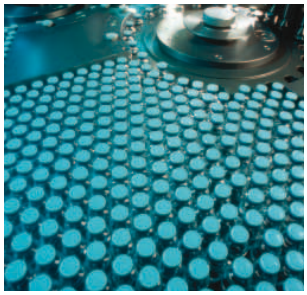

aerospace
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pneumatics
process control
sealing & shielding

TWIN-N and SPD-N

Digital Servo Drives

Parker

ENGINEERING YOUR SUCCESS.

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- 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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Digital Servo Drives - TWIN-N & SPD-N

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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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Offenburg, Germany
Milan, Italy

Asia
Shanghai, China
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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

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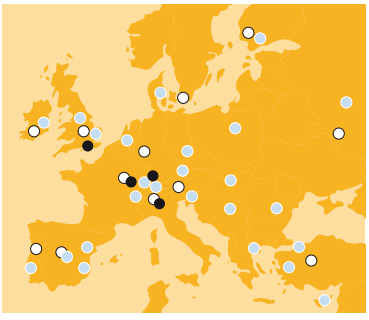
Littlehampton, UK



Manufacturing
Parker Sales Offices
Distributors

Dijon, France

Digital Servo Drives - TWIN-N & SPD-N

Overview

Description

TWIN-N is a series of fully-digital, compact and highperformance servo drives for the simultaneous and independent control of two brushless motors.
The TWIN-N series is suitable for multiaxis applications where compact size and reduced costs are priority factors.
The TWIN-N is complemented by the SPD-N, which adds a single axis option.
The TWIN-N comprises 3 different models which are able to supply, on a continuative basis, a nominal current from 2 A to 8 A (per axis) and a peak current of 4 A to 16 A (per axis).
The TWIN-N/SPD-N drives are designed for single phase/three phase 230 VAC supply or 380-480 VAC three-phase supply.
TWIN-N/SPD-N drives are designed for market sectors such as packaging, pick&place, tobacco machines, automatic stores, and automatic machinery in general, where rapid acceleration and deceleration are critical application factors.

Features

- Current, torque and speed control
- Electronic cams, positioner
- Electric shaft
- Virtual master
- PLC integrated (256 steps)
- Configurable feedback
- Internal braking resistor
- Safety relay optional Cat. 3 EN954-1
- DC Bus connection to the terminal board possible

Technical Characteristics - Overview

Power supply	200...277 VAC monophase (±10 %) 50-60 Hz (±5 %) 200...480 VAC three-phase (±10 %) 50-60 Hz (±5 %)
Control supply	24 VDC (0/+10 %)
Operation temperature	0...45 °C
Operation humidity	<85 % non condensing
Altitude	1000 m asl with 1,5 % derating every 100 m
Protection Rating	IP20
International standard	CE; UL, cUL, CSA (optional) not available for SPD16N

Two axis Module TWIN-N

Model	Nominal current [A]	Peak current [A]	Peak current time [s]
TWIN2N	2	4	2
TWIN5N	5	10	
TWIN8N	8	16	

Single axis Module SPD-N

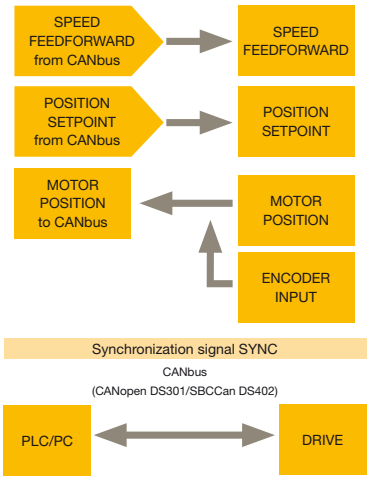
Model	Nominal current [A]	Peak current [A]	Peak current time [s]
SPD2N	2	4	2
SPD5N	5	10	
SPD8N	8	16	
SPD16N	16	32	

Overview

The parameter based TWIN-N/SPD-N operator interface makes it easy to configure the drive. Standard configurations of different kinds make it suitable for many applications. The TWIN-N can control two brushless motors by a single drive. This feature allows space savings within the electrical panel for multi-axis configurations. TWIN-N comprises two separate drives that can be used totally independently.
The SPD-N drive is the single drive, single axis version. The drive features a series of integrated auxiliary functions that allow reduced application programming, offering considerable cost saving.
It uses widely used industrial programming standards and guarantees a high degree of flexibility in selecting inputs and outputs. It is also possible to create custom functions within the drive, such as speed or position loop gain control, or active torque control for tool wear monitoring, etc. It can be configured through the serial keypad, serial comms or CANbus.

Fieldbus

The TWIN-N/SPD-N series have CANbus built in as standard, and can therefore be integrated directly into a CAN network without further additional parts.
The CANbus port on board the drive can be programmed to dialogue with the CANopen DS301/DS402 profile or with propriety profile SBCCan (factory default), which is a propriety motion bus on the CANbus layer specifically optimised for motion control applications.
The TWIN-N/SPD-N series can be integrated into networks with Profibus-DP and Devicenet protocol. This connection is via an external Bridge, using the CANbus port programmed with SBCCan protocol.
EtherCAT bus, based on the industrial standard Ethernet, has been implemented within the TWIN-N option so to best exploit the industrial PC capabilities.



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Technical Characteristics

General Characteristics

TWIN-N, SPD-N

Model		TWIN2N	TWIN5N	TWIN8N	-
		SPD2N	SPD5N	SPD8N	SPD16N
Power supply and current					
Rated output current *	[Aeff]	2	5	8	16
Peak output current (2 s)*	[A]	4	10	16	32 (24@8kHz)
Shaft power *	[kW]	1.0	2.6	4.2	7.5
Continuous service installed load*	[kVA]	1.4	3.5	5.6	11.2
Control electronics dissipation*	[W]	25	60	88	180
Internal fan capacity	[m^3/h]	135			
Switching frequency	[kHz]	8			4
Output frequency	[Hz]	0...450			
Dynamic braking and intermediate DC circuit					
Internal DC capacitors	[µF]	470 ±20 %			680 ±20 %
Braking resistor internal/ external	[Ω]	40			
Peak internal braking power	[kW]	16,2			
Continuous internal braking power	[W]	120			
Max duty cycle (internal resistance)	[%]	0.75			

) the value for TWIN-N is for each of the two axis.

TWIN-N and SPD-N Features

Feedback	
	• Resolver (TWIN-N, SPD-N) • Encoder (TWIN-NE, SPD-NE)
Auxiliary encoder input	
	in quatrature encoder (coupled)
Max frequency	
	400 kHz
RS422 encoder simulation output	
	4...65 000 steps/rev
Max frequency	
	160 kHz
Serial link	
	RS422 / RS485
Fieldbus	
	CAN ISO/DIS11898
Inputs / outputs (each single axis)	
	• 4 digital inputs 0...24 V • 2 digital outputs • 1 differential analog reference ±10 V • 1 differential auxiliary analog input ±10 V • 1 analog output single ended ±10 V
Safety technology	
	Built-in Safety relay cat.3 in compliance with EN954-1

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Electrical Characteristics

Power supply

Model		TWIN-N/SPD-N
	Unit	Control stage
Supply voltage	[VDC]	24 V (0...+10 %)
Current rating of the external power supply	[A]	2
Control electronics dissipation	[W]	25
EMC filter	-	internal
		Power stage
Mains frequency	[Hz]	50...60 ±5 %
Supply voltage	[VAC]	3-phase: 200...480 ±10 % 1-phase: 200...277 ±10 %
DC voltage range	[VDC]	282...678 ±10 %

Environmental Characteristics

Ambient conditions

Temperature range	
	• Operating temperature: 0…+45 °C (+32…+113 °F) • Storage temperature: 1K4 class, -20 …+55 °C (-4…+131 °F) • Transportation temperature: 2K3 class, -25 … +70 °C (-13…+158 °F)
Humidity	
	Humidity: 3K3 class • Relative: <85 % without ice and condensation • Absolute: <25 g/m^3
Altitude (*)	
	≤1000 m asl (≤3281 feet asl)
Protection Rating	
	IP20 (only in close electric cabinet), UL open type equipment
Pollution degree	
	2 or lower (no conductive dust allowed)

* For higher installation altitude, derate the output current by 1.5 % each 100 m up to 2000 m maximum

Standards and Conformance

Safety standards	
	• 2006/95/EC: Low voltage directive • EN 61800-5-1: Adjustable speed electrical power drive systems - Part 5-1: Safety requirements, electrical, thermal and energy
Certification	
	• UL: UL508C (USA) Power Conversion Equipment • CSA: CSA22.2 Nr. 14-05 (Canada) Power Conversion Equipment
Electromagnetic compatibility	
	• 2004/108/EC: EMC directive • EN 61800-3: Adjustable speed electrical power drive systems - Part 3: EMC requirement and specific test methods

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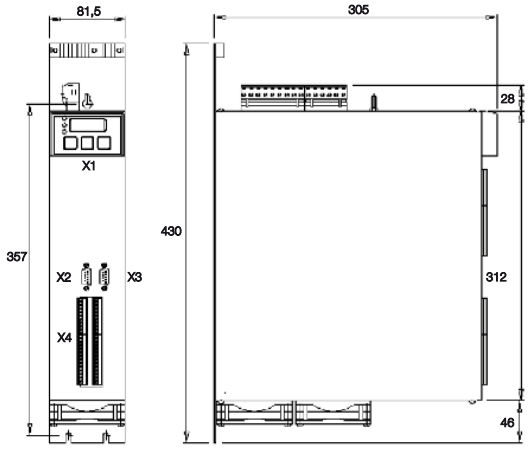
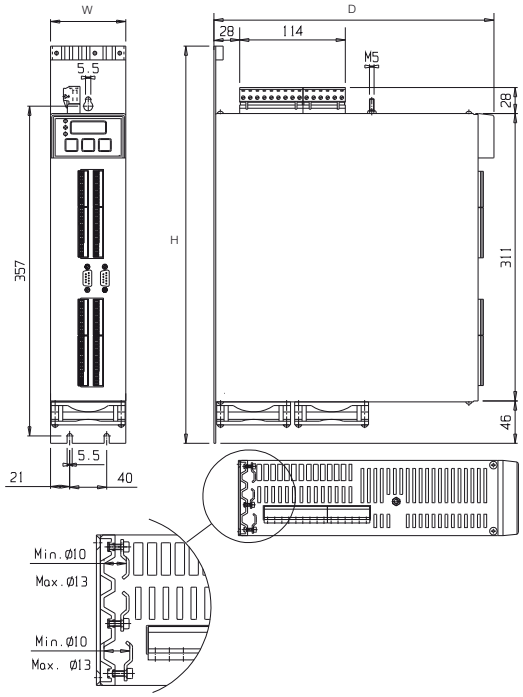
Dimensions

SPD-N 2-5-8-16



TWIN-N 2-5-8



Model	H [mm]	W [mm]	D [mm]	Weight [kg]
TWIN-N	430	81.5	303	6.5
SPD-N				

Connector Layout

Power connection terminal box	• Line • Motor 1 • Motor 2 • DC Bus
Connection terminal box Axis 1	• 2 opto isolated digital inputs 24 VDC (shared with axis 1 and axis 2) • 2 opto isolated digital outputs (axis 1) • 1 differential analog reference ±10 V (axis 1) • 1 differential auxiliary analog input ±10 V (axis 1) • 1 analog output ±10 V single ended (axis 1) • 1 Resolver or encoder SinCos or digital input + Hall probe • 1 configurable encoder input • 1 configurable encoder output
Connection terminal box Axis 2 (only TWIN-N)	• 4 opto isolated digital inputs 24 VDC (axis 2) • 2 opto isolated digital outputs (axis 2) • 1 differential analog reference ±10 V (axis 2) • 1 differential auxiliary analog input ±10 V (axis 2) • 1 analog output ± 10V single ended (axis 2) • 1 Resolver input • 1 configurable encoder input • 1 configurable encoder output • Configurable CAN interface • RS422/485 interface

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Accessories and Options

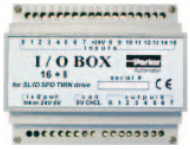
Keypad

SK158/S
Display Module for SPD-N series
SK158/T
Display Module for TWIN-N series

I/O Expansion Module

SK135/S

- 16 in + 8 out
- SBCCAN interface



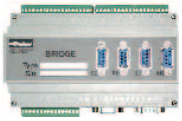
Cables

- Power and signal cables for resolver, incremental and absolute encoder and SinCos feedback
- Cable to connect a Bridge with several TWIN-N/SPD-N

Network Bridge

Interface protocol:

- DeviceNet
- Profibus DP



Fieldbus

- SBCCan (standard)
- CANopen (DS301, DS402)
- EtherCAT

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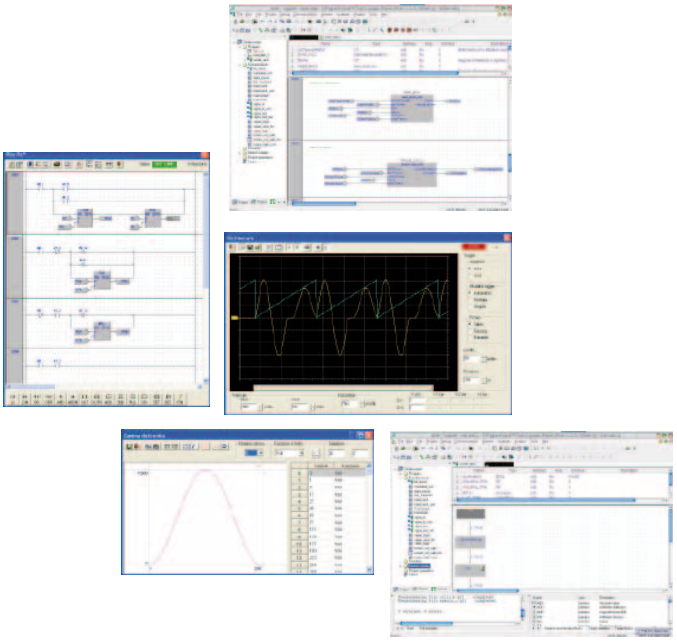
Software

MotionWiz

The free MotionWiz configuration software is available to configure the TWIN system with just a few clicks of the mouse. MotionWiz features an easy and "friendly" interface to speed up installation, optimisation and diagnostics procedures. To simplify configuration, MotionWiz shows a typical Windows® environment on the monitor with dialogue windows and toolbars.
MotionWiz permits performing operations in both "on line" mode, directly in the mechanism, and in "off line" mode in remote on the PC. In this case, personalised configuration can be sent to the mechanism subsequently.
To simplify the configuration of systems with a large number of axes but with different cuts and the same operating mode, MotionWiz permits maintaining the same mechanism configuration and only changing the type of selected motor. Inside the MotionWiz configurator is a database containing the data of standard Parker motors.
MotionWiz incorporates "picoPLC", a built-in PLC enviroment programmable with standard language. PicoPLC allows the external word to communicate with the drive and to execute function sequences.
This environment consists of an editor with instruction list and ladder functions that also permits online debug. comments can also be entered to the code in the editor and the programme made as application documentation can be printed in report form.



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Order Code

Digital Servo Drives - TWIN-N and SPD-N

	1	2	3	4	5	6	7	8	9	10	11
Order example	**TWIN**	**2**	**N**	**S**	**E**	**E5**	**R**	**T**	**B**	**UL**	**Z**

1	**Servo family**	
	SPD	Digital servo drives
	TWIN	Double axis digital servo drives
2	**Drive size (nominal current)**	
	2	2 A
	5	5 A
	8	8 A
	16	16 A (only SPD-N)
3	**Series**	
	N	New Series
4	**Protocol**	
	S	Protocol SBCCan (standard)
	C	Protocol CANopen (DS301)
	D	Protocol CANopen (DS402)
5	**Encoder input**	
	empty field	Resolver
	E	EnDat/incremental/SinCos Encoder Input (from motor feedback)
	H	Incremental Encoder input with Hall probe (from motor feedback)
	F	SinCos Encoder Input one sin polar step or turn
6	**Optional board**	
	E5	EtherCAT
7	**Safety relay**	
	R	Built-in Safety relay cat.3 in compliance with EN954-1
8	**Toroid and Options**	
	T	Inductance core on cables motor inside the drive
	S	Panel short cable installation
	L	Panel long cable installation
9	**Braket to fix the cable**	
	B	Without brackets to fix the cables
10	**UL Certification**	
	UL	(not available for SPD16N)
11	**Firmware revision**	
	Z	Number of firmware revision (optional only for special version up to 3 figures)

Accessories

Communication interface

	1	2
Order example	**BRIDGEN**	**PS**

1	**Bridge (communication interface)**	
	BRIDGEN	Bridge N (communication interface)
2	**Interface**	
	PS	with PROFIBUS DP
	DS	with DeviceNet
	D1S	with DeviceNet "compact"
	U	with Encoder Input - SBCCAN

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AEROSPACE

Key Markets
- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products
- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes

CLIMATE CONTROL

Key Markets
- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products
- CO^2 controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves

ELECTROMECHANICAL

Key Markets
- Aerospace
- Factory automation
- Food & beverage
- 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
- Controllers
- Gantry robots
- Gearheads
- Human machine interfaces
- Industrial PCs
- Inverters
- Linear motors, slides and stages
- Precision stages
- Stepper motors
- Servo motors, drives & controls
- Structural extrusions

FILTRATION

Key Markets
- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products
- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators

FLUID & GAS HANDLING

Key Markets
- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

Key Products
- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects

HYDRAULICS

Key Markets
- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products
- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects

PNEUMATICS

Key Markets
- Aerospace
- Conveyor & material handling
- Factory automation
- Food & beverage
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

Key Products
- Air preparation
- Compact cylinders
- Field bus valve systems
- Grippers
- Guided cylinders
- Manifolds
- Miniature fluidics
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves and controls
- Rodless cylinders
- Rotary actuators
- Tie rod cylinders
- Vacuum generators, cups & sensors

PROCESS CONTROL

Key Markets
- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

Key Products
- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds

SEALING & SHIELDING

Key Markets
- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products
- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

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