TRANSAS 4000
MULTIFUNCTION DISPLAY SERIES

- NAVI-SAILOR 4000 ECDIS MFD
- NAVI-RADAR 4000 MFD
- NAVI-CONNING 4000
- NAVI-AMS 4000
TRANSAS 4000 MFD SERIES

Transas 4000 Multifunction Display System (MFD) is a flexible and fully redundant navigation solution providing the operator with a convenient task-oriented environment. The system combines Transas Navi-Sailor 4000 ECDIS MFD, Navi-Radar 4000 MFD, Navi-Conning 4000 and Alarm Monitoring System running simultaneously. All Transas 4000 MFD components are designed in compliance with IMO, IEC, DNV and Lloyd's Register requirements.

Transas 4000 MFD is developed to meet requirements of all types of ocean-going commercial vessels, offshore, tankers, cruise ships, super yachts and naval ships, and is ideally suited for both, newbuilds and retrofits.

MFD CONCEPT

Transas 4000 MFD software provides the common base for installation of ECDIS MFD and Radar MFD systems depending on the primary task/functionality and required certificate:

- **ECDIS MFD** is type-approved Navi-Sailor 4000 ECDIS in basic configuration with optional **Radar Slave** task for external radar connection without scanner control.
- **Radar MFD** is type-approved Navi-Radar 4000 in basic configuration with X or S-band Scanner Set optionally for up or down mast installation depending on configuration. **ECDIS Slave** is optional; accepted as **ECDIS Backup** by some Flag states.

Conning task is optional and when purchased once then is available on all workstations in network and can be displayed on extra monitor connected to any workstation for space saving and cost reduction.

### Workstations description

<table>
<thead>
<tr>
<th>Name</th>
<th>Workstation</th>
<th>Main purpose</th>
<th>Additional purposes by using optional equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Band Radar</td>
<td>5</td>
<td>Type Approved X-Band Radar</td>
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<tr>
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<td>2</td>
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<td>- Additional ECDIS Backup Workstation</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Alarm Monitoring Workstation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Conning Display</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Chart Handling Workstation</td>
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<tr>
<td>ECDIS Master</td>
<td>4</td>
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<td>- Conning Display</td>
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<td></td>
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<td>- Alarm Monitoring System</td>
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<tr>
<td>ECDIS Backup</td>
<td>3</td>
<td>Type Approved ECDIS Backup</td>
<td>- Additional Radar Backup Workstation</td>
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<tr>
<td></td>
<td></td>
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<td>- Route Planning Workstation</td>
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<td>- Conning Display</td>
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<tr>
<td></td>
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<td></td>
<td>- Alarm Monitoring Workstation</td>
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<td>- Wing Monitors for Rescue Workstation</td>
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<tr>
<td>Slave Workstation</td>
<td>1</td>
<td>Additional Workstation</td>
<td>- ECDIS and Radar Slave Backup Workstation</td>
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<tr>
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<td>- Route Planning Workstation</td>
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<td></td>
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<td>- Conning Display</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- All Workstation</td>
</tr>
<tr>
<td>Black Box Workstation</td>
<td>6</td>
<td>Multifunctional Workstation</td>
<td>- Captains Office Workstation</td>
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<td></td>
<td></td>
<td></td>
<td>- Multi Switch Workstation</td>
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<tr>
<td></td>
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<td></td>
<td>- Data Recording Workstation</td>
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</tbody>
</table>

**Workstations list:**

- **X-Band Radar Workstation**
- **S-Band Radar Workstation**
- **ECDIS Master**
- **ECDIS Backup**
- **Slave Workstation**
- **Black Box Workstation**
**TRANSAS NAVI-SAILOR 4000 ECDIS MFD**

Navi-Sailor 4000 ECDIS (Electronic Chart Display and Information System) is the 5th generation of ECDIS from Transas. It can be installed as a standalone system or as Dual ECDIS pre-filled with official ENCs, preparing for the ECDIS carriage requirements and paperless navigation.

**Transas Navi-Sailor 4000 ECDIS MFD Features**

**Graphic User Interface and display**
- Various resolutions, 5 skins, 4 palettes, common style with other MFD tasks
- “NorthUp”, “CourseUp”, “HeadUp” orientation with True/Relative motion mode

**Navigation tools**
- Route Monitoring and Alarms management
- Generation of SAR operation patterns (reference to std/doc) and RDF support
- Precise Navigation Tools package: Trial Manoeuvring/Curved Headline and Predictor (Optional)

**Planning, Logging and Playback**
- Automated keeping of the ship electronic logbook (the E-Logbook is type-approved by DNV but requires flag state approval)
- Events logging automatically, manually and according to set time intervals of up to 1 minute
- Passage planning includes environment data (currents, weather, etc)
- Advanced route planning and validation
- Passage recording playback function in compliance with IEC requirements regarding 12 hour log
- Vessel track recording with high frequency up to 1 second and for period of up to 15 days
- Track to text conversion via built-in Data Tool utility

**Charts and Databases**
- Multiple operation modes with charts in 7 different formats. Primarily official ENC/SENC but also Transas vector TX-97 (with worldwide coverage, ARCS, etc) including online updates.
- World Ports, Magnetic variation, Tides and Currents databases implemented

**Sensors**
- Connection to RS6 main processor unit NMEA/RS422 serial ports directly
- Discrete signal connection to main unit Digital Input / Output ports
- Analog signal connection via WAGO modules (Onboard systems for presentation on Conning display)
- Additional Sensors connection to 16 NMEA serial ports Data Collector Unit (DCU)

**Interface with External Systems/Sensors**
- Integrates with AIS equipment in compliance with IEC61993/2 standard
- AIS binary messaging support (Meteo Info for Great Lakes area e.g.)
- Incorporated Radar Processor board providing the RAW Radar picture overlay from external radar (optional)
- Automatically reads processes and overlays messages from NAVTEX to the electronic navigation chart
- Tender tracking on electronic chart using SeeTrac Interface (Optional)
- Input data from the following systems in accordance with IEC 61162-1:
- Positioning (GGA, GLL, VTG, RMC, DTM, ZDA, GBS, GNS); Gyrocompass x 2 (HDG, ROT); Speed Log (VHW, VBW); Magnetic Compass (HDT); Echo Sounder (DBT, DPT); Wind Sensor (MWV, VWR); Water Temperature Indicator (MTW); Digitiser YEOMAN (WPL, GLL); Alarm Station (ALR, ACK, analog data via WAGO converters); Customised NMEA sentences; Target data from two ARPA's
- Output the following NMEA data:
  - Navigational Data (GGA, GLL, VTG, VHW, VDR, WPL, RTE, ZDA, XTE, GBS, DTM, HDT, ROT, VBW, APB, BOD, BWC, OSD)
  - Route Segment Transmission (RTE, WPL sentences)
  - Alarms
Navi-Radar 4000 MFD is the 3rd generation RADAR system from Transas. A PC-based system, it’s fully compliant with the latest IMO, IHO and IEC standards and resolutions for ARPA, AIS and Chart Radar. Navi-Radar 4000 MFD allows full integration and multitasking of Chart Radar/ARPA and ECDIS on one workstation.

**Transas Navi-Radar 4000 MFD Features**

**Graphic User Interface and main ARPA tasks**
- User friendly, clear and logically structured interface
- Handling of primary radar information
- Set of ranges: 0.25; 0.5; 0.75; 1.5; 3; 6; 12; 24; 48 nautical miles
- North-up/ Course-up/ Head-up orientation display
- Display of radar information in the true and relative motion modes
- True and relative motion target vectors
- Display of radar picture with centre shifted to up to 2/3 of the screen radius
- Display of two electronic range and bearing lines with offset possibility in drop and carry mode
- Display of four electronic Index lines
- Trial manoeuvre

**Charts**
- Chart Radar with support of different chart formats: SENC/ENC/S-57 and Transas TX-97 charts
- Selection of chart infills (coloured, monochrome) or contours
- Separate layer of objects (MAP) for storage of notes and service information not connected with official chart correction data

**Targets**
- Target data from ARPA for collision avoidance
- Displays
- Targets form AIS for easy identification
- Association of AIS targets with ARPA targets
- Acquires and processes ARPA tasks (up to 80 targets)
- Displays of up to 256 AIS targets

**Interface with External Systems**
- Display of a route loaded from external systems ECDIS/positioning system
- Reception of position, course, speed and route information from the connected external sensors in accordance with NMEA 0183 standard; (IEC 61162 ed.1/2)
- Reception of water and ground speed information from the connected dual axis log in accordance with NMEA 0183 standard; (IEC 61162 ed.1/2)
- Reception and display of routes
- Output of tracked targets (ARPA and AIS) parameters in TTM telegram as per NMEA 0183 standard; (IEC 61162 ed.1/2)
- Output of own ship parameters in RSD and OSD telegram as per NMEA 0183 standard; (IEC 61162 ed.1/2)

**Alerts display & acknowledgment**
- Setting of CPA/TCPA limits
- Control of target association
- Control of target discrimination
- Accumulation of radar signal
- Clutter suppression facilities
- Control of EBL/VRM

**Switching layers on/off**
- Switching on/off target vectors and their length
- Switching on/off scales
- Setting of CPA/TCPA limits
- Switching on/off target marks
- Control of target association
- Control of target discrimination
- Control of target filtering
- Clutter suppression facilities
- Control of EBL/VRM

**Control of parallel index line**
- Cursor data
- Control of parallel index line

**Reference point in use**
- Navigation mode
- Chart Radar
- Radar mode and band
- Auto or manual true mode

**Set the scanner range**
- Distance between range rings
- Stabilisation mode
- Set the radar to transmission
- Set the pulse length

**MD application loading or switching**
- Switching layers on/off
- Warning display
- MD application loading or switching
TRANSAS NAVI-CONNING 4000

Transas Conning Display is available as an option to Navi-Sailor 4000 MFD and Navi-Radar 4000MFD and runs on any of the workstations in a 4000 MFD network.

Transas Navi-Conning 4000 Basic Functions

Navi-Conning enables systems integration and ease of craft/vessel control by a navigators team/officer on watch. The system allows an operator to monitor the environment and vessel’s primary parameters at a glance. One of Navi-Conning’s benefits is the flexibility to meet the bespoke requirements of each customer and to provide optimal information (layout) for different work situations. The customer is able to customise his own Conning Display from a range of existing Screen Views and CCTV Video Servers supported.

Conning customisation

Navi-Conning is a fully customisable product enabling Transas to work closely with its customers to produce a tailored conning package. The main customisations are:

• Creation/design of New Screen Views — each base Screen View can be supplemented with the required indicators available in another base Screen View, whereas unnecessary indicators can be removed. Graphics are vector based and can easily be resized
• Development of New Indicators/graphics — new indicators/graphics can be developed to supplement those provided in the basic Screen View utility
• Development of New Interfaces — various proprietary binary and other interfaces for connection to NC4000

SOFTWARE OPTIONS

Transas Navi-AMS 4000 Alarm Monitoring System

Alarm Monitoring System (AMS) is an additional MFD task to accumulate and display Alarms and Warnings in the MFD from various sources. AMS also indicates which workstation or task generated the Alarm/Warning, and tracks the History.

There are two alarm management system schemes available in the current version:

• Default Alarm management scheme, which conforms to IEC 62288 requirements
• Alarm Station management scheme based on the requirements of:
  – Lloyds register 2003, NAV1 IBS
  – DNV RULES FOR CLASSIFICATION OF SHIPS, NAUT-AW, NAUT-OSV (NAUT-OSV is specific for each ship model)

Configuration of Alarms (Warnings) names and their groups displayed in the Alarm Monitoring System task is available via the integral configuration utility.

Alarms and Warnings may be processed by the following interfaces:

• MFD Alarm interface
• NMEA (ALR, ACK)
• WAGO ADC I/O interface
• RS6 I/O interface
Track Control System

Track control system (TCS) used together with sensors for position, course and speed is designed to keep the vessel on the plotted route. Operation of Track Control functionality is compliant with IEC 62065 standard and is available in 3 categories A/B/C. Transas offers the most advanced category “C” (complete route with controllable turn).

Navi-Planner 4000

Navi-Planner 4000 is an additional integrated application in MFD and a standalone product. The main purpose of Navi-Planner 4000 is to assist the officer to conduct the administrative tasks of voyage planning and create a safe and efficient voyage plan. The user creates a voyage plan with route editor with possibility of route checking to exclude unreliable cartographic areas and calculate under keel clearance (UKC) along a route. The system interacts with various databases to automatically extract the relevant information needed for the plan. Navi Planner 4004 is designed to fully plan and conduct a passage plan electronically or as hybrid with a combination of electronic charts and paper publications.

The Voyage Plan functionality was created in close cooperation with OCIMF vetting inspectors, ship owners and navigation officers as well as the IMO Resolutions, like IMO A.916(22) (Guidelines for the recording of events related to navigation) and IMO A.893(21) (Guidelines for Voyage Planning).

Navi-Planner software for onboard and office use offers:
- Port to port planning providing a full and detailed Voyage Plan
- Under Keel Clearance calculation within XTE along planned route
- Automation of navigation tasks and planning
- Detailed Voyage Plan reports
- Reports
- Export and import functions
- Standalone or Integrated with NS 4000 MFD

Transas Navi-Planner 4000 functions:
- Input of general information about vessel and voyage
- Route editor with route checking (safety parameters) and Under Keel Clearance (UKC) calculation
- Schedule creation including ETDs, ETAs and STAY time for each Waypoint. It also offers weather optimising with SPOS (optional)
- Creation of reference points
  - Automatic Generation of editable Reference Points
  - Dangerous Area - Manual Input
  - Reporting Points - Manual Input
- Creation of AddInfo graphic layer that can be used as Aids to Navigation including Lines, Symbols, Text and to each symbol attachments such as PDF, JPEG and BMP
- Information about charts and publications to be used
  - Automatic Charts status of ENC and its corrections
  - Manual Input for Paper Charts and Nautical Publications
- Data collection of Charts, Reference Points, UKC, Tides (Total Tide) and Currents for Voyage plan document and print outs
- Tidal calculations and presentation throughout the voyage
- Printout of Voyage plan and reports as well as print preview
- Export functionality to open format such as Excel, PDF and HTML.
Electronic Logbook

In addition to the standard logbook in Navi-Sailor 4000 ECDIS, Transas have developed an advanced DNV type-approved Electronic Logbook that could replace the ships paper Logbook. The new E-Logbook is based on IMO Resolution A.916 (22) – Guidelines for the recording of events related to navigation.

Transas E-Logbook is type-approved by DNV and various flag states (e.g. Norway) to replace the on board paper logbook.

Main features of the E-Logbook:
- Effective Ship's Logbook with presentation similar to paper Ship's Logbook
- Printout replicates paper Ship's Logbook
- Various types of printout
- Entry correction
- Protection from unauthorised entries in Ship's Logbook
- Automatic filling of events by rank and family name of a watch officer
- View all changes made by a watch officer
- Archiving of Logbook at two year duration
- Export Ship's Logbook to read-only format (PDF)
- Transfer archived Logbook external media
- Open and read archived Ship's Logbook
- Print Preview function
- Print out entire Ship's Logbook or desired period using date filter
- Synchronisation in Network

Precise Navigation Tools

(Trial Manoeuvering 3000 / Curved Headline / Predictor)

These functions improve safety of sailing in waters with intensive ship traffic. They can calculate the own ship safe manoeuvre parameters (course, start time).

New functionality allows prediction of the ship's position in a preset time interval and plotting on electronic chart.

Radar Overlay in ECDIS

Radar Overlay software option gives a possibility to display radar overlay from vessel's main radar in Transas Navi-Sailor 4000 ECDIS via Transas Radar Integrator Board RIB 6 or RIB 2. When Transas Navi-Radar 4000 is installed simultaneously with Transas Navi-Sailor 4000 ECDIS, the radar picture is shared on all work stations on the common 4000 MFD network without any additional hardware or software.

FleetView Online

A simple, yet sophisticated internet-based fleet tracking and management package, FleetView Online is a valuable office tool enabling constant vessel monitoring from any web enabled location in a secure online environment.

- Animated weather overlay providing data such as swell, wind direction and significant wave height over a 5-day forecast. Includes detailed Tropical Storms
- Unlimited track history displayed in graphical or tabular form
- Data Position Reports (DPRs) and Polling functionality – via Inmarsat C, Inmarsat D+ or Inmarsat Mini-C.
- Proven system to support crisis management (ISM Code requirement)
- User definable chart areas and port shortcuts (search by country/region)

Ice charts option

Ice charts contain the distribution of ice of different age, concentration and forms. This feature displays ice conditions for a certain sea area or the whole sea.

ECDIS MFD allows simultaneous display of up to 6 different semi-transparent layers (different kinds of ice information), with an individual transparency setting for each layer.

The following Ice Chart formats can be presented:
- Ice condition Actual – Actual charts of ice allocation in S-57 format. Charts are based on information from NOAA, Terra, Radarsat, data from hydro-meteo-stations and vessels
- Ice condition forecast – Forecast charts of ice allocation in S-57 format
- Recommended Ways – Recommended ways for ice navigation presented in S-57 format
- Images – Raster images from satellites (Geo TIFF)
### Scanners

<table>
<thead>
<tr>
<th>Scanner type</th>
<th>Antenna length</th>
<th>Power</th>
<th>Weight, kg (Outer Assembly / Inner Accessories)</th>
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</thead>
<tbody>
<tr>
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<td>12 feet</td>
<td>30 kW</td>
<td>255 / 12</td>
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<tr>
<td>X – Band</td>
<td>9 feet</td>
<td>25 kW</td>
<td>44 / 6</td>
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<tr>
<td>X – Band</td>
<td>7.5 feet</td>
<td>10 kW</td>
<td>38.7 / 7</td>
</tr>
<tr>
<td>X – Band</td>
<td>6 feet</td>
<td>25 kW</td>
<td>40 / 6</td>
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<td>10 kW</td>
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<td>X – Band</td>
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<td>4 kW</td>
<td>36.3 / 7</td>
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<td>X – Band</td>
<td>4 feet</td>
<td>4 kW</td>
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### Monitors

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<th>Weight, kg (w/bracket)</th>
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<tr>
<td>19”</td>
<td>H 483 W 444 D 82</td>
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<td>23”</td>
<td>H 584 W 334 D 85</td>
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### Computers

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<td>H 150 W 220 D 300</td>
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<td>H 150 W 260 D 300</td>
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### Keyboards

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<th>Weight, kg</th>
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<tr>
<td>Keyboard and Trackball</td>
<td>Overall – 80</td>
<td>464 x 166</td>
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<tr>
<td>Trackball only</td>
<td>Chassis – 35</td>
<td>105 x 166</td>
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### Options and Accessories

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<td>Overall – 40</td>
<td>278 x 221</td>
</tr>
<tr>
<td>RIB6</td>
<td>Overall – 40</td>
<td>237 x 221</td>
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<table>
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<td>DCU6 with brackets</td>
<td>Overall – 43</td>
<td>470 x 199</td>
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<tr>
<td>DCU6</td>
<td>Overall – 43</td>
<td>430 x 199</td>
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<table>
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<th>Ethernet switch</th>
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<tr>
<td>8 ports</td>
<td>H 54 W 145 D 117 (without DIN rail)</td>
<td>0.7</td>
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<tr>
<td>16 ports</td>
<td>H 73 W 145 D 117 (without DIN rail)</td>
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<th>Weight, kg</th>
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<td>220VAC – 24VDC</td>
<td>H 132 W 306 D 153</td>
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<tr>
<td>24CDC – 24VDC</td>
<td>H 132 W 178 D 153</td>
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