



Case Study

Rugged Membrane HMI Controls. *For International Forklift Manufacturer.*

Toyota was looking for an expert to provide a complete control panel that would meet the unique operating requirements for the forklift. EAO was chosen for the project.

Toyota wanted to work with a vendor who could provide just-in-time delivery of the panels, including spare parts or replacement components if necessary. EAO prides itself on service flexibility and logistics.

“Toyota required durable and reliable, high-end components for this top-of-the-line vehicle.”

Company Profile

Customer
Toyota Material Handling

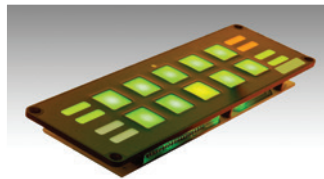
Market
Material Handling

Application
Control panel for high end electric forklift

EAO Series
Series 70 membrane



Toyota has standardized this control panel for VCE 150A due to its reliability and durability.



Series 70 Switch components provide excellent tactile feedback and meet the rugged demands of membrane switches.

Business Challenge

The Toyota BT Vector VCE150A forklift is a powerful electric forklift designed specifically for pallet handling in narrow aisles with high racking systems. The forklift can extend 7-8 meters up and operate for two shifts on a single battery charge. The forklift includes a unique articulated steering system for easy manoeuvrability.

Toyota was looking for a single vendor to provide a complete control panel that would meet the unique operating requirements for the forklift. Toyota required durable and reliable, high-end components for this top-of-the-line vehicle. The forklift would be used in industrial warehouse applications, including cold storage, and needed to operate reliably in conditions that might range from -30°C to +30°C. The controls would also allow for operation by a driver wearing gloves.

The panel needed to fit an existing cut-out of 30 x 22 cm and contain 21 single switches and two double switches plus a display window. In addition to control panel requirements, Toyota wanted to work with a vendor who could provide Just-In-Time delivery of the panels, including spare parts or replacement components if necessary.

Solution

EAO worked with Toyota's design criteria and developed the control panel for the BT Vector VCE 150A in 2000.

Toyota was familiar with EAO from previous applications where reliability was an asset. Toyota selected EAO based on EAO's Human Machine Interface (HMI) Systems expertise as well as its engineering capabilities. EAO provides the complete solution that Toyota requires, including development, assembly, packing, and JIT delivery.

The EAO design incorporated the Series 70 membrane switching systems. The Series 70 provides bright illumination in five possible single colours, dual colour illumination, and illumination dispersment over the complete touch surface of either round or square lens configurations. These tactile switches are mounted behind an overlay and meet the demands of the rugged application that Toyota required. They are directly connected to a PCB interface. The compact size of these switches allowed EAO to meet the space constraints of the panel controller. The layout is in a keypad style configuration along with an integrated display and function keys. The membrane switching system proves to be ideal for severe warehouse use and cold storage activities.

The EAO control panel remains a standard feature on the VCE 150A due to its reliability and durability. *It remains essentially the same configuration that was introduced over a decade ago, a tribute to its design and durability.*

Contact

EAO AG
Tannwaldstrasse 88
CH-4601 Olten, Switzerland
Tel. +41 62 286 91 11
Fax +41 62 296 21 62
info@eao.com

More information
www.eao.com/downloads



The control panel is used on a Toyota Vehicle Handling VCE 150A.

Toyota has standardized on this panel for the VCE 150A series and EAO keeps 30-40 panels on hand at any given time to meet demand. EAO provides roughly 300 pieces per year.

Results

The EAO control panel remains a standard feature on the VCE 150A due to its reliability and durability. Over the last ten years, EAO and Toyota have worked together on some very minor revisions to the panel, but it remains basically the same configuration that was introduced in 2000.

The primary benefits to Toyota are:

- An easy-to-use and attractive control panel for this top-of-the-line electric forklift
- Brightly illuminated, membrane switching system with single and double size switches for ease-of-use
- Product reliability and durability, with ten years of successful field use in harsh operating conditions (cold storage)
- A single vendor source for a complete solution including development, assembly, and packing
- Responsive supply chain implementation with 30-40 panels on-hand and JIT delivery

It's important to work with an HMI expert who can address all the human factors, technical and commercial considerations of a complex HMI development project.

EAO is a global partner and manufacturer of HMI Systems and HMI Components to a range of markets including machinery and

automation, public transport, automotive design, special purpose and heavy-duty vehicles, as well as many others that involve an interaction between humans and machines. EAO is here to make this interaction innovative, intuitive and reliable.

EAO's components and systems undergo rigorous testing to assure reliability, repeatability, and long service life. EAO is ISO 9001, ISO 14001, IRIS, and ISO/TS 16949 certified for automotive and other industry requirements.