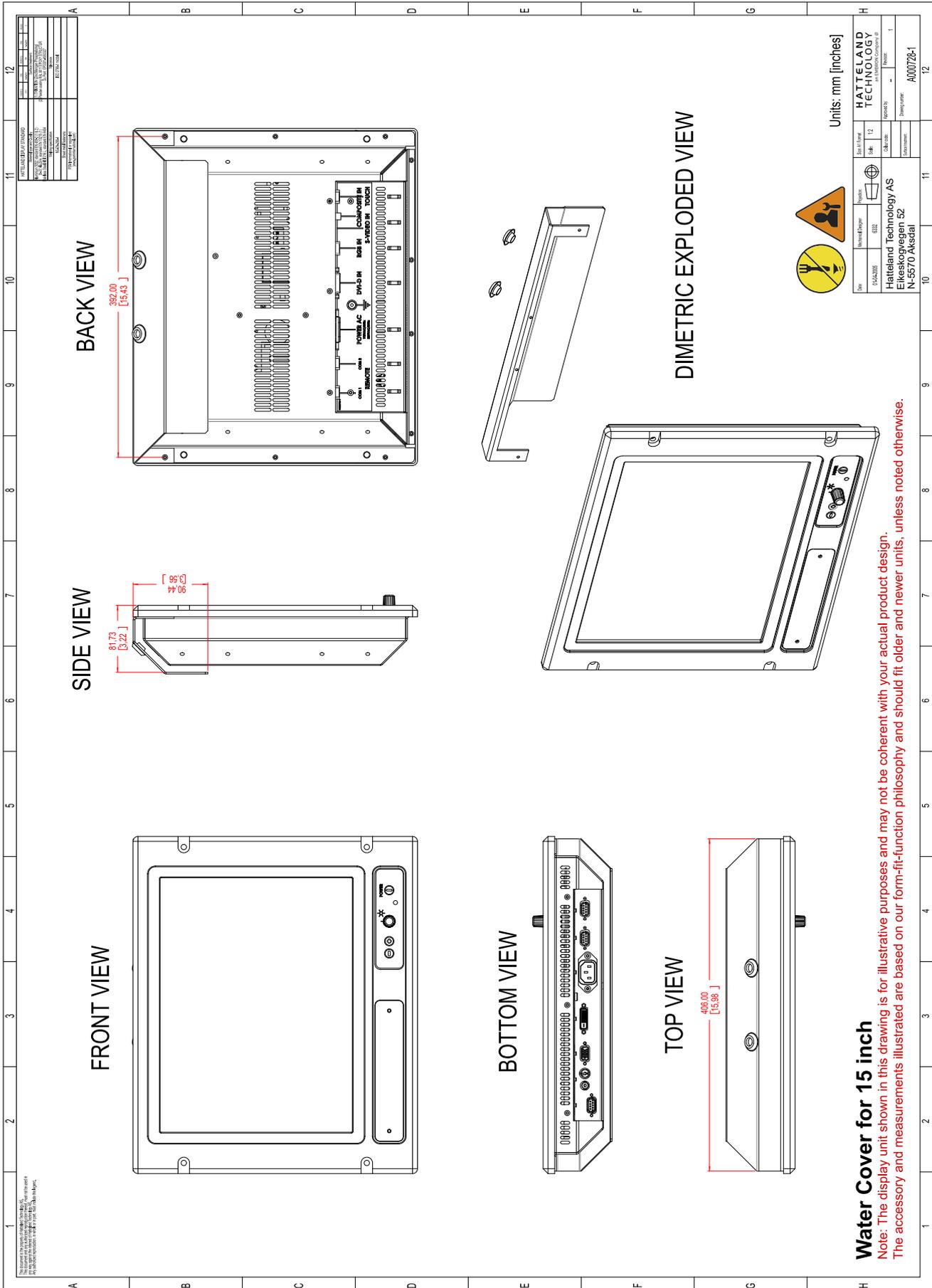
# Technical Drawings - JH 23VED STD-A1

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



# Technical Drawings - JH 15TWC STD-A1

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



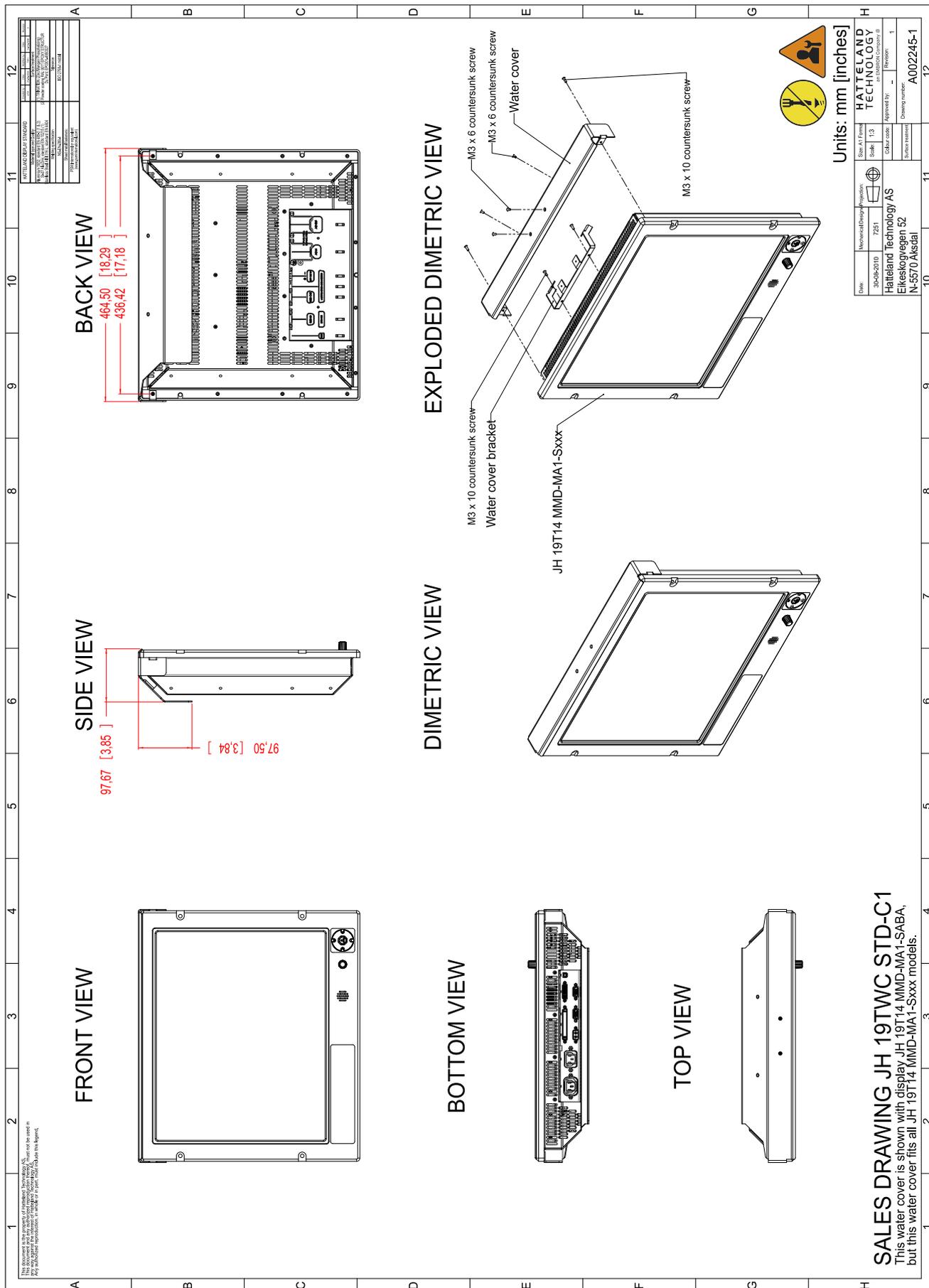
## Water Cover for 15 inch

Note: The display unit shown in this drawing is for illustrative purposes and may not be coherent with your actual product design. The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer units, unless noted otherwise.

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# Technical Drawings - JH 19TWC STD-C1

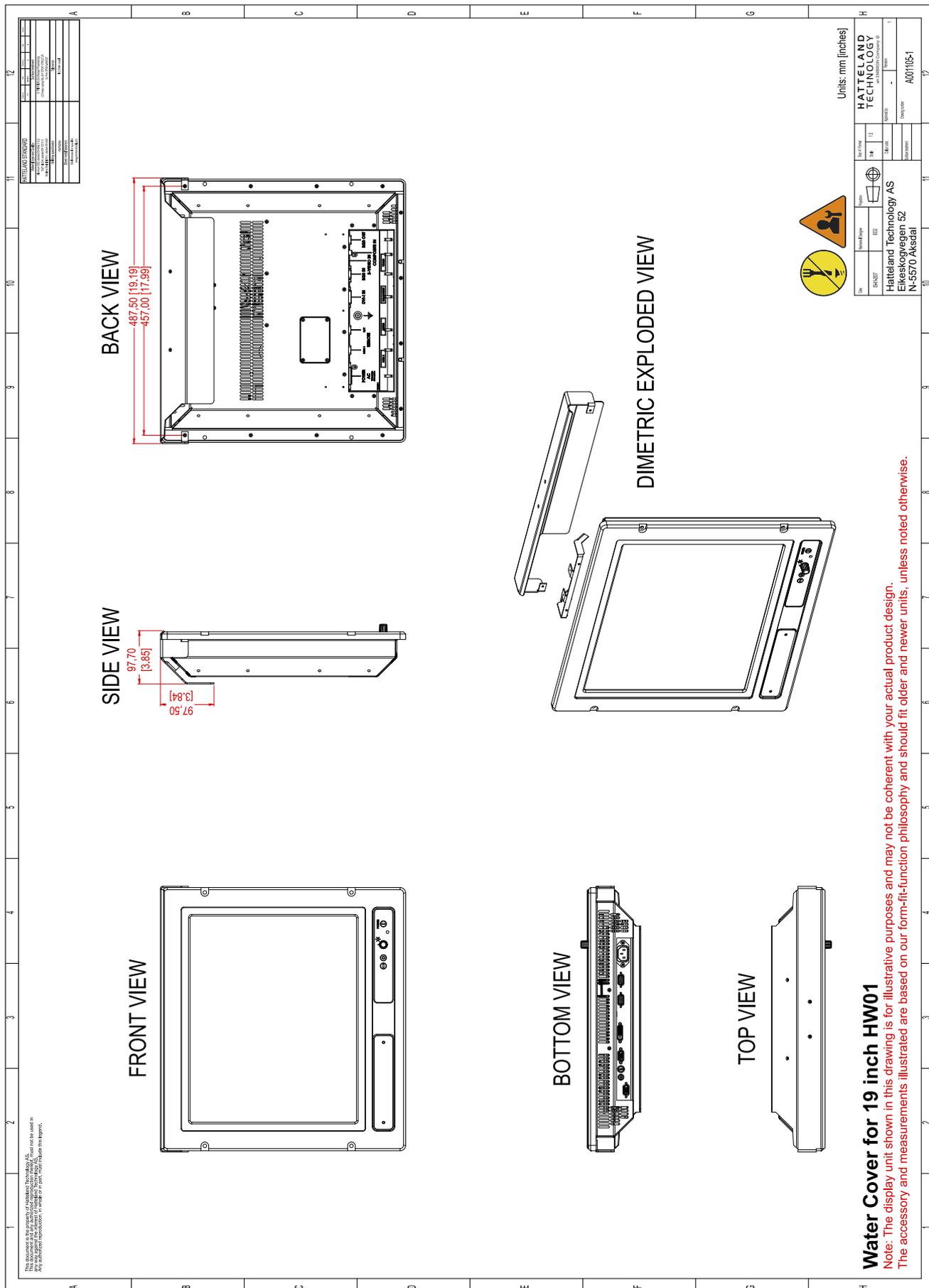
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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# Technical Drawings - JH 19TWC STD-B1

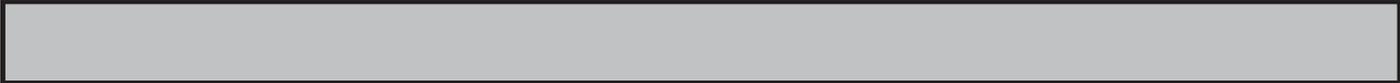
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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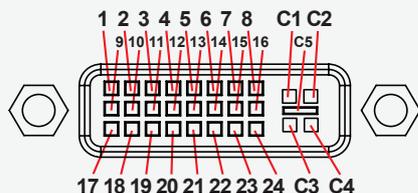


# Appendixes

# Pin Assignments - Common Connectors

**Note:** Not all connectors may be available on your specific product. This depends on the amount of additional hardware installed from factory, or customized solutions. These pin assignments are for the common connectors used. **Connectors are seen from users Point Of View (POV).**

## 18/24/24+5 pin DVI-D, DVI-I, Single Link, Dual Link Combined Female



PIN 01	T.M.D.S. Data2 - (Digital - RED link 1)
PIN 02	T.M.D.S. Data2 + (Digital + RED link 1)
PIN 03	T.M.D.S. Data2/4 Shield
PIN 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
PIN 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
PIN 06	DDC Clock
PIN 07	DDC Data
PIN 08	Analog Vertical Sync (DVI-I only)
PIN 09	T.M.D.S. Data1 - (Digital - GREEN link 1)
PIN 10	T.M.D.S. Data1 + (Digital + GREEN link 1)
PIN 11	T.M.D.S. Data1/3 Shield
PIN 12	T.M.D.S. Data3 - (Digital - BLUE link 2)
PIN 13	T.M.D.S. Data3 + (Digital + BLUE link 2)
PIN 14	+5V Power (for standby mode)
PIN 15	Ground (for +5V and analog sync)
PIN 16	Hot Plug Detect
PIN 17	T.M.D.S. Data0 - (Digital - BLUE link 1) and digital sync.
PIN 18	T.M.D.S. Data0 + (Digital + BLUE link 1) and digital sync.
PIN 19	T.M.D.S. Data0/5 Shield
PIN 20	T.M.D.S. Data5 - (Digital - RED link 2)
PIN 21	T.M.D.S. Data5 + (Digital - RED link 2)
PIN 22	T.M.D.S. Clock Shield
PIN 23	T.M.D.S. Clock + (Digital clock + (Links 1 and 2)
PIN 24	T.M.D.S. Clock - (Digital clock - (Links 1 and 2)
PIN C1	Analog RED
PIN C2	Analog GREEN
PIN C3	Analog BLUE
PIN C4	Analog Horizontal Sync.
PIN C5	Analog Ground (return for RGB signals)

DDC = Display Data Channel.

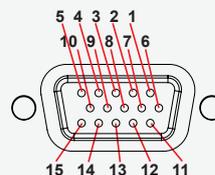
T.M.D.S = Transition Minimized Differential Signal

PIN C1,C2,C3,C4 = Only present on DVI-I connectors.

NOTE: Connector shows a DUAL LINK design, but some units may not support it. Only units with 1920x1200 or more in resolution require / support DUAL LINK.

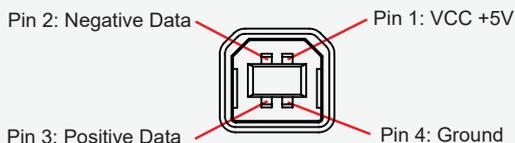
## Analog RGB/VGA, 15-pin DSUB High Density Female

Onboard or via DVI-4 adapter



PIN 01	RED	Red, analog
PIN 02	GREEN	Green, analog
PIN 03	BLUE	Blue, analog
PIN 04	ID2/RES	Reserved for monitor ID bit 2 (grounded)
PIN 05	GND	Digital ground
PIN 06	RED_RTN	Analog ground red
PIN 07	GREEN_RTN	Analog ground green
PIN 08	BLUE_RTN	Analog ground blue
PIN 09	KEY/PWR	+5V power supply for DDC (optional)
PIN 10	GND	Digital ground
PIN 11	ID0/RES	Reserved for monitor ID bit 0 (grounded)
PIN 12	ID1/SDA	DDC serial data
PIN 13	HSYNC.	Horizontal sync or composite sync, input
PIN 14	VSYSN.	Vertical sync, input
PIN 15	ID3/SCL	DDC serial clock

## 4-pin USB TYPE B

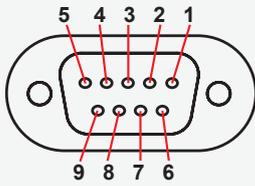


# Pin Assignments - Multifunction Cable Outputs

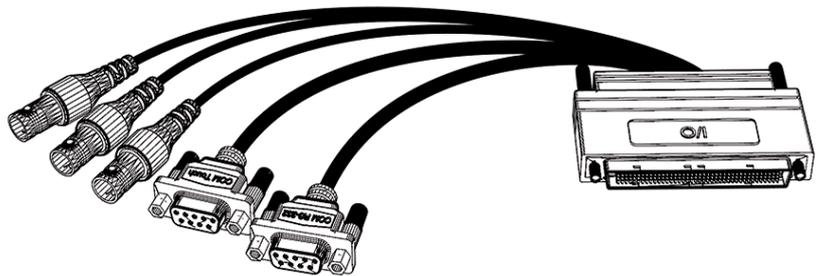
Connectors that are commonly available on the Multifunction Cable or customized cable.

Connectors are seen from users Point Of View (POV).

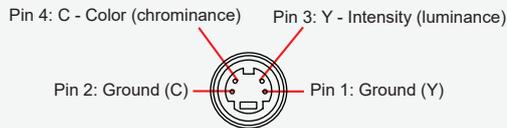
## Pin Assignments - 9P Serial COM RS232



Pin 01 - CTRL(+)	Buzzer Control (+) (+12V input for driving the buzzer)
Pin 02 - TX	Transmit Data
Pin 03 - RX	Receive Data
Pin 04 - DTR	Data Terminal Ready
Pin 05 - GND	Ground
Pin 06 - DSR	Data Set Ready
Pin 07 - RTS	Request To Send
Pin 08 - CTS	Clear To Send
Pin 09 - CTRL (-)	Buzzer Control (-) (Pull low to activate buzzer)



## Pin Assignments - 5P S-VHS/S-VIDEO



## 1-pin RCA/BNC COMP. VIDEO Female



# IEC62368 policy for Hatteland Technology products

## Introduction

According to the requirements of EN 62368-1:2014.

The tables below refers to the policies for opening, servicing and installation of the unit(s) referred to in this manual. This equipment is designed to be used as a fixed installation and to be sold through special sales channels for professional use.

## Based on requirements EN 62368-1:2014 and IEC 62368-1:2018

Defenition	Description
<b>Ordinary person/ Sailor/End-User</b> 	Ordinary person is the term applied to all persons other than instructed persons and skilled persons. Ordinary persons include not only users of the equipment, but also all persons who may have access to the equipment or who may be in the vicinity of the equipment. Under normal operating conditions or abnormal operating conditions, ordinary persons should not be exposed to parts comprising energy sources capable of causing pain or injury. Under a single fault condition, ordinary persons should not be exposed to parts comprising energy sources capable of causing injury.
<b>Instructed person</b> 	Instructed person is a term applied to persons who have been instructed and trained by a skilled person, or who are supervised by a skilled person, to identify energy sources that may cause pain and to take precautions to avoid unintentional contact with or exposure to those energy sources. Under normal operating conditions, abnormal operating conditions or single fault conditions, instructed persons should not be exposed to parts comprising energy sources capable of causing injury.
<b>Skilled person</b> 	Skilled person is a term applied to persons who have training or experience in the equipment technology, particularly in knowing the various energies and energy magnitudes used in the equipment. Skilled persons are expected to use their training and experience to recognize energy sources capable of causing pain or injury and to take action for protection from injury from those energies. Skilled persons should also be protected against unintentional contact or exposure to energy sources capable of causing injury,

# IEC62368 policy for Hatteland Technology products

Authority	Description
<b>Children</b> 	This equipment is not suitable for use in locations where children are likely to be present.
<b>Ordinary person/ Sailor/End-User</b> 	Not allowed to open unit. Not allowed to install the unit. Not allowed to terminate/connect cables to the unit.
<b>Instructed person</b> 	Allowed to open hatches/latches which does not require tools, such as Disktrays. Allowed to open "battery-hatch" to change the battery even if tools are required. Allowed to install the unit. Allowed to terminate/connect cables to the unit indoors.
<b>Skilled person</b> 	Allowed to open and disassemble the unit.  Allowed to install the unit. Allowed to terminate/connect cables to the unit indoors and outdoors. Allowed to terminate/connect earth/ground wire.  Note: Be aware that additional definition for "skilled person" may apply, country dependent.

Conditions	Description
<b>AC power net Class</b>	Class 1. Pollution degree 2. Over voltage category 2.
<b>Transient requirement</b>	External circuits are considered to be installed wholly within the same building structure.
<b>Battery</b>	Obligated to use battery specified for the product.
<b>Altitude</b>	Products are designed for a max operating altitude of 2000m.

Installation	Description
<b>Mounting brackets</b>	Only bracket defined/specified for the unit is allowed.
<b>AC power cord</b>	When installed it shall be possible to disconnect the unit from the AC power net i.e. possible to reach AC connector.
<b>Transient requirement</b>	External circuits are considered to be installed wholly within the same building structure.
<b>Earthing</b>	Obligated to use defined earthing material/method specified for the unit.  Minimum protective bonding conductor size of copper conductors: Wire: Minimum 1,5mm <sup>2</sup> but Hatteland Technology recommends 2,5mm <sup>2</sup> (AWG12) marked yellow/green.
<b>Outdoor</b>	Units with IP66/67-rated fronts can be used in outside environments, provided that the console they are fitted in fulfil certain requirements. <ul style="list-style-type: none"> <li>- There must be a fully water/dustproof seal between the IP66 front and the console.</li> <li>- Dust/water ingress protection of console. (Unit/product is rated for pollution degree 2).</li> <li>- Humidity/condensation control in console.</li> <li>- Thermal management in console (so units can operate within rated temperature range).</li> </ul> Units with IP20/IP22 shall not be used outdoor.
<b>Outdoor Installation</b>	Appropriate RCD with ground current rating of 20mA or less shall be used.

## Basic Trouble-shooting

### GENERAL ISSUES FOR TFT PANEL BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

#### **NO PICTURE / LED BEHAVIOUR:**

If there is no light at all in the LED at the FRONT, check power cables. If the LED in front is green, then check if the brightness is set/adjusted to max brightness. Lack of image is most likely to be caused by incorrect connection, lack of power or wrong BIOS settings.

#### **SCROLLING / UNSTABLE IMAGE:**

Signal cable may not be completely connected to computer or TFT display. Check the pin assignments and signal timings of the display and your video card with respect to recommended timing and pin assignments. Make sure that the video card is compatible and that it is properly seated / installed on the computer.

#### **DISPLAY AREA IS NOT CENTERED / SIZED CORRECTLY**

Make sure that a supported video mode has been selected on the display, or on the video card / system. If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test it again using another graphics card for the PC system. This situation may occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal, such as a signal splitter (please note that normally a signal splitter will not have any adverse effect). If it is impossible to change to the correct resolution/color depth, check if you have the right graphics driver installed in your system.

#### **IMAGE APPEARANCE:**

A faulty TFT panel can have black lines, pixel errors, failed sections, flickering or flashing image. Incorrect graphic card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, it may scroll, flicker badly or possibly even no image is present. Sparkling on the display may be a faulty TFT panel signal cable, and it needs service attention.

VGA Signal Only: Horizontal interference can usually be corrected by adjusting the PHASE (OSD menu).  
Vertical interference can usually be corrected by adjusting the FREQUENCY (OSD menu).

#### **DEW CONDENSATION BEHIND GLASS:**

Note that this problem will not occur on bonded products. For non-bonded products, do the following:  
Power on the TFT product and set brightness to 100%. Turn off any automatic screensavers on PC or similar. During minutes the dew will be gone. To speed up the process, use a fan heater for a reasonable time. Do not overheat the unit.

# Touch Screen Troubleshooting

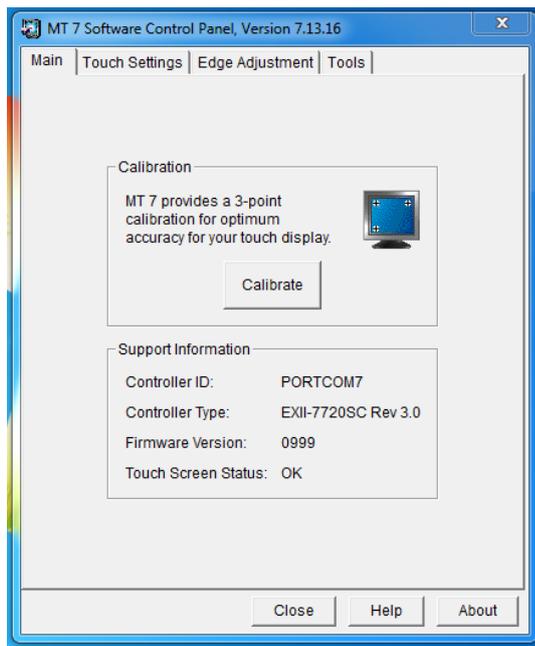
## Jumping cursor in centre of screen issue

Internal Reference: QAR/144738 - 27 May 2019.

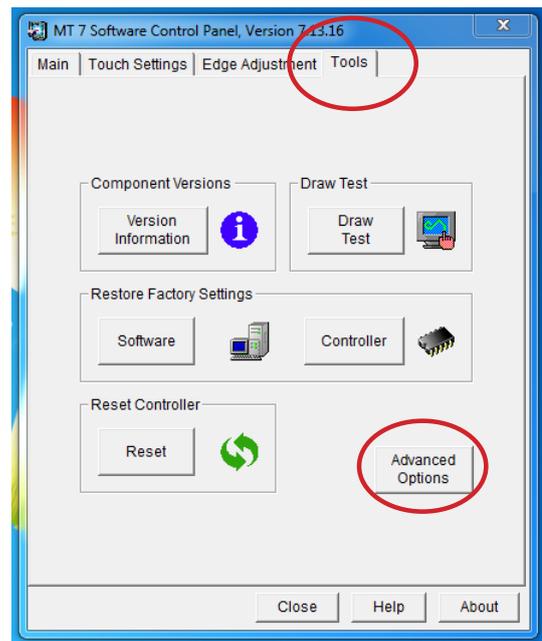
Applies for 22 inch models (example JH 22T11 MMD-AA1-AOBC) with Capacitive Touch Screen.

If the mouse cursor in Windows Operating System seems unstable and jumps around in centre of screen, this could have been caused of a manual (accidental) reset (to 96 kHz) of the Touch Screen controller frequency via the Third-party Driver tool/software. To resolve this issue and set the correct frequency for the internal Touch Controller, please follow the procedure below:

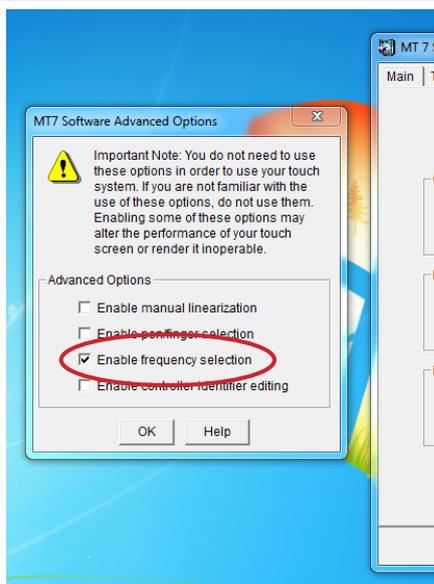
1: Open software MT7 Software Control Panel (example: Version 7.13.16)



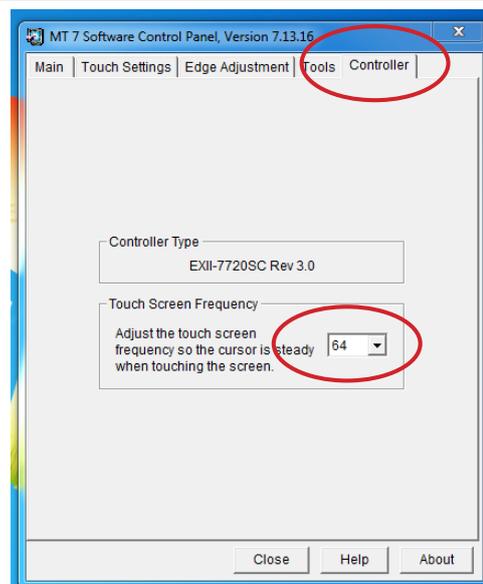
2: Go to "Tools" > "Advanced options"



3: Tick to Enable "Enable frequency selection"



4: Go to "Controller", change "Touch Screen Frequency" to range within 60-70 kHz. "64" used in this example/during testing and click "Close" to save settings.



# HATTELAND TECHNOLOGY

an EMBRON Company 

## Declaration of Conformity

We, manufacturer, **Hatteland Technology AS**, Eikeskogvegen 52, N-5570 Aksdal, Norway

declare under our sole responsibility that the JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HD MVD, HM MMD, HM XRD, HM RMD, HT MMC, HD MMC and HT/HM (computers) product ranges is in conformity with the following standards in accordance with the EMC Directive.

Low Voltage Directive 2014/35/EU  
EN 60950:2006/ A2:2013  
EMC Directive 2014/30/EU  
EN 55032:2012 Class A / AC:2011 Class A  
EN 55024:2010

Signature:.....

Frode Grindheim  
Vice President Product Management  
Aksdal, Norway



CE MARK FIRST AFFIXED DATE (11 March 2010)

Signature:.....

Arne Kristiansen  
Site Manager - Test & Commission Division  
Oslo, Norway

## Declaration of Conformity

We, manufacturer, **Hatteland Technology AS**, Eikeskogvegen 52, N-5570 Aksdal, Norway

declare under our sole responsibility that the JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HD MVD, HM MMD, HM XRD, HM RMD, HT MMC, HD MMC and HT/HM (computers) product ranges is in conformity with IEC 60945 4th (EN 60945:2002) and IACS E10 (where applicable)

# HATTELAND TECHNOLOGY

an EMBRON Company 

## Declaration of Conformity

We, manufacturer, **Hatteland Technology AS**, Eikeskogvegen 52, N-5570 Aksdal, Norway

declare under our sole responsibility that the products listed below comply with  
FCC 47 CFR Part 15, Subpart B, Class A:

JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HD MVD, HM MMD, HM XRD,  
HM RMD, HT MMC, HD MMC and HT/HM (computers) product ranges

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Signature:.....

Frode Grindheim  
Vice President Product Management  
Aksdal, Norway



FCC MARK FIRST AFFIXED DATE (16 February 2012)

Signature:.....

Arne Kristiansen  
Site Manager - Test & Commission Division  
Oslo, Norway

# Return Of Goods Information

## Return of goods:

*(Applies not to warranty/normal service/repair of products)*

Hatteland Technology referenced as “manufacturer” in this document.

Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaluation or products subject for credit, you must ensure that all accessories received from our warehouse are returned. This applies to cables, powermodules and additional equipment except screws or similar, user manual, datasheets or other written paper documents. Furthermore, the product must not have any minor / medium or severe scratches, chemical spills or similar on the backcover, front frame or glass.

This is required in order to credit the invoice 100%. Missing parts will not be subject for credit, and you will not get total credit for returned product. You will either be charged separately, or the amount is withdrawn from the credit. If you decide to ship the missing items later on, you will get 100% credit for that particular invoice or items received at manufacturer incoming goods control. Please contact our Repair Centre if additional questions or review the following links at bottom of page for more information online.



## Handling and packing units for return/credit

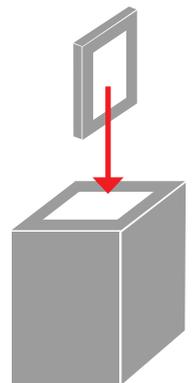
To prevent damage during shipping and transportation, respect the guidelines below.

### Make sure you surround the product with the following material (whenever possible):

Use the original packaging from manufacturer, firm foam material, bubble wrap, lots of PadPack paper or foam chips/polyester wrapped in sealed plastic bags. Please make sure that the unit is protected with a surrounding plastic bag to prevent dust accumulation around the unit.

If you do not have the original packaging or are uncertain as to how to secure the unit properly, please consider seeking advice from nearby shipping or transportation offices, if in doubt!

Do not under any circumstances use loose foam chips, expanded polyester, clothes, cardboard with sharp edges/spikes, too little or nothing to secure the unit inside the box. Do not use cardboard boxes that are clearly too weak or not suitable for securing the unit properly during overseas shipment.



## How to issue a Return merchandise authorization (RMA):

Hatteland Technology requires a pre-registered CDV number prior to sending goods for return. If you do not have an pre-registered CDV number, please visit the links below on how to get one.

<https://www.hattelandtechnology.com/rma-procedure>

Once understood, proceed to registering RMA:

<http://lcm.hatteland-display.com/CustomerRMA/CustomerRMA.aspx>

Additional information:

<https://www.hattelandtechnology.com/legal-documents>

# General Terms and Conditions

As of January 2015, Hatteland Technology AS' "Terms of Sales and Delivery" and "Warranty Terms" have been substituted by the updated "General terms and conditions for sale of goods and performance of additional services" (the "General Terms and Conditions").

Further, from January 2015 onward, the previous "Terms of Sales and Delivery" and "Warranty Terms", as well as other standard terms and conditions, policies and instructions issued by Hatteland Technology AS, will be removed from the User Manuals.

Instead, the updated General Terms and Conditions and the other standard terms and conditions, policies and instructions issued by Hatteland Technology AS will be available via our website only.

Please visit <https://www.hattelandtechnology.com/legal-documents#terms-and-conditions> to review the latest revision

## Long Term Storage Recommendations

For Minimum storage life for Hatteland Technology products, Storage Conditions, Periodic maintenance - test procedure, please visit:

[https://www.hattelandtechnology.com/hubfs/pdf/misc/ind100350-5\\_long\\_term\\_storage\\_recommendations.pdf](https://www.hattelandtechnology.com/hubfs/pdf/misc/ind100350-5_long_term_storage_recommendations.pdf)

## INSTRUCTIONS FOR THE CONSIGNEE

### 1) CONTROL

Control the goods immediately by receipt. Examine the quantity against the invoice/packinglist/shipping documents. Look for outward defects on the packing which may indicate damage on or loss of contents. Control the container and the seals for any defects.

### 2) SECURING EVIDENCE

When defects on the goods have been found, evidence must be secured, and seller must be informed. Call the transporter and point out the defects. Add a description of the defects on the goods receipt, the forwarder's copy of the way-bill or on the driving slip.

### 3) RESCUE

Try to restrict the damage and the loss. Seller will compensate expenses incurred due to reasonable security efforts in addition to damage and loss.

### 4) COMPLAINT

Immediately write a complaint to the transporter or his agent. Immediately forward the complaint to the transporter or his agent, and hold the transporter responsible for the defects. The complaint must be sent at the latest:

- for carriage by sea: within 3 days
- for overland / air transportation within 7 days

### 5) DOCUMENTATION

For any claims the following documentation is required and must be forwarded to the company or their agent: invoice, way-bill and/or bill of landing, and/or statement of arrival, inspection document, besides a copy of the letter of complaint to the transporter.

# Pixel Defect Policy

## PIXEL DEFECT POLICY

### Dot-defects (Bright or dark spots on the panel)

Due to the effect that dot failures are part of the TFT technology such failure occurrence cannot be prevented basically. Even though dot defects usually occur during production process, new defects can appear within the lifespan of a TFT display. Neither the production at LCD-supplier nor the use of an LCD-Monitor after shipment can be influenced by Hatteland Technology. Hence Hatteland Technology cannot be made responsible for such dot failures. However Hatteland Technology understands and accepts the responsibility towards the customers for the delivery of new displays, therefore accepts a limitation on dot defects occurrence on new displays delivered to the customer.

## PRINCIPLES

- a. One pixel consists of 3 dots (Red, Green and Blue)
- b. Dot defects are differentiated between:
  - Bright dot defects: Spot on the panel appear as pixels or sub pixels that are always lit. Non-extinguishing dot.
  - Dark dot defects: Spot on the panel appear as pixels or sub pixels that are always dark (off). Non-lightening dot.
- c. Inspector observes the LCD from normal direction at a distance of 50cm above the worktable. Dark dots are counted under entire white screen. Bright dots are counted under entire black screen.
- d. Dot failures within tolerances below do not qualify for warranty claims.

## PIXEL DEFECT TOLERANCES

Bright dot	$\leq 4$ dots
Two adjacent bright dots *	$\leq 2$
Distance between 2 dot defects *	$\geq 15$ mm
Dark dots	$\leq 8$
Total number of bright or dark dot defects. *	$\leq 8$

\* 1 or 2 adjacent dot defects considered as 1 defect.

## EXTRAORDINARY CIRCUMSTANCES

Possible cases which cannot be influenced either by customer or Hatteland Technology.

### Examples for extraordinary circumstances:

- Allocation from LCD-Supplier
- Outstanding high number of LCD-panels with bright dots but within LCD-suppliers Specification.
- Sharply increased demand by customer

### In such cases a mutual agreement is inevitable.

### Examples:

- Acceptance of bright dots in "non-critical" display areas.
- Acceptance of bright dots with defined color.

Last Revised April 2019

Link to online resource:

[https://www.hattelandtechnology.com/hubfs/pdf/misc/ind100351-1\\_pixeldefectpolicy.pdf](https://www.hattelandtechnology.com/hubfs/pdf/misc/ind100351-1_pixeldefectpolicy.pdf)

## Parts in Displays and Panel Computers, and how to recycle

Part	Where to dispose of parts	
TFT Panel	Electrical waste	Optically bonded units: the TFT Panel, Glass and frame is to be disposed of as Electrical waste. Do not separate.
Glass	Metal waste	
Frame	Metal waste	
Chassis	Metal waste	
Brackets	Metal waste	
Motherboard / Electronic Boards (PCB's)	Electrical waste	
Power supply	Electrical waste	
Cable Kit	Electrical waste	
Outerbox, sleeve and Kit box	Paper waste	
Paper sheets/User Manual	Paper waste	
Plastic bags	Plastic waste	
EPS Foam	Plastic waste	

Contact Hatteland Technology for specific part numbers: <https://www.hattelandtechnology.com/spareparts>

### Dismantling of Displays and Panel Computers into its recyclable parts

To be able to dispose of the unit in the correct manner, Hatteland Technology bases its requirements on *Commissioning Regulation (EU) 2019/2021*. For more instructions concerned to the dismantling procedure, please contact Hatteland Technology. Reference online: <https://www.hattelandtechnology.com/parts-and-recycling>



Step 1. Separate the electronics from any metal and glass that is easily separatable.  
If unit is optically bonded, do not separate TFT panel from glass and Metal frame (glass, TFT panel and Metal Frame is to be disposed of as if electronic waste if Optically Bonded).

Step 2. Sort the source materials and dispose of the electronics and metal/glass parts in the appropriate recycling/sorting station.

### Spare Parts for Panel Computers (none for Displays)

Parts that require scheduled checks and replacement:

Part	Applicable for
SSD	Panel Computers
BIOS Battery	Panel Computers
Air filter	Panel Computers

Contact Hatteland Technology for specific part numbers: <https://www.hattelandtechnology.com/spareparts>

### Service Parts for Displays and Panel Computers

Parts that needs to be replaced in case of failure:

Part	Applicable for
CPU	Panel Computers
RAM	Panel Computers
Power Supply	Displays and Panel Computers
SSD	Panel Computers
CPU FAN/Cooler	Panel Computers
System fans	Displays and Panel Computers
Video Controller	Displays

Contact Hatteland Technology for specific part numbers: <https://www.hattelandtechnology.com/spareparts>

Contact Hatteland Technology for availability of Firmware and Software updates: <https://www.hattelandtechnology.com/support/contact>

## General Notes:

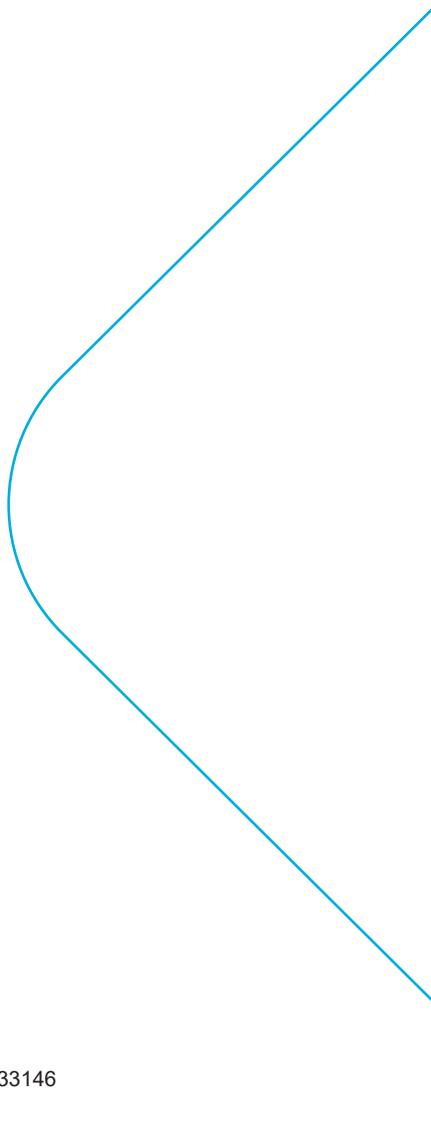
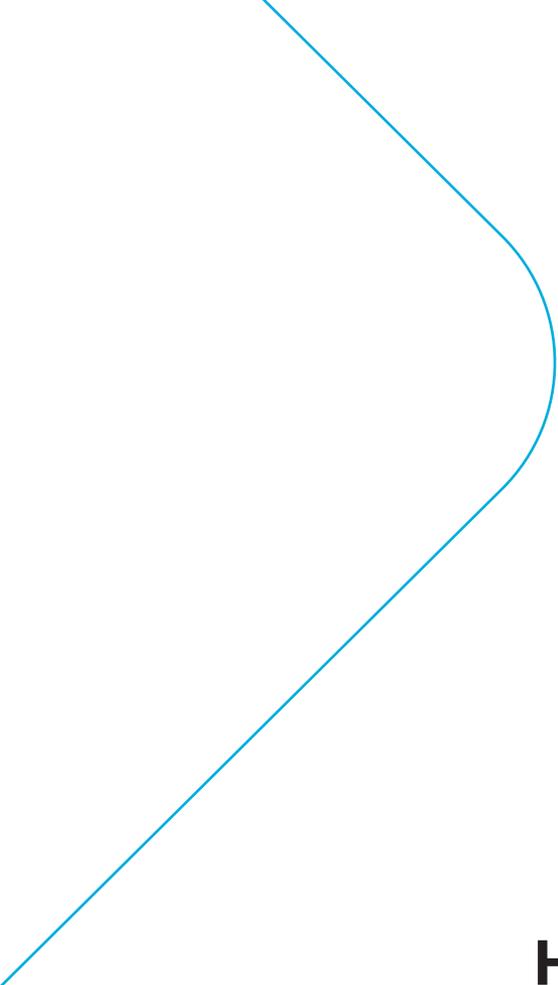
- The unit is tested according to IEC 60945 4th (EN 60945:2002), 4.4, equipment category b) "protected from the weather (formerly class B)".
- Use of brightness and push buttons may inhibit visibility of information at night.

# Revision History

Rev.	By	Date	Notes
0	SE	05 Oct 07	First release, preliminary for prototypes and internal reviews.
1	SE BUL KEO	06 Feb 08	Commercial final release 1
2	SE	07 Apr 08	Revised contents of package chapter (US power cable and console mounting screws added). Revised company profile and company logos throughout manual. Added illustrations and info for DC models (own dedicated housing connector with screw terminal). Revised specifications (environmental considerations). Added 19 inch watercover drawing (HW01). Added note to all accessories drawings (display model is illustration only)
3	SE	15 Jul 2008	Specifications revised: Type approval DNV and BV, Q2 2008 changed to Q4 2008 for potmeter Added Compass Safe Distance for 23 inch.
4	SE PL AK	06 Oct 2008	Added JH 27T11 MMD specifications and technical drawings. Added JH 20T17 MMD specifications and technical drawings. Type approval (ABS and GL) added to specifications where applicable. Replaced JH 15T15 MMD with JH 15T17 MMD. Replaced JH 19T12 MMD with JH 19T14 MMD. Added accessory drawings for 20 inch. Added info about minimum viewing distance. Revised PIP size information.
5	SE	16 Oct 2008	Added JH 15T15 MMD and JH 19T12 MMD as they are available throughout 2008. Added inches to technical drawings and specifications where needed. Revised specifications for 27 inch.
6	SE	13 Nov 2008	Updated JH 23T12 MMD drawing to show buzzer+potmeter functionality. Revised general chapter.
7	SE	05 Jan 2009	Revised specifications (type approval LRS)
8	SE	26 Jan 2009	Revised specifications (type approval ClassNK). Added potmeter knob precaution in installation chapter.
9	SE BU	28 May 2009	Revised specifications for 15 inches (not ECDIS compliant) and 27 inch (factory options) Added pin out assignments for Multifunction Revised OSD menu, due to upgrade of firmware - Reference: <a href="http://www.hatteland-display.com/emails/17_2009_ecn.html">http://www.hatteland-display.com/emails/17_2009_ecn.html</a> Revised specifications regarding type approvals Added front logo label measurements
10	SE KEO BQ	02 Jul 2009	Added JH19BRD STD-A1 and JH23BRD STD-A1 EN60945 tested bracket drawings & revised specifications. Added typenumbers for Contents of Package list. Added Technical Drawings for 15 inch Mounting Bracket and Rotary bracket + revised specifications where needed.
11	KO SE	08 Oct 2009 Pressed Version	Added introduction page for Series 1 displays (page 9) Removed JH 15T15 MMD and JH 19T12 MMD specifications and drawings, due to End of Life - Reference: <a href="http://www.hatteland-display.com/emails/31_2008_eol.html">http://www.hatteland-display.com/emails/31_2008_eol.html</a> (December 2008) Added 22 inch 16:10 widescreen specifications and drawings + accessories (page 53,61,85) Added 23 inch with LED backlight specifications and drawings. (page 55,63) Added 27 inch VESA bracket drawing (page 87) Removed reference to LRS Type Approval for certain newer products.
12	KO BU SE	21 Jan 2010	Fixed typing error "Display Data Configuration" to "Display Data Channel" (page 42) Revised specifications 27 inch (VESA Typenumber and removal of LRS Type Approval text) page 54 Added 22 inch SunVisor drawings (page 67) Rewrite text regarding "Hotkeys" and "Direct Access" (page 25,43)
13	KE SE	11 Feb 2010	Added Rotary and Mounting Bracket assembly/disassembly page 15 Added indication of +/- for the DC power plug illustration (page 18,21).
14	KO SE	26 Feb 2010	Added JH 19TAP STD-B1, customized variant drawings and to specifications. Page 81
15	MS FG BU LE SE	06 May 2010	Added information about keycodes 321 and 158 (page 28) Added note for Multipower (page 21, 53) Added reference to "Current Temp" function in OSD menu (page 30) Revised OSD MENU Functions (Signal Support, 1066x800i, 1056x792i, Fixed DDC, 1920x1200, 1600x1200, 1280x1024, 1360x768, 1024x768, 800x600, 640,480) (page 30,31,37,42,44) due to firmware Update V1.50.00 - Reference Engineering Change Notification: <a href="http://www.hatteland-display.com/emails/15_2010_ecn.html">http://www.hatteland-display.com/emails/15_2010_ecn.html</a> Added LRS Approval (pending) text where needed for specifications pages.
16	BB FG SE	17 Jun 2010	Added info about signal quality and content for "Display / Source / PBP / xxx" (page 45) Revised specifications for 27 inch (IP-66 is pending) (page 54)
17	AK SE	26 Aug 2010	Revised specifications page 51,53 (remove pending for ABS Type Approval) Added JH 22TBR STD-A1 Mounting bracket drawings and typenumber page 51,74
18	BB AK SE	07 Oct 2010	Revised Multi-power text note (page 21) Added Spec. and Drawing for JH 19T14 MMD Sxxx (suitable replacement/cutout as JH 17T02 MMD) page 1,49,59 Removed (pending) for BV, GL and DNV approval JH 22T11 MMD and JH 23T14 MMD (page 52,54) Added VESA bracket Drawing for JH 19T14 MMD Sxxx Slim Frame Model (page 88)
19	GOS BB SE	26 May 2011	Revised Contents of Package (user manual dvd), page 6 Added Water Cover and Sun Visor drawings for 19 inch Slim Frame (page 69, 99) Added JH 26T11 MMD drawings, specifications and accessories (page 55, 65, 74, 84, 96) Revised IP-rating for all specifications page 48, 49, 50, 51, 52, 53, 54, 55, 56

# Revision History

20	AK SE	05 Mar 2012	Added Water Cover drawing for 27 inch (page 103) Added FCC declaration (page 109) Revised text for "return/credit" (page 110)
21	VM SE	04 May 2012	Fixed typo (browsing) page 43 Added note to Hotkey function, page 43
22	GOS BB SE	12 Nov 2012	Revised text and graphical layout as per. current Company Profile throughout the manual, page 1,8 and more. Removed JH 23T12 MMD pages, ref EOL: <a href="http://www.hatteland-display.com/emails/48_2008_eol.html">http://www.hatteland-display.com/emails/48_2008_eol.html</a> Added upgraded 15 inch spec., ref ECN: <a href="http://www.hatteland-display.com/emails/31_2011_ecn.html">http://www.hatteland-display.com/emails/31_2011_ecn.html</a> , page 49 Added upgraded 19 inch spec., ref ECN: <a href="http://www.hatteland-display.com/emails/02_2012_ecn.html">http://www.hatteland-display.com/emails/02_2012_ecn.html</a> , page 51,53 Revised 19 inch Sun Visor drawing, page 72 Revised 19 inch EN60945 Mounting Bracket drawing, page 81
23	BU FG SE	02 Jul 2013	Revised point 7 in General mounting instructions, grounding, page 19 Added text/description for Orange led (alarm/buzzer), page 28,50,51,52,53,54,55,56,57,59 Added LED Backlight for 26 inch, page 59, ref: <a href="http://www.hatteland-display.com/emails/06_2013_ecn.html">http://www.hatteland-display.com/emails/06_2013_ecn.html</a> Added Sales Drawings for EN60945 Mounting Bracket - 26 inch, page 87 Removed 27 inch model and its accessories (End of Life) throughout the manual. - Reference: <a href="http://www.hatteland-display.com/emails/02_2013_eol.html">http://www.hatteland-display.com/emails/02_2013_eol.html</a>
24	SE	06 Jan 2014	Revised Product Labelling and Touch Screen Label chapters, page 11,12,13 (reference: QAR/117540) Added JH 19TBR STD-B1 and JH 19BRD STD-B1 drawing placeholder, currently pending, page 83,85 Added JH 17TAP STD-A1, Technical Drawings (suitable for JH 19T14 MMD Slim Frame), page 94 Added JH 19TAP STD-A2 Technical Drawings, page 96 Added JH 22TWC STD-A1 and JH 26TWC STD-A1 drawing placeholder, currently pending, page 109,111
25	SE	02 Jun 2014	General maintenance, minor adjustments prior to release of MEDIA STD rev-009 Docs/Drivers DVD Removed reference to "LED Backlight Technology" for 26 inch, ref: 06_2013_ecn.html (Check <a href="http://www.hatteland-display.com/display_jh26t11mmd.php">http://www.hatteland-display.com/display_jh26t11mmd.php</a> for updates)
26	AK JK SE	09 Jul 2014	Removed 17inch / 27inch, added 22inch Viewing Distance for ECDIS applications value, page 21 Revised default 9300k to 8000k (Color Temperature OSD setting), page 39
27	KK SE	27 Oct 2014	Separated and indicated difference in mechanics for Mounting Bracket+Rotary Bracket (15, 17-26 inch), page 23,24
28	BB SE	06 Jan 2015	Added Serial Extension Cable (Touch screen) to Contents of Package, page 6
29	KK SE	26 Mar 2015	Removed JH 26T11 MMD throughout the manual, ref: <a href="http://www.hatteland-display.com/emails/16_2014_eol.html">http://www.hatteland-display.com/emails/16_2014_eol.html</a> Revised Grounding, General Mounting Instructions chapter, point 7, page 21 Added JH 23T14 MMD with JH 23TBR T01-A1 mounting bracket combined, page 70 Revised Return of Goods, page 112 Revised General Terms and Conditions, page 113
30	MJL SE	09 Apr 2015	Added text for Grounding Screw, page 25
31	SE	04 Aug 2016	Removed "Typenumber Structure (example)", page 14 General updates performed throughout the manual Removed 15,19, 19 (Slim) and 20 inch CCFL datasheets, obsolete models, reference: <a href="http://www.hatteland-display.com/emails/31_2011_ecn.html">http://www.hatteland-display.com/emails/31_2011_ecn.html</a> <a href="http://www.hatteland-display.com/emails/28_2012_ecn.html">http://www.hatteland-display.com/emails/28_2012_ecn.html</a> <a href="http://www.hatteland-display.com/emails/03_2015_ecn.html">http://www.hatteland-display.com/emails/03_2015_ecn.html</a>
32	BB SE	23 Sep 2016	Removed word "orange" LED for User Controls, page 52,53,54,55,57 Added note for "orange" LED for User Controls, page 30 Reference: <a href="http://www.hatteland-display.com/emails/15_2016_ecn.html">http://www.hatteland-display.com/emails/15_2016_ecn.html</a>
33	BB SE	07 Dec 2016	Added note for "orange" LED for User Controls for 22inch Model, page 30, 56 Reference: <a href="http://www.hatteland-display.com/emails/15_2016_ecn.html">http://www.hatteland-display.com/emails/15_2016_ecn.html</a>
34	VM SE	29 Nov 2017	Revised all Mounting Bracket drawings with location of mounting holes, page 76,77,78,82 Revised Mounting Bracket/Rotary Bracket combined assembly, ref: QAR/136828, page 21,22 General updates performed throughout the manual based on latest company profile
35	YG VM SE	19 Dec 2018	General updates performed throughout the entire manual after internal reviews Revised Hot-key details, page 48
36	VM YG SE	02 Aug 2019	Updated with latest company profile, revised various grammar, several improvements performed through the entire user manual. Added "Touch Screen Troubleshooting", page 105
37	YG SE	26 Nov 2019	Revised typenumber DV02-SK to DVI-4, page 6
38	ALL SE	14 Jun 2021	Performed general maintenance throughout the entire manual.  Removed reference to Global Documentation and Drivers DVD, page 6,16 ref: <a href="https://www.hattelandtechnology.com/product-notifications/global-documentation-and-driver-dvd-end-of-life">https://www.hattelandtechnology.com/product-notifications/global-documentation-and-driver-dvd-end-of-life</a>  Added information related to IEC62368 and Commissioning Regulation (EU) 2019/2021 throughout the entire user manual.  Note: By official ECN/EOL 15,19,20 and 23 inch models are obsolete and not produced anymore, reference: <a href="https://www.hattelandtechnology.com/product-notifications/update-series-1-maritime-multi-displays">https://www.hattelandtechnology.com/product-notifications/update-series-1-maritime-multi-displays</a>



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