APPLICATION NOTE

Sensata Technologies

SELF-PROPELLED SCISSOR LIFTS

Background

Self-propelled scissor lifts, the most common type of Mobile Elevating Work Platforms (MEWPs) move vertically through folding supports in a 'X' pattern, known as a scissor mechanism. They are classified in 2 main categories based on how they are powered and where they are used. Battery-powered (or electric) scissor lifts are used mainly indoors on slab surfaces, while the engine-powered lifts are used outdoors where the surfaces are frequently uneven (for this reason they are commonly referred to be for 'rough terrain'). Regardless of how they are powered, they have many sensors and controls to manage movement, safety, and mainly stability (operators on the platform are subject to fall hazards, therefore safety is a priority).

"All functions and movements are controlled using Sensata's platform control systems and sensors to guarantee compliance with international safety standards"

Solution

Operator Controls:

For decades, Sensata has been a market-leading supplier of complete platform control systems for scissor lifts, either battery or engine powered. The platform control unit and the electronic control unit (or ground control unit for the engine powered) can connect and control a variety of digital and analog machine interface as joysticks, sensors, limit switches, motor controllers, pushbuttons, alarms and control them through a dedicated CAN-bus system.

The new K610 generation of scissor lift controllers integrate an open source platform, CoDeSys, which enables manufacturers to create their own customized functionality.

Motor Controls:

The M700 is a high-power hydraulic pump motor controller which can provide fully programmable control of DC series wound motors. It features microprocessor-based logic with programmable parameters and offers maximum flexibility for minimum cost. Redundant hardware and software.

Sensors:

Sensata can also supply a complete set of main sensors: the high-pressure sensor (PTE series) that controls the hydraulic pressure of the main cylinder, the angle sensor (9360 Series) used to determine the height of the platform; and the inclinometer (T series or other) to control the chassis inclination for safety reasons. The pressure and angle sensor used in combination are also aimed to control the platform overload condition, another important condition, which is required to comply with ANSI 92 and EN280 safety standards.

Rough Terrain (engine-powered) scissor lift

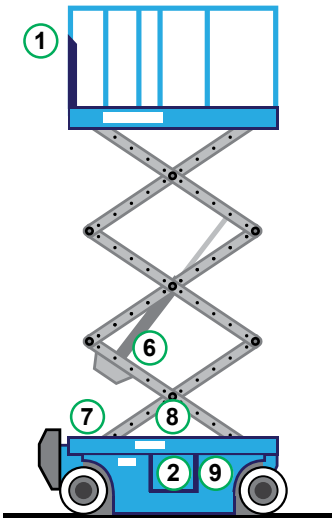
Slab (battery-powered) scissor lift

RELATED PRODUCTS

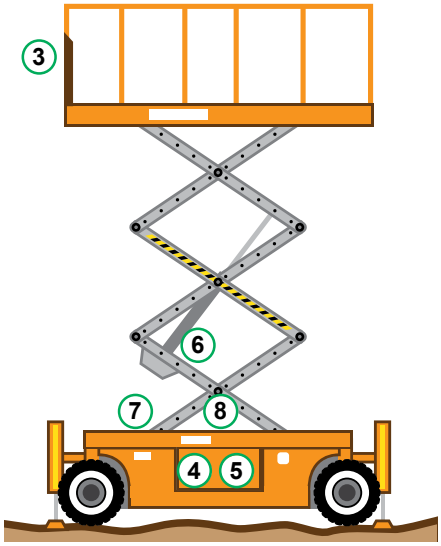
Reference on Diagram	Product		Features	Function
1		P610	• 3 Analog Inputs integrated • IP65 • USB	Platform Control Unit
2		E610	• 2 CAN, 2 USB • 40 input/output • Multi-language, • Large LCD display	Electronic Control Unit
3		PCU100	• Extensive integrated controls • IP65	Platform Control Unit
5		GCU120	• CAN, MCU • 70 input/output	Ground Control Unit
6		PTE7100	• High pressure • MSG (Micro Silicon Strain Gauge)	Pressure Sensor
7		9360 Series	• Hall effect sensor • IP67	Angle Sensor
8		T Series	• High resolution 0.01° • High accuracy 0.1°	Inclinometer
9		M700	•Pre-charge control •Redundant design hardware and software •Short duration boost capability •Can communication to ECU	DC Motor Controller

GENERAL DIAGRAM

Slab (battery-powered) scissor lift



Rough Terrain (engine-powered) scissor lift



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