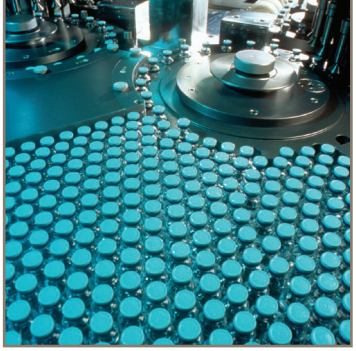
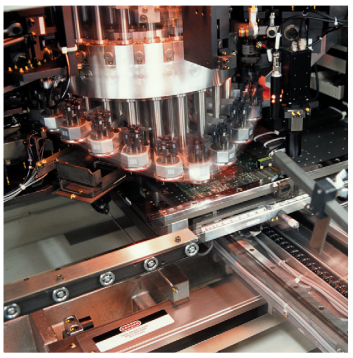
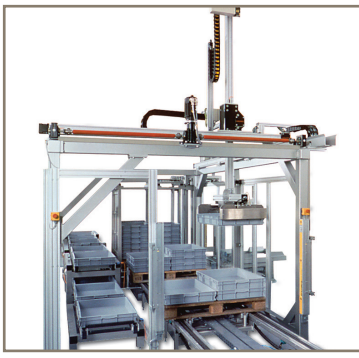




Servonet DC

Decentralized double-axis servo drive



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The global leader in motion and control technologies

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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.

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Electromechanical Worldwide Manufacturing Locations

Europe
Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia
Wuxi, China
Jangan, Korea
Chennai, India

North America
Rohnert Park, California
Irwin, Pennsylvania
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Milan, Italy

Littlehampton, UK

Filderstadt, Germany

Dijon, France

Decentralised Double-Axis Servo Drive with Robust IP67 Housing - Servonet DC

Overview

Description

Servonet DC is a double-axis servo drive built in a robust IP67 housing, allowing the drive to be used in rough environments outside the cabinet and close to the motor. The system is completed by a wide range of rotary and linear servo motors, a power supply and an interface module, which is the only system component which remains in the cabinet. The wiring of the system is fast and easy thanks to the hybrid cable, transferring power and communication.
Ideally suited to multi-axis applications with a number of drives mounted in close proximity on the machine, Servonet DC allows a decentralised motion control approach. Motion control functionality is executed by means of EtherCAT communication or optionally CANopen DS402 communication, allowing substantial savings in time and materials, while reducing machine footprints.
Typical applications for Servonet DC include packaging machines and rotary tables where numerous drives and motors are mounted on the machine.

Technical Characteristics - Overview

Model	Current		DC Voltage	
	Continuous [A]	Peak [A]	Min [VDC]	Max [VDC]
SDC20505NxxxxK000	5 + 5	10 + 10	300	680
SDC21005NxxxxK000	10 + 5	20 + 10		
SDC21010NxxxxK000	10 + 10	20+20		

Application

- **Food, pharmaceuticals & beverage**
- **Packaging machines**
- **Material forming**
- **Material handling**
- **Factory automation**
- **Robotics**

Features

- **Multi-axis servo system**
- **Double axis servo drive module (5A/5A, 10A/5A or 10A/10A)**
- **Power range from 2.7 kW to 10.8 kW**
- **Protection class IP67**
- **Fieldbus: EtherCAT (option CANopen)**
- **Feedback: DSL®, resolver**

Servonet DC

Overview

Machine design becomes very easy because of the modular nature of Servonet DC, additional axes can be added with minimal effort, simply by duplicating schematic drawings from other axes. This not only reduces engineering time and costs, but simplifies build and significantly improves time to market.

Servonet DC works on a common DC bus power supply that allows the system to absorb and re-supply much of the braking energy to other Servonet DC units rather than dissipating it in the form of heat via external resistors. In some instances, resistors can be removed completely and in others smaller resistors are sufficient.

Servonet DC solutions are usable together with motor integrated drives of the Motornet DC family, as the cabling concept and communication is identical.

Machines equipped with Servonet DC have a minimal machine footprint: power supply and interface module being the only additional components required in the cabinet. The electronics footprint is up to 70 % smaller than traditional centralised solutions. Additionally, all wiring changes are made on the machine via plug and socket connections rather than in the electrical cabinet.

EtherCAT®

High speed communication

- Communication over Ethernet via TCP/IP.
- Onboard EtherCAT connection
- 100 Mbit/s, 500 µs cycle time

Optional motor feedback

- Resolver, Hiperface, Hall

Quick and simple wiring

- Reduction in wiring costs
- Increased reliability
- SpeedTec

DSL feedback interface

- Single cable feedback interface as standard
- Electronic motor nameplate

HIPERFACE® DSL

Inputs / outputs

- Servonet DC offers 1 digital input and 1 digital selectable input/output
- Connection via fast and simple push-in direct plug-in technology.

EtherCAT monitor

- EtherCAT alias address or CAN address
- 2 communication's status led

DC bus energy saving

- Energy exchange between drives
- No accessories required

Configuration Software - MotionWiz -

MotionWiz is free of charge downloadable configuration software that allows users to configure and optimise the Servonet DC series with a few easy clicks of the mouse.

MotionWiz features an intuitive, easy and simple to use Windows® style environment to aid installation, optimisation and diagnostic use.

MotionWiz permits operation in both “on line” mode, directly in the controller, and in “offline” mode, remotely on the PC before downloading to the controller.

MotionWiz allows users to copy the configuration from one application to another to simplify the configuration of systems with a large number of similar axes but with different motion profiles.

Inside the MotionWiz configurator is a database containing the technical characteristics of the full range of Parker motors and drives.

MotionWiz can be downloaded from www.parker.com/eme

Technical Characteristics

Electrical Characteristics

Servonet DC

Servonet DC Model	Unit	SDC20505	SDC21005	SDC21010
Continous Current	[A]	5 + 5	10 + 5	10 + 10
Peak Current	[A]	10 + 10	20 + 10	20 + 20
DC Voltage Min	[VDC]	300		
DC Voltage Max	[V]	680		

PSUP - Power Supply Unit

Mains Supply

Power Supply Type	Unit	PSUP10			PSUP20			PSUP30 (2)		
Input Voltage		3*230...480 VAC ±10 % 50...60 Hz (Rated voltage 3*400 VAC)								
Output Voltage		325...680 VDC ±10 %								
Supplied Voltage	[VAC]	230	400	480	230	400	480	230	400	480
Output Power	[kVA]	6	10	10	12	20	20	18	30	30
Output Peak Power (<5 s)	[kVA]	12	20	20	24	40	40	34	60	60

Control Supply

Rated Input Voltage		24 VDC ±10 %		
Maximum Ripple		1 V_{pkpk}		
Supply Current	[A]	PSUP10D6: 0,2 A	PSUP20D6: 0,3 A	PSUP30D6: 0,3 A

(2) Operation of the PSUP30 only with line choke.

PSI - Power Supply Fieldbus Interface for Servonet DC

Power Supply Interface	Unit	PSI5	PSI10	PSI20
Supply Voltage				
DC Voltage Range	[V]	300...750 VDC		
Regenerative Braking				
Capacity	[µF]	470	940	940
Storable Energy	[WS]	75@400 VAC 42@480 VAC	150@400 VAC 84@480 VAC	150@400 VAC 84@480 VAC

PSC - Capacitor Module

Capacitor Module	Unit	PSC023	PSC047	PSC068
Capacity	[µF]	2300	4700	6800

Environmental Characteristics

Servonet DC, PSUP - Power Supply Unit and PSI - Power Supply Interface

Temperature			
	• Operating Temperature: 0...+40 °C • Storage Temperature: -25...+55 °C • Shipping Temperature: -25...+70 °C		
Product Enclosure Rating			
	Servonet DC	**PSUP**	**PSI**
	IP65 / IP67	IP20 (only in closed electrical cabinet) UL open type equipment	
Altitude			
	1000 m ASL. Derate output current by 1.5 % per 100 m to a maximum of 2000 m		
Humidity			
	• Operating Humidity: Class 3K3 - Maximum 85 % non-condensing • Storage Humidity: Class 1K3 - Maximum 95 % non-condensing • Shipping Humidity: Class 2K3 - Maximum 95 % at 40 °C		
Operating Vibration			
	Servonet DC	**PSUP**	**PSI**
	IEC60068-2-6 10...57 Hz width 0.075 mm 57...150 Hz accel. 9.81 m/s^2		

Standards & Conformance

Servonet DC

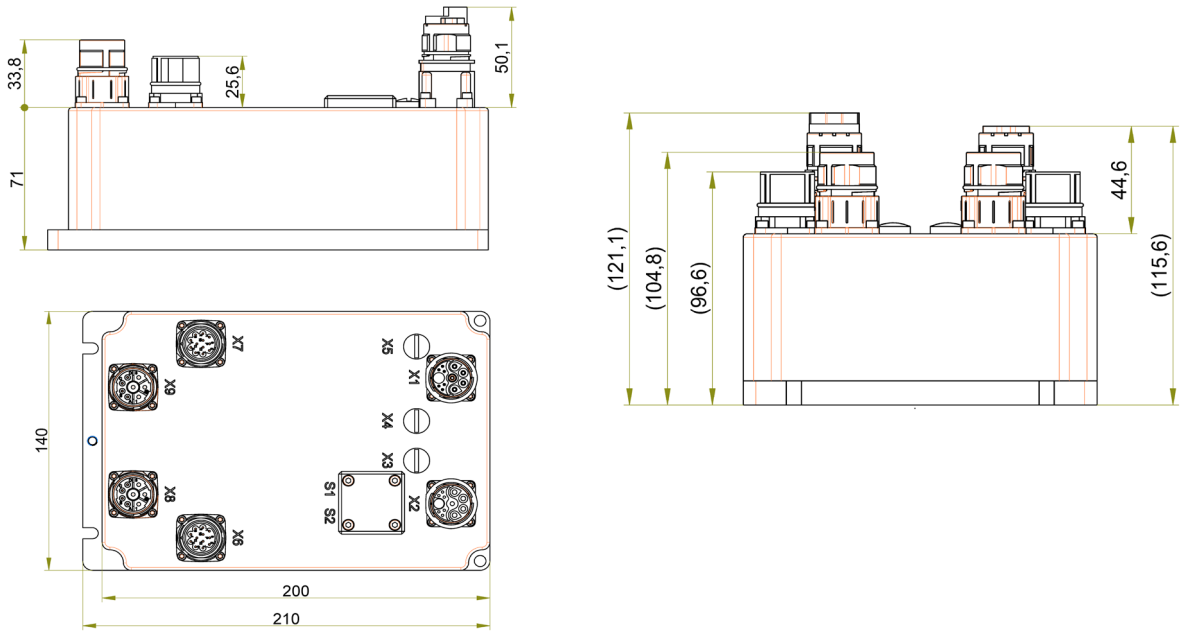
2014/35/EU	
	Low Voltage Directive
EN61800-5-1	
	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
UL61800-5-1	
	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy (under preparation)
CSA22.2 No. 274-13	
	(Canada) Power Conversion Equipment (under preparation)
2014/30/EU	
	EMC Directive
EN61800-3	
	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test method

PSUP - Power Supply Unit and PSI - Power Supply Interface for Servonet DC

2006/95/EC	
	Low voltage directive
2004/108/CE	
	EMC Directive
EN 61800-3	
	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test method
EN 61800-5-1	
	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
UL508C	
	(USA) Power Conversion Equipment
CSA22.2 No. 274-13	
	(Canada) Power Conversion Equipment

Dimensions

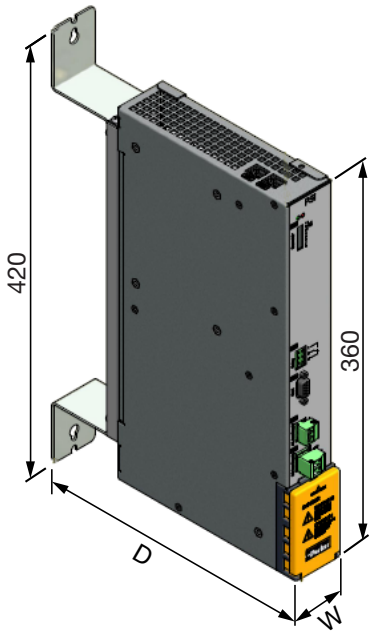
Servonet DC



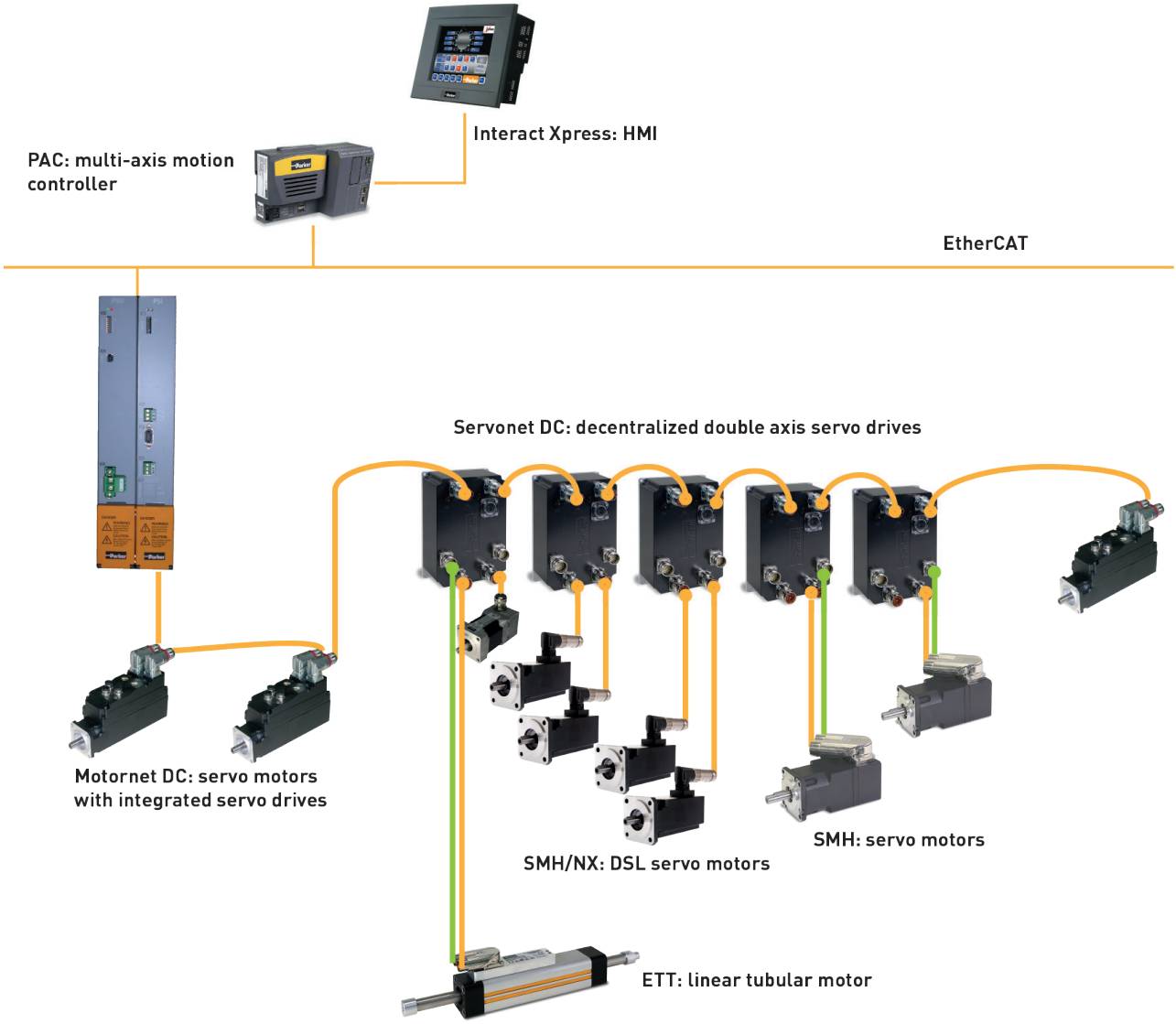
Type	H [mm]	W [mm]	D [mm]	Weight [kg]
SDC20505	71	210	140	2.3
SDC21005				
SDC21010				

PSU - Power Supply Unit and PSI - Power Supply Interface for Servonet DC

Type	W [mm]	D [mm]	Weight [kg]
PSUP10, PSI5/PSI10/PSI20	50	270	3.6
PSUP20/PSUP30	100	270	5.4



Hybrid Integrated Motion Solutions



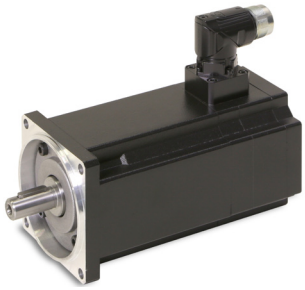
In this example Servonet DC is shown in a system which also uses the Motornet DC servo motors with integrated servo drives, SMB/H single cable DSL servo motors series, InteractXpress series HMI, PAC multi-axis controller with I/O to form a complete integrated hybrid motion solution. This type of architecture can be used for the complete control of packaging or process lines.

PAC Parker Automation Controller
Centralised motion control for precise multi-axis synchronisation

Designed for OEMs to maximize efficiencies while exceeding performance expectations, the EtherCAT based Parker Automation Controller (PAC) combines machine logic, signal handling, and high-speed motion control into a standards based, performance driven, fan-less and din rail mountable solution.
This programmable automation controller comes equipped with a native, uninterrupted EtherCAT bus for high-speed I/O and motion control, a modular interface slot for 3rd Party device communication, standard Ethernet and USB ports, and onboard SD program storage. Programmed with the Parker Automation Manager software, OEMs can produce efficient, high-performance control systems based on the IEC61131-3 and PLCopen Motion standards.

SMH-MH
Low inertia brushless servo motors

The MH and SMH series of highly-dynamic brushless servo motors utilise "salient pole" technology to produce an extremely compact design. Motor dimensions are drastically reduced and significant gains in terms of torque and dynamic performance are achieved. The high quality Neodymium-Iron-Boron magnets and the encapsulation method used to fasten them to the shaft, allow the two series to achieve very high acceleration and withstand high overloads without risk of demagnetisation or detachment of the magnets. The MH and SMH series are avalaible in sizes from 0.2 to 285 Nm.

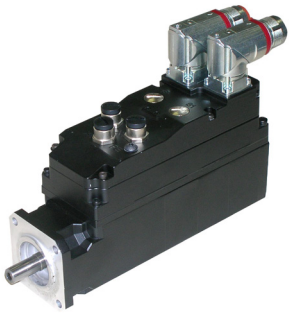


Parker Servo Drive PSD1
Flexible and compact multi-axis servo drive

The PSD1 is Parker Servo Drive series, available with different power rating and in a variety of form factors. Today the offering contains:
The PSD1 S standalone version which can be connected directly to the main supply. The PSD1 M, a multi-axis system where each power 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 in one, two and three-axis versions, making the system very flexible.
PSD-M servo drive is particularly suitable for all centralised automation systems, such as those found in many packaging machines, where large numbers of drives are often required.

Motornet DC
Decentralized motion control solution to reduce wiring and complexity

Motornet DC is a brushless servo motor system with integrated servo drive, supplied from a DC-bus voltage. Hybrid power, control and communications cables, a power supply and interface module complete the system and local I/O's can be connected directly to the motor.
Ideally suited to multi-axis applications where a number of motors are mounted in close proximity on the machine, Motornet DC allows a decentralized approach to motion control to be taken.



Order Code

Servonet DC

	1	2	3	4	5	6	7	8
Example	**SDC**	**2**	**1005**	**N**	**1**	**H**	**00**	**K000**

1	**Product type**	
	SDC	Servonet DC servo drive
2	**Number of axis**	
	2	2 Axis available
3	**Size [A]**	
	0505	Axis one 5 A, axis two 5 A
	1005	Axis one 10 A, axis two 5 A
	1010	Axis one 10 A, axis two 10 A
4	**Feedback type**	
	N	Fixed field (Hiperface DSL & resolver)
5	**Fieldbus**	
	1	EtherCAT
	2	CANopen
6	**Safety**	
	H	In development
7	**Option**	
	00	No option
8	**Customizing**	
	K000	No Custom Version

PSUP - Mains Module

	1	2	3		4	5
Example	**PSU**	**P**	**10**	**D6**	**USB**	**M00**

1	**Device family**	
	PSU	Power module
2	**Device type**	
	P	Power module
3	**Nominal power; supply voltage**	
	10 D6	10 kW; 400 VAC (3-phase)
	20 D6	20 kW; 400 VAC (3-phase)
	30 D6	30 kW; 400 VAC (3-phase) [1]
4	**Interface**	
	USB	USB connection
5	**Options**	
	M00	No additional supplement

[1] Operation of the PSUP30 only with line choke. Required line choke for the PSUP30: 0.45 mH / 55 A

PSI - Power Supply Interface

	1	2	3
Example	**PSI**	**10**	**P**

1	**Device type**	
	PSI	Power supply interface for Servonet DC
2	**Power**	
	5	5 kW rating
	10	10 kW rating
	20	20 kW rating

Capacitor Module

	1	2
Order example	**PSC**	**023 M00**

1	**Accessories**	
	PSC	Capacitor module
2	**Type**	
	023 M00	2300 µF no additional supplement
	047 M00	4700 µF no additional supplement
	068 M00	6800 µF no additional supplement

Mains filter for PSUP

	1	2
Order example	**NFI**	**03/01**

1	**Accessories**	
	NFI	Mains filter
2	**Type**	
	03/01	For PSUP10 Reference axis combination 3 x 480 V 25 A 6 x 10 m motor cable length
	03/02	For PSUP10 Reference axis combination 3 x 480 V 25 A 6 x 50 m motor cable length
	03/03	For PSUP20, PSUP30 Reference axis combination 3 x 480 V 50 A 6 x 50 m motor cable length

Braking Resistors

	1	2
Order example	**BRM**	**05/01**

1	**Accessories**	
	BRM	Braking resistor
2	**Type**	
	13/01	30 Ω / 0.5 $kW_{cont.}$ for PSUP10D6, for PSUP20D6 (2x30Ω parallel)
	14/01	15 Ω / 0.5 $kW_{cont.}$ for PSUP10D6 (2 x 15 Ω in series) for PSUP20, PSUP30
	12/01	18 Ω / 4.5 $kW_{cont.}$ for PSUP30

Servonet DC/Motornet DC Hybrid Cables

	1	2	3	4
Order example	**HYBCA**	**0030**	**PSI**	**4**

1	**Cable type**	
	HYBCA	Hybrid cable for Servonet DC/Motornet DC
2	**Length (x10 mm)**	
	0030	300 mm
	0100	1000 mm (1 m)
	1000	10 m
	Note: maximum cable length is 15 m	
3	**Connector Type**	
	PSI	Wired cable for PSI to Servonet DC with PSI connector and female mating Servonet DC connector
	MDC	Wired cable for Servonet DC to Servonet DC with male and female mating Servonet DC connectors
4	**Cable Size**	
	Empty field	2.5 mm^2 cable size
	4	4.0 mm^2 cable size

Cables options

HYBCA1	Servonet DC hybrid cable only (no connectors) - 1 m length / 2.5 mm^2
HYBCA4	Servonet DC hybrid cable only (no connectors) - 1 m length / 4 mm^2
CONMDCMV	Servonet DC hybrid connector (male)
CONMDCFV	Servonet DC hybrid connector (female)
TAPMDCETH	Terminal cup for Servonet DC/Motornet DC
TAPMDCETHS	Terminal cup for Servonet DC/Motornet DC EtherCAT
TAPMDCCANS	Terminal cup for Servonet DC/Motornet DC CANbus

Power Motor Cables Accessories

HYBCA-U	Hybrid cable 200 mm for connecting 2 Servonet DC drives
CBACAP00-M23-SDX-0000-00	Cover for M23 interconnectron receptable (plastic black)
CBACAM-M23-SDX-0000-00	Cover for M23 Phoenix receptable (metal)

Power Motor Cables

	1	2	3	4	5	6	7	8
Example	**CBM**	**007**	**H**	**D**	**M23**	**SDX**	**0050**	**00**

1	**Cable type**	
	CBM	Motor motor cable
2	**Cable Section**	
	007	Section 0.75 mm^2
	010	Section 1 mm^2
	015	Section 1.5 mm^2
	025	Section 2.5 mm^2
3	**Cable Type**	
	S	Standard motor cable
	H	High flex motor cable
4	**Brake**	
	0	Power cable without brake
	B	Power cable with brake
	D	Power DSL cable with brake
5	**Motor Connection Type**	
	M15	Interconnectron connector
	M23	Interconnectron connector motor type: Mx 70,105,145 SMx 60,82,100,115,142
	TBX	Terminal box solution
6	**Drive Connection Type**	
	SDX	Servonet DC
7	**Cable Length**	
	0030	3 m
	0050	5 m
	0070	7 m
	0100	10 m
8	**Fixed Field**	
	00	Fixed field

Feedback Motor Cables

	1	2	3	4	5	6	7	8
Example	**CBF**	**RE0**	**H**	**0**	**M23**	**SDX**	**0050**	**00**

1	**Cable type**	
	CBF	Feedback motor cable
2	**Feedback Type**	
	RE0	Resolver
	HF0	Hiperface
	IN0	Incremental
	HL0	Hall
3	**Cable Type**	
	H	High flex feedback cable
4	**Brake**	
	0	Fixed field
5	**Motor Connection Type**	
	M15	Interconnectron connector
	M23	Interconnectron connector motor type: Mx 70,105,145 SMx 60,82,100,115,142
	TBX	Terminal box solution
6	**Drive Connection Type**	
	SDX	Servonet DC
7	**Cable Length**	
	0030	3 m
	0050	5 m
	0070	7 m
	0100	10 m
8	**Fixed Field**	
	00	Fixed field

Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374

Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes

Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO_2 controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves

Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydrostatic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions

Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems

Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors

Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves

Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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