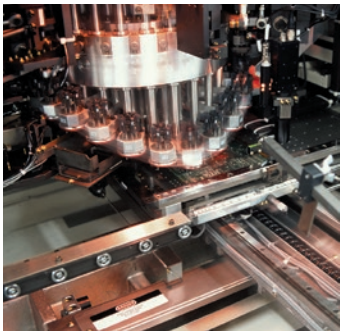




aerospace  
climate control  
**electromechanical**  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



# PSD1 Parker Servo Drive

Standalone Servo Drive and Multi-axis Servo System



ENGINEERING YOUR SUCCESS.



**WARNING – USER RESPONSIBILITY**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
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# Parker Hannifin

## The global leader in motion and control technologies

### A world class player on a local stage

#### Global Product Design

Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

#### Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs.

#### Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

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Offenburg, Germany  
Filderstadt, Germany  
Milan, Italy

##### Asia

Wuxi, China  
Jangan, Korea  
Chennai, India

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Irwin, Pennsylvania  
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Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

For contact information, please refer to the Sales Offices on the back cover of this document or visit [www.parker.com](http://www.parker.com)



Milan, Italy



Littlehampton, UK



Filderstadt, Germany



Dijon, France



# Parker Servo Drive - PSD

## Overview

### Description

The PSD1 is Parker Servo Drive family, available with different power rating from 2 to 30A and form factors. Today the offering contains:

The PSD1-S is a standalone drive which can be connected directly to the main supply.

The PSD1-M is a multi-axis servo system where each axis module can supply up to three servo motors. The base configuration consists of a common DC bus supply and multiples PSD1-M modules, connected through DC bus bars. The modules are available as one, two or three axis versions. This makes the system highly flexible.

PSD1-M servo system is particularly suitable for all centralised automation systems, such as those found in many packaging machines, where large numbers of drives are often required offering significant advantages.

- Packaging machines
- Material forming machines
- Handling machines
- General automation

### Common Features

The PSD servo drives support the following feedback systems (chosen by configuration):

- DSL (Single or Multiturn) Single cable solution
- Resolver
- 1 Vpp Rotary and Linear Encoders
- Incremental TTL Encoders
- EtherCAT / PROFINET / Ethernet/IP
- Quick and simple wiring
- Removable SD card
- Same software functionalities for standalone drive and multi-axis servo system

PSD1-S unique features

- Single or three phases power supply
- Compact housing
- Particularly suitable for small machines

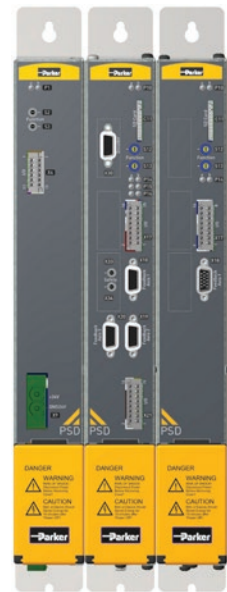
PSD1-M unique features

- The most compact multi-axis servo system on the market
- One, two or three axis versions combined in one housing
- Common DC bus connection for energy exchange between drives



### Technical characteristics - Overview

Standalone axis PSD1 S	Continuous current [A <sub>rms</sub> ]	Peak current A (≤ 2 s)
PSD1 SW1200	2	6
PSD1 SW1300	5	15



Multi axis PSD1 M	Continuous current [A <sub>rms</sub> ]	Peak current A (≤ 2 s)
PSD1 MW1300	5	10
PSD1 MW1400	8	16
PSD1 MW1600	15	30
PSD1 MW1800	30	60
PSD1 MW2220	2 + 2	4 + 4
PSD1 MW2330	5 + 5	10 + 10
PSD1 MW2440	8 + 8	16 + 16
PSD1 MW3222	2 + 2 + 2	4 + 4 + 4
PSD1 MW3433	8 + 5 + 5	16 + 10 + 10

(additional module on request)

# PSD Overview

## Communications

The support of all common Fieldbus interfaces is an essential feature of open systems. The PSD is based on the modern Ethernet based interfaces such as EtherCAT, PROFINET and Ethernet IP.

## Feedback Systems

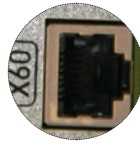
The PSD servo drives support the following feedback systems:

- DSL (Single or Multiturn) Single cable solution
- Resolver
- 1 Vpp Rotary and Linear Encoders
- Incremental TTL Encoders

All different Feedbacks can be used on identical hardware, kind of feedback can be chosen just simple configuration

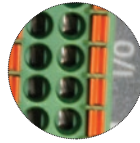
Note: On all single axis devices the full set of feedback is possible, and can be chosen by configuration. On double and triple axis modules either DSL or resolver can be configured.

EtherCAT®



### High speed communication

- Communication over Ethernet
- Onboard connection



### Inputs / Outputs

- PSD offers 4 fast digital inputs and 2 digital outputs per axis.
- Connection via fast and simple push-in direct plug-in technology.



### Motor Feedback

- Resolver, 1Vpp, TTL



### Quick and Simple Wiring

- Single cable connection between drive and SMH motor
- Reduction in wiring costs
- Increase reliability



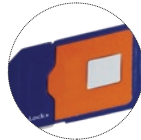
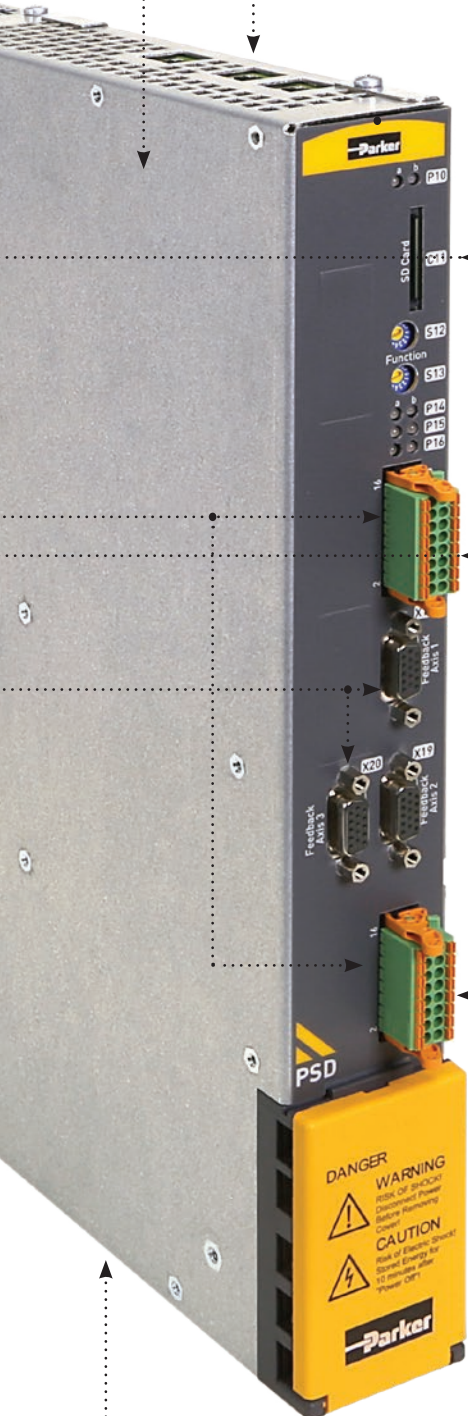
### Reduce machine footprint

- Up to 3 axis in one single housing
- Reduce the size of the cabinet
- Electronics footprint is up to 40 % smaller than traditional solutions



**High Performance and customization capabilities**

- Autotuning
- Observer technology
- Anti resonance adjustments, vibration suppression, notch-filter...
- Fast control loops (sample times):
  - Current control 62,5  $\mu$ s,
  - Speed control 125  $\mu$ s,
  - Position control 125  $\mu$ s



**Removable SD card**

- Easy exchange between drives less than 1 minute
- Software upgrade
- Parameters and application memory



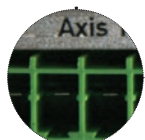
**STO Safety Functions reduce time and cost , no need additional cabling**

- 2 Safety Torque Off (STO) circuits for 3 axis module (one for axis1 and one for axis 2,3).
- 2 independent Safety Torque Off circuits for 2 axis module
- 1 Safety Torque Off circuit for 1 axis module
- Optional Safety Functions over EtherCAT FSoE



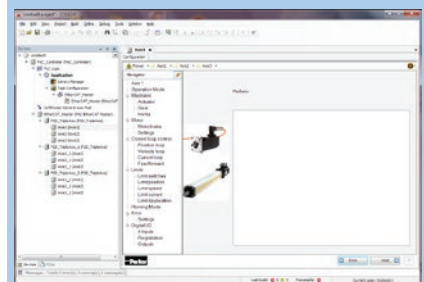
**DC Bus energy saving**

- Energy exchange between drives
- No accessories required



**PSD Configuration Plug-in**

With the help of the Parker Automation Manager (PAM) all ongoing tasks can be managed. Based on the PAM framework a complete integrated tool is available. The set-up and commissioning of the drive can be done easily using the wizard based configuration tool. Parker motors will be recognized by a electronic nameplate. Technical data for the Parker linear actuators such as ETH, HPLA etc are available in database.



**Configuration / parameterization**

- Wizard-guided query of all necessary inputs
- Graphically supported selection
- Reference to mechanical system / application


**Diagnostics / maintenance / service**

- Complete support of diagnostics and analysis functions
- Test functions
- 4-channel oscilloscope
- Signal tracking directly on the PC
- Various modes (single/normal/ auto/roll)
- Zoom function
- Export as image or table (for example to Excel)
- Enhanced optimisation possibilities for the drive technology Set-up
- Predefined motion profiles
- Convenient operation
- Automatic determination of the moment of inertia


# Technical Characteristics


## Technical Data


### PSD1 SW Standalone Axis

	Type		<b>Standalone Axis</b>			
	Input voltage	VAC	3*230 VAC ±10 % 50...60 Hz 1*230 VAC ±10 % 50...60 Hz 30...253 VAC			
	PWM Frequency nom.	kHz	8		8	
	Possible PWM frequency	kHz	4 / 8 / 16		4 / 8 / 16	
	Continuous current	A	2		5	
	Peak current (≤ 2 s)	A	6		15	

### PSD1 MW Multi-Axis Module

	Type		<b>Single Axis</b>			
	DC Bus voltage	VDC	325...680 VDC ±10 % (Rated voltage 560 VDC)			
	PWM Frequency nom.	kHz	8	8	4	4
	Possible PWM frequency	kHz	4 / 8 / 16	4 / 8 / 16	4 / 8 / 16	4 / 8 / 16
	Continuous current	A	5	8	15	30
	Peak current (≤ 2 s)	A	10	16	30	60

	Type		<b>Twin Axis</b>			
	DC Bus voltage	VDC	325...680 VDC ±10 % (Rated voltage 560 VDC)			
	PWM Frequency nom.	kHz	8	8	8	
	Possible PWM frequency	kHz	4 / 8 / 16	4 / 8 / 16	4 / 8 / 16	
	Continuous current*	A	2 + 2	5 + 5	8 + 8	
	Peak current (≤ 2 s)	A	4 + 4	10 + 10	16 + 16	

	Type		<b>Triple Axis</b>			
	DC Bus voltage	VDC	325...680 VDC ±10 % (Rated voltage 560 VDC)			
	PWM Frequency nom.	kHz	8		8	
	Possible PWM frequency	kHz	4 / 8 / 16		4 / 8 / 16	
	Continuous current*	A	2 + 2 + 2		8 + 5 + 5	
	Peak current (≤ 2 s)	A	4 + 4 + 4		16 + 10 + 10	

\*with an continuous limit current at 16A max. by module

### PSD1-MW-P - Power Supply Unit

#### Mains Supply

Power Supply Type	Unit	PSD1 MW P010			with LCG-0030-0,86mH-UL*			PSD1 MW P020			with LCG-0055-0,45mH*		
Input Voltage		3*230 ... 480 VAC ±10 % 50...60 Hz (Rated voltage 3*400 VAC)											
Output Voltage		325...680 VDC ±10 % (Rated voltage 560 VDC)											
Supplied Voltage	[VAC]	230	400	480	230	400	480	230	400	480	230	400	480
Output Power	[kVA]	6	10	10	9	15	15	12	20	20	19	30	30
Peak Output Power (<5 s)	[kVA]	12	20	20	18	30	30	24	40	40	36	60	60

#### Control Supply

Rated Input Voltage		24 VDC ±10 %											
Maximum Ripple		1 V <sub>pkpk</sub>											
Supply Current	[A]	0.2 A			0.8 A			0.3 A			0.3 A		

<sup>†</sup> Operation of the P010 and P020 power supplies with additional line choke (to be ordered separately).



## Environmental Characteristics

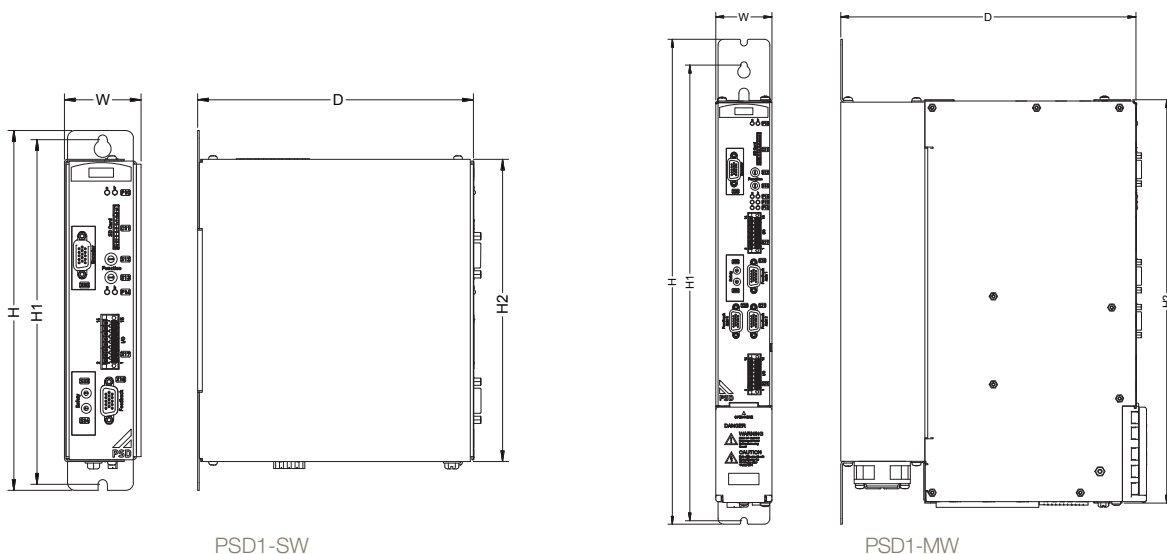
<b>Operating Temperature</b>	0...+40 °C
<b>Storage Temperature</b>	-25 °C...+70 °C
<b>Shipping Temperature</b>	-25 °C...+70 °C
<b>Product Enclosure Rating</b>	IP20 (only in closed electrical cabinet) UL open type equipment
<b>Altitude</b>	1000 m ASL. Derate output current by 1.0 % per 100 m to a maximum of 2000 m
<b>Operating Humidity</b>	Class 3K3 - Maximum 85 % non-condensing
<b>Storage Humidity</b>	Class 1K3 - Maximum 95 % non-condensing
<b>Shipping Humidity</b>	Class 2K3 - Maximum 95 % at 40 °C
<b>Operating Vibration</b>	IEC60068-2-6 10...57 Hz width 0.075 mm 57...150 Hz accel. 9.81 m/s <sup>2</sup>

## Standards & Conformance

<b>2006/95/EC</b>	Low voltage directive
<b>EN 60204-1</b>	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
<b>EN 61800-5-1</b>	Adjustable speed electrical power drive systems - safety requirements, thermal and energy
<b>UL</b>	Power Conversion Equipment UL508C
<b>2004/108/EC</b>	EMC directive
<b>EN 61800-3</b>	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test method
<b>STO</b>	Performance Level PL=e according to EN ISO 13849

## Dimensions

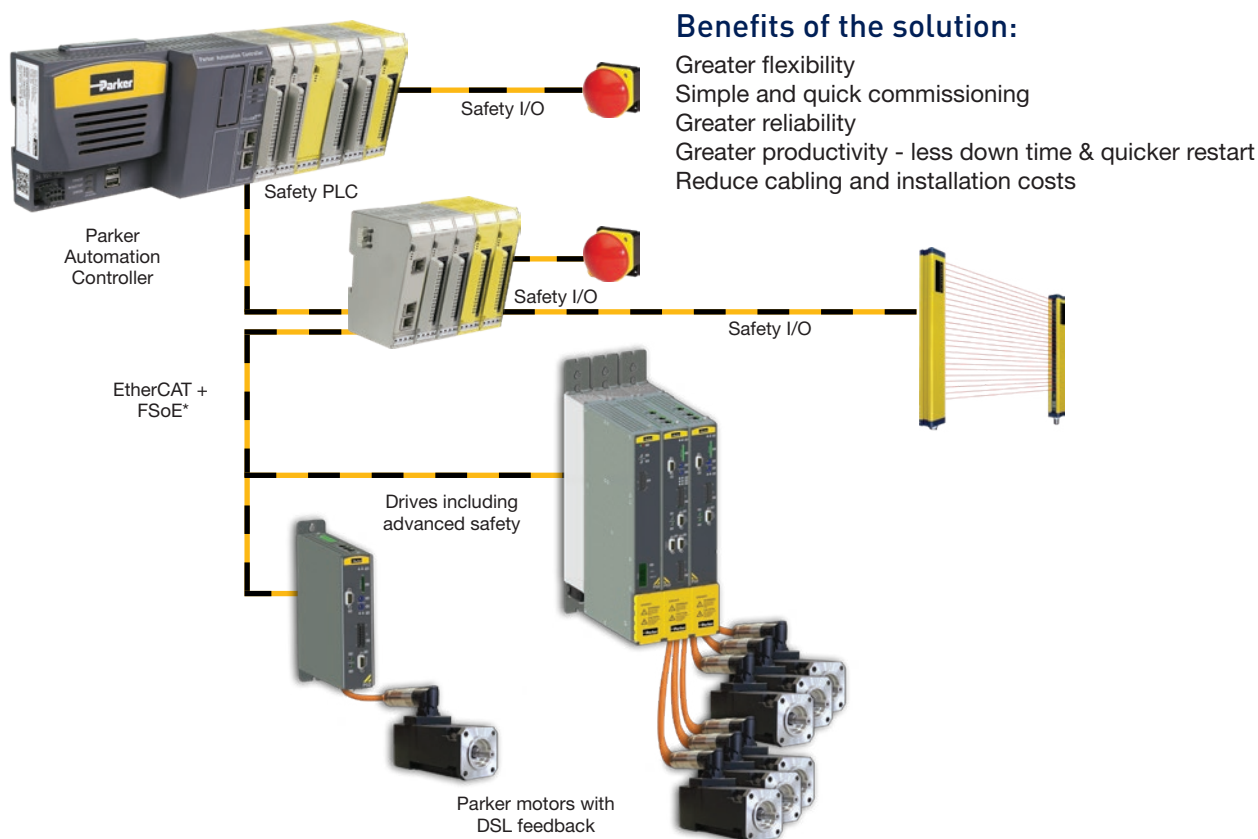
Type	H [mm]	H1 [mm]	H2 [mm]	W [mm]	D [mm]	Weight [kg]
<b>PSD1-SW</b>	235	225	200	50	180	1.8
<b>PSD1-MW 1/2/3 axes</b>	432	405	360	50	263	4.3
<b>PSD1-MW Single axis 30 A</b>	432	405	360	100	263	8.6
<b>PSD1-MW-P-010</b>	432	405	360	50	263	3.6
<b>PSD1-MW-P-020</b>	432	405	360	100	263	5.4



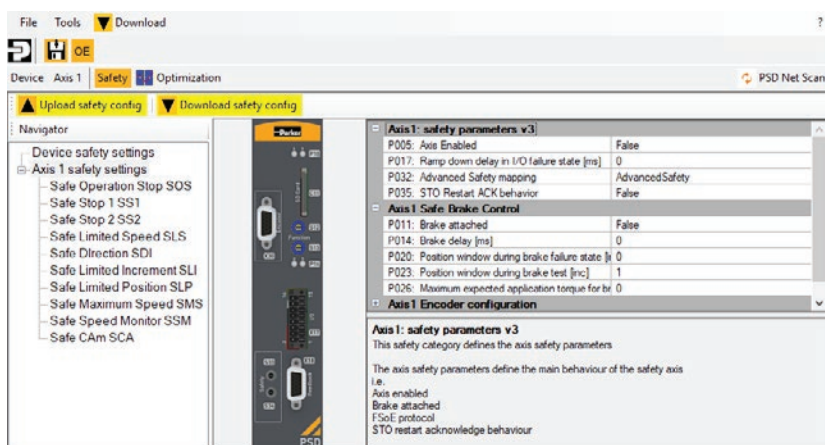
## Specific Functionalities

### Safety configuration

The Parker Servo Drives have featured "Safe Torque Off" (STO) as standard function, helping to protect users and machinery against unexpected motor start-up. Performance Level PL=e according to EN ISO 13849. In order to fulfil the new machinery directive 2006/42/EG, the PSD can be equipped with a safety option board. The system does not need any additional wiring, as the Functional Safety over EtherCAT (FSoE)\* uses the existing wiring.



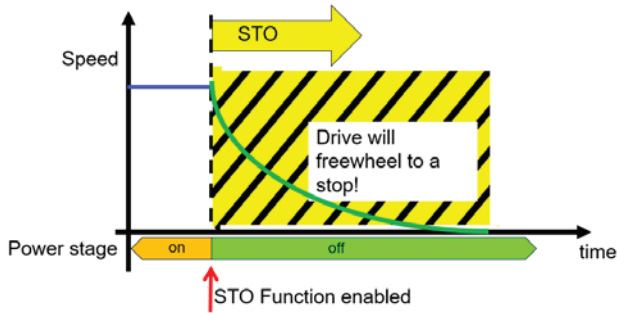
The Safety option board offers following safety functions:



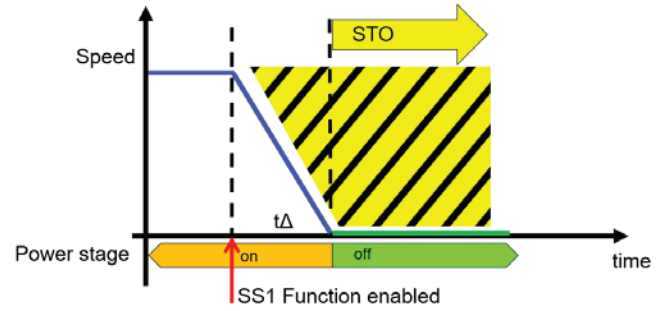
Besides the functionality shown in the picture it is possible to choose the STO either as hardwired input or via FSoE. Safe Brake Control is available as well

A few examples for the safety functions:

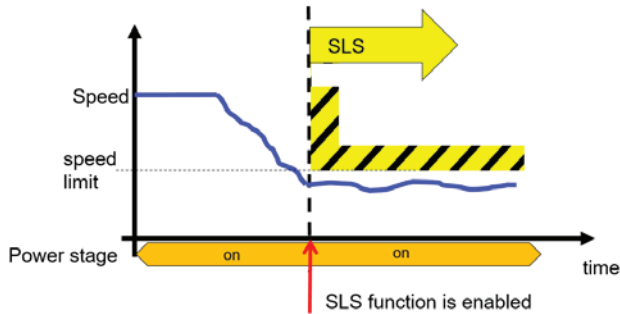
**STO: Safe Torque Off**



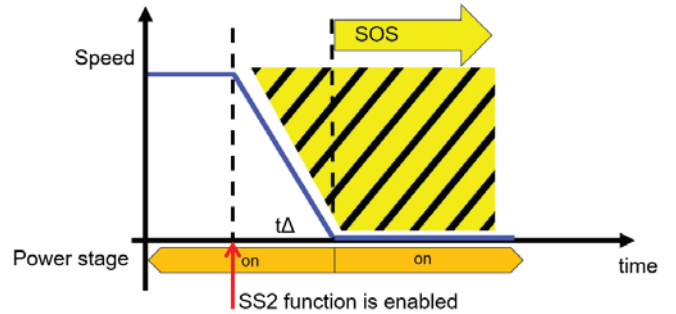
**SS1: Safe Stop 1**



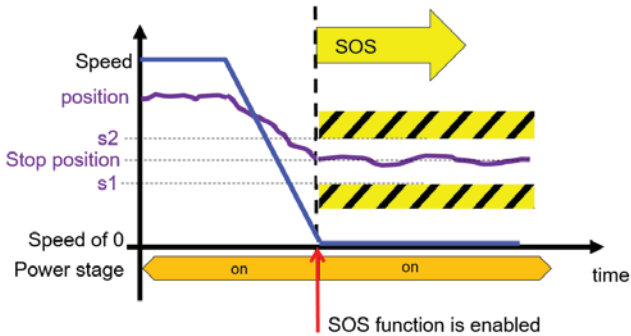
**SLS: Safe Limited Speed**



**SS2: Safe Stop 2**



**SOS: Safe Operating Stop**



# Order Code

## Parker Servo Drive PSD

	1	2	3	4	5	6	7	8	9	10	11
Order example	<b>PSD1</b>	<b>M</b>	<b>W</b>	<b>3</b>	<b>433</b>	<b>B</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>000</b>

<b>1 Drive Family</b>	<b>PSD1</b> Parker Servo Drive
<b>2 Device Type</b>	<b>S</b> Standalone 230VAC <b>M</b> Multi-axis 400VAC
<b>3 Mounting Type</b>	<b>W</b> Wall mounting
<b>4 Device Type</b>	<b>1</b> One powerstage <b>2</b> Two powerstages <b>3</b> Three powerstages <b>P</b> Power module
<b>5 Device Type</b>	<b>PSD1SW1 Standalone</b> <b>200</b> 2 Ampere <b>300</b> 5 Ampere <b>PSD1MW1 One powerstage</b> <b>300</b> 5 Ampere <b>400</b> 8 Ampere <b>600</b> 15 Ampere <b>800</b> 30 Ampere <b>PSD1MW2 Two powerstages</b> <b>220</b> 2 + 2 Ampere <b>330</b> 5 + 5 Ampere <b>440</b> 8 + 8 Ampere <b>PSD1MW3 Three powerstages</b> <b>222</b> 2 + 2 + 2 Ampere <b>433</b> 8 + 5 + 5 Ampere <b>PSD1MWP Passive power supply</b> <b>010</b> 10 kVA <b>020</b> 20 kVA

<b>6 Technology</b>	<b>B</b> Basic
<b>7 Interface</b>	<b>1</b> EtherCAT <b>2</b> EtherCAT, PROFINET, Ethernet/IP
<b>8 Feedback</b>	<b>1</b> DSL® <b>2</b> DSL®, Resolver, Encoder (1 Vss) <sup>1</sup> , Encoder A/B (TTL) <sup>1</sup> , Analog Hall (1 Vss) <sup>1</sup> ,
<b>9 Option 1</b>	<b>0</b> No option <b>1</b> Functional Safety over Ethercat <sup>2</sup>
<b>10 Option 2</b>	<b>0</b> No option
<b>11 Customisation</b>	<b>000</b> Non customized

<sup>1</sup> Only for PSD1-S and first power stage of multi-axis unit  
PSD1MW1 ...

<sup>2</sup> Only available with Interface 1: EtherCAT and Feedback 1: Hiperface DSL®



## Accessories

Braking Resistors	Description	Compatible with
ACB-0004-01	0.1kW	PSD1SW1200/300
ACB-0005-01	0,12kW	PSD1SW1200/300
ACB-0001-01	0.50kW	PSD1MWP010
ACB-0002-01	0.50kW	PSD1MWP020
ACB-0003-01	1.50kW	PSD1MWP020

Motor Choke	Description	Compatible with
ECM-0005-01	1mH; 7A; Motor Cable Length >50m	PSD1SW1200/300
ECM-0004-01	3,6mH; 6,3A; Motor Cable Length >50m	PSD1MW1/2/3
ECM-0001-01	2mH; 16A; Motor Cable Length >50m	PSD1MW1
ECM-0002-01	1,1mH; 30A; Motor Cable Length >50m	PSD1MW1

Mains Filters	Description	Compatible with
ECP-0001-01	Single phase; Motor Cable Length >10m	PSD1SW1200/300
ECP-0002-01	3 phase; Motor Cable Length >10m	PSD1SW1200/300
ECP-0003-01	Motor Cable Length < 6*10m	PSD1MWP010
ECP-0003-02	Motor Cable Length < 6*50m	PSD1MWP010
ECP-0003-03	Motor Cable Length < 6*50m	PSD1MWP020

Fieldbus Accessories	Description	Compatible with
CBD000C0-T00-T00-0002-00	EtherCAT cable	PSD1MWP010
CBD000C0-T00-T00-0005-00	EtherCAT cable	PSD1MWP020
CBD000C0-T00-T00-0010-00	EtherCAT cable	PSD1MWP020

Mains Choke	Description	Compatible with
IND-0001-02	0,86mH; 30A; UL	PSD1MWP010
IND-0002-01	0,45mH; 55A	PSD1MWP020
IND-0002-02	0,45mH; 55A; UL	PSD1MWP020





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**MX – Mexico, Toluca**  
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### EMEA Product Information Centre

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### US Product Information Centre

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